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2024 TECHNOLOGY REPORT

ISBANK Subsidiary

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IMPRESSUM

PREFACE

M. Bülent Özçengel

AUTHORS

Prof. Dr. Ahmet Kırman
Ahmet Kocamaz
Ali Can Işıtman
Ali Faruk Göksu
Aslı Abacı
Aydın Bozdemir
Dr. Aylin Şahin
Balca Yılmaz
Barış Karakullukçu
Dr. Burcu Sakız
Bülent Siyah
Cahit Barkın Özer
Ceren Sever
Doruk Keser
Ebru Bağran
Emre Ölçer
Ezgi Sönmez
Fatih Günaydın
Hasan Reyhanoğlu
Dr. Hüseyin Güler
İskender Ada
Jale İpekoğlu
Nergiz Çiğdem Demiray
Ömer Barbaros Yiş
Pınar Kutsal
Salih Cemil Çetin
Serdar Salepcioğlu
Serkan Turhal
Serkan Uğraş Kaygalak
Serkan Ünsal
Tufan Aygüneş
Turan Sert
Uzm. Dr. Yusuf Yeşil
Yeşim Yürüyen

EDITORS

Aylin Öztürk
Deniz Yenihayat
Fatih Günaydın

DESIGN

Anıl Çelebi
PEP Creative Design Studio

CONTACT

Ezginur Gök
Nilüfer Yörüger
Ömer Gökçeli

LOCALIZATION

BabylonWorks

PRINT & DISTRIBUTION

PrintCenter

DEAR ESTEEMED READERS,

Each year, as we craft an introduction for the Technology Report, the anticipation we feel is as profound as the enthusiasm dedicated to curating its content. With this prelude marking the completion of the report and signaling its moment to rendezvous with you, we aspire for it to convey the labor and excitement invested in its preparation.

In a world where information on technology is often swiftly consumed and deemed outdated, we hold a distinct perspective. Acknowledging the human aspect intertwined with technology, a guiding principle in shaping the report's content, ensures its enduring significance as a point of reference with archival qualities, even as years pass.

Simultaneously, the Technology Report, now an esteemed brand in its seventh year, assumes paramount importance in illuminating the trajectory toward the future. In selecting our thematic elements, we endeavored to unravel the pivotal technologies for 2024 and beyond, delving into their impacts on, and transformations of, human life through the seasoned insights of our expert team. Furthermore, the contemplation of the essential phenomenon that distinguishes human essence from technology, a matter of increasing relevance in the era of advanced artificial intelligence permeating every facet of our existence, resonates with our esteemed authors.

Beyond the creation of the Technology Report lies the crucial endeavor to ensure its widespread accessibility. Our dedicated outreach efforts, a time-honored tradition, synchronize with the annual launch through press releases, our social media platforms, and the unveiling on our website.

Additionally, we recognize the enduring value of the Technology Report by producing tangible prints, envisaging a place within the libraries of the discerning audience. The invaluable support of our esteemed authors remains instrumental in extending its reach to a wider audience.

Complementing this, an unsung team, the silent architects of the Technology Report, invest considerable effort each year in design and presentation. The synergy between content and cover design, reflecting our narrative intent and leaving an indelible mark on the reader's memory, is a testament to their dedication, thereby contributing to the report's narrative essence.

Within the 2024 Technology Report, you will discover profound insights into technologies that we believe will significantly shape human life. As we joyously and eagerly reconnect with you this year, we hope to have realized our objective of creating content that not only captivates your reading experience but also prompts contemplation and reflection.

May technology continue to serve as a mere instrument for a world defined by peace and the safeguarding of fundamental human values.

Yours sincerely,

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FUTURE OF INDUSTRIES AND INNOVATION

PREFACE

M. BÜLENT ÖZÇENGEL

Softtech
General Manager

Reflecting on the outset of 2024, it becomes evident that in recent times, particularly with regard to technological advancements, humanity's insatiable curiosity, inventive spirit, and quest for exploration have yielded significant achievements across various domains.

Among these achievements, generative artificial intelligence stands out as particularly groundbreaking, experiencing rapid adoption. For numerous observers, it represents the most significant technological advancement since the inception of the internet. Bill Gates has emphasized its revolutionary impact, alongside the user interface, as one of the pivotal outputs of technological innovation.

There is widespread consensus regarding the transformative potential of generative AI across business practices, creative endeavors, and virtually every industry. Nevertheless, a common concern pervades: "What will be the human dimension of this transformation?"

In 2023, the significance of concepts such as climate change, sustainability, and social justice remains paramount. As a global community, we have come to appreciate the potency of collective action in light of our current circumstances. We find ourselves navigating times where acting with a sense of shared responsibility, mindful of the finite nature of our resources, is not merely optional but imperative.

The 28th UN Climate Change Conference (COP 28) convened a diverse array of participants, including signatories of the UN

Framework Convention on Climate Change (UNFCCC), non-profit organizations, companies, and various other stakeholders. Following the conclusion of this year's summit, over 100 countries pledged significant commitments to curtail carbon emissions and bolster the utilization of renewable energy sources and energy efficiency measures. Consequently, given the substantial energy requirements associated with investments in artificial intelligence, it is evident that considerations of energy efficiency must be integral to the assessment of such investments.

As energy efficiency remains a priority for governments, companies, and stakeholders across various sectors, these same entities are actively engaged in forecasting the near and medium-term future. However, such predictions are formulated within an environment characterized by escalating levels of uncertainty with each passing year.

Prominent figures in the technology sector anticipate a reconfiguration of globalization driven by the impact of artificial intelligence (AI), commonly denoted as "reglobalization." Additionally, the introduction of productive AI is expected to bring about transformative effects, especially in the domains of healthcare, defense, and climate technologies.

These advancements both inspire me as a conscientious citizen and, in a way, spark my curiosity. While we find ourselves on the cusp of revolutionary progress, the question of our role in this revolution arises. As you reach the conclusion of this article, it is worth noting that OpenAI has unveiled "Sora," a model capable of generating creative and lifelike videos based on textual commands. Indeed, it is entirely plausible that additional thresholds may have been surpassed by the time this report reaches your attention.

Contemplating our involvement in this revolution, the foremost consideration is integrating this technology into our decision-making processes. AI algorithms possess the capability to analyze vast datasets, identifying patterns and trends beyond human comprehension. By harnessing the analytical prowess of AI, we can make more informed and strategic decisions. This has the potential to expedite progress in crucial areas like health, defense, and climate change, where data-driven insights can yield life-altering outcomes.

As artificial intelligence technology swiftly integrates into every facet of our lives, the manner in which this technology is governed becomes progressively crucial. Observably, states are inclined to adopt individualized control mechanisms rather than a unified global regulatory approach. Notably, the European Union is set to implement comprehensive regulations through the "Artificial Intelligence Act" (AI Act) scheduled for enactment in 2025. This legislation will, for instance, mandate developers of large language models to adhere to copyright laws and necessitate reporting on cybersecurity and energy efficiency.

While discussions surrounding the rules, controls, and regulatory frameworks for artificial intelligence are ongoing, productive artificial intelligence is advancing at an accelerated pace. Its

potential to enhance human creativity and redefine the frontiers of innovation is expanding rapidly.

However, intellectual property rights and copyright emerge as contentious issues in the realm of technology poised to revolutionize numerous positive facets. While debates persist regarding the originality of "creative" content generated by productive artificial intelligence, precedent-setting cases have surfaced concerning the utilization of written, visual, and audio resources by artificial intelligence for educational purposes. In early January, the US media giant New York Times initiated legal action against OpenAI and Microsoft, alleging copyright infringement and unauthorized utilization of its original content. The resolutions of these lawsuits will likely shape the trajectory of copyright evolution within the emerging paradigm inclusive of machine creativity.

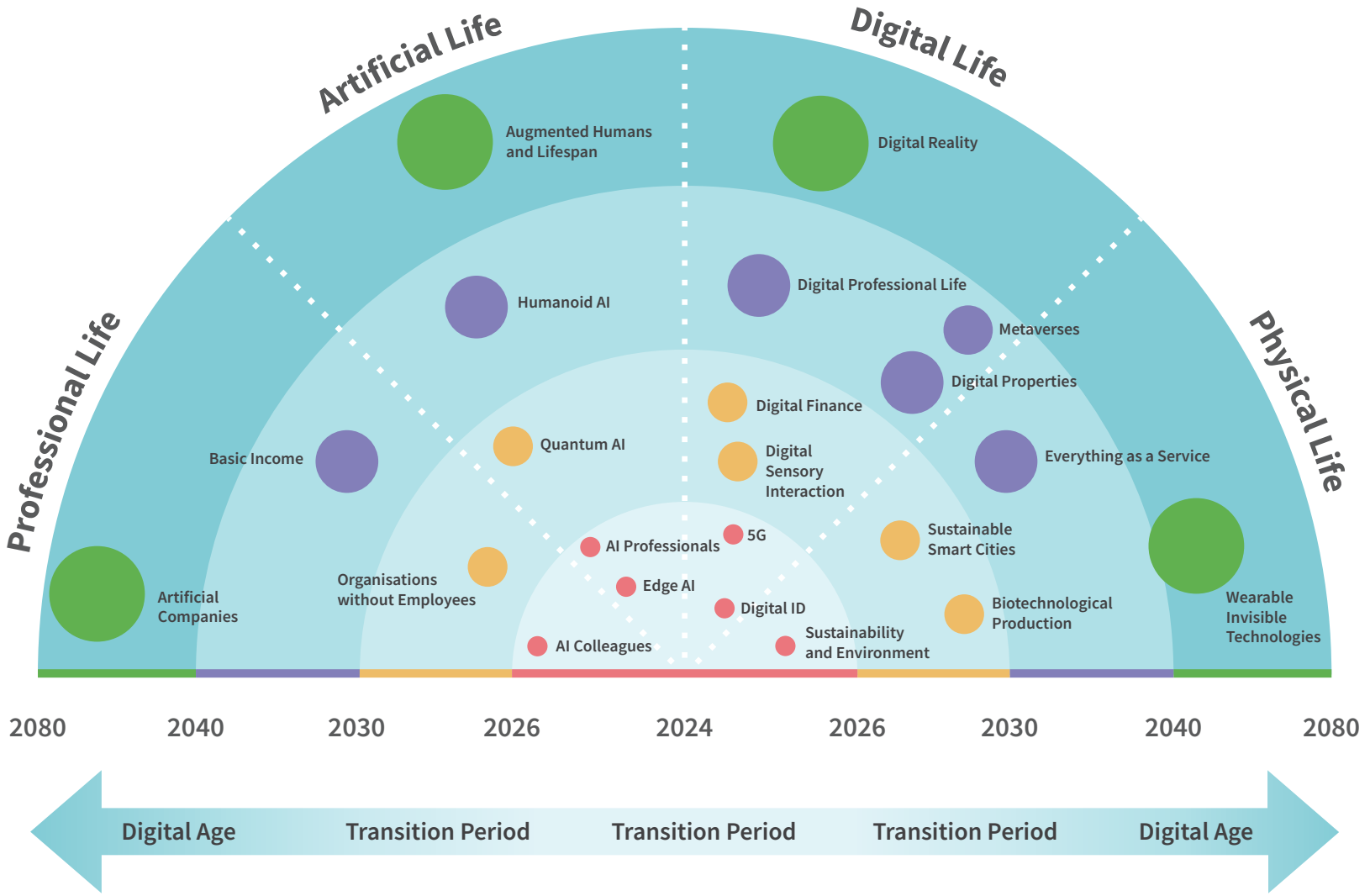
As the regulation of copyrights in the context of artificial intelligence remains pending, another critical facet of this matter is the anticipated scarcity of original data, particularly in the training of large language models. According to an article released by Epoch, an institute dedicated to researching pivotal trends influencing AI governance, there is an estimation that all "high-quality language data" will be depleted by the year 2026. According to the study, language data categorized as "high-quality" encompasses sources such as "books, news articles, scientific papers, Wikipedia, and curated web content."

The forecast that machine learning will rapidly deplete original data resources paves the way for considering alternatives, including the utilization of lower-quality data or data generated by productive AI. Additionally, there is an opportunity to leverage AI in the creation of solutions to address this challenge.

As technology continues to reshape the world, it is essential to recognize that human beings have always been and will continue to be at its core. The advent of generative AI, which blurs the boundaries between human and machine creativity, prompts us to reevaluate the essence of humanity itself. Constructing responsible and ethical AI necessitates collaboration among technologists, policymakers, and society at large. Open dialogue regarding intellectual property rights and societal implications is imperative in this endeavor. Moreover, ensuring equitable access to this technology and fostering digital literacy are essential steps toward creating a future where everyone can reap the benefits of this technological revolution.

Speaking of equal access, I extend heartfelt gratitude to all our esteemed supporters who have played an integral role in amplifying the reach of our Technology Report this year, just as they did in the previous year. Their contributions have not only facilitated the realization of the report but also enabled us to develop resources in Turkish through their insightful articles.

FUTURE OF TECHNOLOGIES


Artificial Life
Digital Life
Professional Life
Physical Life
Augmented Humans and Lifespan
Digital Reality
Humanoid AI
Digital Professional Life
Metaverses
Digital Properties
Digital Finance
Basic Income
Quantum AI
Digital Sensory Interaction
Everything as a Service
Sustainable Smart Cities
AI Professionals
5G
Artificial Companies
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Edge AI
Digital ID
Biotechnological Production
Wearable Invisible Technologies
AI Colleagues
Sustainability and Environment
2080
2040
2030
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2026
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Digital Age
Transition Period
Transition Period
Transition Period
Digital Age

TECHNOLOGY RADAR AND AN OVERVIEW OF 2024

FATİH GÜNAYDIN

Softtech

Director of Innovation

For the seventh consecutive year, the Softtech Technology Report returns to meet its readers with the 2024 issue. Sustaining such a longstanding endeavor requires dedication and effort, yet the positive feedback from our esteemed readers serves as a source of motivation for our entire team. Despite the challenges involved, the encouragement from our readers helps us overcome any fatigue associated with the process. As we launch this year's report, we eagerly await your feedback, which is invaluable to us in shaping future editions.

As we bid farewell to 2023 and embark upon the early days of 2024, let us endeavor to illuminate the path ahead by revisiting the predictions outlined in our previous report. By examining the evolving landscape, we aim to discern what lies ahead in 2024 and beyond.

In crafting this year's Technology Radar, we have taken careful consideration of continuity with past reports, striving to maintain consistency while incorporating any pertinent changes. Our approach emphasizes building upon previous insights rather than introducing entirely new concepts that disregard past findings.

The 2024 Technology Radar is structured around four axes: "Work Life, Artificial Life, Digital Life, and Physical Life." Each axis presents both short and long-term projections spanning from the present day to 2080. Within the Work Life axis, we explore concepts such as AI colleagues, employeeless organizations, basic income, and the artificial company. On the Artificial Life axis, sub-headings include edge AI, AI professionals, quantum AI, humanoid AI, augmented

human, and human lifespan. Within the Digital Life axis, our radar encompasses digital identity, 5G technology, digital sensory interaction, digital finance, digital business, digital property, virtual universes, and digital reality. Meanwhile, the Physical Life axis delves into sustainability and environmental initiatives, biotechnological production, sustainable smart cities, the concept of everything as a service, and wearable invisible technologies.

With the unveiling of the 2024 Technology Radar, we are witnessing the gradual transition from the long-standing Mobile Era, which has held sway for an extended period, towards the Transition Era. This shift signifies a pivotal moment in our digital evolution. While mobile technology, particularly smartphones, played a pivotal role in integrating individuals into digital life during the Mobile Era, we are now entering a hybrid phase characterized by the convergence of real-life experiences and digital spaces. In this Transition Period, mixed realities will blur the boundaries between physical and digital realms, ushering in an era where smart hardware supporting this integration will become increasingly prevalent. We find ourselves at the early stages of a transformative process where the concepts encapsulated within the realms of Digital Life and Physical Life will increasingly intersect and intertwine.

ARTIFICIAL INTELLIGENCE PROFESSIONALS, DIGITAL IDENTITY, BIOTECHNOLOGICAL PRODUCTION AND SUSTAINABLE SMART CITIES

Transitioning from 2023 to 2024, we have elevated the concept of "Artificial Intelligence Professionals" on the radar. Originally anticipated to gain prominence in the 2025-2030 timeframe, recent developments in productive artificial intelligence observed in 2023, along with applications emerging in certain sectors tied to vertical specialties within this field, have prompted us to position this concept in the core part of the graph. Consequently, we anticipate the widespread adoption of Artificial Intelligence Professionals by 2026, marking a shift accelerated by the rapid developments in productive AI. Specialized artificial intelligence applications, which have become part of our daily lives in various professional domains, have rapidly gained traction. In fact, some of these vertical specializations, such as "Artificial Intelligence Colleagues," initially introduced last year, are now actively shaping business

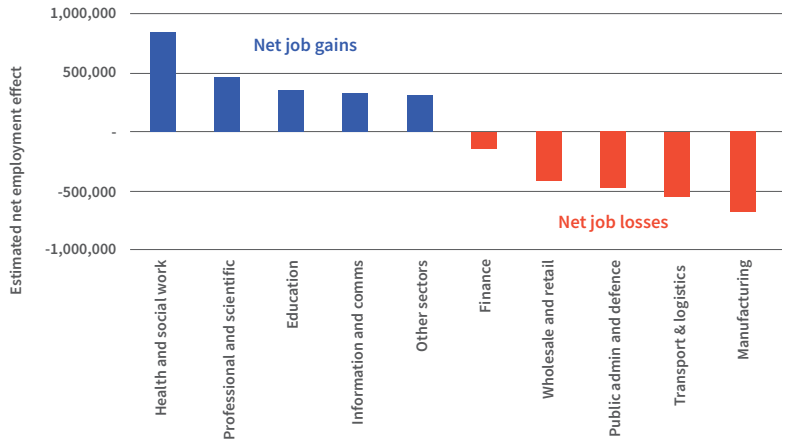
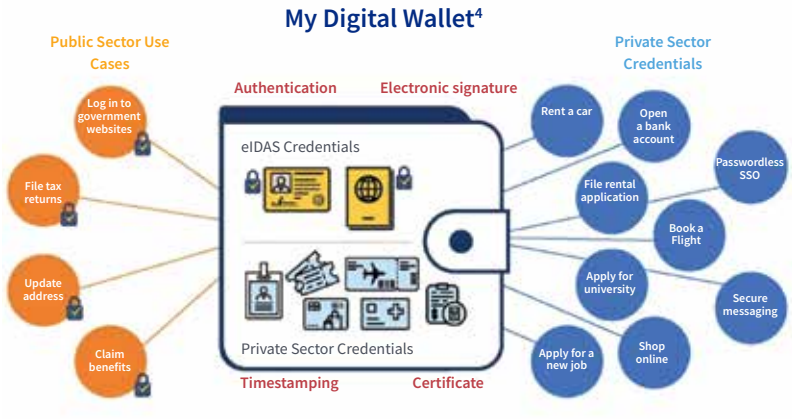


Figure 1: AI's estimated net employment effects on selected sectors over 20 years (SIC 1)[1]

Source: PwC analysis of OECD PIAAC and ONS APS data

operations. I anticipate a surge in specialized artificial intelligence across diverse sectors, challenging previously perceived boundaries. A UK study on artificial intelligence's impact on labor and talent demand underscores this trajectory. Over the next two decades, there's projected to be heightened demand for human resources, particularly in health and social services. Conversely, the manufacturing sector may face significant job displacement due to artificial intelligence integration.

In this year's radar, "Digital Identity" has been added to the Digital Life axis, spanning the 2024-2026 timeframe. Digital Identity, at its essence, serves as a digital manifestation of an individual, organization, or internet-connected device. This encompassing concept spans a diverse array of data, ranging from traditional identity particulars to health records, technical hardware specifications, and usage patterns. While blockchain has garnered considerable attention, particularly in the realm of technology, its applications extend to various domains, including decentralized ID, self-sovereign identity, and digital identity wallets. Digital identities can be tailored by both public institutions for civic purposes and private entities for commercial endeavors. However, it's crucial to note that, according to research by the World Bank[2], roughly 850 million individuals lack official identities. This significant segment of the global population remains disconnected from societal integration. Meanwhile, those possessing digital identities encounter significant challenges concerning the privacy and control of their identity data. Considering these definitions and scenarios collectively, digital identity applications are poised to usher in numerous innovations that could permeate both the digital and physical realms of daily life. In 2023, the European Union took significant strides in providing a Digital Identity Wallet to every citizen residing within its borders, subject to the relevant country's request. This initiative gained momentum in alignment with the eIDAS regulation[3] (Electronic Identification, Authentication, and Trust Services), which has been evolving since 2014, shaping the contours of the Digital Identity Wallet.



eIDAS 2.0

Biotechnological Production takes a prominent place on the Technology Radar within the Physical Life axis. In its fundamental definition, biotechnology is a discipline that leverages biological processes, living organisms, cells, etc., to advance new technologies and products. While we have consistently featured biotechnology-related innovations in recent reports, a noteworthy development

prompting its inclusion on the radar this year is the transformation of R&D activities in this field into practical and usable products. The escalating demand for sustainable and environmentally friendly products further propels the momentum in this domain. Simultaneously, advancements in artificial intelligence are evolving to address complex challenges in biotechnology, indicating that biotechnological production is poised to enter a period of

maturity, particularly in the 2026-2030 timeframe, reaching a broader audience in terms of both the production process and the final product. In the coming years, laboratory-produced foods suitable for commercial consumption and data storage on DNA are expected to gain prominence as notable subtopics.

We have a title on the Technology Radar that, while not new, has undergone a name change: Sustainable Smart Cities. Smart cities have long been a fixture on the radar, but today, it's increasingly challenging to separate the smart city concept from sustainability. As a result, the smart city concept is converging with sustainability to form "Sustainable Smart Cities." Sustainable transportation solutions emerge as one of the primary subtopics. Shared transportation vehicles, advanced public transportation systems, and Mobility as a Service (MaaS) applications are at the forefront, offering uninterrupted and environmentally friendly alternatives for daily transportation needs. For instance, Transport for West Midlands, a MaaS application tested in the UK in 2018 without much success, is undergoing new trials this year[5] with support from the Ministry of Transport. It provides access to various transportation options through a single subscription, simplifies daily journey planning, and facilitates booking of bicycles, cars, trams, buses, and more. On the other hand, another prominent trend in sustainability-related smart cities is the "circular economy." This concept involves reducing waste in cities, implementing recycling programs, utilizing waste-to-energy production methods, and promoting environmentally friendly products. Prioritizing the principles of the circular economy in smart cities entails various initiatives. Integrating renewable energy infrastructures into cities, employing blockchain technologies for city governance and security, implementing disaster management technologies (such as early warning systems, data-driven evacuation planning, and post-disaster governance), and utilizing Augmented Reality

in city planning and decision-making processes are among the subtopics pertinent to Sustainable Smart Cities.

In addition to these initiatives, it's impossible to overlook the integration of artificial intelligence into the smart city concept, a trend that's gaining momentum globally. Significant strides are being made in cities like Singapore, Zurich, Oslo, Copenhagen, and Amsterdam. Take Singapore, for instance; facing challenges such as dense population, limited space, and scarce resources, the city has embraced the smart city concept as a solution and has actively adapted its society to it. Singapore, ranked seventh in the Smart City Index 2023[6] (with Istanbul ranking 107th out of 141 cities on this list), has leveraged its National Artificial Intelligence Strategy Program, spearheaded by public institutions, to drive the development of smart cities powered by artificial intelligence. Singapore has set an ambitious goal to become a global leader in smart city development by 2030. The city-state utilizes artificial intelligence to analyze data collected from sensors deployed across various urban areas, employing it to enhance municipal services, transportation, education, and healthcare. However, concerns surrounding privacy and security regarding the handling

City	Rank 2023	Rank 2021	Rank 2020	Rank 2019
Zurich	1	1	1	1
Oslo	2	2	2	2
Canberra	3	-	-	-
Copenhagen	4	5	3	4
Lausanne	5	4	-	-
London	6	3	10	3
Singapore	7	7	7	10
Helsinki	8	9	5	6
Geneva	9	6	8	7
Stockholm	10	11	9	9
Hamburg	11	8	6	-
Beijing	12	17	22	30
Abu Dhabi	13	12	14	16
Prague	14	10	4	8
Amsterdam	15	13	11	11
Seoul	16	18	20	23
Dubai	17	14	19	13
Sydney	18	29	32	22
Hong Kong	19	33	34	38

Smart City Index 2023[8]

of this data are being addressed. With systems containing vast amounts of sensitive public and personal data, cybersecurity threats are a significant consideration. In response, Singapore has established AI Verify[7] to establish standards in artificial intelligence governance and testing processes, aiming to bolster cybersecurity measures in the corporate environment. Certainly, the holistic approach in Singapore involves collaborative efforts between the public and private sectors. These collaborations aim to develop end-to-end solutions covering various domains essential for constructing sustainable smart cities, encompassing processes and technologies.

BEING HUMAN AMONG ARTIFICIAL INTELLIGENCES

In our Technology Report, we consistently prioritize both people and the trajectory of technology, dedicating a section to exploring how technology shapes and impacts human life. In 2024, our focus has centered on a critical question: amidst the omnipresence of artificial intelligence in our daily lives, what defines our humanity and sets us apart from AI? We've delved deeply into this inquiry, considering the implications of AI's increasing capabilities across various domains traditionally associated with human expertise. From composing music and creating artwork to crafting job descriptions and providing innovative solutions, AI's prowess seems to blur the lines between human and artificial intelligence. In fact, AI has even ventured into the realm of medical innovation, with drugs developed entirely by AI undergoing clinical trials for conditions like "idiopathic pulmonary fibrosis". This exploration prompts profound reflection on the essence of human identity in the face of advancing technology[9].

Amidst these developments, I would like to delve into the findings of an academic study[10] published last summer in the Journal of Experimental Social Psychology titled "The AI Effect," which explores the question "What makes us human?" Conducted by Benoit Monin, a psychology professor at Stanford University, and Erik Santoro, a former PhD candidate in social psychology, the study is grounded in the Social Identity Theory in psychology. This widely accepted theory posits that individuals identify with a group, differentiate their group from others, and consider their own group to be more valid - a dynamic underlying many contemporary

Characteristics that Distinguish Humans	Common Traits of Humans and Artificial Intelligence
Having a Culture	Ability to Make Calculations
Having a Faith	Use of Language
Having a Sense of Humor	Ability to Implement the Rules
Having Ethics	Ability to Predict the Future
Having a Spirituality	Use of Logic
Feeling Happiness	Communication
Feeling in Love	Face Recognition
Having Passions	Detecting Sounds
Having a Personality	Sensing the Temperature
Having Relationships	Remembering Things

social conflicts. Monin and Santoro posit that artificial intelligence could be perceived as a new group, given the portrayal of AI as possessing human-like, and sometimes superior, characteristics. They sought to gauge human reactions to the perceived threat to their uniqueness. To achieve this, they compiled a list of 10 traits shared with artificial intelligence and 10 traits deemed uniquely human. The list as follows:

Initially, 200 individuals were surveyed individually to gauge their perception of human and artificial intelligence capabilities across 20 distinct traits. Across the board, respondents attributed greater proficiency to humans for all traits, although the disparity between common traits was narrower compared to discriminative traits. Subsequently, researchers expanded their study to include 800 participants, dividing them into two groups. One group was exposed to an article titled "The Artificial Intelligence Revolution," while the other group read about trees and their notable characteristics. Following this, participants were individually questioned about the importance of the same 20 human traits. Interestingly, those who had read about artificial intelligence rated distinctive human attributes −such as morality, interpersonal relationships, and personality− as more crucial compared to those who read about trees. This phenomenon, termed the "Artificial Intelligence Effect" by researchers, suggests that individuals with greater knowledge and exposure to AI tend to prioritize traits that machines lack.

In essence, the research findings suggest that individuals with greater awareness of artificial intelligence tend to place higher

value on distinctive human traits. While participants didn't undervalue common traits shared with AI when considering AI as a group in social identity theory, they perceived AI's strengths to lie in cognitive skills and creativity −areas where machines excel− potentially leading them to prioritize other human traits. Monin's conclusion is thought-provoking; he suggests that in a future dominated by capable AI solutions, professions emphasizing interpersonal and social skills, like teachers and caregivers, may command more respect and income than roles such as lawyers or certain civil servants. He underscores the importance of interpersonal/social skills in a world where AI is prevalent, noting that there are numerous competencies that not only AI won't take over, but that humans will increasingly value.[11]

In the second part of our report, we delve into a wealth of insights

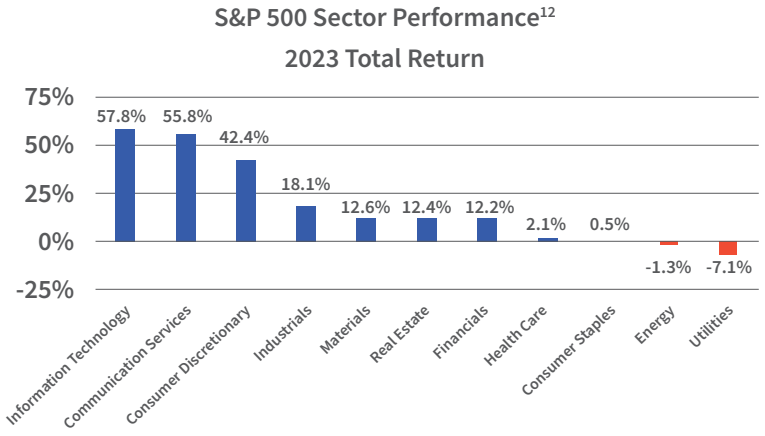
provided by our guest writers regarding the role of human beings in the business landscape and the implications of artificial intelligence on their roles.

WHAT IS HAPPENING IN INDUSTRIES AS TECHNOLOGY AND PEOPLE CHANGE?

In the third part of the Technology Report 2024, we present a comprehensive exploration of the Future of Industries and Innovation. Through our articles in this section, you'll uncover invaluable insights that provide a definitive response to the question posed in the title.

In sectors like Banking, Finance, e-Commerce, Health, and Energy, the influence of technologies like artificial intelligence and blockchain is profound. Established organizations are grappling with the need to adapt, while newly founded companies are leveraging these technologies adeptly to gain competitive advantages.

In 2023, the profound impact of technology was strongly evident in sectoral performance within stock markets. In the S&P 500, Information Technology, Communication Services, and Discretionary Spending emerged as the sectors delivering the highest returns throughout the year. The noteworthy rise in the Discretionary Spending category, representing non-essential consumption, highlights a significant aspect from an entrepreneurial and innovation standpoint, which forms a key focus area in our report. In the upcoming years, there's a potential



for further growth in demand for pleasure-oriented technological products and applications, especially with potential global financial expansion policies. Consequently, investments may continue to pour into this sector.

Once again, I extend my gratitude to our valued readers who eagerly anticipate the Technology Report each year, as well as our guest authors who have tirelessly contributed to this publication, as they do annually. I trust you will find this issue, the culmination of months of dedicated effort, both informative and enjoyable. Enjoy your reading!

Resources

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ANATOMY OF A TRANSFORMATION: TOKENIZATION

SALİH CEMİL ÇETİN

Softtech

Innovation Architect

RECENT HISTORY

We are currently witnessing a genuine digital revolution marked by advancements in internet speed, storage capacity, processing power, and distributed architecture, as well as the addition of cryptography. In this article you'll read an analysis of Tokenization, a key breakthrough in the blockchain revolution.

I'd like to take you back for a moment to a time when technology wasn't as advanced as it is today. Instead of going as far back as tablets carved from stone or coins made of copper, I've chosen to reference my childhood years, the earliest period I can recall.

I recall the days when I would scrutinize the "jeton" (token) in my hand with amazement while waiting for the ferry at the pier. Even though it wasn't actual money, I felt an inner sense of curiosity and admiration for this small, round metal piece that we used as a form of payment. The turnstiles, which emitted a satisfying sound when the token was dropped into their slots and turned around, added to the intrigue.

Even though we purchased these tokens with the intention of boarding the ferry, we did not have to use them right away; we could put them in our pockets and take them home. This was because, with each token, we were essentially acquiring the right to board the ferry once at the current day's price. Since it now belonged exclusively to

us, we had the freedom to exercise this right whenever we pleased. However, these small metal tokens held no value beyond the ferry turnstiles until we found someone eager to board the ferry.

Of course, we frequently used "jeton" - referred to as "token" in English - that were created for us to utilize various tools, each designed for specific functions. These ranged from payphone services to game machines in arcade halls, not limited to city lines.

DIGITALIZATION OF MONEY

Over the past 30 years, the widespread adoption of the internet and the digitization of payments have impacted tokens, much like many other things. The digital representation of money by banks enables easy payment receipt, gradually diminishing the need for tokens.

This process has further accelerated with the widespread adoption of customizable payment systems and magnetic cards. It was no longer the era of physical tokens, but rather the era of reusable magnetic cards capable of carrying balance information. Institutions serving in various sectors such as gaming halls, urban transportation, communication networks, and loyalty systems either distributed their own cards to customers or began offering services by accepting instant payments through credit cards.

Thus, nostalgic tokens became history.

BLOCKCHAINS, SMART CONTRACTS AND TOKENS

Saying that history is absolutely a repetition would not be accurate in terms of historical determinism. However, the recurring patterns we have witnessed many times may be unfolding right in front of us at this moment.

After Bitcoin, the emergence of blockchains, considered as second-generation blockchain protocols capable of executing code snippets, made it possible to develop the required functionalities in a distributed architecture.

Operating with minimal service interruption, utilizing predefined rules, ensuring high transaction accuracy, and enforcing strict agreement between parties, blockchains elevated smart contracts to the status of a trustworthy authority. This system, where sectoral functions can be programmed and autonomously operated, introduced a set of rules known as the Token Standard.

For nearly 10 years, in this system, tokens with limited or unlimited supply in certain formats can be easily issued through smart contracts. Companies that operate their own business rules on smart contracts

with their own tokens can effortlessly distribute these tokens to their users through crypto exchanges or "airdrop" events.

Moreover, thanks to the security provided by cryptography, the complete management of tokens is in the hands of individual owners. Unlike magnetic cards, tokens are distributed, stored in individual wallets, and not centralized in a database, which evokes the nostalgic feel of traditional tokens.

The most common application that integrates crypto tokens into our daily lives is undoubtedly payment systems. The reason for this is that Bitcoin, which can be considered the pioneer of the introduction of tokens into our lives, played a significant role. On the other hand, there is a rapidly evolving financial industry on cryptocurrencies due to the widespread adoption of smart contracts. The operation of this ecosystem, known as Decentralized Finance (DeFi), is facilitated through crypto tokens.

Tokens that focus on proving the concepts of uniqueness and ownership are called NFT (Non-Fungible Token). A limited number of content created by digital artists can be stored, sold, or traded on NFTs. Although the reputation of digital art NFTs has been somewhat negatively affected by the fluctuations in the crypto markets, their place in the development process of the NFT concept remains crucial.

For the reasons mentioned, tokens not only serve as keys to specific functions but also represent privileges, digital ownership, and singularity, aligning with the genetic traits inherited from their predecessors. Additionally, tokens have the ability to bring communities together. Similar to having the exclusive right to board a ferry with a token that solely belongs to us, the value of this token increases when there is someone interested in riding the ferry.

TOKENIZATION

The tokens I have described so far exist entirely on blockchains, execute functions on the chain, and are referred to as Utility Tokens.

Now, is it possible to create tokens that can represent not only digital but also real-world assets (RWA) on blockchain networks? The concept of tokenization, which has been under development in recent years, seeks to answer this very question.

One of the open aspects of blockchain networks is the limited interaction with the real world. While it is indeed possible to provide information flow from the outside world to the chain, the

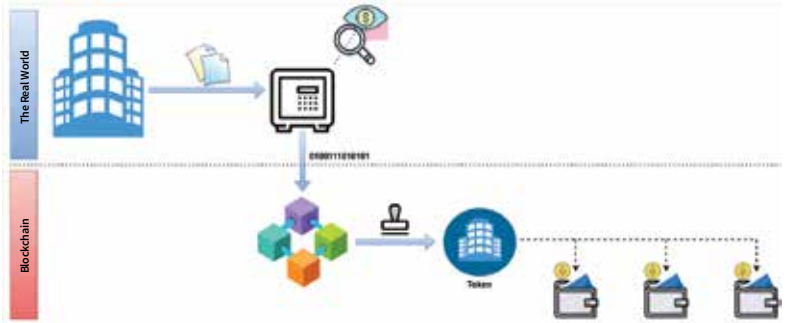
reliability of this information is not yet at the desired level due to the absence of central authority. Hence, we utilize hybrid systems to integrate real-world assets with blockchain tokens.

Hybrid systems ensure the storage of crucial data on the chain while referencing information and documents verified by reliable institutions in the external world. This allows for the combination of both on-chain and off-chain data, enabling the representation of real assets on the blockchain.

At this juncture, the Security Token standard comes into play to represent real-world financial values. Security Tokens, used for investment and capital-raising purposes, must adhere to supervisory and regulatory rules since they reference real assets. The key element that instills trust is the oversight of real assets by authorized institutions, securing the representation of these assets on the blockchain.

Security Tokens facilitate the representation of financial assets such as stocks, bonds, and real estate funds on blockchains, thanks to the security standard they provide. Consequently, investors can trade crypto assets 24/7 while also having the opportunity to invest in financial instruments partially. Taking all these aspects into account, Softtech closely monitors the tokenization concept and identifies significant opportunities in this field.

To illustrate the concept further, let's examine the process of real estate tokenization, which stands out as one of the most compelling examples.



In this example, the real-world value is represented by the blue-colored building.

- Firstly, the decision is made on the real estate to be "tokenized," and the income and expense items are clarified in legal terms.
- The documents related to the real estate are handed over to a custodian under the supervision of authorized institutions.
- The custodian undergoes regular audits and shares the documents they preserve with the public within the framework of transparency.
- At the same time, the custodian, serving as a user on the blockchain, records information that they have verified and will transparently store the documents within the blockchain.
- At this point, on the blockchain side, a specific amount of tokens is generated through smart contracts in exchange for the real estate. This is considered as the token supply and must be greater than zero and limited. (E.g., 100 pieces)
- The current valuation of the property is divided by the supply amount to determine the unit token valuation.

• The tokens, whose value has been determined, are made available for purchase to customers who have undergone identity verification processes.

• Income from the real estate is managed through smart contracts, ensuring that users are regularly paid in proportion to the tokens they own.

The key consideration here is that individuals wishing to acquire tokens must successfully undergo identity verification processes (KYC). Simultaneously, regulations governing the transfer of tokens between users need to be defined post the initial sale. It is imperative to avoid any scenario where ownership shares of the tokenized real estate end up in the possession of individuals who are not legally authorized to conduct financial transactions.

PAST, PRESENT, FUTURE

"Jetons", blockchains, tokens...

With this application, as I am trying to explain in general terms, users can invest in real estate with amounts significantly lower than the property's market price. They can hold partial ownership of the real estate in their wallets and, simultaneously, enjoy income streams like rent proportionate to their shareholding. Furthermore, if the transaction is conducted through a trusted institution that has previously verified identities, such as a bank, it can be seamlessly completed using personal computers, eliminating the need for extensive paperwork.

Tokenization opens the door to a transformation of unprecedented scale, allowing not only traditional investment instruments but also real-world assets to exist on blockchains under real-world rules, bridging the gap between the conventional and the innovative.

Thanks to this transformation, the child who gazed in awe at a token on the ferry pier yesterday might now be an investor proudly storing the token of a maritime transport company in their wallet, or perhaps even an engineer actively contributing to the development of tokenization platforms.

Life is full of surprises, right?

2024 TRENDS IN BLOCKCHAIN-FOCUSED FINANCIAL APPLICATIONS

TURAN SERT

Researcher - Author

In this article, we will examine the blockchain-based financial applications that are expected to take center stage in 2024. Before delving into that, let's provide a brief overview of the definitions mentioned in the article's title for readers who may not be familiar with the topic.

Blockchain denotes the technology that empowers individuals or entities in the digital realm to coordinate and transfer data and value among themselves without the need for any intermediary.

Examining the application areas of blockchain-based technologies, the financial sector prominently emerges. The fundamental reason behind this lies in the imperative for the applied domain of blockchain to be entirely digital for its effectiveness. Due to its swift digitalization in the past two decades, the financial sector has recorded substantial growth by adeptly capitalizing on opportunities presented by the evolving world. However, this digitalization also renders the financial world more susceptible to the influence of emerging technologies like blockchain.

The term "Decentralized Finance," which is the general name for blockchain-based applications, gained rapid popularity among users in 2020. These technologies aim to provide users with 'intermediary-free' access to services such as loans and buying/selling, offering the deposits typical of classical finance. However, it cannot be claimed that these technologies have fully found their balance. Still in the experimental phase, these applications face challenging obstacles to gaining widespread acceptance, following the initial excitement experienced in their early years.

Does this situation raise questions about the potential of decentralized finance? I'm certain that for some, the answer to this question will be yes. However, certain experiments conducted in the past year are steering us towards optimism about the future. Let's collectively examine the developments, particularly those on the corporate side:

TOKENIZATION OF REAL-WORLD ASSETS

Digital assets, such as cryptocurrencies, have played a pivotal role as the driving force behind the growth of decentralized finance up to this point. For this growth to persist in the future, the involvement of physical world assets is imperative. It is worth noting that there have been numerous diverse experiments in this field thus far. Let's take a quick look at a few:

• The European Investment Bank conducted a bond issuance worth 100 Million Euros entirely on the blockchain. (Previously, the Bank of France, in collaboration with Societe Generale, executed a bond issuance and settlement worth 40 Million Euros via blockchain.)

• A money market fund owned by Franklin Templeton executed transactions and recorded fund shares via the Ethereum and Polygon chains.

• BlackRock conducted its inaugural transaction on the Onyx chain, an Ethereum clone owned by J.P. Morgan. The company sent tokenized shares of its money market fund to Barclays in the UK, intending to use them as collateral in an over-the-counter derivatives transaction.

• Similarly, J.P. Morgan and Citi have announced that they are conducting experiments with private networks built on the Avalanche chain for portfolio management, as well as the pricing and processing of FX transactions.

• Societe Generale utilized tokens it generated as collateral on MakerDAO, a decentralized platform, against the loans provided to its customers, effectively accessing credit through the platform.

• MakerDAO, the decentralized finance platform built on the Ethereum chain, acquired US Treasury bonds with the 500 Million USD held in its treasury.

• In the USA, over five houses have been transformed into NFTs (qualified intellectual title deeds) and sold via blockchain.

It's not a bold prediction to say that this trend will further intensify in the upcoming period. In its "Money, Tokens, and Games" report released in March 2023, investment bank Citi anticipates

the tokenization market to reach 5-6 Trillion Dollars by 2030. Given the current total market value of cryptocurrencies standing at approximately $1.4 Trillion, the enormous potential is evident. However, expecting this growth to unfold in the next year might be premature. The primary challenge hindering the tokenization of real-world assets lies in establishing the connection between the physical and digital realms. Issues such as the valuation and secure storage of physical assets, along with the confirmation of ownership for digital assets, remain unclear. As necessary legal regulations gradually take shape over time, reducing current risks, the advantages offered by digital assets, including speed, low costs, and global accessibility, could spark a significant surge in this domain.

FINANCIAL INSTITUTIONS EMBRACING DECENTRALIZED FINANCE

Decentralized finance products, which haven't yet delivered tangible value to users, are currently perceived more as speculative investment tools. Hence, existing financial institutions have begun offering investment products in this field to their customers.

One of the most eagerly awaited events in this field for 2024 is the approval process of Bitcoin and Ethereum ETFs in the United States. The expected introduction of index investment funds to individual investors and pension funds could significantly boost demand in this sector.

The matter of legal infrastructure remains uncertain in the United States. While the passage of a bill in the stable currency domain is anticipated in the initial stage, the enactment of a comprehensive digital asset law might be deferred until after the upcoming presidential elections. Meanwhile, Europe, in conjunction with MiCA, is actively engaged in fleshing out the legal framework it has outlined.

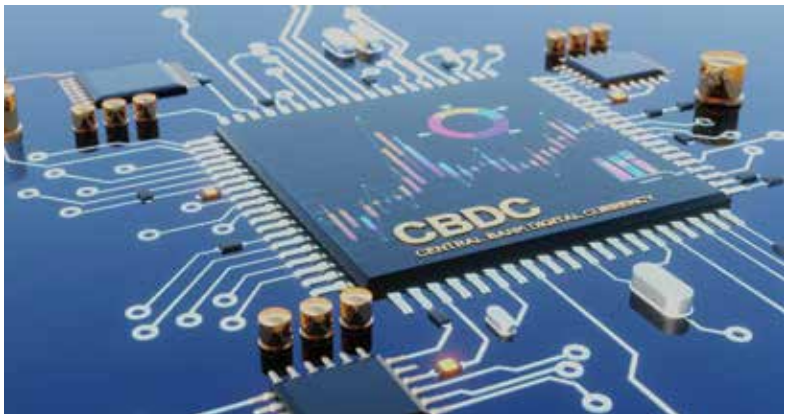
With the introduction of the required legal framework in our country, financial institutions have begun extending their services, starting from custody and trading, with cryptocurrencies in addition to traditional fiat currencies. While decentralized finance inherently grants users full sovereignty over their digital assets, it also comes with a significant responsibility for the users. There's a potential for substantial opportunities for financial institutions at a juncture where a considerable portion of society may be reluctant to bear this responsibility.

CENTRAL BANK DIGITAL CURRENCIES (CBDC)

Valuable assets in the digital realm are predominantly comprised of self-valued cryptocurrencies and stable currencies pegged to fiat currency. Particularly in some widely-used stable

cryptocurrencies, users are required to bear the risk associated with the issuing institution. Therefore, digital currencies (CBDCs) issued by central banks are, at the very least, positioned as a solution to eliminate this risk.

Central banks are actively pursuing work in the field of CBDC, and predicting that we'll witness immediate results in 2024 is quite challenging. Nevertheless, if financial startups establish the necessary infrastructures for these currencies expected to circulate in the medium term, they can position themselves at the forefront of the race.



On the other hand, the introduction of a CBDC in the US Dollar, the most widely used stable currency, by US public authorities does not seem likely in the short term. It is crucial for other central banks aiming to take a leading role in this field to consider the legitimate concerns of politicians and non-governmental organizations in the USA regarding CBDCs.

FINTECH SUPPORT FOR DECENTRALIZED FINANCIAL PRODUCTS

As decentralized finance players predominantly concentrate on infrastructure development in this field, they have, until now, overlooked the aspects of the products that directly impact users. If these products aspire to reach one billion users someday, substantial improvements in user experiences are imperative. Fintech initiatives, which have made considerable strides in this realm in recent years, can come to their aid. It is plausible that we will witness new fintech products utilizing DeFi infrastructure in the upcoming period.

THE RISE OF ZK TECHNOLOGIES

While Fintech players are dedicated to improving user access, one of the most frequently discussed topics in the decentralized finance infrastructure in the upcoming year is "Zero-Knowledge Proof Technology." This innovative technology is poised to safeguard individuals' privacy in the digital realm while

facilitating the scalability of blockchain technology. As a result, every venture in financial technologies should attentively delve into this cryptographic advancement, as it is set to create new realms of application in decentralized finance.

CAN ARTIFICIAL INTELLIGENCE (AI) AND BLOCKCHAIN COEXIST?

So, what kind of relationship exists between artificial intelligence, the standout of 2023, and blockchains? Numerous theses have been proposed regarding how artificial intelligence and blockchain can complement each other. I'm confident that we'll witness many initiatives and innovations in this field in the upcoming period. Alongside the myriad benefits that artificial intelligence will introduce into our lives, there comes a significant influx of information – both a boon and a challenge. Let's conclude this article by emphasizing that blockchain, in proving which information is generated by humans, can potentially act as a 'litmus test' against artificial intelligence.

CONCLUSION

In 2024, we are poised to achieve significant milestones in the widespread adoption of blockchain-based technologies, both locally and globally, following the implementation of the required legal infrastructure. From an investment perspective, classical financial institutions and fintech ventures will offer decentralized financial products to their customers. Additionally, during this period, we'll grasp the initial indicators of the trend involving the blockchain tokenization of physical assets set to enter our lives in the longer term. Anticipated advancements in decentralized financial infrastructure will pave the way for the broad usage of this technology. We eagerly look forward to following the innovations that the upcoming period will bring to us in this field.

EMERGING LEGAL CHALLENGES POSED BY GENERATIVE ARTIFICIAL INTELLIGENCE

DR. AYLİN ŞAHİN

Igniters Tech Law
Managing Partner

Research on artificial intelligence began with scientists seeking an answer to the question, "Can machines think?" The response to this query varies depending on how the concept of thinking is defined and how the "output" generated by artificial intelligence when provided with an "input" (data entered into a system) is assessed. In philosophy, “thinking” typically denotes conscious, meaningful, and purposeful mental activities. According to this definition, the prevalent view is that machines "cannot think." This is because machines are acknowledged not to be conscious beings and cannot undergo mental experiences like humans. However, if the concept of “thinking” is interpreted more broadly, encompassing functional activities such as problem solving or data processing, some philosophers accept that artificial intelligence can indeed accomplish these functional forms of thinking.

In computer science, artificial intelligence strives to emulate human thinking processes like learning, problem solving, and decision making. In this regard, artificial intelligence systems can be acknowledged as possessing the ability to "think" in specific tasks. However, as Noam Chomsky pointed out, these capabilities of artificial intelligence do not yet fully capture the intricacy and depth of the human thinking process.[1] According to Alan Turing, if a machine can deceive people by mimicking human reasoning, it can be considered to be "thinking".[2] In a conference at Erzurum Atatürk University in 1959, Cahit Arf stated that the most significant difference between machine thinking and human thinking is aesthetics.[3] According to Arf, a machine cannot express a preference for or against a piece of music. This is a unique feature of human thought.

As rights are debated regarding the "output" generated by human and machine thought, attempting legal analysis without considering the fundamental differences will become increasingly challenging. Moreover, with the growing utilization of generative artificial intelligence in creativity, courts deciding based on existing copyright laws and practices may impede them from reaching a fair outcome.

When discussing the existence of a right in law, there must be some fundamental social, philosophical, economic, and cultural justifications for the legal system to protect that right. The reason copyright laws protect the intellectual rights of authors is to foster creativity in society, boost artistic and cultural activities, and consequently promote societal development. While copyright laws enable the author to commercialize the "monopoly" established over their work and provide both material and moral incentives for the continuity of their creativity, they also stipulate that in instances like fair use, society should benefit from the work without remunerating the author. In this context, legal systems strike a balance between rules and exceptions in the interest of the public. The more costly and challenging it is to produce the work, the more robust the social, philosophical, and economic justifications for the "monopoly" bestowed upon the author by law.

Up until generative artificial intelligence, one could argue that the system mentioned above functioned seamlessly, with the exception of new technologies. To provide a simple example, the notion that the subject of copyright is the work and the entity in question is the natural person who owns the work were well-established concepts in nearly all advanced legal systems. Encouraging the creativity of the author to produce the work had social, economic, and philosophical justifications.

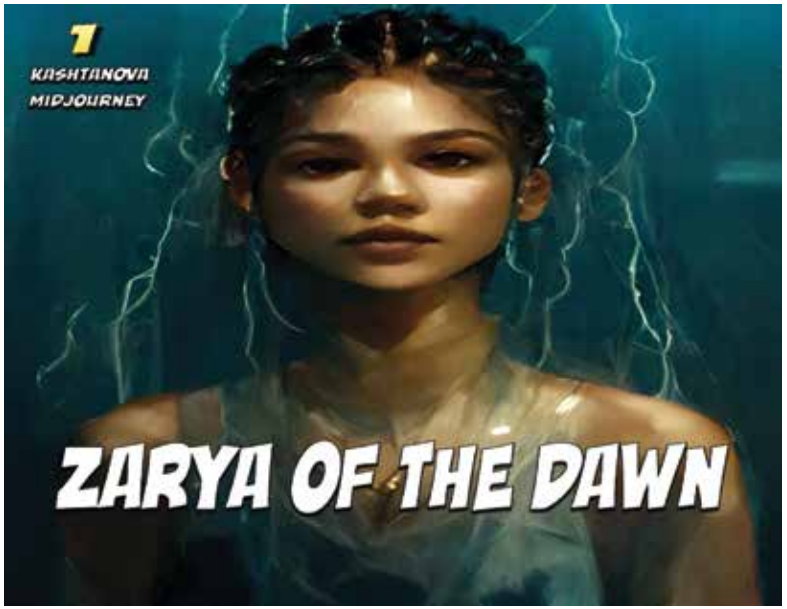
In the present day, generative artificial intelligence systems and algorithms can rapidly generate original content, data, or objects with just a few sentences of "prompt" given by a real person, thus thoroughly challenging the foundations of copyright laws. However, in the process of having generative artificial intelligence create a "work" by providing "prompts," it becomes challenging to argue that there is intensive effort worth the protection of legal systems. Consequently, the issue of which creativity of the prompt engineer should be encouraged is progressively becoming less clear.

Generative artificial intelligence is also utilized by artists in the creation of paintings and music, and when artists seek copyright

protection, they often encounter rejection decisions, particularly in the United States. For instance, the U.S. Copyright Office rejected a copyright registration application for Théâtre D'opéra Spatial, an AI-generated painting that garnered extensive media attention last year after winning an art competition.[4] The rationale behind the rejection was that the artwork was deemed "not the product of human creativity" as it was generated by the artificial intelligence software Midjourney. Despite the creator of Théâtre D'opéra Spatial claiming to have used over 600 prompts and invested hours of effort in creating the "work," it proved to be ineffective.

(Théâtre D'opéra Spatial)

This marked the third decision by the US Copyright Office indicating that art created by artificial intelligence cannot be protected by copyright. The Copyright Office had initially made a decision on this matter in 2019. Artist Stephen Thaler had submitted a copyright registration application for an image he claimed was entirely generated by a computer program. The Copyright Office rejected the application, citing that copyright protection only applies to works created by humans.[5] Whether this ruling by the US Copyright Office implies a categorical exemption of copyright protection for art produced by artificial intelligence remains to be seen. However, as of now, the decisions from the Office continue in this direction. Following this decision, the Copyright Office also revoked the copyright registration of a comic book named "Zarya of the Dawn," which featured images generated by artificial intelligence.[6] The justification emphasized that the author of the work was not human.



However, both in the decisions of the US Copyright Office and in the court cases addressing similar issues, the arguments put forward by the lawyers, the decisions rendered by the courts, and the evaluations made within the boundaries of copyright law resemble discussions of classical copyright issues. It is evident that these evaluations fall significantly short of reaching a fair decision. The problems introduced by generative artificial intelligence are not of a nature that can be resolved with the known rules and perspectives of copyright law.

Generative artificial intelligence will bring about fundamental changes in copyright law. The new creativity model introduced by generative AI fundamentally challenges two key legal doctrines in copyright law - the idea-expression dichotomy and the substantial similarity test for infringement. Going forward, creativity in generative artificial intelligence will depend not on what is produced (expression) but on asking the right questions (ideas). However, in conventional intellectual property law, it is the expression, not the idea, that is protected. This doctrine worked well in times when the difficulty of turning an idea into a work made it worthy of protection. However, now the entire process of transforming an idea into a work can be carried out by artificial intelligence, leaving people's contribution to the work as the idea entered into the prompt.[7]

Prompts may contain creativity, but artificial intelligence handles most of the work traditionally rewarded by copyright law. Creative prompts seem to receive narrow copyright protection, applicable only to the original part, challenging the values upheld by copyright law since its establishment. As the questions asked will be foundational for copyright-ability, the similarity of expression in the answers/works will no longer be effective in proving that the questions have been copied. This implies that we might need to relinquish our established tests for determining copyright infringement or, at the very least, apply them in entirely different ways.

While many copyright issues related to generative artificial intelligence have been addressed in American courts in recent years, two seemingly contradictory decisions have emerged regarding fair use, which could serve as references in infringement cases related to generative artificial intelligence. The first case, mentioned in the dispute between The Authors Guild and Google[8], represents one of the most significant recent precedents concerning fair use. The focal point of the case involves Google copying entire books and displaying a brief excerpt when the book is searched in the search engine. Google secured victory in the Court of Appeal by asserting that the scanning of book texts through the "scraping" method, making them accessible in the search engine, qualifies as "transformative use." Another significant ruling is from the case between Warhol and Goldsmith in the US Supreme Court.[9] This case undeniably altered the discussion around the fair use test and its application by courts. Following this ruling, the question arises as to whether AI platforms utilizing billions of photos, songs, and other content for training generative AI or other purposes will need permission from the copyright holders. Nevertheless, the use of copyrighted works by AI developers to train artificial intelligence

models should fall within the fair use exception of copyright law. Considering the benefits that artificial intelligence will contribute to humanity and the impracticality of obtaining permission from millions of copyright holders, advocating for the fair use exception to train artificial intelligence aligns with public interests.

Another issue that closely concerns software developers and software companies involves an ongoing legal process regarding the intellectual property rights related to GitHub Copilot, a tool recently used by developers when writing code.[10] The Software Freedom Conservancy has pointed out that the use of GitHub Copilot raises complex issues violating open source software licenses, leading to the filing of a class-action lawsuit on this matter. The case revolves around allegations that the open-source codes used for training GitHub Copilot did not adhere to certain license terms, such as attribution, thus leading to a violation. Two of the 11 open-source code licenses mentioned are MIT and Apache. There is currently no definitive information on the case's outcome. Nevertheless, this matter represents a significant point of discussion for the open-source and free software communities.

As a result, when it comes to works produced with generative artificial intelligence and copyrights, current intellectual property doctrines will be insufficient, and we will need to reevaluate basic concepts of copyright such as work, author, creativity, fair use, and licensing issues from a new perspective. In this regard, developments in artificial intelligence are giving rise to highly anticipated and original discussions that I am eagerly looking forward to.

Resources

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COULD GENERATIVE ARTIFICIAL INTELLIGENCE SUBSTITUTE SOFTWARE DEVELOPERS?

CAHİT BARKIN ÖZER

Softtech

AI LAB Production Team Member

PROCESSING CODE USING GENERATIVE ARTIFICIAL INTELLIGENCE

Transformer-based deep networks have achieved a significant breakthrough in the realm of generative artificial intelligence. OpenAI's free-access ChatGPT, surpassing 100 million users within a mere two months, has marked itself as the fastest-growing internet application in history.[1] This milestone represents a pioneering step in introducing generative artificial intelligence to society. Subsequent to this introduction, the boundaries of what can be accomplished with generative artificial intelligence have started to be explored and tested.

One of the standout capabilities of large language models is their superior performance in tasks related to code. These capabilities hold great potential in the realms of software development, machine learning, and artificial intelligence research.

CODE LLMS

Code LLMs are large language models specialized in code operations.

Code LLMs have the potential to execute a broad spectrum of operations in programming. Some of these operations include code annotation, generating code from text, code completion, code enhancement, writing documentation and tests, posing questions about code, and translating between code languages. These operations streamline the work of software developers, expediting the software development process and enhancing efficiency.

The potential of generative AI in coding can be leveraged to create innovative and unique products. For instance, extensions integrated into IDEs can simplify the work of code developers. Tools enhancing code quality can carry out operations like automatic unit testing and composing "commit" messages. Agents scanning code repositories and providing improvement suggestions contribute to enhanced quality and maintainability of code. Additionally, agents conducting code reviews can assist developers in identifying bugs and deficiencies in the code.

SIGNIFICANCE OF PROMPT ENGINEERING

When employing code LLMs, prompts serve as inputs. Prompts are natural language inputs that you type to obtain outputs from language models. In other words, you can request information or generate content from large language models simply by typing. The simplicity of this interface for using LLMs is particularly beneficial, making it accessible for anyone, whether technical or non-technical.

Just as understanding a sentence relies on constructing it according to certain rules, prompt engineering follows specific guidelines. For instance, simply saying "Refactor this code" may not yield successful output. Instead, it might be necessary to instruct the large language model precisely where to refactor the code and provide examples accordingly for more favorable results. Similarly, when requesting error elimination in the code, specifying the framework and indicating which errors in which language should be addressed can enhance the likelihood of a successful response.

Various techniques for writing prompts are continuously researched and developed under the umbrella of prompt engineering. For more in-depth insights into these methods, please refer to my blog post summarizing current prompt engineering methodologies:

Medium - State-of-the-Art Prompt Engineering Methods (https://cbarkinozer.medium.com/son-teknoloji-i%CC%87stem-m%C3%BChendisli%C4%9Fi-y%C3%B6ntemleri-auto-cot-pot-multimodal-cot-tot-got-aot-ve-sot-e3dd36d32a06)

In future tools, the most effective prompts will be readily available for users, reducing the necessity for a deep understanding of prompt engineering. Nevertheless, having some knowledge of prompt engineering can be beneficial for those involved in developing in these areas.

Advancements in generative artificial intelligence may pave the way for the development of fully automated LLM agents, enabling a range of actions to be performed automatically through API tools. This has the potential to revolutionize the software development process entirely.

While the preparation of end-to-end complex and high-quality projects is not currently feasible, research such as "Communicative Intermediaries for Software Development"[2] suggests that such capabilities may become achievable in the medium term.

It is crucial to bear in mind that not every operation can be executed with every code language model. The success of operations carried out with code language models is contingent on the model's capacity to perform that specific operation (i.e., the existence of examples of that type in the dataset), the model's size, the quality of your request, and the complexity of the operation you wish to perform.

This field is still in its infancy but evolving rapidly. Hence, it would not be surprising if you could accomplish something tomorrow that is not achievable today.

Leaderboard (ranked by Human Eval Pass@1)

Model	Params	HumanEval	MBPP	HF	Source
GPT-4 + Reflexion	?	91.0	77.1		paper
GPT-4 (latest)	?	84.1	80.0		github
DeepSeek-Coder-Instruct	33B	79.3	70.0	ckpt	github
DeepSeek-Coder-Instruct	7B	78.6	65.4	ckpt	github
GPT-3.5-Turbo (latest)	?	76.2	70.8		github
Code-Llama	34B	62.2	61.2		paper
Pangu-Coder2	15B	61.6			paper
WizardCoder-15B	15B	57.3	51.8	ckpt	paper
Kod-Davinci-002	?	47.0			paper
StarCoder-15B (Prompted)	15B	40.8	49.5	ckpt	paper

Leaderboard (Sort by Human Eval Pass@1)[4]

For instance, in the past, Large Language Models (LLMs) were not proficient in mathematical operations. However, in recent years, researchers have trained LLMs in mathematics, leading to significant advancements in this domain.[3]

CODE LLMS LEADERBOARD

Here are some of the best code LLMs (please note that this leaderboard is constantly changing):

At present, OpenAI's closed-source LLM models demonstrate the highest success in code development processes.

At the forefront is the GPT-4 + Reflexion model, which stands out as OpenAI's most successful model. GPT-4 is a closed-source multimodal Large Language Model (LLM).

GPT-4 + Reflexion is a model where GPT-4 is enhanced through the use of the reflection method. Reflection is an approach that employs verbal reinforcement to teach agents to learn from past mistakes, proving highly successful in learning complex tasks from a few examples.[5]

GPT-4 is a general and multimodal model, but the table also includes open-source models trained solely with code data. It is important to note that in open-source models, making the model freely available and disclosing the details of the model to the public are two distinct aspects. In the articles, it is acknowledged that the model weights are publicly available as part of an open-source project.[6]

If you wish to explore open-source models on your own, HuggingFace is a popular platform that stores, downloads, and showcases information about open-source models, providing live leaderboards as well.[7]

DISADVANTAGES OF CODE LLMS

The most well-known drawback of Code LLM models is hallucinations, meaning they do not always provide accurate results. Expert oversight is required for controlling the outputs.

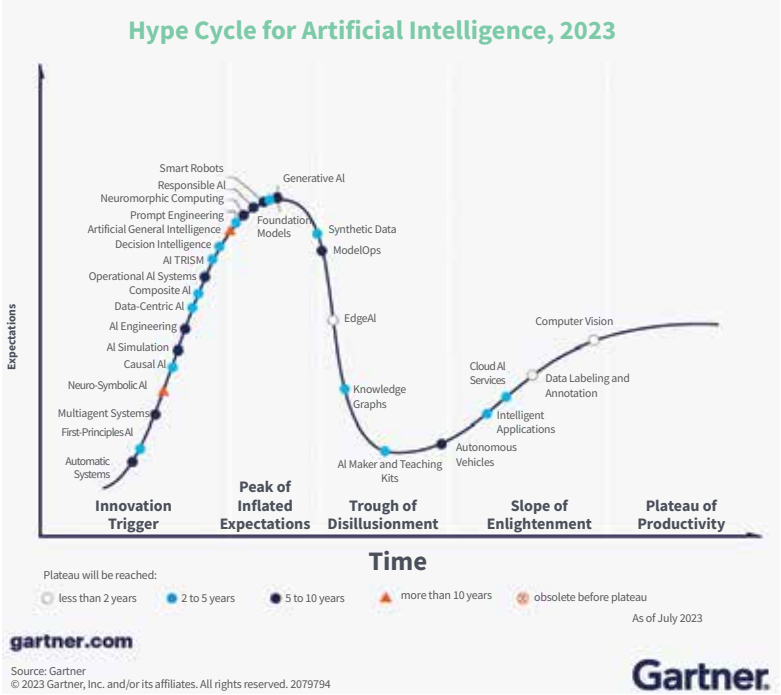
Moreover, since models are trained with public data up to a specific date, they might not have access to the most up-to-date information or be publicly available. To address this issue, "fine-tuning" is a more resource-intensive solution, while system engineering approaches are simpler but less robust than "fine-tuning."

COMPETING WITH CLOSED-SOURCE LARGE LANGUAGE MODELS

Competing with large closed-source models is quite difficult, but not impossible.

Meta adopts an open-source strategy by publishing models like LLama2 and Code Llama. This approach is aimed at gaining an edge over competitors, particularly OpenAI, in the Large Language Model (LLM) field. Meta seeks to attract top AI researchers worldwide, encouraging them to contribute to its projects and integrate them into its established open-source ecosystem. By doing so, Meta demonstrates the potential to outpace models that it might struggle to compete with in a closed-source environment.

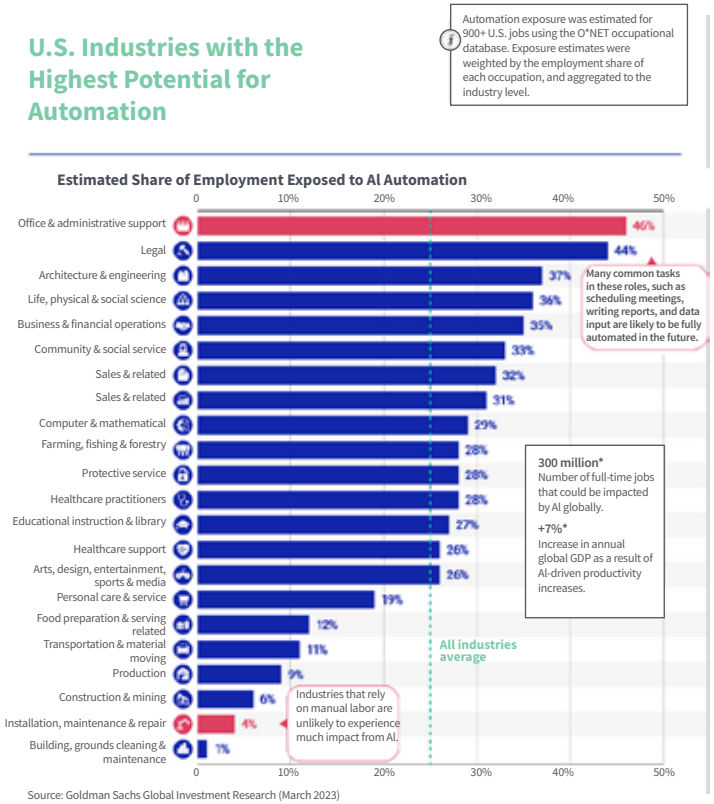
You may have observed that a considerable number of open-source models in the aforementioned table have achieved high scores with fewer parameters compared to their counterparts. The WizardCoder model, for instance, utilizes the Evol-Instruct method with 15 billion parameters. This approach employs Large



[https://emt.gartnerweb.com/ngw/globalassets/en/articles/images/hype-cycle-for-artificial-intelligence-2023.png]

Language Models (LLMs) to automatically generate instructions at varying difficulty levels. **In essence, the methods employed play a crucial role alongside the parameter count in determining the performance of these models.**[8]

The intricacies of data preparation hold paramount importance in the development of a model. Regardless of the model's size, poor data quality inevitably leads to low-quality outputs.[9] The process of creating data often involves the synthesis of data using artificial intelligence or software methods. In previous years, synthetic data gained popularity and yielded significant advantages.[10]However, the concept of data synthesis is waning in popularity, as indicated by Gartner's 2023 Artificial Intelligence Hype Cycle. This shift is attributed to the fact that data synthesized by large language models tends to produce inferior results compared to data generated by human output.



[https://www.visualcapitalist.com/wp-content/uploads/2023/06/robotics-and-ai-industries-infographic.jpg]

COULD CODE LLMS SUBSTITIUTE SOFTWARE DEVELOPERS?

The final point I'd like to address is the concern regarding whether the widespread adoption of artificial intelligence will lead to unemployment among software developers. Artificial intelligence excels in handling repetitive tasks, primarily due to the abundance of sample data available for such tasks. However, it's crucial to note that software development, being a field that demands creativity, remains one of the least susceptible non-physical professions to replacement by artificial intelligence.

If artificial intelligence encounters a problem without a comparable solution, its performance may be suboptimal. Moreover, the code generated by artificial intelligence is not flawless, necessitating the input of an expert. **Consequently, at present, the role of software developers leveraging artificial intelligence is more**

of augmentation rather than complete replacement.

Another perspective to consider is the impact on productivity. While fewer software developers can accomplish similar tasks with the assistance of artificial intelligence tools, the same team can potentially achieve more. A parallel example can be drawn from "no-code" tools. Although these tools have streamlined software development, they haven't rendered it obsolete. Instead, they enable quicker and more cost-effective execution of repetitive tasks. However, for creating original, distinctive, and complex products, the expertise of software developers remains indispensable. This analogy may hold true for the integration of artificial intelligence as well.

Moreover, software engineering extends beyond mere coding or programming. Developers engage in communication with colleagues, undertake planning, decision making, and perform various manual tasks.

If my earlier explanations haven't eased your worries and you still have concerns about potential job loss due to artificial intelligence in the future, it's worth noting that in such a scenario, highly capable AI could potentially handle a wide range of tasks across various professions. Moreover, software engineering is closely connected to the realm of artificial intelligence, as both fields are grounded in computer science.

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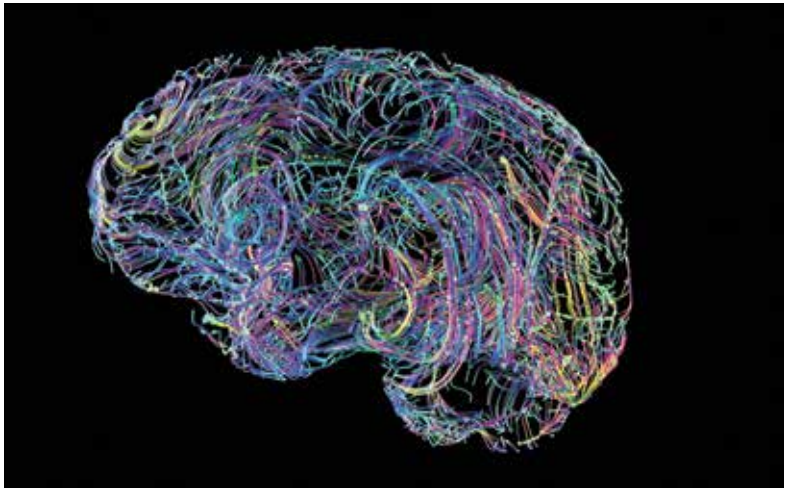
ADVANCING BEYOND 'GENERATIVE ARTIFICIAL INTELLIGENCE': EXPLORING THE REALM OF SYNTHESIS ARTIFICIAL INTELLIGENCE

ALİ CAN IŞITMAN

Maxitech

Corporate Innovation Manager



In 2023, a groundbreaking technological advancement emerged, marking one of the most significant leaps in history. The advent of "Generative Artificial Intelligence," commonly referred to as Generative AI or Gen AI, has bestowed upon users unparalleled creative capabilities through user-friendly tools. This transformative technology encompasses algorithms trained on extensive datasets, enabling the generation of novel content by identifying patterns inherent in the training data. Generative Artificial Intelligence models, when trained on various data types like images, texts, or voice recordings, possess the ability to analyze the input data and generate comparable content.

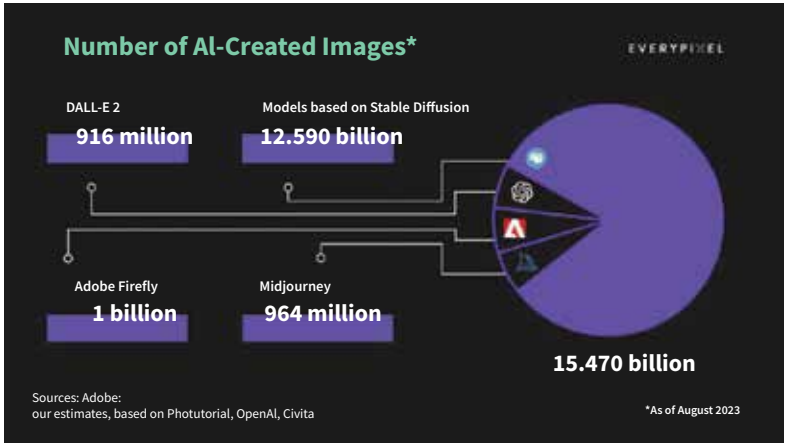


Image produced by Discord user Sixu with Midjourney product, Everypixel Journal, 2023

As reported by Everypixel Journal, calculations reveal that since the introduction of this technology into our lives in late 2022, the production of images has surpassed the cumulative number of photographs taken over the span of 150 years.

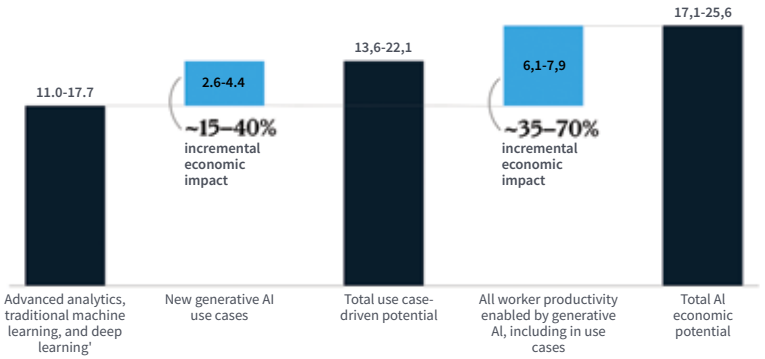
Certainly, precise calculation of these figures may pose challenges, but employing hypothetical approaches allows us to assess the following statistics related to the image production facilitated by generative artificial intelligence:

- Text-to-Image algorithms have contributed to the generation of over 15 billion images. Remarkably, it took cameras, since their invention in 1826, a span of 150 years until 1975 to reach the 15 billion image milestone.
- Since the introduction of DALLE-2, an average of 34 million images per day have been generated.
- Adobe Firefly has rapidly ascended as the fastest-growing Generative AI product, exemplified by the generation of an astounding 1 billion images within its first three months of launch.

Given that this data exclusively pertains to image production, it is evident that text generation surpasses these figures significantly. The prevalence of over 100 million users for OpenAI's ChatGPT, in contrast to approximately 2 million users for the DALLE-2 product, underscores that the volume of text produced far exceeds the

Generative AI could create additional value potential above what could be unlocked by other AI and analytics.

AI's potential impact on the global economy, $ trillion



Notes from the AI frontier: Applications and value of deep learning, McKinsey Global Institute, 17 Nisan 2018.

McKinsey&Company

The Economic Potential of Generative AI: The Next Productivity Frontier, McKinsey, June 2023

capacity for consumption by users. Some statistics about this are as follows:

- Surveys indicate that 1/3 of college students openly acknowledge utilizing ChatGPT during their written assignments.
- Artificial intelligence aids 23% of book authors based in the United States.
- The market for artificial intelligence products utilized in marketing is projected to achieve a size of 107.5 billion dollars by the year 2028.
- Netflix, known for its active utilization of artificial intelligence applications, can realize an annual savings averaging 1 billion dollars through these technologies.

As outlined in McKinsey's article titled "The Economic Potential of Generative AI: The Next Productivity Frontier" published in June 2023, applications of "Generative Artificial Intelligence" have become an integral and irreversible part of our lives. The research estimates that artificial intelligence is poised to contribute a substantial amount, ranging between 2.6 Trillion Dollars and 4.4 Trillion Dollars, to the overall market size across the 63 use cases examined by McKinsey.

At this stage, several questions come to mind: Who will engage with this extensive and seemingly boundless content that spans across various industrial sectors, and by what means? Additionally, how will individuals locate the specific information they are seeking within this vast amount of content? How will the accuracy of this data be evaluated?

The upcoming technological advancement, referred to as "Synthesis Artificial Intelligence," distinguishes itself from generative artificial intelligence by not only possessing content generation capabilities but also by its ability to synthesize and summarize information gathered from diverse sources. The foundation of this innovative technology lies in a structure where generative artificial intelligence processes dynamically merge with autonomous learning techniques. While generative artificial intelligence excels at creating content based on references, Synthesis AI stands out for its aptitude in amalgamating information, learning from it, and dynamically adapting its responses.

Autonomous learning algorithms empower Synthesis AI systems to adjust to evolving environments and perpetually learn from real-

world data. This dynamic learning capability enables Synthesis Artificial Intelligence to enhance its comprehension and response abilities over time, facilitating continual self-improvement in synthesizing complex information. Notably, it can seamlessly detect and integrate diverse materials, such as medical sources and financial data, within a broad context without necessitating a separation of sources.

This groundbreaking technological advancement is anticipated to have a profound impact across various industries, with healthcare standing out as a prime example. Particularly, its potential to revolutionize diagnostic processes is noteworthy. Through the synthesis of data derived from electronic patient records, diagnostic imaging technologies, and medical literature, this technology can offer a comprehensive insight into a patient's health. This holistic approach signifies a paradigm shift in healthcare, promising more accurate diagnoses and the development of personalized treatment plans.

Financial institutions stand to gain significant advantages from the dynamic integration capabilities of Synthesis AI, particularly in the realm of market data. Unlike traditional predictive analytics, Synthesis Artificial Intelligence can rapidly amalgamate information gathered from global economic indicators, social trends, and geopolitical events. This comprehensive synthesis empowers institutions to operate with heightened accuracy in financial markets, enhancing decision-making processes and enabling more informed actions.

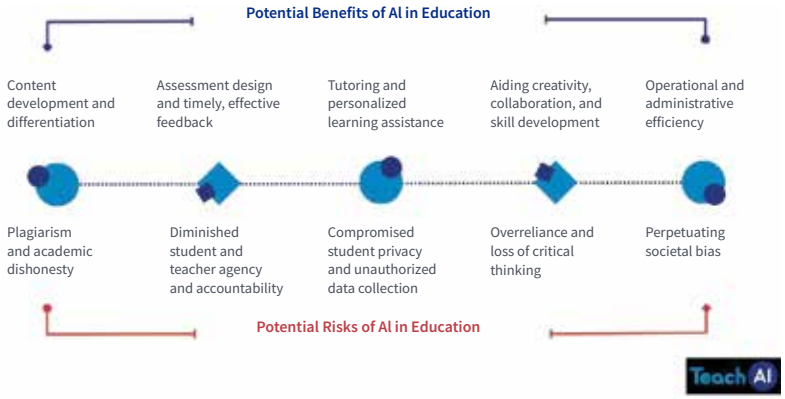


Image 3- Potential Risks and Benefits of AI in Education, TeachAI.org, 2023

The influence of Synthetic Artificial Intelligence on education necessitates a fundamental shift in traditional models. Through the synthesis of information sourced from diverse educational outlets, it becomes feasible to establish a framework that tailors teaching methods to individual learning styles and progress. This dynamic adaptation is anticipated to foster a personalized learning experience. Beyond facilitating a deeper understanding of subjects, it will empower students to rapidly grasp evolving and updated information in its latest form. Moreover, it promotes an understanding and internalization of research and learning mechanisms as an ongoing and ever-changing process.

While synthetic artificial intelligence holds immense promise, it also presents certain challenges. Successfully addressing these obstacles will be crucial to unlock the full potential of this potentially groundbreaking technology.

The dynamic and adaptable characteristics of synthetic AI pose challenges in terms of transparency and interpretability. Establishing an understanding of how these systems achieve specific synthesized outputs is crucial for building user trust, ensuring ethical use, and maintaining accountability. However, balancing this need for transparency with the imperative of ensuring system and user security becomes paramount, particularly in the dynamic processing of new data. Safeguarding the integrity of the synthesis process against potential malicious attacks remains a critical necessity in the ongoing development and deployment of synthetic AI.

The efficacy of information synthesis heavily relies on the quality and diversity of the underlying data. Tackling issues related to data quality, integrity, and potential bias poses a persistent challenge. Implementing stricter data management practices and employing continuous monitoring systems are essential measures to mitigate these challenges. This approach is crucial for ensuring accurate and unbiased information synthesis in synthetic AI systems.

Given the presence of information synthesized from diverse sources, nearly every study in this field will necessitate interdisciplinary collaboration. Technologists, ethicists, and policymakers must collaborate to formulate comprehensive control mechanisms addressing the ethical use, security, and interpretability of synthetic AI. Interdisciplinary research will be pivotal in shaping the future of this technology and ensuring its responsible development and deployment.

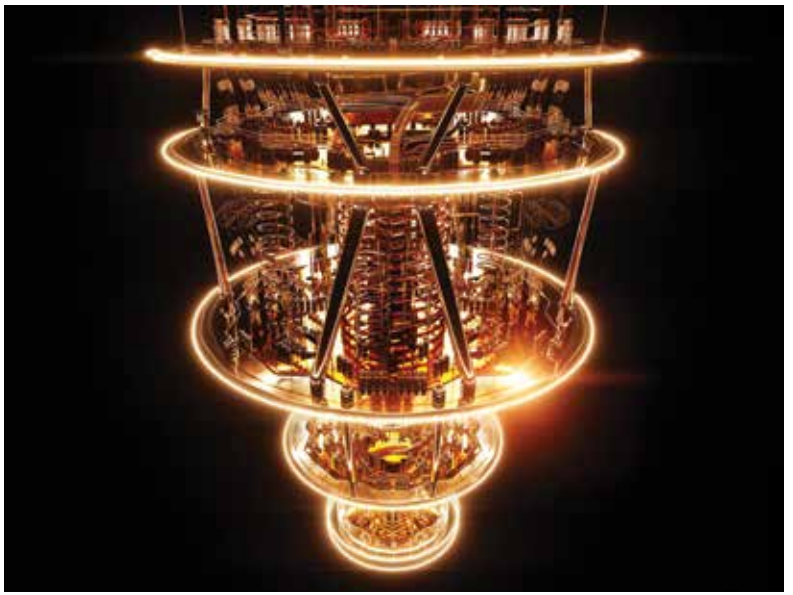
The shift from generative AI to synthetic AI heralds a transformative change for artificial intelligence. Synthesis AI is emerging as a dynamic force that not only generates content but also effectively synthesizes information, learns, and adapts in real time. This technological milestone is anticipated to bring about radical changes in areas such as disease diagnoses, financial decision-making processes, creative expression, and education. However, the transformative potential of synthetic AI comes with ethical challenges that require careful consideration. This significance extends beyond a mere leap forward in artificial intelligence; it marks a progression into a future where the boundaries between human creativity and machine capabilities are blurred, opening up almost limitless opportunities for innovation.

RECENT DEVELOPMENTS IN THE GLOBAL LANDSCAPE OF POST-QUANTUM CRYPTOGRAPHY

JALE İPEKOĞLU

Maxitech

Corporate Innovation Expert



Quantum computers are anticipated to bring about profound changes in the methodologies employed to tackle intricate problems across various industries such as finance, energy, aviation, automotive, pharmaceuticals, and chemicals. Ongoing research in the field aims to overcome daily challenges in augmenting the capacity of quantum processors feasible for small-scale production. Despite the potential for more efficient and precise calculations, the technology's superior computational capacity also raises concerns, as it is perceived as a potential threat.

Almost every sector relies on systems for the daily flow, storage, and communication of data, both internally and with external systems. The advent of quantum computing presents a substantial threat to the security of the digital realm, particularly concerning data

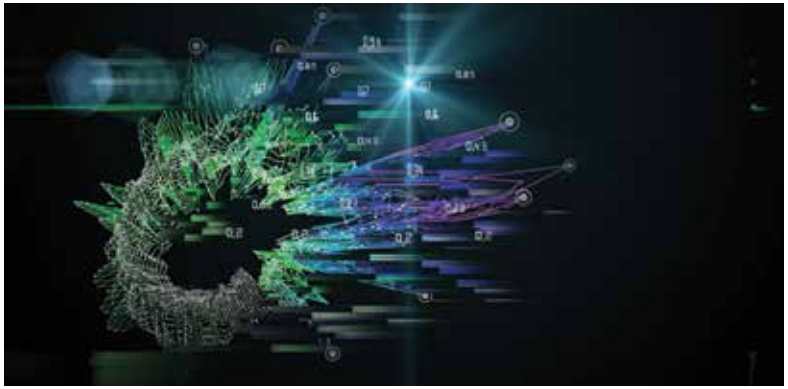
encryption - a foundational security requirement for any system utilizing data in such capacities. This article delves into post-quantum encryption, an innovative field focused on guaranteeing data security and ensuring secure communication in the post-quantum era. It provides insights into the latest developments in this domain.

ENCRYPTION IN THE AGE OF QUANTUM COMPUTING: CURRENT METHODS AND EMERGING THREATS

In the encryption of conventional communication channels, a framework known as public key cryptography is employed, relying on the utilization of two mathematically linked keys - one public and the other private. This method of encrypting and decrypting transmitted messages, utilizing distinct keys, is termed asymmetric encryption. In contrast to the symmetric encryption approach, which employs a single key for both encryption and decryption, asymmetric encryption, being more secure, involves a public key for message encryption. The encrypted message can only be decrypted and comprehended using the corresponding private key, known exclusively to the recipient. Public keys are generated through a sophisticated encryption algorithm to ensure resistance against exploitation through brute force attacks.

Three prevalent encryption algorithms currently in use are Rivest-Shamir-Adleman (RSA), the Digital Signature Algorithm (DSA), and Elliptic Curve Cryptography (ECC). The security of these algorithms hinges on three challenging mathematical problems: the Integer Factorization Problem (IFP) for RSA, the Discrete Log Problem (DLP) for DSA, and the Elliptic Curve Discrete Log Problem (ECDLP) for ECC. Additionally, augmenting the key size or bit length of public keys contributes to elevating the overall security level.

The mentioned encryption algorithms pose a challenge to resist the computational power of classical computers. However, American mathematician Peter Shor, in a 1994 article, theoretically demonstrated the possibility of efficiently solving the mathematical problems forming the basis of these algorithms. Shor's work highlighted the vulnerability of these algorithms to quantum computing, as it could reveal the relationship between public and private keys in a short time, rendering the encryption ineffective and jeopardizing data security (Shor, 1994). While quantum processor hardware was not readily available at that time, recent developments indicate a shift. Quantum processors are now being produced on a small scale, and ongoing advancements aim to enable these processors to perform meaningful calculations (Liu et al., 2023; Kannan et al., 2023). Major technology companies like IBM, Google, and Amazon are heavily investing in and progressing with their research teams in this domain. Consequently, the question now revolves around not "when will passwords be cracked?" but rather "will passwords be broken?" The timeline for the production of a processor capable of running Shor's algorithm remains uncertain. However, acknowledging the progress in quantum technologies, devising a solution has become crucial on both international and private sector fronts.



POST-QUANTUM CRYPTOGRAPHY AND CURRENT DEVELOPMENTS

While the computing power of quantum computers may not immediately render encryption algorithms vulnerable, the necessary precautions will reshape an infrastructure that has been in use for many years. It is crucial to take early action, recognizing that the transformation of widely adopted systems will be a long-term endeavor. A comprehensive national analysis is imperative for this transformation, involving in-depth research into new encryption algorithms. These algorithms must then be seamlessly integrated into existing systems without disrupting their communication with each other.

The identification and application of novel "quantum-resistant" encryption methods, designed to withstand the expected computational capabilities of quantum computers, fall under the purview of post-quantum cryptography (PQC). Post-quantum encryption methods, being software-based and compatible with classical computers, can seamlessly substitute the existing encryption algorithms. Quantum-resistant encryption methods are crafted using alternative algorithms, including lattice-based, code-based, hash-based, or multivariate encryption.

Since 2016, the United States National Institute of Standards and Technology (NIST) has been soliciting proposals from the academic community for new encryption methods capable of withstanding the computational power of quantum computers. NIST continues to assess and review these submissions on an annual basis. Notably, among the applications from our country, Dr. Erdem Alkım, a faculty member, contributed to the research teams behind the NewHope and FrodoKEM algorithms. These algorithms successfully progressed from the initial application round in 2016 and qualified to advance to the second round, initiated in 2019.

Moreover, the University of Waterloo in Ontario, Canada, in collaboration with a research group featuring members from Amazon Web Services, IBM, and Microsoft, initiated the open-source project "Open Quantum Safe" (OQS) in 2016. This project aims to facilitate the development and implementation of quantum-resistant encryption. As part of the initiative, a library named liboqs, comprising quantum-resistant encryption algorithms, has been released as open source on GitHub for researchers. Additionally, efforts are underway to integrate the liboqs library into security protocols and applications, including the widely used OpenSSL library in encryption.

In September 2023, a coalition of technologists and researchers announced the establishment of the Post-Quantum Cryptography Coalition (PQC Coalition) under the National Institute of Science and Technology. The coalition aims to enhance understanding and global adoption of post-quantum encryption algorithms, both commercially and as open source. Founding members include IBM Quantum, Microsoft, MITER Labs, and SandboxAQ from the United States, along with PQShield from the UK and the University of Waterloo from Canada. SandboxAQ, a New York-based company specializing in artificial intelligence and quantum technologies, plays a key role in raising awareness nationwide, promoting the development and implementation of quantum encryption solutions, and assisting organizations in transitioning to post-quantum encryption algorithms. IBM has also taken steps to integrate quantum-resilient algorithms into its technologies and customer solutions. As part of these efforts, it introduced the "Quantum Secure Road Map" service to customers in May 2023. In these services, IBM provides customers with a comprehensive three-stage offering: first, identifying all encryption algorithms utilized by a company at the code level; second, assessing and prioritizing the risk levels associated with encrypted data; and third, furnishing automated tools designed to facilitate the transformation of the technological infrastructure.

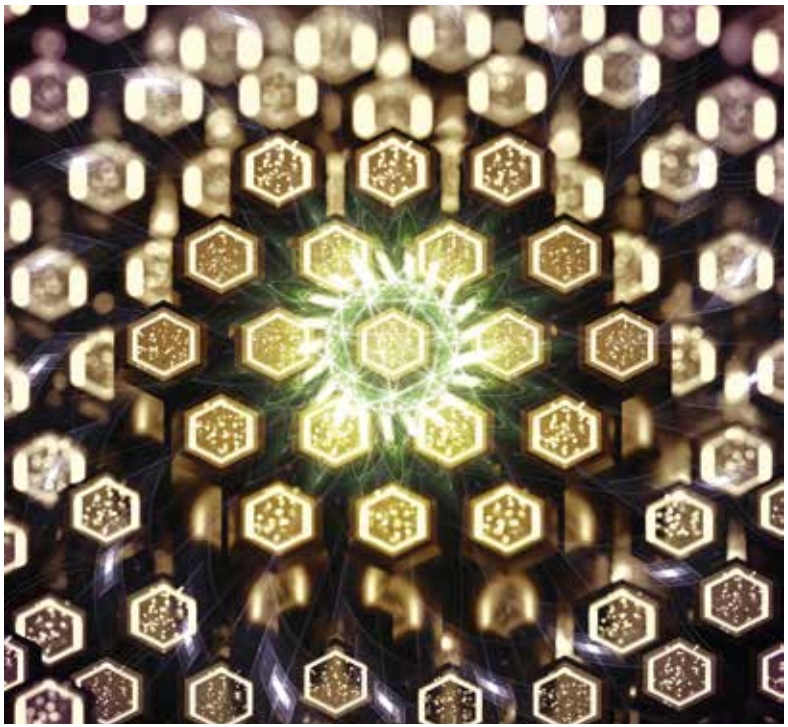
Efforts are underway to cultivate a skilled workforce in the USA. Acknowledging the imminent shortage of talent in artificial intelligence and quantum technology due to the growing industry demand for advanced technologies, SandboxAQ, based in New York, has initiated collaborations with 30 universities globally. Within this framework, the goal is to host university students, tailor curricula to the relevant subjects, offer scholarships to both faculty members and students, establish a sustainable workforce resource through seminar series, and equip graduates for roles in the quantum industry.

In the financial sector, the U.S.-based Accredited Standards Committee X9, responsible for setting standards in the financial services industry both in the U.S. and internationally, revealed in June 2023 that they have initiated the development of a guide for assessments related to post-quantum cryptography.

Beyond post-quantum encryption, there is ongoing exploration of alternative infrastructural approaches leveraging quantum technologies. However, these solutions are anticipated to gain widespread adoption in the longer term. Quantum Key Distribution (QKD) is an emerging technology grounded in quantum mechanics and specialized hardware. It serves as an alternative to post-quantum encryption, relying on classical computers and algorithms. The inherent security of quantum key distribution, often employing photons and their distinctive quantum entanglement properties, lies in its ability to detect eavesdropping attempts by a third party on the communication network between two parties. Any interference with the key exchange triggers changes in quantum properties, immediately exposing the unwanted intrusion. In contrast to purely software-based solutions, quantum

key distribution systems maintain their security irrespective of computational capacity.

Another long-term research focus leveraging quantum entanglement is the development of the quantum internet. This concept revolves around interconnecting quantum computers and processors, currently in early stages of production and development. The objective is to establish a quantum computing and information network, aiming to forge an entirely new and inherently secure network infrastructure beyond classical internet technology.



CRYPTO AGILITY

Given the extensive transformation involved in implementing post-quantum encryption techniques, the concept of "crypto agility" is gaining paramount importance for organizations. Crypto agility refers to the capability of the data encryption infrastructure within an organization to seamlessly transition to a new algorithm following industry standards without requiring application rewrites or the installation of new hardware systems. To ensure this agility, organizations should focus on establishing easily monitored and centralized encryption infrastructures, with clearly identified teams responsible for encryption stages. Attaining this capability across the entire organizational infrastructure will facilitate a swift adaptation to new quantum-resistant algorithms as they continue to be developed. Since algorithms are evolving daily and may lose reliability in the face of successful attacks, organizations that are more agile in implementing new encryption algorithms will be better equipped to swiftly address the threats posed by quantum computers.

CONCLUSION

As research persists in empowering quantum computers to harness big data for meaningful calculations, parallel efforts are directed towards seeking alternative solutions for data security that may face threats from the ensuing superior computing power. While this doesn't appear to be an imminent threat, it's evident that the implementation of planned measures will be a

time-consuming process. In light of this, collaboration among government agencies, academia, and commercial institutions becomes imperative. Analyzing the encryption methods in use, adapting security infrastructures both technically and institutionally to accommodate the impending transformation, and promptly instituting measures against the potential threat posed by quantum computers should be prioritized without delay.

For comprehensive research reports and detailed insights into the applications of quantum technologies, post-quantum encryption, and the quantum internet, you can explore Maxitech's innovation platform, Entrapeer.

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IS CYBER SECURITY CRITICAL?

HASAN REYHANOĞLU

Softtech
Director of Information Security
and Risk Management

If we simplify it to a "Yes" or "No," we might not capture the full nuance for the reader. Naturally, you might be anticipating a "Yes." That's a common theme in fiction.

Alternatively, you could say, "Sure, offer a different perspective." Well, I'm ready to share something else, but it would be great if we could consider the whole issue beyond just this response... Without delay, let me state: "It's not quite that straightforward."

Let's examine this critical situation together.

It was a November morning, in the 2000s.

We were at a conference on Information Systems Governance and Information Security. A friend of ours, a manager at a well-known consultancy firm, presented information from a freshly prepared report on Information Technologies. In

his presentation, he posed a straightforward question to the significant CIOs and CTOs of that time: "Can you outline the top 10 priority on your agenda?"

They did. What unfolded was quite a spectacle. With around 50 CTOs and CIOs each providing their input, it amounts to a whopping 500 items. Quite a situation indeed.

Yet, there was something missing: Information Security.

Not one single mention! Information Security wasn't anyone's concern; it never became a priority. Cybersecurity wasn't even a term back then. This aligns with our response to the earlier question: "It's not quite that straightforward."

Cybersecurity didn't exist. Moreover, just a few years prior, the world had been rattled by self-replicating malware like Chernobyl (CIH), ILOVEYOU, and such, disrupting and sabotaging the operations of hundreds of thousands of companies.

"What's the issue? We tightened operating systems and communication protocols. We implemented firewalls, IPS, etc. We invested in this and overcame it. Isn't that enough?" was probably their line of thought.

AND THEN?

It was 2011. US Department of Defense received intel revealing that the design of a warplane planned by China for prototype production surprisingly resembled a plane that the USA was gearing up to manufacture.

All eyes turned to the manufacturing company. A sudden raid was conducted, and their information systems were scrutinized. The verdict? Chinese hackers, based in the USA, were actively leaking data from the system. Upon detailed examination of the attack, it became apparent that the hackers had infiltrated the system over an extended period through a systematic attack, and the company was oblivious to the intrusion with no measures in place for detection at that time.

This attack method earned the moniker "Cyber Kill Chain" due to its consistent sequence used in numerous subsequent attacks. The details of the attack were documented in a book titled "At War - The Rise of the Internet Complex" by Shane Harris in 2014.

Certainly, a single attack wasn't sufficient to radically shift the perception of the criticality of information security. However, it was not the sole incident. Over the next two years, several companies were targeted, impacting a significant number of customers. Some notable examples include Adobe with 150 Million users, eBay with 145 Million, Target with 110 Million, Home Depot with 109 Million, Anthem with 88 Million, and JP Morgan Chase with 83 Million (M: Million users). Indeed, the minimum number of affected individuals in each case equaled the population of Turkiye, highlighting the substantial impact, and the financial losses were so extensive that they couldn't be accurately quantified.

THE RISE OF PRIVACY

Imagine you are a former US secret service agent. During your duty, you had previously entered a country using a different passport. Upon retirement, you and your spouse decided to visit the country with your real identities. At passport control, you were stopped and asked to provide biometric data for a detailed check. Despite not being concerned initially, you complied. To your surprise, you were then informed that you were recognized as an American secret service agent. Disbelievingly, you uttered, "No way, no way," but it turned out to be true.

In April 2015, a cybersecurity employee at the US Office of Personnel Management (OPM) identified suspicious traffic on the agency's outgoing network, leading to opmsecurity.org. Questions arose: Was this address registered with OPM? What application generated this traffic? Surprisingly, it was a security application, but not one used by OPM, and it shouldn't have produced such outbound traffic. A more alarming discovery was the duration – the employee had been working since April 2014.

Chinese hackers had unrestricted access to the OPM database for an entire year. Originally, OPM held limited individual data, but after the September 11 attacks, this dataset expanded significantly. Every public servant, from a kindergarten teacher to a senator or secret service agent, had their comprehensive data uploaded to these databases – information about their education, teachers, classmates, dormitory friends, close relationships, usernames, passwords, intelligence reports, and eventually, even their biometric data. Changing names or getting a new passport couldn't conceal their true identity as biometric data remained unchanged.

During his pre-election campaign, Donald Trump mentioned in a speech: "It turns out that Chinese hackers are snooping around in our government archives, but no one is talking about it."

In that same year, a different event occurred, changing the lives of those involved forever. A research assistant, who had an account on a site facilitating extramarital relationships, with the slogan "Life is short. Have an affair", wished to delete their account from the platform. The issue was that while creating an account on the site was free, yet, a transaction fee was charged for account deletion.

Even though the researcher was willing to pay to prevent the revelation of their identity and activities on the site, they remained skeptical about the platform's assurance in removing their account information. Describing the situation to a knowledgeable friend, they decided to investigate the site. Despite the security certification logo displayed on the site's homepage, the friend remarked, "If they truly uphold the security certification, it might not be easy for me to infiltrate and examine. However, I have hacker friends, and we can explore it together."

They investigated and discovered that the security measures were ineffective. The logos were fake, and the certification held no practical value. Despite the promise of deletion upon payment, the records were still present in the system. They decided to copy the data of 37 million people within their reach. Upon entering the site, they boldly declared, "We infiltrated your site, copied your data, and we will publish it on the Internet." They followed through with their threat, publishing the data without contemplating the consequences.

A software developer, for whatever reason they did this, created a user-friendly query program for the site. Through the interface, users could input any information about the person they wanted to query. If a match was found, the program provided access to all recorded data about that individual on the site. This included their username, password, physical characteristics, sexual orientation and preferences, likes, one-on-one correspondence with other members, as well as photos uploaded to their account or shared with others.

People began doing searches in the site, starting with their relatives and influential acquaintances, and eventually expanding to everyone they knew. Consequently, records of numerous politicians, artists, senior executives, athletes, retirees, or ordinary citizens who had opened accounts on the site were exposed.

Another thing that soon came to light was that some individuals were unaware that they were in fact users of this site. To make the platform seem more vibrant and populated, the site generated profiles using real people's accounts on other social media platforms and operated them on its own. They even set up accounts for women who joined social media to view pictures of

their grandchildren. These profiles were enhanced by using the photos they posted during their daily activities.

Families were reportedly torn apart after this incident. Thousands of individuals are said to have turned down prestigious job offers or resigned from comparable positions to avoid drawing attention. Reports indicate suicide attempts, and some people allegedly left the country due to laws in certain regions that penalize specific types of relationships. The full extent of the incident remains unknown.

The fate of the company remains unknown, and it's unclear whether any outcomes have emerged from the lawsuits that were filed.

In these last two examples I have described, the main issue was the abuse of privacy. People's data were compiled and processed without their consent, without their knowledge, and they were not protected. Some lives were ruined not because of what individuals did, but because of what companies and even states did not do. This issue needed to be regulated urgently.

It was around that time that abbreviations such as PDPL (Personal Data Protection Law) and GDPR (General Data Protection Regulation) entered our lives. Preliminary work took years, and there were objections. Without further delay, authorities determined what would count as personal data; they changed the data storage and processing rules, if any, and made violations subject to penalty.

INDUSTRY 4.0

Of course, there was also the notion of "safety", which we owe in part to Industry 4.0.

While initially discussing information security, we used to use a car analogy to illustrate the concept. Information security was likened to the seat belt in a car. However, one might argue against this analogy as the seat belt primarily falls under compensatory control—mitigating damage in the event of an accident. Yet, there exist numerous controls within the preventive and detection categories that actively reduce risks. From this perspective, various features such as dials, alarm systems, signals, and even the structural integrity of the vehicle contribute as elements of information security.

Was that all? What determines how fast you can drive a vehicle? One might answer horsepower and thrust, and that's correct; these factors primarily influence the maximum speed the vehicle can achieve. However, can you reach this speed? Probably not. If you can't stop safely, it's not advisable. Therefore, the speed you can attain is essentially determined by the vehicle's ability to come to a halt when necessary. If everyone aspires to fly, what if you can't land safely?

This detail altered the approach to discussing Industry 4.0 components. Previously, cybersecurity was mentioned under big data, cloud computing, open-source codes, and augmented reality. However, regardless of how much data you possess,

would you place it where everyone can access it freely? If anyone could remotely access the systems of an autonomously flying plane that eliminates the risk of accidents through precise calculations, would you board that plane? What if the devices in a hospital could keep the connected patients alive, but someone remotely accessed these devices and demanded ransom from the patients' relatives?

When safety was incorporated, the framework of Industry 4.0 components underwent a transformation.

WORLD ECONOMIC FORUM

The summarized cases mentioned earlier were not unique; they lacked distinctiveness. Rather, they represented just two instances among dozens, if not hundreds, of well-documented cases, each deserving thorough scrutiny. These companies did not stand out based on their actions or lack thereof; each one engaged in cybersecurity measures without any exceptional deviation. They were not singled out as scapegoats; instead, they had genuinely experienced the repercussions of cyber threats.

In the technology reports of that year, a recurring theme was "The Rise of Cybersecurity." The world faced an impact in areas that were previously indifferent to such concerns. One particularly notable statement in the report asserted, "Cybersecurity threats have emerged as a critical concern for both companies and individuals, rapidly ascending the ranks to claim the title of the most significant threat."

They did. A year later, at the World Economic Forum, Cyber Threats surpassed Nuclear Threats, claiming the top position, and have consistently held that rank ever since.

Since 2015, one of two distinct occurrences has taken place. Either cybersecurity has consistently occupied a prominent position on the agendas of Chief Information Officers (CIOs) and Chief Technology Officers (CTOs), seeking retribution for past oversights, or a company has experienced its fair share of cyber attacks.

Weren't the others aware? Those who prioritized cybersecurity did indeed grasp its importance. However, the impact on companies that made prudent investments - and by investment, I don't solely refer to financial aspects - those who were cognizant of the issue, understood both themselves and the threats, strategized precautionary measures, executed effective detection protocols, and dedicated time to incident management, was significantly minimized.

REST OF THE STORY

In 2019, FireEye, a prominent cybersecurity company globally, disclosed that tools used in attack drills (Red Team exercises), designed to evaluate the attack prevention capabilities of organizations, might have been compromised and accessed by attackers. This revelation garnered significant attention due to the ironic twist involved - the potential exploitation of the very tool developed by the company, whose detection and prevention mechanisms are extensively utilized worldwide.

Subsequent to extensive investigations, a deeper layer of the incident unfolded. It was discovered that a backdoor existed within a software known as Orion Software, utilized by the cybersecurity company. Certain versions of this software, developed by another company and employed by over 30,000 customers worldwide, were found to contain backdoors. The breach originated from the theft of an employee's username, affiliated with a support company responsible for the ventilation work of the Orion software producer. This breach facilitated the infiltration and addition of backdoors to the software. Initial findings indicated widespread damage, affecting nearly all U.S. public institutions and 18,000 companies.

BENEFITS OF CYBERSECURITY - DIFFERENCES AND REQUIREMENTS

The initial shift in perception occurred with a simple change in terminology - specifically, the shift from "information security" to "cybersecurity." Remarkably, doors that remained closed when referencing "information security," despite identical content, swung open when the term "cybersecurity" was employed. It's weird but true.

We addressed the ascent of privacy and security concerns with illustrative examples. However, another noteworthy issue commands attention.

Mike Tyson's quote, "Everyone has a plan until they get punched in the face," holds a profound truth that is inevitably realized at some point. In the past, the emphasis was on the cost-effectiveness of preventive measures over compensatory actions, and the focus was primarily on prevention. However, the landscape has evolved. Incident Management now holds equal significance. Comprehensive Incident Management, spanning from crafting press messages to conducting regular drills, is imperative. Without this holistic approach, the risk exists that, in the heat of the moment, panic may lead to a mishandling of the situation when faced with an unexpected blow. This shift marks a critical difference in approach.

Yet another crucial distinction lies in the holistic management approach that permeates all facets of the company, coupled with

an awareness that spans across all employees, from the general manager to the gardener. However, delving into these aspects warrants a separate article.

Well, now let's ask the critical question at the beginning again: Is cyber security that critical?

In fact, attempting to characterize it with just the term "critical" may fall short. Alternatively, we might describe it as "vital" if that suffices. This entity not only caters to your needs but also navigates seamlessly, soaring and landing precisely as required.

Wishing everyone a healthy day! This extends not only to our physical well-being but also encompasses the protection of our personal information and digital data.

Resources

- *https://en.wikipedia.org/wiki/Office_of_Personnel_Management_data_breach*
- *https://en.wikipedia.org/wiki/Ashley_Madison_data_breach*
- *https://portswigger.net/daily-swig/growing-cyber-threats-listed-among-greatest-global-risks-in-annual-world-economic-forum-report*
- *https://www.techtarget.com/whatis/feature/SolarWinds-hack-explained-Everything-you-need-to-know*
- *HP Cyber Risk Report 2015*

USING ARTIFICIAL INTELLIGENCE AND OPEN DATA FOR PRACTICAL FINANCIAL RISK MANAGEMENT APPLICATIONS

AHMET KOCAMAZ

Crede Data Service

Founder

Financial risk management stands out as one of the pioneering domains in the commercialization of artificial intelligence. Originating from the work of statistical scientists in the 1960s, the development of artificial intelligence algorithms quickly gained traction in the realm of finance. Its integration into the world of computer engineering became more pronounced as computers demonstrated the capability to process vast amounts of data.

THE POTENTIAL FOR COMMERCIALISATION

Given the inherently numerical nature of financial data, the integration of artificial intelligence algorithms is particularly smooth in the financial world. This stands in contrast to numerous other sectors where data collection is often a subsequent and more involved process.

In the competitive landscape of finance, where accurate risk predictions can lead to significant advantages, it's widely recognized that artificial intelligence outperforms humans in making successful predictions. This superiority stems from the AI's capacity to analyze data on a scale beyond human memory capabilities and make decisions devoid of emotions and situational biases.

As a result of these capabilities, artificial intelligence applications have swiftly integrated into the finance sector and gained widespread acceptance.

IMPROVEMENT WITH VARIED DATA

After utilizing predictive models with available data for a period, the risk management sector has started to investigate the reasons behind the instances where these models fall short. Even organizations with sound financial data can encounter adverse situations. Why? Because businesses are dynamic entities that encompass more than just financial aspects. It has become apparent that factors like corporate culture, partnership dynamics, and ethical payment practices play a significant role.

Risk managers are exploring methods to instruct artificial intelligence with comparable non-numerical data. Naturally, this type of data wasn't readily accessible in organizational databases. Companies sought invoice data to comprehend payment patterns, market intelligence for partner alignment, and more. Throughout this process, they encountered various regulatory and structural challenges. Initially, this primarily manual data (collected through branches) was susceptible to numerous errors and couldn't encompass the entire portfolio.

Here, digitalization played a crucial role. The transition of data into the digital realm, which gained momentum with the advent of personal computers, and even the generation of data directly in the digital environment, provided the chance to access a plethora of information in an open environment.

MODERN FINANCIAL RISK MANAGEMENT AND OPEN DATA

The concept of open data is quite expansive, demanding multidisciplinary teams, involving additional engineering efforts, and, in some cases, linguists to unleash the information encapsulated within.

This area, known as Natural Language Processing, strives to extract information from texts. This information may encompass details like a company's name, a partner's actions (e.g., initiating a conflict, making a donation), or assessing a judgment as positive/negative. Given the language-dependent nature of these applications and the intricacies of analyzing Turkish, an agglutinative language with distinct usage patterns, variations can be observed between global and Turkish contexts.

INTERESTING OPEN DATA PRACTICES FROM AROUND THE WORLD

By tracing the digital footprints of individuals and scrutinizing the photos, posts, and lifestyles they share, their loan repayment capability is gauged. The modeling has unveiled that individuals who share photos with friend groups and disclose their location tend to be more reliable compared to those who share nature photos and are more reserved about divulging personal information.

Given that forgery frequently occurs within close contacts, certain banks leverage relationships among individuals to mitigate the risk of forgery.

Another example is the Person's Address History application. This tool provides information about the addresses where individuals have previously lived and, in some cases, the prices of real estate at these addresses. This information is particularly available for those living in North America.

INTERESTING OPEN DATA PRACTICES IN TURKİYE

The most significant area of application for the increasingly widespread use of open data in Turkiye is risk estimation. Negative circumstances found in Open Data are utilized when estimating the risk status of legal entities. The realization of these negative circumstances in specific chains is also incorporated into risk estimation. Information presented to decision-makers encompasses crucial data such as commercial partnership networks between individuals, tax payment status, and international banned status. Open data also proves beneficial in risk estimation by providing an Early Warning feature.

Similar to examples abroad, clues about the possibility of forgery can be derived based on the addresses of companies. Factors such as previous instances of forgery at the operating address, incongruence between business activities and location, and the presence of numerous different companies at the same address provide valuable insights to risk professionals.

Teams selling credit products in the financial sector often face the challenge of prospective customers failing risk assessments, leading to wasted efforts. By identifying commercially related

individuals, risky situations, such as souvenir cheques and commercial activity through relatives, can be uncovered. Using relationship information among companies allows the identification of potential individuals and companies that have undergone pre-risk analysis for sales. This approach enables the offering of risk products to more accurately targeted individuals and businesses.

One of the significant challenges for large corporate companies is the selection of dealers/agents. Despite their meticulous approach to choosing representatives who will act on their behalf with customers, mistakes can occur. Monitoring news in the open environment, especially with Natural Language Processing Algorithms, offers the chance to proactively mitigate various risks. These algorithms make sense of news content, extracting potential risk situations from vast amounts of data to prevent issues before they escalate.

CONCLUSION

For many years, the financial industry has constructed artificial intelligence models primarily using financial data. However, experience has shown that while this approach is efficient, it can be insufficient in certain cases. Consequently, the need to enhance the data feeding artificial intelligence has become evident, leading to the exploration of alternative data sources. Natural Language Processing solutions have been employed to extract information from unstructured sources. Recognizing the untapped wealth of information in the public domain, publicly available data has now found its way into contemporary financial risk management models. This integration has enabled the prediction of some risky situations that traditional financial data alone may not foresee.

DATA: THE ECONOMIC RESOURCE WITH EVER-GROWING RESERVES

SERKAN TURHAL

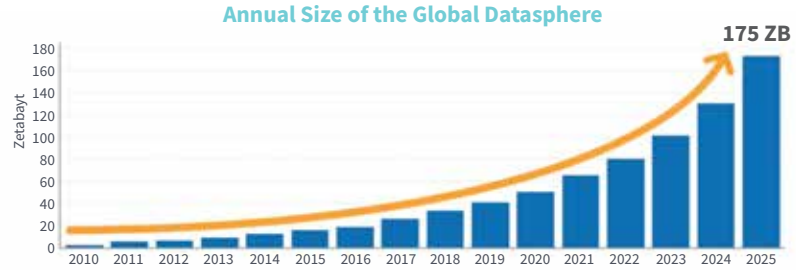
Softtech

Data & AI Group Manager

In recent years, data, often metaphorically referred to as "the new oil," has been commodified as a valuable asset, drawing attention as an economic resource with continuously expanding reserves worldwide. The recognition of data as a standalone economic entity has been acknowledged throughout history by humanity, with numerous examples supporting this fact. For instance, data used in the creation of maps, crucial in navigation, has played a significant role in the development of maritime trade and facilitated new discoveries. The exploration of new routes has, in turn, contributed to economic growth by expanding trade opportunities. During the Industrial Revolution, production data in factories enhanced the efficiency of operational processes, enabling increased output. Over the past decade, particularly with the advent of big data analytics, data obtained has empowered companies to refine

marketing strategies and better respond to customer demands. Online shopping data, for instance, has boosted company revenues through the creation of personalized advertisements and the precise matching of products with appropriate customers. Another illustration is the utilization of vast quantities of natural life data, including meteorological observations, statistical data, ocean currents, vegetation data, and topographical features, to generate highly accurate weather forecasts. These forecasts, spanning numerous sectors from tourism to agriculture and logistics, have bolstered efficiency, making significant contributions to the global economy.

The most distinguishing feature that sets data apart from its metaphorical counterpart, petroleum, is its lack of limited reserves; on the contrary, it exponentially grows with each passing day. IDC predicts that global data could reach 175 zettabytes by the year 2025.[1] This growth is anticipated to advance even further with the inclusion of intelligent agents utilizing machine learning and other forms of artificial intelligence to analyze the vast amounts of big data generated by digital elements in our lives.

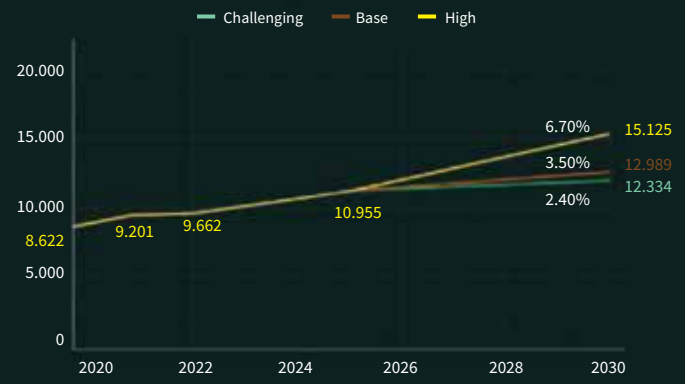


The recent advancements in artificial intelligence that we all bear witness to these days, leading to claims of the onset of a new era, are also causing an extraordinary surge in demand for data trading. Predictions suggest that artificial intelligence, especially "Generative AI," is poised to make a significant contribution to the global economy, further fueling the widespread adoption of data commerce. This contribution will be achieved by enhancing efficiency and personalization in various sectors such as manufacturing, consumer goods, healthcare, energy, and transportation through the widespread adoption of artificial intelligence. However, for this contribution to materialize, it is evident that artificial intelligence solutions need substantial data support from almost every field. Furthermore, the quality of data has become a parameter as crucial as its volume, evaluated through metrics such as completeness, consistency, currency, accuracy, and structure. Large artificial neural network models like LLM and LVM necessitate customization in almost every domain, emphasizing the recurring need for high-quality data in the process of customization.

Indeed, data is a valuable resource. However, similar to how crude oil needs refining before use, data must undergo processing to attain commercial value. As the demand for data continues to escalate, standards for its availability, security, transport, and quality tracking have not yet become widespread. In this context, the emerging approach of Data Product will likely play a significant role in the upcoming processes. In this productization process, which essentially dissects data attributes, information such as

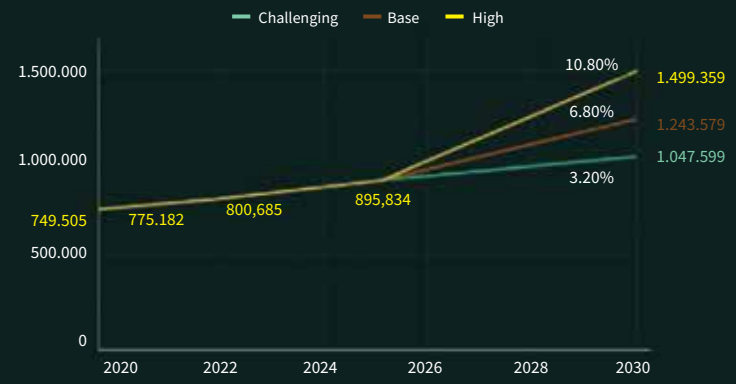
Number of Data Professionals

By Member State: 2020-2022, 2025, 2030 3 Scenarios



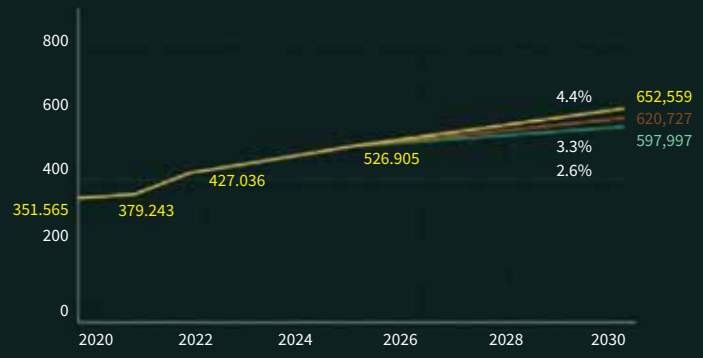
Number of Data User Companies

By Member State: 2020-2022, 2025, 2030



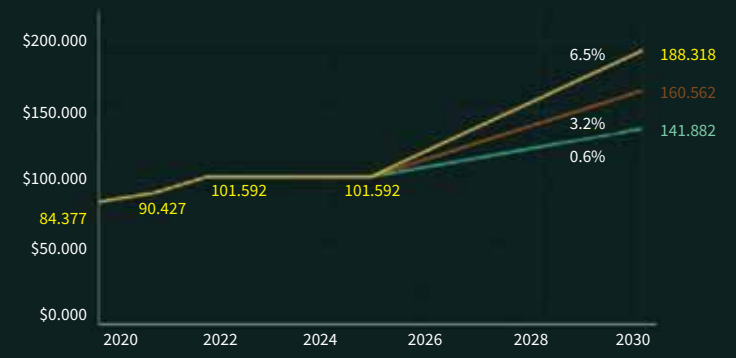
Data Suppliers

By Member State: 2020-2022, 2025, 2030



Data Market Value

By Member State: 2020, 2021, 2022, 2025, 2030



European DATA Market Study 2021–2023, D2.4 SECOND REPORT ON FACTS AND FIGURES

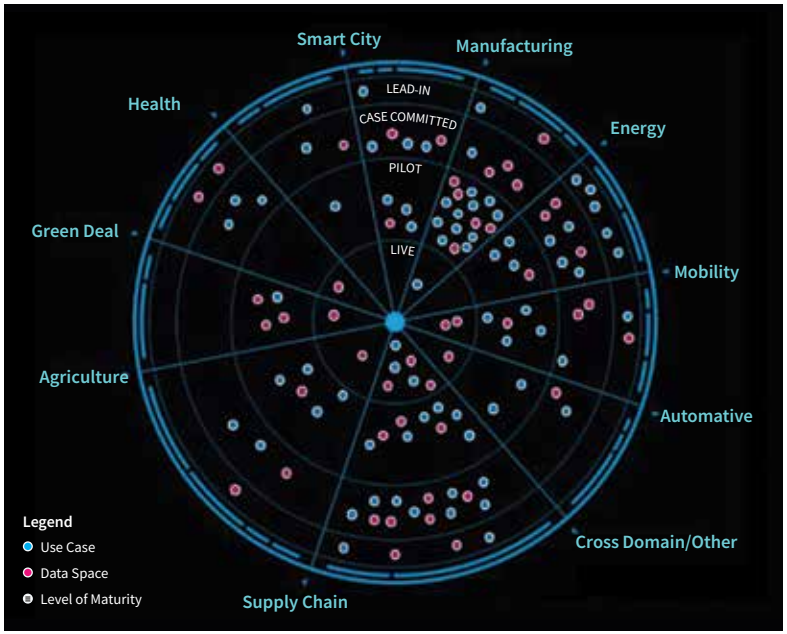
the size, quality, security, and licensing of data is made separately accessible. Consequently, the commercialization of data becomes feasible, independent of the entity using or producing it.

Two fundamental elements stand out in the process of data productization: Data Marketplaces and Data Contracts. Data marketplaces facilitate the coming together of providers and consumers, allowing them to engage in data exchanges through contracts. This not only streamlines the governance costs of data but also ensures the security and reliability of the trade between parties through data contracts.

The European Union has made significant contributions to standardization efforts in this regard. The data law they defined in February 2022, known as the Data Act, standardizes the operational mechanisms of data marketplaces under the International Data Space (IDS) framework and establishes standards for components such as data products and data contracts. In this context, the "Data Act" movement emphasizes that data is one of the most crucial elements of the EU's economic independence and security. As a result, more than 50 semi-open data marketplaces have been established, and by the end of 2022, data trade within the EU amounted to 72.9 Billion Euros. The data marketplace report published by the EU Commission estimates the data professional gap, the number of data consumers and producers, and the market value of the data marketplace. Based on developments from 2021 to 2023, the report outlines three scenarios for 2030: "Challenging," "Base," and "High." It is indicated that even if there is a contraction in global data trade by 2030, it is expected to surpass 101.5 billion euros.[2] While measuring the size of data trade within Turkiye is not yet feasible, given our agility in adapting to new technologies, it is evident that initiatives in this direction will emerge shortly.

IDS Radar

The International Data Space (IDS)[3] is an initiative aimed at developing standards for data sharing and security. Within this framework, it strives to bring together data ecosystems to create a secure, transparent, and standards-compliant environment for



IDS Radar

data exchange. IDS aims to promote secure data exchange by empowering data owners to retain control. To achieve this goal, tools such as IDS Radar have been developed. IDS Radar, as part of IDS, monitors transactions in data marketplaces established by various organizations, supporting availability, security, and compliance. In this way, it enables data ecosystems to operate more reliably and facilitates trustworthy data exchange across different industries.

In conclusion, while all eyes are currently on developments in the field of artificial intelligence, the fastest-growing market is undeniably the data market. As with every new technological advancement, there are significant barriers to hiding data, with tendencies toward closed economies and cautious attitudes. However, considering the potential promised by artificial intelligence, it appears inevitable that, to survive in this fiercely competitive landscape, coalitions will need to embrace data sharing.

Resources

1. IDC's Data Age 2025 study, sponsored by Seagate

2. European DATA Market Study 2021–2023, D2.4 SECOND REPORT ON FACTS AND FIGURES
https://ec.europa.eu/newsroom/dae/redirection/document/93914

3. International Data Space Radar
https://internationaldataspaces.org/adopt/data-spaces-radar/

GOVERNANCE AND SECURITY OF ARTIFICIAL INTELLIGENCE AND LARGE LANGUAGE PROCESSING MODELS (LLMS)

BÜLENT SİYAH

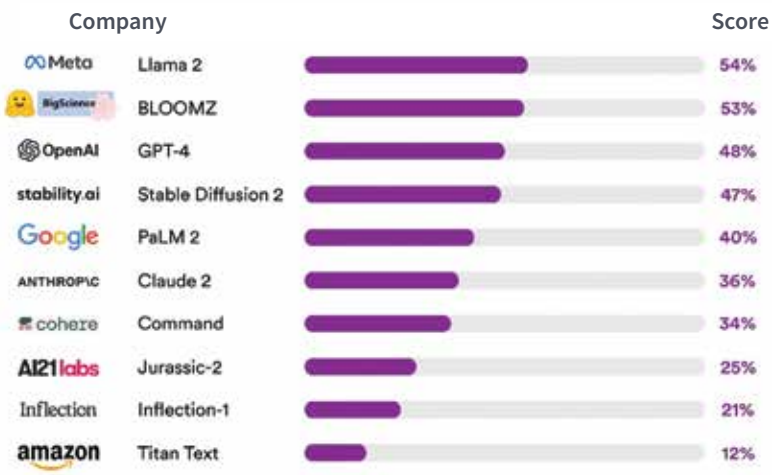
Softtech

AI LAB Senior Expert

The rapid evolution of artificial intelligence and large language processing models (LLMs) is ushering in transformative changes across various facets of our world, with the potential to revolutionize multiple industries and aspects of our daily lives.[1] Nevertheless, the formidable power of these technologies necessitates a profound sense of responsibility. Establishing an effective governance and security framework becomes paramount to ensure the responsible and safe utilization of these groundbreaking advancements.[2]

CHALLENGES AND CONSIDERATIONS

In the realm of artificial intelligence (AI) and large language processing models (LLMs), governance and security pose unique challenges and considerations.[3] The complexity of these technologies, particularly within intricate systems, presents



Source: The 10 large "foundation models" graded by a new AI transparency index all had failing scores. Stanford center for research on foundation models.

a daunting task for understanding. This lack of transparency complicates efforts to hold developers and users accountable for their actions. Therefore, it is crucial to establish clear mechanisms ensuring transparency and accountability during the development and utilization of these advanced technologies.[4]

AI and LLMs undergo training using data that might mirror the biases and discrimination present in the real world. This can result in unfair and discriminatory outcomes, potentially reinforcing existing social inequalities. It is incumbent upon us to address bias and prioritize fairness in AI systems, recognizing the importance of mitigating these challenges to ensure equitable and just outcomes.[3]

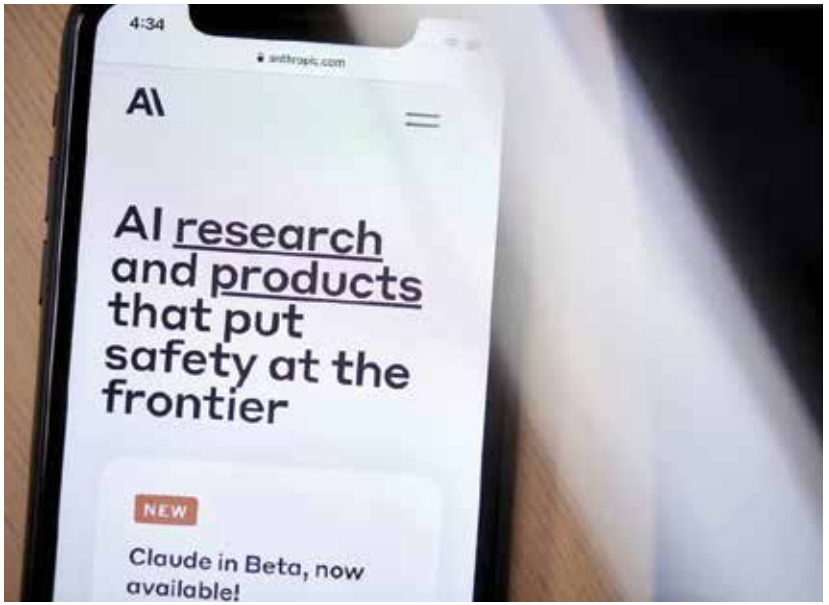
AI and LLMs, with their transformative capabilities, have the potential to give rise to novel forms of attacks and surveillance, thereby posing threats to the privacy and overall security of individuals. In response to these potential risks, the implementation of robust security measures, such as encryption, access control, and auditing, becomes imperative to effectively safeguard against emerging threats.

AI and LLMs possess the capacity to generate information that appears genuine but is, in fact, misleading, with potential devastating effects on democracy and social cohesion. Mitigating the dissemination of misinformation and disinformation emerges as a critical facet of responsibility within the governance of AI. Addressing this challenge is essential to uphold the integrity of information and foster a healthy societal discourse.[5]

RECENT DEVELOPMENTS AND BEST PRACTICES

Numerous organizations and initiatives are actively engaged in tackling the challenges associated with AI and LLM governance and security.[3] Here are some of the latest developments and best practices in this domain:

The United Nations (UN) has acknowledged the imperative to assess the risks associated with artificial intelligence (AI).[6] In a concerted effort to address these risks, the UN is engaging in collaborations with major technology companies, including Google and Microsoft. Google is bolstering its commitment to



Source: Anthropic's website, https://www.anthropic.com/index.
Photographer: Gabby Jones/Bloomberg

AI security research through increased investments, exemplified by its recent funding of Anthropic, a company specializing in AI security. This strategic initiative underscores the escalating importance attributed to the security of artificial intelligence, signaling a proactive stance in addressing the evolving challenges in this field.[7]

OpenAI, a leading AI research organization, has established a specialized team to assess "catastrophic risks" in AI. This highlights the crucial need for proactive risk management in the development of artificial intelligence.[6]

Numerous initiatives are innovating tools and technologies to aid organizations in monitoring, managing, and securing their AI systems. These efforts play a pivotal role in advancing the development of AI security applications.

In ensuring effective AI and LLM governance and security, organizations should prioritize transparency in disclosing the usage of these technologies. Clear policies and procedures must be established to hold developers and users accountable. Minimizing bias in AI and LLM systems is crucial for equitable outcomes, requiring diverse training data. Additionally, implementing robust security measures, including encryption and access control, is essential for protecting these systems and maintaining privacy.[4]

In preventing the misuse of AI and LLMs for generating and spreading misinformation and disinformation, organizations should implement policies and procedures. Incorporating human review of outputs and deploying verification tools becomes invaluable in this context.[8]

RESOLUTIONS AND CONCLUSION

The swift progress of artificial intelligence technologies is rendering them increasingly essential, presenting numerous conveniences and benefits to humanity. Nonetheless, establishing a crucial framework for the responsible utilization of AI and large language models (LLMs) requires the incorporation of essential elements. These include transparency, the mitigation of biases, security measures, prevention of disinformation, and the implementation of effective policies and procedures.

This framework should include the following elements:

Transparency and accountability: Organizations must openly communicate about their usage of these technologies, implementing explicit policies and procedures that hold developers and users accountable for their actions. This transparency is essential for comprehending the inner workings of the systems and identifying potential risks.

Bias reduction: The training of AI and LLMs involves data that may inherently harbor real-world biases, consequently giving rise to unfair and discriminatory outcomes. To tackle this challenge, it is essential to undertake deliberate efforts aimed at minimizing bias by incorporating a diverse range of training data sources.

Security and privacy: The deployment of AI and LLMs introduces the potential for the creation of novel forms of attacks and surveillance, posing threats to the privacy and overall security of individuals. To counteract these risks, it is imperative to implement robust security and privacy measures.

Preventing disinformation: AI and LLMs have the capacity to produce information that may appear authentic but is, in fact, false. Such misinformation can pose serious threats to democracy and social cohesion. To mitigate these risks, it is essential to implement measures like human review and verification tools to prevent the dissemination of false or misleading information.

Incorporating these elements is crucial to guarantee the responsible and secure use of AI and LLMs, thereby optimizing their positive impacts while minimizing potential risks.

To conclude, the responsible development and utilization of AI are pivotal in establishing the groundwork for a more equitable, secure, and sustainable future.

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HUMAN AND ENVIRONMENT

TALENT DISCOVERY IN THE ERA OF ARTIFICIAL INTELLIGENCE: TRANSFORMING COMPANY COMPETENCY MODELS AND INNOVATING NEXT-GENERATION MEASUREMENT-DEVELOPMENT STRATEGIES

EBRU BAĞRAN

foxhr Turkey

Founder

The contemporary business landscape is undergoing a profound shift marked by the rapid evolution of artificial intelligence and technological innovations. This transformative wave necessitates employers to reevaluate the competencies and skills they prioritize in their workforce. In this era dominated by artificial intelligence, defining and distinguishing individuals deemed as "talent" pose critical questions for organizations. Who exactly qualifies as "talent" in this age, and how can we effectively differentiate and identify these individuals?

WHO IS THE "TALENT" IN THE AGE OF ARTIFICIAL INTELLIGENCE?

The evolution of artificial intelligence technologies has profoundly altered conventional business roles. While possessing technical expertise and a strong affinity for technology undeniably contribute to the definition of "talent," they do not singularly dominate this characterization. Beyond technical skills, the contemporary business landscape increasingly demands individuals with a broader spectrum of competencies. These include creative problem solving, cognitive flexibility, resilience, learning agility, collaboration, impact, and leadership rooted in emotional intelligence. These qualities are becoming increasingly indispensable for business professionals in the age of artificial intelligence, showcasing a noticeable and growing significance day by day.

Three decades ago, during an era when cognitive intelligence took center stage in the business world, Daniel Goleman's article "Emotional Intelligence: Why It Can Be More Important Than IQ" emerged as a groundbreaking perspective. Goleman continued to revolutionize conventional thinking with his book "Emotional Intelligence: Why It Can Matter More Than IQ," altering the trajectory of expectations within the business landscape. In the current age dominated by artificial intelligence, the concept of emotional intelligence must undergo a transformation to align with the evolving needs of this era.

In essence, this requirement underscores the significance of not only possessing the requisite technical skills and a proclivity for collaborating with the technology integral to a role but also being attuned to and proficient in managing our emotions - a distinctly human trait. In this context, comprehending our social milieu and adeptly handling interpersonal relationships become paramount. The ability to interpret this theory within the context of contemporary needs assumes a crucial guiding role in shaping our understanding of the definition of "talent" in this new age.

In this article, we will delve into the criteria defining talent in the era of artificial intelligence within the framework of Goleman's Emotional Intelligence theory. We will explore how these talents can be identified and nurtured throughout the processes of recruitment, promotion, and talent management.

INTERPRETING GOLEMAN'S EMOTIONAL INTELLIGENCE THEORY IN THE AGE OF ARTIFICIAL INTELLIGENCE

Goleman's Emotional Intelligence theory stands as a pivotal approach underscoring the significance of emotional intelligence in the business realm. Let's delve into the relevance of this theory in the age of artificial intelligence by examining the four dimensions it addresses and seeking insights into their implications.

How self-aware am I?

This dimension, in which Goleman explains that one should evaluate oneself accurately and realistically, has become a more difficult test today than it was in the 90s. In the contemporary landscape marked by complexity, uncertainty, and constant

variability, the demand for regular information updates creates an environment where business professionals often feel akin to navigating through an unfamiliar and intricate city center during their first visit. Similar to warning signs indicating our location on a map, cultivating self-awareness in understanding our competencies within the business realm serves as a guiding beacon, preventing us from becoming disoriented.

How well can I manage myself?

In this dimension, Goleman directs attention to the capability of business professionals to regulate their emotions and behaviors through the application of willpower. When interpreting this dimension within the context of the artificial intelligence age, we can underscore the significance of "psychological capital" for swiftly adapting to the evolving demands of business life, navigating uncertainty, and effectively managing crises brought about by transformation. This concept encompasses goal-setting, resilience, maintaining optimism, and fostering self-belief in the realm of professional life.

How aware am I of my social environment?

In contemporary times, the emphasis on being a proficient communicator, a collaborative team member, or a leader capable of making a meaningful impact has heightened significantly. These skills now play a crucial role as our distinguishing factors from artificial intelligence in the realm of business life. Fundamentally, we can characterize these skills as the ability to accurately discern the emotions underlying the behavior of those around us and respond accordingly - in essence, "showing sympathy." Cultivating greater empathy and collaboration not only positions us as effective team players but also provides substantial advantages in adopting the "Valuing Leader" approach, which epitomizes today's leadership paradigm.

How well can I manage my social relationships?

In conjunction with social environmental awareness, qualities like impact creation, leadership, communication prowess, and change management have become indispensable. When interpreting these attributes within the context of contemporary requirements, they encompass the ability to guide a diverse team of remote

workers toward a shared goal, spearheading change initiatives, placing entrepreneurship at the core of business life, and fostering development by actively sharing knowledge with peers.

APPROACH TO CRAFTING A NEXT-GENERATION COMPETENCY MODEL TAILORED TO DEFINE INSTITUTIONAL "TALENT"

In our exploration of Goleman's theory from the past to the present, we delved into the influence of Emotional Intelligence-based competencies on shaping the definition of "talent" in the era of Artificial Intelligence. Now, let's closely examine the concept of the "Competency Model," which customizes the definition of "talent" to the institution, and the transformative methodology of "Competency Model Creation" prevalent today.

In defining the concept of "talent," companies are shifting from accepting conventional or subjective definitions to actively asking, "Whom do we consider as talent?" This transition involves adopting competency models that provide unique, measurable, and clear answers to this crucial question.

The conventional use of competency models for assessing performance and potential within corporate structures has been a longstanding practice. However, this traditional understanding is now giving way to innovative approaches in the creation of next-generation competency models.

At times, recruiting a highly successful professional from a competitor may not translate into success within your own institution. However, a competency model aligned with your specific definition of "talent" can serve as an indicator that this individual might have low compatibility with your company. To make critical decisions accurately, competency models must be institution-specific and formulated using a scientific methodology grounded in data, including task analyses, institutional values, global and sectoral trends, resources, and the strategic plan. The outdated "One size fits all!" approach, relying on global sets from pre-made competency libraries or models crafted based on common competency headings, has given way to new-generation approaches. These approaches analyze the authentic elements, business dynamics, and values of the institution, structuring the model accordingly.

This innovative approach also offers content conducive to real-time performance evaluation. As an alternative to the traditional annual performance evaluation utilized in conventional models, it incorporates performance sets featuring explicit, concrete, and easily measurable expressions.

UTILIZING DATA-DRIVEN APPROACHES IN THE ENHANCEMENT OF EMOTIONAL INTELLIGENCE-BASED COMPETENCIES: ASSESSMENT AND DEVELOPMENT STRATEGIES

Once competency models are accurately defined, we establish a specific institutional definition of "talent." An equally crucial subsequent step is to periodically measure the organization's alignment with this talent description, akin to regular health check-ups, ensuring ongoing relevance and effectiveness. Given that competencies based on emotional intelligence are dynamic, much like the values assessed in blood tests, their status can regress or progress without active engagement or application. Developing targeted plans based on the results of these evaluations is instrumental in saving time and facilitating swift progress in adult learning.

NAVIGATING THE SHIFT IN THE AGE OF ARTIFICIAL INTELLIGENCE: THE CRUCIAL RELEVANCE FOR BUSINESS PROFESSIONALS AND INSTITUTIONS

In conclusion, embracing the transformation ushered in by the age of artificial intelligence is paramount for both business professionals and institutions.

Examining this journey from the employee's standpoint, rather than solely concentrating on job tasks and enhancing technical skills, the endeavor to fortify oneself in terms of emotional intelligence-based competencies aligned with the demands of this era can expedite the process of professionals attaining "talented" status in their chosen career paths.

From the corporate standpoint, prioritizing emotional intelligence-based competencies over technical skills is crucial for talent discovery and management. Consequently, adopting an approach that involves crafting institution-specific models for these competencies and anchoring them in an assessment-based development strategy is considered an ideal practice.

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NAVIGATING THE DILEMMA: HUMAN RESOURCES AND ARTIFICIAL INTELLIGENCE IN BUSINESSES

PINAR KUTSAL

Crenvo IK

Founder & CEO

In the rapidly evolving landscape of the business world, technological advancements, particularly the integration of artificial intelligence (AI), stand out as a prominent catalyst for change. Companies are increasingly integrating AI to streamline business processes, enhance efficiency, and maintain competitiveness. In the realm of human resources, the incorporation of artificial intelligence is still in its early stages across various processes.

The revolution in artificial intelligence has presented numerous dilemmas for institutions regarding the utilization of technological workforce. Within human resources departments, this dilemma intensifies, raising a profound question in terms of workforce management: "Human or machine?"

Human resources play a pivotal role in managing various business processes within institutions, with recruitment being a key focus. It is evident that artificial intelligence holds significant potential in automating these business processes and analyzing data. A closer examination of the activities and outcomes of both human

resources and artificial intelligence can provide valuable insights toward addressing the question at hand.

THE SIGNIFICANCE OF HUMAN RESOURCES IN ORGANIZATIONS

Human resources departments operate in crucial domains like recruitment, training, performance management, and employee satisfaction. Therefore, the role of HR significantly influences the success of a business. According to a Gallup study[1], organizations with high employee engagement exhibit a 23% higher profitability rate.

Furthermore, delving into the influence of the human resources team on the employee experience, a study conducted by McKinsey[2] reveals that when human resources actively contribute to fostering a positive employee experience, the likelihood of employees demonstrating superior performance in the organization increases by 1.3 times.

THE RISE OF ARTIFICIAL INTELLIGENCE

As per data presented by Gartner, 81% of human resources leaders have either explored or implemented AI solutions to enhance process efficiency within their organizations.[3] Furthermore, the same data from Gartner indicates that 76% of human resources leaders believe that organizations failing to adopt and implement artificial intelligence solutions, such as productive artificial intelligence, within the next 12 to 24 months will lag behind compared to those institutions that embrace such advancements.

Examining the use cases of artificial intelligence in the realm of human resources reveals applications such as the automation of business processes, big data analysis, and forecasting. HR professionals can harness AI algorithms to expedite hiring processes, tailor training programs to individual needs, and enhance performance management. Artificial intelligence tools not only automate resume screening processes but also provide a deeper understanding of employees' capabilities, contributing to more objective recruitment interviews.

A DILEMMA FOR BUSINESSES: PEOPLE OR MACHINES?

As per the Slack State of Work[4] report, when examining various departments within companies, it is evident that 57% of employees who demonstrate productivity at work utilize automation, and 41% leverage artificial intelligence. Moreover, the likelihood of exceeding managerial expectations is reported to be 71% among users of automation.

How can artificial intelligence be effectively integrated into the human resources department? Should HR functions be entirely handed over to artificial intelligence? In such a scenario, how can HR departments preserve human interaction and a personal touch?

Initially, it may seem that a fully automated HR process could enhance objectivity in recruitment and management. However, it's crucial not to overlook the fact that artificial intelligence and machine learning algorithms can develop biases rooted in the training data they are exposed to.

Let's consider the outcomes stemming from Amazon's recruitment algorithm. Amazon's experimental hiring tool employed an artificial intelligence model to assign job applicants scores on a scale of one to five stars. The system was introduced in 2014, and by 2015, the company recognized that the algorithm failed to assess candidates for software and technical roles impartially, exhibiting a notable bias against women. Although Amazon later implemented necessary adjustments, this biased hiring process remained active within the company for an entire year.

This example underscores the ongoing necessity for human oversight as an integral component of artificial intelligence utilization for the foreseeable future. Presently, while artificial intelligence tools have implemented controls to generate outputs that align with regulations, they have yet to achieve the desired level of scrutiny over these outputs. In the realm of human resources, the human factor plays a crucial role in establishing emotional bonds and empathy, influencing not only corporate culture but also recruitment and orientation processes. This directly impacts interpersonal relationships among employees, their connection with the company, and, consequently, the overall atmosphere and productivity in the workplace.

AI-ENABLED HUMAN RESOURCES: HOW TO BEST BRING THE TWO CONCEPTS TOGETHER?

The research and examples presented thus far prompt us to explore the concept of artificial intelligence-supported human resources. Within the framework of this concept, let's delve into how artificial intelligence and the human resources department can synergize under optimal conditions.

In the contemporary landscape, human resources teams can effectively address the organization's "upskilling" and "reskilling" requirements through the framework of artificial intelligence-supported human resources. Consequently, HR departments can

align with evolving workforce dynamics by strategically integrating artificial intelligence. The utilization of artificial intelligence, particularly in areas like workforce planning and demand forecasting, will fortify the department's pivotal role in navigating rapidly changing job markets and skill requirements.

Similarly, harnessing the advantages of collaboration between artificial intelligence and human resources proves beneficial for cultural adaptation and change management in the face of technological advancements. The seamless integration of artificial intelligence into organizations and workflows is intricately linked to corporate culture and employees' ability to adapt to technology. Human resources departments play a pivotal role in this process, requiring them to formulate effective change management and training strategies to facilitate employees' familiarity with artificial intelligence tools and foster their successful adoption.

Lastly, let's underscore the significance of optimizing collaboration between humans and machines. Artificial intelligence tools serve to alleviate human resources teams from routine and time-consuming tasks, enabling them to channel their efforts towards more strategic and analytical responsibilities. As a result, the human resources department can initiate efforts to maximize the effectiveness of human and machine collaboration.

In this context, consistently gathering feedback from employees will play a pivotal role in refining artificial intelligence models. Models continuously developed with such feedback will be better positioned to address the needs and preferences of employees, directly influencing the efficiency of the workforce and the overall productivity of the institution.

COOPERATION AND A BALANCED APPROACH

In conclusion, rather than a conflict, we can characterize the relationship between artificial intelligence and human resources departments as a collaboration. The arguments presented throughout the article underscore the imperative for a balanced and harmonious approach to harness the strengths of both elements effectively. HR departments can enhance their effectiveness and become more data-driven by leveraging the advantages offered by artificial intelligence. However, it is crucial for HR professionals to simultaneously uphold human interaction and maintain emotional connections, recognizing the indispensable role of the human touch in workforce management.

Successfully harmonizing these two elements allows human resources professionals to optimize business processes and elevate employee satisfaction. In essence, this new challenge in the business world presents a tremendous opportunity for the future success of businesses.

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PEACE AT WORK... THAT'S HAPPINESS!

ASLI ABACI

Softtech

Director of Human Resources

Even though we are more used to hearing these words from our elders as "Peace at home... That is happiness", for those who spend most of the day working, it would not be wrong to change this phrase into "Peace at work... That is happiness."

When looked at from a narrow perspective, "working" is simply a necessity that enters our lives to provide the income necessary to sustain our livelihoods. However, in reality, it is a drive that enables us to improve our quality of life, personal and social development, and often uncovers many potentials that we may not even be aware of, becoming the "purpose of life" for some of us. The environment in the workplace where we spend most of our days affects our experiences, emotional motivation, and subsequently influences our relationships, physical and mental health. As someone who has felt happy and motivated working in the same institution for 25 years and has had the chance to acquire their closest friends and even spouse through this valuable group, I sincerely feel the importance of the workplace in an individual's life. That's why I chose the title: "Peace at work... That's happiness." Given the profound importance of the workplace in people's lives, providing a working environment that has a positive impact on the health and well-being of employees and where they feel truly happy has become the most important agenda not only for Human Resources professionals, but also for all leaders.

In today's world, with the rapid change in technology and the impacts of the global pandemic, traditional business models

have shifted to a different direction in order to ensure the happiness of employees. We now have a **"hybrid working" model** that replaces constantly working from the office. The employees appreciated the ability to work independently from their physical location and the convenience of alleviating the financial burden and time loss associated with the daily commute to the workplace. However, from the perspective of companies providing this opportunity, we need to consider its advantages as well as some of its disadvantages and develop alternative solutions on related issues.

If we refer to the conveniences that hybrid working introduces to professional life in terms of employees and companies briefly;

- Providing access to many talents independent of their geographical location and enabling the sharing of experience,
- Providing convenience in terms of various costs and commuting issues associated with working from the workplace,
- Enabling employees to personalise their working environment so as to maximise their productivity,
- Happiness and motivation arising from the freedom to determine the way of working.

In addition to the mentioned benefits, some challenges can arise in the long term: Negative impacts on business processes if a good technological infrastructure is not established, a decline in interpersonal interaction and collaboration among employees due to the inability of digital interactions to fully replace face-to-face communication, and potential drawbacks in forming and sustaining company culture and sustainability.

At this point, it becomes inevitable to develop different business processes to establish an efficient working environment and maintain strong communication among employees. Without compromising the positive sentiment that remote work creates in employees, it is crucial to encourage regular face-to-face meetings and open communication. Providing a good technological infrastructure and equipment while adhering to security policies, as well as updating business processes to encompass all working models, are the most prioritized tasks in this regard. When examining the current practices of leading companies worldwide, it's evident that some of them are mandating employees to return to the office on specific days. Others are establishing alternative office spaces in easily accessible locations, diverging from traditional fixed addresses. These companies are making substantial investments

in office aesthetics, creating modern working environments that foster socialization and a sense of home. Additionally, they are implementing new face-to-face or digital applications to support the emotional well-being of their employees.

In addition to supporting various working models, fostering **diversity, equality, and inclusion** in the workplace significantly influences employee happiness and motivation.

We define diversity as the facilitation of greater inclusion of employees with different experiences and characteristics within the company. This concept involves concrete steps and actionable measures.

Equity can be defined as the fair treatment of employees in all employment decisions, irrespective of gender, color, race, or other personal differences. This concept also encompasses specific action steps that need to be implemented.

On the other hand, the concept of inclusion revolves around an employee's sense of being cared for, secure, and belonging to a trustworthy environment where they can perform at their best. In essence, it is an emotional state that follows actions. Individuals working under inclusive leadership tend to feel secure and productive, contributing to their company to the fullest and achieving success together. Inclusion embodies mutual respect, fairness, care, collaboration, and shared achievement – values that individuals consistently prioritize not only in their professional lives but also in their personal lives. Therefore, these values are essential to us, and we all inherently recognize their importance, making them natural expectations in the workplace.

Encouraging the coexistence of diverse perspectives and skills within the company's strategy, and taking deliberate actions to ensure that individuals feel valued and thrive, are crucial concepts. These considerations should not be confined to ethical considerations alone; they demand conscious efforts and strategic thinking. By embracing diversity, organizations can provide effective services to diverse customer profiles, foster creativity within the company, adapt easily to new challenges, generate solutions to potential problems in business processes more efficiently, navigate global business environments adeptly, and cultivate employee loyalty and productivity.

The **agile working model**, designed to overcome the drawbacks of traditional hierarchical models, promotes individuals fulfilling their personal responsibilities while working collaboratively to

achieve team success. This approach can be viewed as a new-generation working model that actively supports inclusivity.

In action and science fiction movies featuring superheroes like Superman and Spider-Man, the protagonist with superpowers traditionally addressed challenges that individuals couldn't handle on their own. However, in contemporary Marvel films, a shift is evident where multiple superheroes collaborate, harnessing the power of unity to collectively overcome and defeat villains. I used to wonder why things evolved in such a way and whether it didn't lead to the rapid exhaustion of possible scenarios. In an article I came across in recent years about inclusivity, I was surprised to read about the connection between this change and the concept of "inclusivity." The article summarized the relationship between the evolving economic power dynamics and business models with the rising trend of Asia in the economy, suggesting that the individual-based approach in the West is shifting towards concepts embraced by Chinese culture, such as the power of collaboration and the concept of "we." It was explained that this shift emerged to convey messages to society, reflecting the changing economic landscape due to technological advancements.

Cultivating a culture of diversity and inclusion and witnessing its outcomes is a demanding process that requires patience, consistency, and a commitment to identifying and implementing innovative steps. This involves continuously listening to the voices of employees and adapting strategies in line with evolving developments.

In McKinsey's article titled "Diversity, Equity and Inclusion Lighthouses 2023," published in January 2023, (2023 DEI initiatives report: Inside the lighthouses | McKinsey), it is noted that despite companies' eagerness and efforts in this regard, progress is slow when looking at the data. It is suggested that as time progresses, investments made will exponentially increase, and for instance, it will take many more years to eliminate economic gender inequality in all fields. Additionally, the article mentions "DEI Lighthouse Programme," initiated by The Global Parity Alliance to guide leaders in this area. The program addresses five key success factors: understanding root causes, defining success meaningfully, having responsible and investing leaders, identifying solutions tailored to root causes, and conducting meticulous monitoring and course correction efforts.

To understand our employees' perspectives on these concepts and how they feel about their environment, we prioritize regularly conducting loyalty and culture surveys to monitor progress. In identifying areas for improvement, we strive to act by placing our employees at the core of relevant issues through focus group studies and brainstorming sessions involving individuals from different teams and experiences. We have long integrated the agile working model into our company culture through our experience with İşbank teams. We value having employees from diverse generations across the company, recognizing the importance of enriching perspectives. We support programs that encourage internal interaction and knowledge sharing, such as reverse mentoring. In the technology sector, where the number of female employees is a minority compared to males, we are actively working to increase the number of women in senior management and new hires. An example of our commitment is the 'Gender-Free Dictionary' software launched last year to create awareness about language in our communication, which is now implemented company-wide.

As we reflect on the wealth of information shared, it becomes evident that the secret to peace and happiness in the 'business' realm lies in the value and investment placed in people. While we consistently update and rejuvenate our business processes in tandem with technological advancements, it remains paramount to maintain our central focus on positioning technology next to people, not instead of them.

INNOVATIVE APPROACHES IN EMPLOYEE ENGAGEMENT: 2024 VISION AND STRATEGIES

EZGİ SÖNMEZ

Softtech

Innovation Expert

In recent years, significant technological, social, and economic shifts have catalyzed profound transformations in the business landscape. As companies navigate these changes, their working models and relationships with employees undergo evolution, elevating the importance of employee engagement. Engaged employees, characterized by heightened energy, passion, and loyalty, demonstrate greater motivation and productivity. They exhibit initiative, maintaining a positive demeanor while approaching tasks. Notably, successful companies distinguish themselves in the market by cultivating highly engaged employees who align with the company's vision and operate with a sense of purpose. According to Gallup's "The Benefits of Employee Engagement," a highly engaged workforce can drive profitability, enhance customer satisfaction, and mitigate turnover rates.[1] As we enter 2024, companies are poised to intensify efforts in devising novel strategies to bolster employee engagement and surmount associated challenges.

HOW COMPANIES SEEK ENGAGEMENT IN A HYBRID WORKPLACE

According to the findings of the 2022 Technology Report, trends such as remote working, digital nomadism, and virtual/digital workspaces are projected to become increasingly prevalent and integrated into working models by 2023. Subsequently, the "Work Reimagined Survey," conducted by EY in May 2023, revealed that approximately half of companies aim to have their employees

present in the office for at least two or three days per week.[2] Conversely, over half of employees express a preference for working remotely either once a week or entirely. Amidst this divergence in preferences, the hybrid model emerges as a prominent solution. Indeed, Gallup's October 2023 article, "The Future of the Office Has Arrived: It's Hybrid," underscores this trend, indicating that eight out of ten individuals engage in hybrid or fully remote work arrangements.[3]

As emphasized in the article "90% of Companies Will Return to Office By the End of 2024," findings from a 2023 survey conducted by ResumeBuilder.com reveal that 90% of companies are planning to shift back to office-based work by the close of 2024.[4] This underscores that, despite the prevalent adoption of the hybrid

5 out of 10 people work hybrid.

part of the week at home, part of the week at the office

3 out of 10 work only remotely.

2 out of 10 work entirely on-site.

The Biggest Advantages of Hybrid Work

Top 5 Greatest Benefits for Employees
% Selected by employees

1 Improved work-life balance	76
2 More efficient use of my time throughout the day/week	64
3 Less burnout or fatigue at work	61
4 More freedom to choose when or where I work	57
5 Higher productivity	52

Top 5 Greatest Benefits for Organizations
% Selected by leaders and managers

1 Reduced burnout or fatigue	58
2 Improved retention	50
3 Greater productivity	31
4 Bigger talent pool	27
5 Improved employee value proposition	25

The Biggest Challenges of Hybrid Work

Top 5 Greatest Challenges for Employees
% Selected by employees

1 Less access to work resources and equipment	31
2 Feel less connected to my organization's culture	28
3 Decreased collaboration with my team	24
4 Impaired working relationship with coworkers	21
5 Reduced cross-functional communication and collaboration	18

Top 5 Greatest Drawbacks for Organizations
% Selected by leaders and managers

1 Decreased workplace communication	48
2 Decreased collaboration	44
3 Negative impact on workplace culture	43
4 Lower productivity	21
5 Decreased creativity or innovation	15

model, there remains a lack of complete consensus between companies and employees. In essence, the business world continues to navigate the complexities of defining workplace norms and preferences.

As noted in the article "6 Workplace Trends Leaders Should Watch in 2024," Gallup's 2023 research reveals that both leaders and hybrid workers highlight the benefits of hybrid work, such as increased efficiency, productivity, and flexibility. However, challenges persist in areas like collaboration, communication, and company culture.[5] Surprisingly, only 20-30% of employees report these challenges, suggesting that with effective management, the benefits of hybrid work can outweigh the risks. Measures such as enhancing company culture and improving internal communication can not only enhance engagement and experience but also mitigate these challenges.

This trend is prompting many companies to seek solutions to enhance employee engagement within the hybrid workplace. Potential strategies include promoting appealing work values, fostering team collaboration and communication, revamping performance management systems, and equipping managers with the necessary skills to serve as effective hybrid coaches. Moreover, devising hybrid work policies aligned with the company's needs, actively involving employees in the decision-making process, and offering flexibility are factors that can positively impact employee engagement. In this vein, prioritizing the consideration of employees' concerns and sensitivities emerges as a crucial aspect of companies' focus areas in 2024.

As of 2021, platforms like Meta's Horizon Workrooms and Microsoft's Mesh have introduced office-like collaboration and interaction for remote workers, effectively overcoming physical location barriers. Microsoft's Hololens offers an augmented reality experience, particularly beneficial for employees in technical fields, facilitating learning from home.[6] These technologies offer several benefits, including replicating the dynamics of face-to-face conversations and group meetings virtually, thereby enhancing interactivity and collaboration in remote work settings. Additionally, working together in a virtual environment mitigates the sense of isolation among remote workers, fostering

team cohesion and motivation. The emergence of wearable technologies like Meta's Oculus and Apple's Vision Pro, slated for launch in 2024, further enriches this experience. However, technical challenges remain, such as the incomplete adaptation of products to human ergonomics. Overcoming these hurdles could substantially enhance the remote working experience through virtual reality offices.

ENHANCING EMPLOYEE EXPERIENCE IN RECRUITMENT

According to Harvard Business Review, 32% of new hires depart within the initial 90 days if they perceive a mismatch with the company culture. Furthermore, research by Zippia indicates that 88% of employees feel they were not provided with an adequate onboarding program.[7] These findings underscore the significance of recruitment and orientation processes in retaining talent. To foster an effective recruitment process, it is imperative to prioritize company values and infuse culture-focused elements. This approach facilitates swift evaluation of candidates' alignment with organizational values and fosters the establishment of robust employee relationships. Ultimately, this approach can contribute to prolonged employee tenure within the company.

Another crucial aspect for corporate organizations to consider is converting the recruitment process into a social experience using technology. Particularly in virtual work settings, it's vital to devise recruitment strategies that integrate social components without requiring in-person interactions.

THE IMPORTANCE OF FOCUSING ON EMPLOYEES' VALUES AND NEEDS

As the lines between work and personal life continue to blur, employees are increasingly prioritizing meaning and purpose in their work, seeking values beyond mere financial gain. In response, companies are expected to take on greater responsibility in addressing employees' needs for mental health, well-being, and fair compensation. This entails investing in diversity, equity, inclusion, and belonging (DEIB) programs to foster a more inclusive work environment. Simultaneously, companies are encouraged to engage in social responsibility initiatives and allocate resources towards employee well-being programs to attract and retain top talent. Offering innovative benefits like flexible work hours, childcare assistance, and pet-friendly policies further contribute to employee satisfaction. Moreover, mentoring and career development programs are gaining significance in nurturing

employees' personal and professional growth. Furthermore, sustainable practices are increasingly appealing to a socially and environmentally conscious workforce aligned with values. These emerging trends are expected to play a pivotal role in talent acquisition and retention strategies for companies in 2024.

THE ROLE OF ARTIFICIAL INTELLIGENCE IN EMPLOYEE EXPERIENCE

According to a report published by Gartner in 2023 titled "AI in HR: The Ultimate Guide to Implementing AI in Your HR Organization," human resources leaders assert that companies risk falling behind competitors if they fail to adopt productive artificial intelligence technologies in the coming years.[8] This technology holds the potential to streamline employees' work processes, thereby enhancing their productivity and loyalty to the company. Contrary to concerns regarding job displacement, AI serves as a supportive tool for employees, enabling them to work more efficiently and with greater focus. Consequently, I believe that acquiring proficiency in using productive AI tools will become an indispensable skill for the future business landscape.

As employees increasingly seek personalized experiences, AI is emerging as a crucial tool for delivering them. By facilitating performance evaluation, feedback mechanisms, and analysis of individual preferences, AI can curate tailored experiences for each employee. This enables companies to enhance the effectiveness and engagement of their employee engagement initiatives while catering to the diverse needs of their workforce. Moreover, AI empowers employees with customized learning paths, fostering skill development and guiding career planning endeavors. By leveraging AI, organizations have the potential to fundamentally transform the employee experience, creating a more personalized and effective work environment that is responsive to the unique needs and expectations of each employee.

While AI plays a crucial role in boosting employee engagement, I contend that the inherent human values and skills remain pivotal. Workplace satisfaction and engagement are not solely shaped by technological solutions; rather, they are profoundly influenced by human attributes such as creativity, empathy, and leadership skills. AI can efficiently handle routine tasks and data analysis, thereby allowing employees more time for creative and strategic endeavors. Nevertheless, aspects like

teamwork, problem-solving, innovative thinking, and human relationships still heavily depend on the unique contributions of individuals. The flourishing of employee engagement and workplace happiness is fostered in environments where people can showcase their distinct talents and feel genuinely valued. Hence, alongside the efficiency and personalization offered by AI, it is imperative to establish a culture that supports and appreciates the human side of employees. Consequently, achieving a harmonious balance between AI and the human factor becomes essential for optimal employee engagement. This balance involves both taking advantage of technological innovations and preserving the value of the human element in the workplace.

A SUCCESSFUL EXAMPLE OF EMPLOYEE EXPERIENCE PRACTICES: LOKUM

The widespread adoption of remote or hybrid working models, coupled with technological advancements, has facilitated the emergence of various HR practices. In this context, applications focused on enhancing employee experience and comprehensive human resources super applications have proven to be effective tools for bolstering employee engagement within companies. An illustrative example of these applications is the Lokum application, a novel product in the local market. The Lokum app serves as a multi-channel employee experience application designed to heighten employee engagement and motivation. It achieves this by fostering increased communication and interaction among employees while introducing a culture of intra-team and inter-team enjoyment within the work environment. The application operates on a Software as a Service (SaaS) model. Lokum, the primary feature of the application, enables employees to send virtual Lokums to one another as a means of expressing gratitude and celebrating successes. Additionally, Lokum offers a range of other products and features designed to enhance communication and interaction among employees within the work environment, fostering engagement both amongst team members and with the company. Some of these products and features include:

- Emergency request management with the emergency product, administration-based automatic location collection features
- Reward management
- Announcement management and push notification features with the announcement product
- Mood questionnaires within the survey product, multi-question surveys that measure employee engagement or are prepared for various purposes polls, live contest polls,
- Feedback product
- Team games
- Event management and and assets for events
- Orientation games
- AI HR assistant (document-based Q&A chatbot)
- Artificial intelligence personality analysis
- In-house social network product
- Reporting product

By consolidating all employee-related functions into Lokum, employees can conveniently conduct various processes through a single application within the company. This eliminates the need for multiple applications for different company procedures, thereby avoiding overwhelm among employees. Moreover, Lokum is accessible via both web and mobile applications for iOS and Android devices. This enables companies to swiftly reach their employees while providing a fun and motivational social environment for them to engage with. Lokum's primary goal is to furnish companies with insights and analytics that empower them to enhance employee experience and engagement. The application is equipped with real-time data and analytics capabilities, enabling HR professionals to closely monitor engagement levels, identify potential gaps, and make necessary adjustments for continuous improvement.

I think 2024 will be a year full of innovations and developments in terms of employee engagement. HR professionals must embrace new trends that align with the evolving needs and expectations of employees, leveraging both strategic and technological approaches. Embracing these trends will enable organizations to enhance employee engagement, elevate performance levels, and cultivate a more inclusive and productive workplace environment. Employee experience applications, like the Lokum application, are poised to emerge as valuable tools that support HR strategies in this endeavor. They will play pivotal roles in augmenting employee engagement and satisfaction within the company, ultimately contributing to organizational success.

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THE AGE OF ARTIFICIAL INTELLIGENCE AND LEARNING AGILITY

SERDAR SALEPCİOĞLU

academya
Founding Partner

Artificial intelligence has already started to integrate into various facets of daily life, business operations, and societal functions.

Summarizing how artificial intelligence is shaping job markets and industries:

Automating routine tasks: Artificial intelligence is automating routine and repetitive tasks, reducing the need for human labor in certain roles and enhancing efficiency. This shift is leading to a decline in demand for jobs involving routine, manual, and cognitive tasks.

Formation of new job categories: While some jobs are being automated, new roles such as human-machine interaction management, training, and maintenance of AI systems, and the development of AI-supported technologies are emerging.

Changing skills and requirements: Evolving skill sets are needed for many occupations, with a growing demand for skills like digital literacy, data analysis, complex problem-solving, creativity, and emotional intelligence that AI cannot easily replicate.

Impact on wage structures: Jobs easily automated experience stagnating or decreasing wages, while positions requiring skills that complement AI witness wage increases.

Increasing productivity: AI significantly boosts productivity by analyzing vast amounts of data faster than humans can, leading to faster decision-making and innovation.

Globalization of the workforce: AI tools facilitate remote work and collaboration across borders, fostering a more global workforce with talent available worldwide.

Increasing need for continuous learning: With AI's ongoing evolution, there's a growing necessity for lifelong learning to keep employees' skills relevant and up-to-date.

The current period brings to mind the days when the internet was in its "dial-up" phase at the close of the last century - a time that personally influenced my career decisions.

For those old enough to remember, there was a time when it was predicted that the internet would revolutionize many aspects of our lives, termed as the "new economy." The actual impact of the internet on our daily lives far exceeded the expectations set during that period.

Having personally witnessed the transformative power of the internet in the industry, I am convinced that Artificial Intelligence will surpass all current predictions regarding its impact on the way we live, work, and interact with the world.

This situation forces individuals and companies to adapt to change and transformation once again.

In the era of artificial intelligence, it's evident that individuals cannot sustain their relevance solely through technical expertise. Simply excelling as a software developer or a skilled doctor making accurate diagnoses is no longer sufficient. The demand of the new era necessitates supplementing technical skills with social acumen and fostering versatility. I believe the term "learning agility" encapsulates this imperative, signifying the ability to quickly adapt and learn in response to evolving challenges.

I can succinctly define learning agility as an individual's capacity

to rapidly acquire new information, comprehend novel situations, and apply knowledge garnered from past experiences to navigate new conditions. In essence, learning agility serves as a metric for adaptability, prioritizing the ability to adapt over intelligence or current knowledge level.

The key components of the concept for individuals include:

Mental Agility: The ability to think critically and handle complexity, uncertainty, and change comfortably.

Relationship Agility: Understanding and collaborating effectively with others, showcasing strong interpersonal skills and emotional intelligence.

Change Agility: Embracing new ideas, enjoying experimentation with new solutions, and effectively managing change efforts.

Result Agility: Achieving results in unfamiliar and challenging situations by inspiring the team, leading the search for innovation, and using resources efficiently.

Self-Awareness: Recognizing one's strengths and weaknesses and utilizing this awareness for learning and adaptation.

In the era of artificial intelligence, businesses aiming to attract and retain talent with learning agility, curiosity, and high internal motivation and emotional resilience should consider the following strategies:

Providing psychological safety: Creating environments where employees can freely express ideas and concerns, where mistakes are treated as learning opportunities, and where they feel encouraged to take risks.

Cultivating a learning culture: Encouraging continuous learning and curiosity, with rewards for efforts spent on learning and personal development alongside performance.

Offering rich learning resources: Providing access to diverse learning opportunities, including online courses, workshops, seminars, and training. Investing in learning platforms that will enable employees to acquire new skills.

Encouraging cross-functional projects: Allowing employees to work on projects beyond their job scope to expose them to new ideas and perspectives.

Supporting risk-taking: Fostering an environment conducive to

trying new things, where failure is viewed as a learning opportunity on the path to innovation and efficiency. Encouraging innovation and fostering a comfort with change among employees is essential.

Encouraging knowledge sharing: Facilitating regular knowledge-sharing sessions for employees to learn from each other's experiences and collaborate on problem-solving.

Adopting agile methodologies: Integrating agile practices into workflows to help teams adapt quickly, review progress, and continuously improve.

Providing personalized learning paths: Offering customized learning paths that align with individual needs, preferences, and career goals.

Leveraging AI and analytics: Using AI tools to deliver personalized learning recommendations, track progress, identify skill gaps, and predict future learning needs. AI can help identify skill gaps and predict future learning needs.

Encouraging structured assessments: Promoting reflection on learning experiences and outcomes.

Currently, I believe we are merely witnessing the dawn of the age of artificial intelligence. In this transformative period marked by unprecedented changes, learning agility emerges as a critical survival skill. This capacity enables rapid responses to new information, the willingness to unlearn and re-learn as circumstances evolve, and the transformation of experiences into wisdom guiding future actions.

As individuals, it is imperative that we consistently and proactively seek opportunities to broaden our skill sets and adopt a growth mindset. Businesses, in turn, should invest in developing the potential of their employees, preparing them to meet the demands of tomorrow.

Standing on the threshold of a future brimming with potential, we must wholeheartedly embrace artificial intelligence to propel our world towards greater innovation, efficiency, and prosperity for all.

ORGANIZATIONAL RESILIENCE

YEŞİM YÜRÜYEN

Softtech

Retail Loans & Bancassurance Group Manager

The turbulent environment shaped by economic, political, technological, social, environmental, and legal developments in today's world introduces a myriad of both familiar and unforeseen risks for the business landscape. Political instabilities, economic fluctuations, unpredictable natural events driven by climate change, and disasters such as earthquakes, along with the shifts in production processes propelled by digital transformation, escalating employee expectations, and evolving customer demands, coupled with social and environmental factors, collectively give rise to a variable, uncertain, complex, and ambiguous (VUCA) environment for businesses. This poses a significant threat to the sustainability and competitiveness of enterprises.

To thrive in the VUCA world – marked by volatility, uncertainty, complexity, and ambiguity – businesses require skills such as strategic adaptation, agility, flexibility, and robust governance for resilience.

Beyond the global ramifications of events like the COVID-19 epidemic, the Russia-Ukraine War, the chip crisis, the food crisis, and disruptions in the supply chain, businesses are attuned to the economic, social, environmental, technological, and geopolitical effects. They must also navigate Turkiye's impact due to its economic, social, geopolitical, and geographical factors, coupled with the challenges stemming from its high-risk profile.

2023 BUSINESS RISK RANKING IN THE WORLD AND IN TURKİYE

In the 2023 findings from the Allianz Risk Barometer, an annual Global Business Risk Survey, cyber incidents and business interruption risks have taken the top spots in the list of global business risks.

This year, macroeconomic developments and the newly introduced energy crisis have emerged as significant risks, entering the rankings for the first time. In the Turkish business landscape, responses prioritize macroeconomic developments as the foremost concern, followed by business interruption, climate change, and political risks in the second position.

In the 2023 global crisis and resilience research conducted by PwC, a striking 96% of businesses reported experiencing at least one business interruption in the last two years. Additionally, 91% indicated facing a business interruption unrelated to the pandemic (PwC, 2023). Comparatively, a study conducted in 2019 revealed that 69% of individuals had encountered outages in the preceding five years. This notable increase underscores the heightened risks businesses are currently confronting.

According to the INFORM risk index from the European Commission Disaster Risk Management Information Center, Turkiye is positioned at 45th place in the medium-risk category among 191 countries, scoring 4.7 out of 10, closely approaching the high-risk threshold of 5 (DRMKC, 2023). Recent seismic events, including 7.7 and 7.6 magnitude earthquakes in Pazarcık and Elbistan districts of Kahramanmaraş on February 6, 2023, and a 6.4 magnitude earthquake with aftershocks in Hatay's Yayladağ district on February 20, 2023, have impacted 11 provinces. As per the Turkiye Earthquakes Reconstruction and Recovery Assessment Report, the economic loss equates to 9% of Turkiye's estimated gross national product for 2023, totaling 103.6 Billion Dollars. Specifically, the damage to the production sector was assessed at 8.2 Billion Dollars (Republic of Turkiye, Presidency of Strategy and Budget, 2023).

The recent events and developments have heightened Turkiye's risk profile, underscoring the imperative for businesses to be well-prepared and adaptable to changing conditions – in essence, emphasizing the importance of resilience. Consequently, the concept of organizational resilience is gaining prominence in response to these challenges.

ORGANIZATIONAL RESILIENCE

Organizational Resilience, as defined by the British Standards Institution (BSI) BS 65000 standard, encompasses an organization's capability to anticipate, prepare for, respond to, and adapt to a spectrum of events – ranging from routine daily occurrences to abrupt shocks – with the ultimate aim of not only surviving but thriving (BS 65000, 2014).

Organizational resilience and flexibility stem from sound business practices and the successful implementation of risk management. The essence of organizational resilience lies in a business's ability to foresee threats and opportunities arising from both sudden and gradual changes in its internal and external environment and respond in a manner that benefits the organization. To ensure ongoing business activities, embracing change, preparing for uncertainty, sustaining operations in adverse situations, and thereby contributing value to the business will enhance the organization's durability, flexibility, and resilience. Consequently, addressing organizational resilience as a strategic goal, with a holistic perspective and a proactive approach, becomes essential.

The 2021 research conducted by PwC, encompassing 2,814 leading companies across 73 countries and 29 sectors, highlighted that establishing organizational resilience and flexibility stands as the top-priority goal for leaders. Moreover, the research indicates that businesses investing in organizational resilience programs tend to outperform their competitors and navigate crisis periods with reduced damage. Notably, institutions lacking organizational resilience and business continuity preparations during a crisis face a closure rate of 75% within three years (Ernst & Young, 2020). In the same study, it was revealed that organizations are likely to encounter a significant crisis every five years, and an investment of 1 dollar made before the crisis translates to between 4-7 dollars after the crisis (Figure 1).

ORGANIZATIONAL RESILIENCE AND BUSINESS CONTINUITY

A crucial component of organizational resilience is business continuity. According to the ISO 22301 standard, business continuity (BC) is defined as the organization's capacity to sustain the delivery of products or services at predefined levels within acceptable timeframes during a disruptive event (ISO 22301:2019).

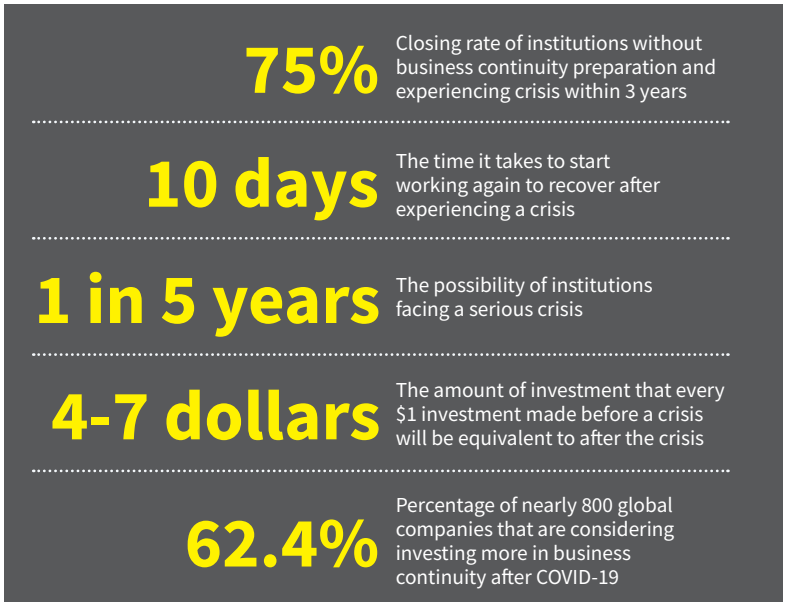

Figure 1. Organizational resilience research results (Ernst&Young, 2020)

Essentially, it encompasses all tactical and strategic activities aimed at enabling businesses, regardless of their size, to respond effectively to disruptions that may impact their operations.

The primary objective of business continuity is to sustain critical processes following an interruption, emphasizing operational resilience and risk management. In this framework, it is essential to proactively assess risks, implement necessary risk reduction measures, intervene by executing pre-prepared plans when risks materialize, and subsequently undertake improvement initiatives.

Business Continuity Management, on the other hand, involves identifying potential threats to an organization and assessing their impact on business operations. It aims to safeguard the interests of key stakeholders, protect the organization's reputation, brand, and value-creating activities. This holistic management process, as outlined in ISO 22301:2019, establishes a framework for cultivating organizational resilience with the capacity to respond effectively. Although Business Continuity Management initially evolved to address planning and interventions for information technology outages, it has evolved into an organization-wide process with a strategic orientation.

PDCA CONTINUOUS IMPROVEMENT CYCLE AND SUSTAINABILITY

The activities conducted before a disaster within the realm of business continuity management encompass the preparation of plans such as Incident Management Plan, Emergency Management Plan, Crisis Management Plan, Information Technologies Recovery Plan, and Business Continuity Plan. This involves conducting training and exercises related to plan implementation and making improvements based on the outcomes obtained. In the event of implementing these plans due to a disaster, improvement efforts must be undertaken based on the assessed implementation results. These specified activities are conducted within the framework of the Plan-Do-Check-Act (PDCA) continuous improvement cycle, playing a pivotal role in ensuring continuity and sustainability.

The activities within the realm of business continuity management,

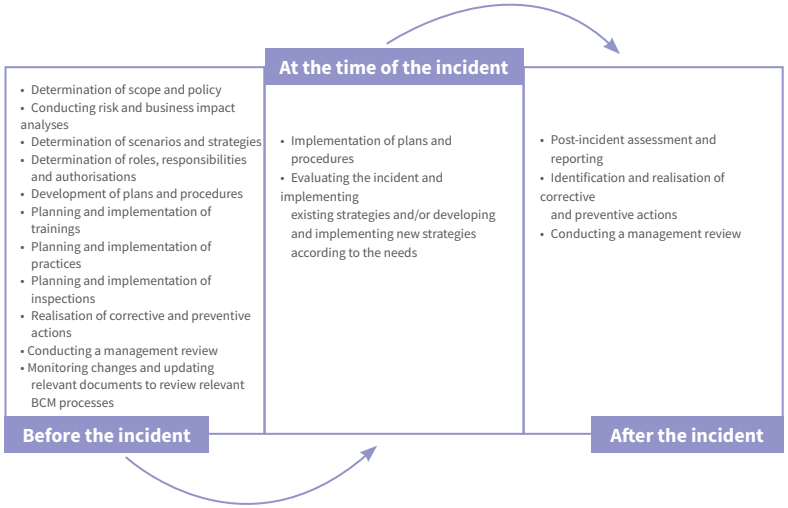

Figure 2. Business Continuity Life Cycle, Saymaz

to be conducted before, during, and after a disaster, are illustrated in Figure 2.

Benefits of Organizational Resilience and Business Continuity

Business continuity management offers a myriad of advantages from various perspectives:

From a business perspective:

- Supports strategic goals.
- Creates competitive advantage.
- Protects and enhances reputation and reliability.
- Contributes to organizational resilience.

From a financial perspective:

- Reduces legal and financial risks..
- Mitigates the direct and indirect impacts of disruptions.

From the perspective of relevant stakeholders (customers, partners, employees, suppliers, etc.):

- Safeguards life, property, and the environment.
- Takes into account the expectations of relevant stakeholders.
- Boosts confidence in the organization's ability to thrive.

From the perspective of internal processes:

- Enhances the ability to remain effective during disruptions.
- Proactively and effectively controls risks.
- Addresses operational weaknesses and vulnerabilities.

The primary objective of business continuity is to safeguard the company's reputation, brand value, and stakeholders' interests in the face of disasters, crises, or interruptions.

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INDUSTRIAL SUSTAINABILITY

PROF. DR. AHMET KIRMAN

Şişecam

Chairman and Executive Member of the Board

The most straightforward definition of sustainability is meeting the needs of the present without jeopardizing the ability of future generations to meet their own needs.

The question arises: Can we translate this definition into practical action?

It's evident that, until recently, putting this definition into practice has been a challenging task.

For centuries, people lived in harmony with nature, deriving the resources they needed without upsetting the delicate balance. This harmonious coexistence allowed our singular home, the world, to sustain its rhythm without disruption.

However, with the rise in production and the adoption of a consumption-oriented approach by humanity, numerous issues emerged. Global warming, population growth, food crises, and

environmental pollution became prevalent challenges. Our only home, whose resources were exhaustively exploited, began signaling the need for assistance.

In recent years, the noticeable effects of these challenges have prompted a shift in focus, placing sustainability at the forefront of our agenda. It is widely acknowledged, both on an individual and societal level, that achieving sustainability is imperative across all aspects of life. Undoubtedly, production stands out among these areas. Collaborative efforts between the business sector and governments are emerging as crucial actors in taking steps toward a solution.

Adopting a robust, integrated, and multifunctional sustainability policy is no longer merely a choice for companies; it has become an obligation. Global trends are intensifying the focus on ESG (Environmental, Social, and Corporate Governance) issues. Notably, 90% of institutional investors now prioritize compliance with ESG criteria when making investments in a company. Similarly, the expectations of employees and consumers align with these principles, with 70% of employees and 84% of consumers considering sustainability practices as crucial criteria.

In assessing the present scenario, efficient resource utilization, along with a strong emphasis on waste management and recycling, emerges as imperative. It is crucial to recognize that renewable energy sources like solar, wind, and hydroelectricity serve as the cornerstones for a sustainable future. However, the human factor is paramount. Sustainable production extends beyond environmental considerations; it fundamentally involves the well-being of people. The health and safety of employees should constitute an integral component of a robust sustainability strategy. In this context, smart production systems and digital technologies stand out as significant allies for the business world, aiding in the optimization of energy and resource utilization.

The glass industry, being energy-intensive, holds a crucial role, particularly in championing the implementation of carbon reduction strategies. Embracing ecologically designed, lightweight, and sustainable packaging, as well as promoting recycled products and energy-efficient solutions, are pivotal tools for the industry in pursuit of sustainability goals.

At Şişecam, we have consistently recognized the significance of nature and the imperative to coexist harmoniously with

it for a sustainable ecosystem. Driven by this awareness, we have heeded the global call for sustainability and prioritized environmentally responsible practices in every facet of our operations, spanning from raw material sourcing to post-consumption recycling.

With our "CareforNext 2030" strategy, we have established explicit objectives that address the evolving challenges and needs of the planet, society, and the business world. Aligned and integrated with the United Nations Sustainable Development Goals (UN-SDGs), our primary aim is to contribute to a better world across various domains. This commitment is manifested through the strategic pillars of "Protect the Planet," "Strengthen Society," and "Transform Life."

An integral step in our journey has been fortifying our governance structure to ensure the effective implementation and assessment of our strategy. We recognize that a strategy, no matter how well-crafted, can only yield results when it is actively monitored and managed. In line with this awareness, we have taken steps to integrate our sustainability strategy across all functions and levels, ensuring effective and comprehensive management. This involves the establishment of the Board of Directors Sustainability Committee, comprising Board members, and the Sustainability Executive Committee, consisting of our Executive Board members. By embracing our sustainability strategy and goals from the top levels of leadership and involving all employees, we foster a holistic approach to sustainability throughout the organization. We chart our course and outline specific actions through the valuable contributions of various working groups affiliated with our committees.

Aligned with the "Protect the Planet" principle of our strategy, we concentrate on sustainable production, leveraging the best available technologies for the Şişecam ecosystem and the planet. As pioneers in corporate R&D efforts in Turkiye, we harness the strength of our experience to develop new technologies and inventions. Functioning as a technology leader, we collaborate with international business partners to advance innovative and modern furnace and production technologies. Our aspiration is to spearhead collaborations that enhance the sustainability of the glass industry, exemplified by the implementation of the "Plant of The Future" model.

As a global organization with a presence in 14 countries across four continents, we place technology at the forefront of all our endeavors, aiming to contribute to a sustainable and more livable world while advancing steadfastly with our robust goals and strategies. The expansive nature of our operations necessitates a comprehensive strategy that aligns with global trends. Taking responsibility for a better future, we remain committed to illuminating all business sectors and geographic regions in which we operate with the light of reason and science.

In all the diverse geographies where we operate, we implement effective risk management and rely on data-based decision mechanisms. Recognizing the importance of not only embracing the best available technologies but also leading the way in pioneering groundbreaking technologies, we plan strategic investments. These include initiatives to utilize green electricity in energy-intensive processes and the transition to hybrid furnace technologies, incorporating electric melting furnace technology.

Our initial move in this domain involves converting one of our glassware furnaces to fully embrace electric melting technology, leveraging our robust R&D expertise. We've also established targets for the integration of advanced furnace control technologies and the implementation of waste heat recovery systems. Complementing our commitment to green electricity, we actively explore green hydrogen technologies and engage in international projects through consortiums in this field.

Energy saving and environmental awareness are the primary objectives of Şişecam, not only in its production processes but also in its research and development endeavors for product and process development. Continuous enhancement of energy efficiency is a top priority within Şişecam's operations. Through our efforts, we successfully decreased the specific energy consumption during the glass melting phase by 15%. This accomplishment was realized by emphasizing improvements in the production process through advancements in melting technology and a series of energy-saving measures implemented over time.

Furthermore, in an industry that produces around 130 million tons of glass annually, glass recycling stands as another crucial aspect directly contributing to the 2050 Carbon Neutral target. Current estimates indicate that approximately 27 million tons

of glass are recycled within the industry each year. Şişecam has been actively engaged for many years in efforts to boost glass recycling and foster the advancement of this field. As a result of our continuous initiatives since 2011, utilizing recycled glass waste in our production instead of natural resources, we have successfully prevented up to 1.3 million tons of carbon dioxide emissions. This achievement is equivalent to averting carbon emissions similar to removing 720 thousand cars from traffic for a distance of 10 thousand kilometers. The energy savings accomplished through recycling have now reached a scale where they can meet the annual heating and hot water needs of 84 thousand residences. Additionally, these efforts have resulted in preventing carbon dioxide emissions equivalent to the air purified by 62 million trees in a year.

In assessing the environmental and social implications of our current and prospective investments, we consistently consider the potential adverse effects of our activities on the environment. Adopting this holistic perspective, our investment in natural soda ash in Wyoming, USA, has played a pivotal role in achieving a 50% reduction in carbon emission intensity and water consumption associated with soda ash production. With further investments in this sector, we aspire to position ourselves as the world's leading soda ash producer. Through Basalia, our inaugural venture into the realm of biotechnology, we are steadfast in our commitment to furthering sustainability goals. Our approach involves initially neutralizing waste and subsequently harnessing hydrogen gas, an environmentally friendly energy source, from these waste materials.

We will persist in obtaining environmental product declarations for products that positively impact society and nature. Furthermore, we will conduct comprehensive evaluations of the end-to-end impacts of our products and production processes using a life cycle analysis approach.

As a result of all these steps, by 2030:

- Expanding our installed capacity for renewable energy by eightfold, reaching 53 Megawatts.
- Sourcing 15% of our clean water consumption from treated wastewater.
- Raising the proportion of externally sourced glass waste utilized in glass packaging production to 35%.
- Reducing packaging waste by 50%.
- Elevating women's employment to a minimum of 25%.
- Advancing towards the goal of zero work accidents across all processes.
- To ensure that all our suppliers comply with the Supplier Code of Conduct.
- Our objective is to augment the share of sustainable products in our turnover and expand the number of our life cycle analyses.

Our objective for 2050 is to achieve carbon neutrality.

We recognize that sustainability in production is an essential stride towards a healthy future, both environmentally and economically. I firmly believe that by learning from past mistakes and prioritizing sustainability, we can play a crucial role in building societies that have reestablished harmony with the world.

Hoping to always bear in mind that the most precious legacy we can leave to future generations is a world that is more livable and cleaner...

Resource

• *The EY Future Consumer Index and Şişecam Sustainability Report*

CLIMATE TECHNOLOGIES: THE ROAD TO A SUSTAINABLE FUTURE

DR. HÜSEYİN GÜLER

TTGV Climate Technologies Ambassador

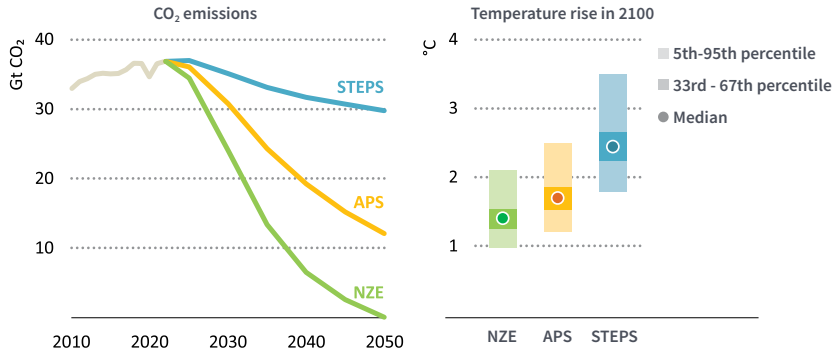
As is widely recognized, the final quarter of the 20th century witnessed a surge in industrialization and production, leading to heightened awareness of the impacts of climate change. In response to the profound consequences of this situation, global solutions were sought, spearheaded by European nations. This quest culminated in the Kyoto Protocol, which took effect in 2005, and the Paris Climate Agreement, which came into force in 2016. By formally endorsing the Paris Climate Agreement in 2021, Turkiye joined the league of nations committed to restraining the global temperature increase to below 1.5°C. Moreover, the European Union's ambitious objective of achieving climate neutrality by 2050, aligned with the European Green Deal and the European Climate Act, along with the commitment to slash emissions by 55% by 2030 under the "Fit for 55" initiative, serves as a significant milestone. This has laid a crucial foundation for the advancement of new technologies. Furthermore, the "Carbon Border Adjustment Mechanism" (CBAM), integral to the European Green Deal, was

crafted to counteract carbon leakage and mitigate greenhouse gas emissions within the EU. Initiatives are currently underway to initiate cohesive regulations under the CBAM framework, with proposals for additional obligations like a carbon tax aimed at sectors susceptible to carbon leakage.

In addition to these developments, the geopolitical tensions arising from Russia's invasion of Ukraine in 2022 have further complicated the energy crisis, prompting many countries, especially the EU, to adopt a more strategic approach to the issue of energy resources. In our country, a significant step toward achieving the goals of the Paris Climate Agreement has been the preparation of the "Updated First National Contribution Declaration" under the coordination of the Ministry of Environment, Urbanisation, and Climate Change, with contributions from institutions and organizations under the Climate Change and Adaptation Coordination Board. Through this declaration, we have committed to reducing greenhouse gas emissions by 41% by 2030, using 2012 as a reference year, equivalent to 695 million tonnes of CO_2 emissions in 2030.

Moreover, in alignment with Turkiye's 2053 vision, the recently formulated 12th Development Plan outlines a comprehensive roadmap, ensuring the realization of long-term sustainable and inclusive growth objectives. Shared with the public in October 2023, the Development Plan identifies priority sectors and development

Global energy-related and industrial process CO_2 emissions by scenario and temperature rise above pre-industrial levels in 2100

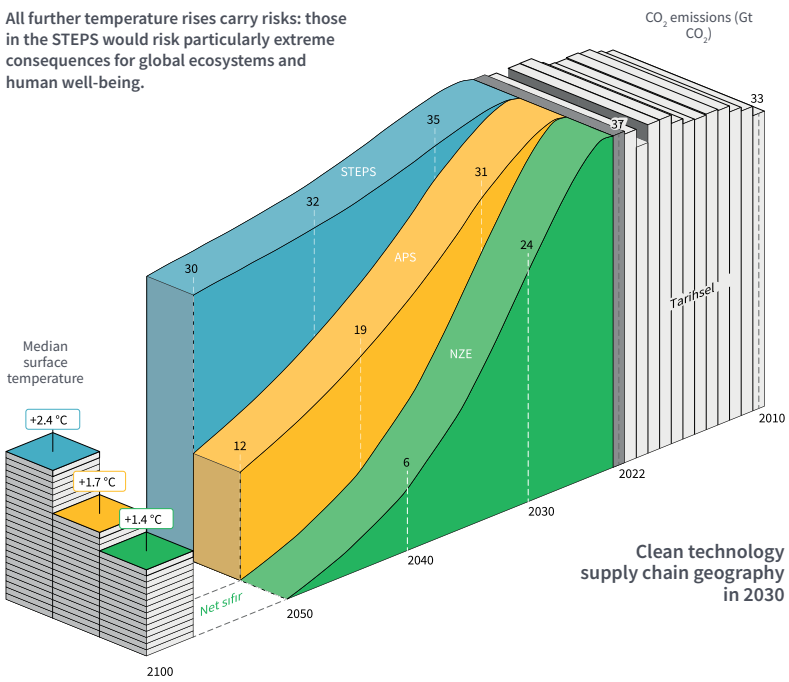


Temperature rise in 2100 is 2.4 °C in the STEPS and 1.7 °C in the APS: it peaks at just under 1.6 °C around 2040 in the NZE Scenario and then declines to about 1.4 °C by 2100

Note: Gt CO_2 = gigatonnes of carbon dioxide; STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario.
Source: IEA analysis based on outputs of MAGICC 7.5.3.

"Global energy-related CO_2 emissions have risen to an all-time high of 37 gigatonnes of carbon dioxide (Gt CO_2) in 2022."

CO_2 emissions and temperature rise in 2100



Source: IEA. (2023). World Energy Outlook 2023. Paris, France: IEA.

areas under the theme of "Competitive Production with Green and Digital Transformation," emphasizing a vision centered on high-value production through advanced technology. As we navigate the global and local changes, it becomes evident that we are entering a world where climate change triggers a transformative paradigm shift. The question arises: Do we have the opportunity to transform this competitive threat into an advantage? Can the Turkish industry leverage this paradigm shift to enhance global competitiveness in an era where international trade rules are swiftly adapting to climate considerations? This is precisely where climate technologies come into play.

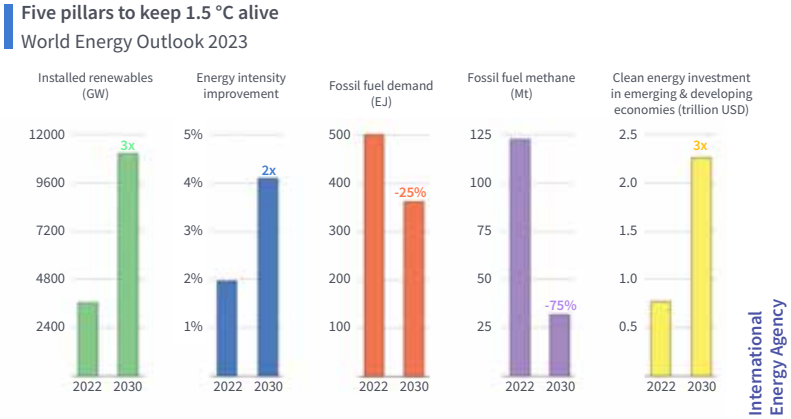
How do climate technologies reduce global warming?

Climate technologies encompass innovative solutions devised to mitigate greenhouse gas emissions, the primary contributors to global warming. Climate technologies, as an inclusive concept, encompass technologies that:

- Contribute to the reduction or prevention of the causes of climate change,
- Enhance adaptation or resilience to climate change,
- Enable the mitigation of negative effects resulting from climate change and the management of their consequences.

These technologies provide solutions in critical areas that are major contributors to climate change, including energy, mobility, industrial production, agriculture, and the built environment. Examples of such technologies include advanced energy storage technologies, clean hydrogen technologies, carbon capture, use, and storage technologies, as well as smart and precision agriculture technologies. Beyond reducing carbon emissions, these technologies serve various purposes related to sustainable development and environmental protection.

In the "World Energy Outlook 2023" report released by the International Energy Agency in October 2023, there are five key



Source: IEA. (2023). World Energy Outlook 2023. Paris, France: IEA.

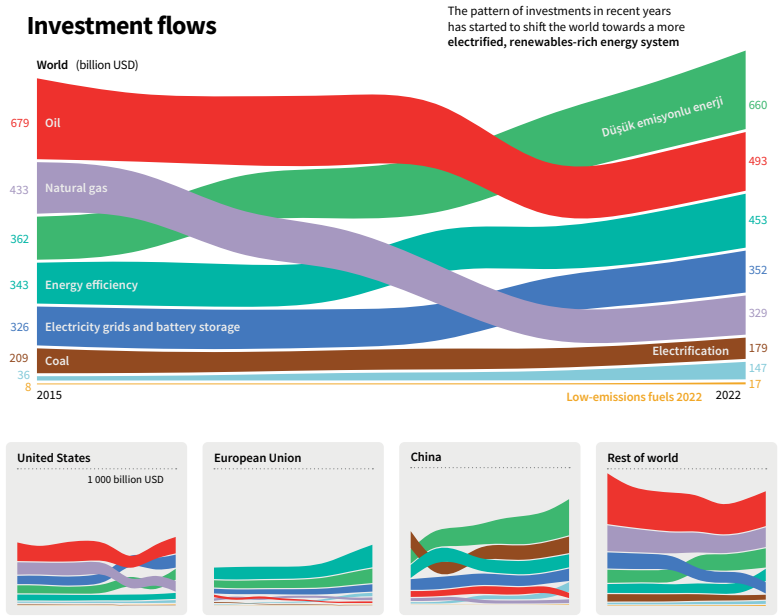
pillars highlighted to limit the global temperature increase to below 1.5°C. As of September 2023, net-zero emissions commitments cover over 85% of global energy-related emissions and nearly 90% of global GDP. The global response to the pandemic and the energy crisis has led to increased adoption of renewable energy sources, electric vehicles, heat pumps, energy efficiency measures, and other clean energy technologies, particularly in developed economies.

THE NEW FOCUS OF STARTUPS

Examining investment flows reveals a global trend towards an energy system abundant in electricity and renewable resources. In the last five years, the allocation of investments has shifted, with today's scenario seeing $1.80 out of every $1 invested in fossil fuels directed towards clean energy, marking a notable increase from the past.

Government financial incentives for clean energy investments, coupled with the response from global markets, are contributing to the prominence of mass-produced technologies like photovoltaic solar panels, wind turbines, and electric vehicles (EVs). Additionally, there is substantial growth in the sales of residential heat pumps and fixed battery storage systems.

It is evident that climate technologies, emerging as a new trend on the global stage, are progressing considerably compared to other concerns. This presents our country with the chance to leverage this significant transformation as an opportunity, aligning with the rest of the world. The question arises: Why has the Turkish



Source: IEA. (2023). World Energy Outlook 2023. Paris, France: IEA.

Technology Development Foundation (TTGV) chosen to focus on climate technologies?

Established in 1991, TTGV is a foundation dedicated to bolstering the private sector's international competitiveness and technological proficiency. Its primary focus is on developing and implementing models to address evolving global challenges. TTGV adapts its activities to align with the dynamic competitive requirements encountered by the private sector, ensuring relevance and impact. The foundation distinguishes itself through the application of pioneering models designed to raise awareness and possess the potential for widespread adoption. In a rapidly changing world of competitive dynamics, TTGV assumes the role of a strategic player, diligently monitoring trends, interpreting them, and devising innovative models. These models aim to transform risks into opportunities for the private sector, and TTGV transparently shares them for broader dissemination. Given today's global priorities and commercial demands, TTGV recognizes the imperative for novel approaches in technologies. Addressing the competitive threat necessitates moving beyond conventional supply-oriented strategies, particularly in the realm of climate technologies. TTGV's strategic plan involves the development of groundbreaking field projects with significant scalability potential. The foundation intends to implement these projects on a commercial scale, collaborating closely with stakeholders. By interpreting global developments in alignment with Turkiye's specific needs and potential, TTGV aspires to be at the forefront of pioneering projects that contribute to both local and global advancements.

Resource

• *https://www.iea.org/reports/world-energy-outlook-2023/context-and-scenario-design?utm_content=buffer5bff7&utm_medium=social&utm_source=linkedin.com&utm_campaign=buffer#abstract*

CAN THE JOINT EFFORTS OF ARTIFICIAL INTELLIGENCE AND HUMAN COLLABORATION EFFECTIVELY ADDRESS THE CHALLENGES POSED BY CLIMATE CHANGE?

ALİ FARUK GÖKSU

City Planner

The "smart city" concept, driven by technology and innovation, has evolved into a multifaceted approach encompassing sustainable living, improved governance, and collaborative decision making. Researchers and leaders now recognize that smart city strategies are inherently linked to people, extending beyond technology. It is evident that the concept of smartness goes beyond merely designing digital interfaces for traditional infrastructure or optimizing city operations.

As technology continues to play an ever-expanding role, digital platforms see increased usage, and consumers express a preference for mobile applications, the "sharing economy" has

entered a phase of diversification. This evolution is marked by the emergence of new business models and the growing prevalence of collaborative entrepreneurial ventures.

In the current era, smart cities, digital transformation, and combating climate change stand out as the most influential trends. The manner in which we navigate and manage these trends will play a pivotal role in shaping the future of our planet.

EXTINCTION HAS BEGUN

It is an established fact that the global population is currently utilizing the Earth's resources excessively. Projections indicating a further increase in population, particularly in urban areas, highlight the escalating risks to the quality of life. Scientists consistently assert that population growth, the concentration of people in urban areas, and the mismanagement of scarce resources push our planet beyond its capacity limits. This unsustainable trend is indicated to have initiated the process of extinction. Scientific studies demonstrate that nature no longer possesses the capacity to manage this challenge.

In their book "Doughnut Economics," which provides a reinterpretation of the economic concept, Professor Kate Raworth of Oxford University discusses the equilibrium between the social ceiling and the ecological ceiling. They liken this balance to a doughnut ring, stating, "The bagel of social and global boundaries is a simple visualization of the two conditions (social and ecological boundaries) on which the collective well-being of people depends." The social foundation directs attention to the internal boundaries of the "bagel" and identifies fundamental needs that no one should be deprived of. The ecological ceiling represents the outer limit of the bagel. Exceeding this limit leads to a perilous level of pressure exerted by humans on Earth's life-sustaining systems. The aim is to establish an ecologically safe and socially just space between these two boundaries, conducive to the development of humanity.

In the endeavor to reverse the extinction process, the significance of human-artificial intelligence interactions and experience design has started to emerge. Considering the limited time society has to address climate change, the swift expansion of climate solutions across crucial sectors will be imperative.

Artificial intelligence is advancing swiftly, particularly in the realms of health, education, and industry. With climate change

posing as one of the most urgent challenges demanding prompt action, the pivotal question arises: How can these cutting-edge technologies assist the world in combating climate change and mitigating its impacts?

There is a contention that artificial intelligence can play a crucial role in addressing climate change across various domains, including enhancing energy efficiency, minimizing emissions in agriculture and industry, and forecasting changing weather patterns. AI has the potential to identify risk factors and formulate plans for their reduction. Moreover, it can play a critical role in bolstering resilience to the impacts of climate change.

COLLABORATION BETWEEN ARTIFICIAL INTELLIGENCE AND HUMANS

"Artificial intelligence should be regarded as an integral part of solutions, rather than a standalone remedy. Its influence on climate and the environment can be both positive and negative, showcasing a complex relationship with climate change and environmental factors."

One of the fundamental features that sets us apart from artificial intelligence, defining our humanity, is the cultivation of a culture of interaction and experience within society. Consequently, there is ongoing exploration into novel human-artificial intelligence interactions and experiences designed to augment human capabilities.

Future data science studies are anticipated to witness a collaboration between humans and artificial intelligence systems, where automation and human expertise become indispensable in tandem. This partnership encompasses various facets, focusing on how human-centered AI systems can yield beneficial outcomes for their direct users, those impacted by their operations, and society as a whole.

Initiatives to cultivate responsible and human-compatible AI take into consideration various factors, including the imperative to comprehend how humans interact with and place trust in their artificial systems.

SMART CITIES AND INNOVATION

Climate change poses a substantial challenge to urban planning, necessitating efforts to transform cities into smart, sustainable,

and resilient environments. The "Innovation Partnership for Smart Cities and Communities" is a crucial initiative that comprehensively addresses information and communication technologies, as well as energy and transportation management. It seeks innovative solutions to address the environmental, social, and health challenges confronted by European cities.

In envisioning societal advancements toward the year 2050, the focus is on creating a community where all services are seamlessly managed in smart residential areas, enhancing lives through the integration of digital technology. The essential prerequisite for this vision is the development of green city designs and sustainable neighborhood approaches that align with decarbonization targets.

Collaboration between artificial intelligence and humans can foster creative environments for decision-makers, practitioners, and society, particularly in addressing the challenges and crises stemming from climate change.

The scope of smart cities, which has evolved with the fundamental principles of sustainable living, improved management, and shared decision-making, should also incorporate the concept of "resilience." Urban resilience strategies must be developed to enhance resistance to risks and mitigate potential impacts of natural disasters across all settlements, with a particular focus on large cities.

Climate change, migration, poverty, epidemic, etc. Comprehensive and participatory solutions that take into account the inadequacy of known approaches and methods in solving global problems should be developed with a process design approach. The process should also include the steps of understanding the current system and problems well, planning strategies within the framework of future predictions, and designing solutions to priority problems and strategies.

In addressing the intricate challenges faced by cities, novel approaches should be formulated through the collaboration of artificial intelligence and human efforts, departing from conventional methods. Artificial intelligence should be viewed as a tool rather than an end goal, and methodologies centered on the synergy between artificial intelligence and human input should be cultivated during the design of urban systems.

SUSTAINABILITY IN FINANCIAL MARKETS THROUGH DIGITALISATION

NERGİZ ÇİĞDEM DEMİRAY

Softtech

Strategy and Product Management, Product Manager

WHY SHOULD COMPANIES ADDRESS SUSTAINABILITY?

As part of the Paris Agreement, unanimously adopted by 195 countries at the United Nations Framework Convention on Climate Change Conference, the Border Carbon Regulation Mechanism (BCRM) has been instituted. This system mandates importers within the EU to acquire carbon certificates corresponding to the carbon content embedded in the products they import. The CCSM Regulation primarily seeks to mitigate the risk of carbon leakage, which could arise from the relocation of EU production to countries with less stringent climate change policies, potentially undermining the EU's emission reduction efforts.

The implementation of a carbon tax introduces additional costs for producers who do not undergo the harmonization process. Beyond the financial burden, non-compliance also exposes these producers to the risk of market losses in exports. Establishing policies and pre-determining processes related to carbon neutralization by companies can proactively mitigate potential costs and minimize the risk of market loss.

WHAT SHOULD COMPANIES IN TURKİYE PAY ATTENTION TO IN SUSTAINABILITY?

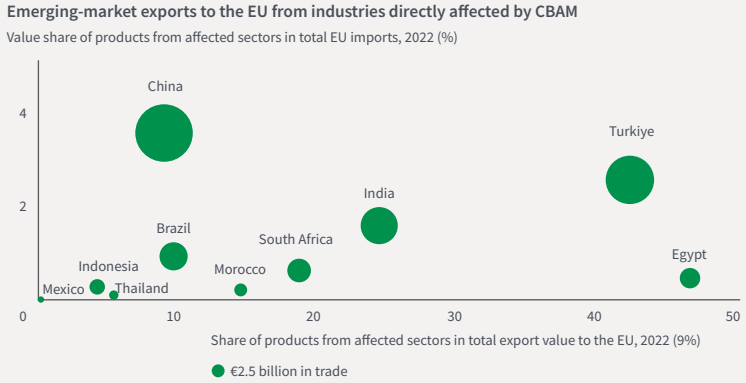
The recently enacted Corporate Sustainability Reporting Directive (CSRD) in the EU brings forth comprehensive reporting obligations. The CSRD is designed to establish a harmonized sustainability reporting ecosystem aligned with the EU Taxonomy and the Sustainable Finance Reporting Directive. In conjunction with these efforts, the International Sustainability Standards Board has been established. Companies are expected to commence reporting under the CSRD in 2025 for the fiscal year 2024.

Under CSRD, companies are obligated to disclose critical information, including:

- Integration of sustainability into business models and strategies
- Sustainability targets and progress
- Management roles and responsibilities
- Primary risks associated with sustainability

Given that countries like Germany, Italy, and the United Kingdom, major recipients of Turkish exports, are bound by the new reporting obligations in the European Union, it is anticipated that Turkish exporting companies will soon be required to adhere to this legislation as well. The following figure illustrates the export volumes of countries exporting high-risk goods such as construction materials, iron, and steel to the European Union under the Extended Single Data Model (ESDM). Turkiye holds a significant position among these exporting nations.

Exhibit 2 - CBAM Will Initially Have Its Strongest Impact on Export Sectors in China, Turkiye, and India



Source: International Trade Commission, trade map.
Note: Directly affected industries are iron and steel, cement, fertilizers, aluminum, hydrogen, and electricity.

The 2024-2026 Medium-Term Programme (MTP) outlines comprehensive action plans categorized under the theme of Green Transformation. A key aspect involves finalizing and enhancing the legal framework for the National Emissions Trading System (ETS), aligning it with the European Union Carbon

Border Adjustment Mechanism (CBAM). The transition period will be efficiently leveraged to make requisite preparations for the upcoming financial obligation phase. Additionally, infrastructure will be established to monitor and price greenhouse gas emissions. Legislative measures will be devised for the calculation and monitoring of carbon footprints and other environmental indicators, supported by the necessary digital infrastructure.

Furthermore, within the context of sustainability in capital markets, companies' sustainability reporting principles are set to be revised in alignment with international standards. Consequently, there is a likelihood of additional reporting obligations being imposed on companies listed on Borsa Istanbul. While the Capital Markets Board's (CMB) "Sustainability Principles Compliance Framework" presently necessitates reporting without mandating compliance with specific principles for publicly traded companies, there is a potential for this to become mandatory in the upcoming period.

SUSTAINABILITY POLICIES OF COMPANIES

Essential Steps Companies Should Undertake for ESG Data Management

- Implementing a centralized Environmental, Social, and Governance (ESG) data platform for companies, seamlessly integrated with existing financial and risk data sources.
- Creating an ESG data model for certification to facilitate the easy acquisition of data necessary for certifications through the model's output.
- Empowering investors to access real-time visibility into ESG-related aspects of their investment portfolios.
- Mitigating technical debt by modernizing the technology infrastructure, paving the way for future solutions, and transitioning from legacy ESG platform solutions to a cloud-based solution.

ESG Processes for the Near Future

- Companies are incorporating new workflows into their existing processes, such as integrating artificial intelligence to include Environmental, Social, and Governance (ESG) data in decision-making processes, such as credit decisions in banks.
- Companies are disseminating Environmental, Social, and Governance (ESG) requirements throughout the organization and involving all employees in an informed change management approach.
- Review and amend existing data processes to align with evolving

Environmental, Social, and Governance (ESG) requirements, such as enhancing the frequency of data updates.

- Formulate a comprehensive plan to facilitate the integration of new Environmental, Social, and Governance (ESG) policies, including procedures for adding new certifications to investments.

Challenges that companies in Turkiye may face

- In the upcoming period, the significance of supply transparency in sustainability reporting for companies is expected to escalate. In a globalized world, products often encompass added value from various countries. This scenario can pose notable challenges for companies in our country, especially those importing raw materials or semi-finished products from China or energy from Russia while exporting to Europe.
- Given the recent economic challenges globally and in Turkiye, allocating resources for Environmental, Social, and Governance (ESG) investments may impose additional burdens on companies.
- Listed companies may face additional compliance and certification costs due to transparency and reporting obligations.
- Companies will need authorized personnel or dedicated departments specifically focused on sustainability. In the banking sector, these investments have already commenced.

TRENDING APPLICATIONS AND APPROACHES IN THE FINANCIAL WORLD

Banks are actively developing numerous products and services to promote carbon neutrality within the realm of sustainability. The enhanced convenience and security provided by digital payment technology have led to heightened consumer interest in sustainability, with a growing demand for green initiatives, frequently facilitated through digital payments. Financial technology firms are actively championing sustainability and fostering green awareness across various industries. Companies within financial markets are implementing diverse methods to attain these sustainability goals.

Green investing: Fintech companies are developing digital solutions to address environmental challenges, and industry leaders are exploring investments in sustainable initiatives like renewable energy. Digital platforms simplify the process of endorsing environmentally friendly projects, contributing to the development of a more sustainable future.

Digital payments and signatures: The increasing prevalence of digital payments, electronic signatures, and mobile banking represents a significant opportunity to diminish the environmental footprint associated with traditional banking practices like cash, cheques, and paper statements. This transition towards fully digital banking not only enhances convenience but also contributes to the establishment of more sustainable financial operations. In 2022, global green investments amounted to $495 billion, marking a 17% increase from 2021.

Green loans and sustainable finance: Financial institutions are introducing novel loan products to incentivize companies to prioritize sustainability. These loans may provide advantages such as lower interest rates or incentives for businesses investing in energy-efficient technologies or sustainable agriculture. This approach encourages a growing number of companies to prioritize sustainability when exploring financing options. According to PwC forecasts, ESG-focused corporate investments are projected to reach $33.9 trillion in 2026.

Carbon monitoring: Carbon monitoring technology plays a crucial role in tracking carbon emissions, a significant step towards attaining global environmental objectives. Digital solutions, including the utilization of blockchain, enable real-time tracking of CO_2 emissions, providing businesses with the capability to conduct thorough audits of their carbon footprint and proactively implement measures to reduce their environmental impact.

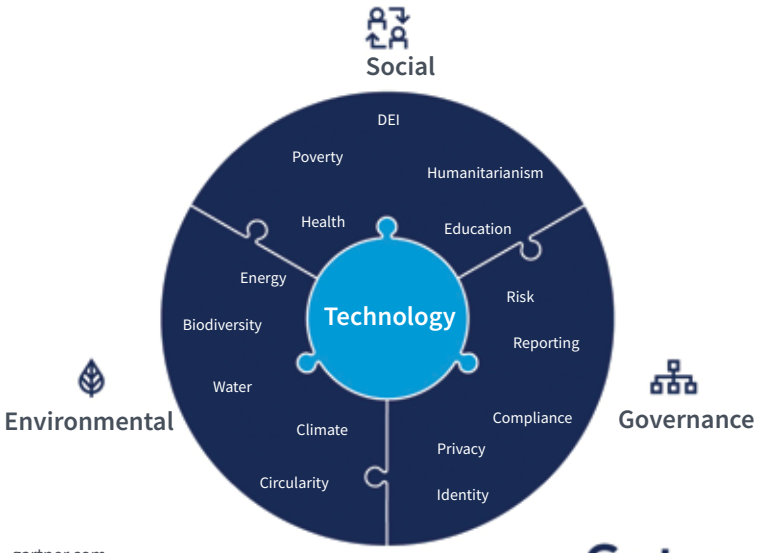
Major banks in Turkiye are actively setting targets to reduce operational emissions, expand the scope of digital products and innovative services, and transition to 100% renewable energy to achieve carbon neutrality in the short term within a sustainability framework. Numerous products and services have been developed in support of carbon neutrality under the sustainability umbrella. Initiatives include encouraging customers to adopt digital payment habits and transitioning credit card usage to mobile payments, thereby minimizing the use of plastic cards and paper. The bank's commitment to sustainability is further reinforced through innovative digital banking applications, aiming to reduce carbon footprint by eliminating paper slips in credit and debit card transactions and promoting digital document storage. As an illustrative example, İşbank, one of Turkiye's prominent banks, has implemented a program where customers can earn carbon points through their

banking transactions and daily life activities. Through the mobile application, customers can participate in the "Forest for the Future" campaigns, earning carbon points. Once the carbon points reach a predetermined value, the bank, in collaboration with the TEMA Foundation, donates saplings on behalf of its customers, allowing them to contribute to environmental conservation and reduce their carbon footprint. This initiative demonstrates the bank's commitment to sustainability and encourages customers to actively engage in environmentally friendly actions.

5 green FinTech approaches seen in 2023 are as follows;

• **Environmentally friendly cryptocurrencies:** In response to growing concerns about the environmental footprint of cryptocurrencies, fintech leaders are exploring alternative

Sustainable Technology Framework



gartner.com

Gartner

technologies that demand less energy, aiming to promote sustainable cryptocurrency investments.

• **Digital wallets as a tool to reduce waste and emissions:** Conventional payment methods, such as cash and plastic credit cards, contribute to an average of 3.78 grams of CO_2 per transaction. Digital wallets emerge as an eco-friendly payment alternative, playing a pivotal role in reducing paper and plastic waste.

• **Carbon neutral payment transaction methods to reduce emissions:** The idea of carbon-neutral payment transactions revolves around compensating for carbon emissions by

participating in carbon offset programs or supporting renewable energy projects, ultimately achieving a net-zero carbon footprint.

• **Mobile payment solutions for carbon offsetting:** Empowers users to counterbalance carbon emissions generated by their transactions by endorsing renewable energy projects or contributing to reforestation initiatives.

Resources

• *The Commitment – United Nations Environment – Finance Initiative (unepfi.org)*

• *Net-Zero Banking Alliance – United Nations Environment – Finance Initiative (unepfi.org)*

• *Sürdürülebilir Bankacılık ve Yeşil Finansman Nedir? | İş Bankası Blog (isbank.com.tr)*
(What is Sustainable Banking and Green Financing? | İş Bank Blog)

• *Sustainable Technology to Enable ESG Outcomes (gartner.com)*

• *Why are Financial Institutions Prioritizing Sustainable Banking? – ClimateTrade*

• *Financing net zero | HSBC Holdings plc*

• *sustainable-finance-e-book (cms.law)*

• *green_social_sustainable_finance_framework.pdf (ziraatbank.com.tr)*

• *SBFN_Sustainable_Finance_Roadmap-Toolkit_Guide.pdf (sbfnetwork.org)*

• *How FinTech is Helping Build a More Sustainable Financial Future (cryptomathic.com)*

• *sustainability_reporting_financial_sector.pdf (unep.org)*

• *Innovative Strategies to Finance Sustainable Development (worldbank.org)*

FUTURE OF INDUSTRIES AND INNOVATION

FOSTERING SUSTAINABILITY THROUGH TECHNOLOGICAL INNOVATION FOR THE FUTURE

BARIŞ KARAKULLUKÇU

Is Group

Next Generation Entrepreneurship President

Türkiye's vibrant technology and entrepreneurial ecosystem have experienced significant momentum in recent years, establishing a robust presence on the global stage. Being a participant in this ecosystem, drawing from my experiences both in Türkiye and globally, I firmly believe that crafting an effective roadmap for a sustainable future necessitates a central focus on technology and entrepreneurship.

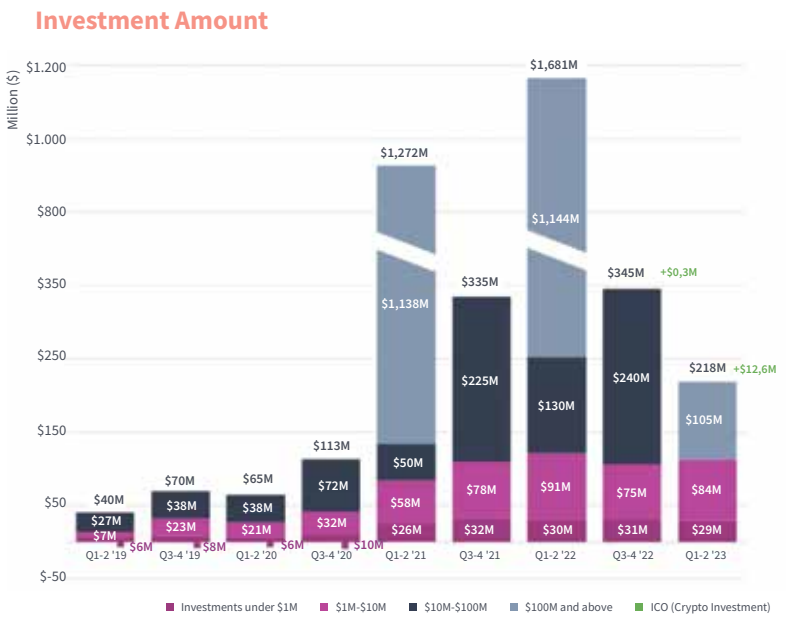
In an era marked by recurring challenges like global warming, wars, pandemics, and political crises, decision-makers worldwide prioritize sustainable growth and innovation. The key components driving sustainable growth are innovation and collaboration with startups. Highlighting innovation as the cornerstone and fundamental element of the entrepreneurial process, we observe entrepreneurs providing inventive solutions to existing challenges, thereby becoming the driving force behind economic growth.

During times of disruptive transformation, the adaptability and

innovation potential of Türkiye's entrepreneurial ecosystem take center stage. In the post-pandemic period, entrepreneurs have demonstrated their ability to overcome challenges by swiftly transforming their existing business models. The rise of initiatives grounded in digital infrastructure and the transformation of traditional business models vividly showcase the dynamic and flexible nature of the entrepreneurial ecosystem.

Current Trends in Entrepreneurship and Venture Investments:

In recent years, both in Türkiye and globally, there has been notable growth in entrepreneurship and venture investments.



Source: Startup Centrum 2023- Halfyear Turkish Startup Ecosystem Funding Report

Periods of crisis, while presenting challenges, also brought forth opportunities for Türkiye's entrepreneurial ecosystem. Swift adaptation by Turkish entrepreneurs resulted in success stories, overcoming challenges and crafting innovative solutions. This showcased the flexibility and innovative spirit of entrepreneurs, with many collaborating with NGOs and volunteer groups to deliver solutions that created value for society.

The surge in both local and international investments indicates that the entrepreneurial ecosystem is persistently expanding despite challenging conditions. Notably, 2021 stands out as an exceptionally productive year for Türkiye's entrepreneurship ecosystem. The rise in the number of investment rounds and the uptick in the average investment amount per startup underscore the vitality, diversity, and expanding potential of the ecosystem.

Türkiye has prominently increased its potential to attract international investment, transforming into an appealing destination for global investors. Furthermore, the international success stories emerging from the technology and entrepreneurship sectors affirm that Türkiye possesses an entrepreneurial ecosystem capable of competing on the global stage.

Entrepreneurship and venture investments have witnessed significant growth in recent years, both in Türkiye and globally. This surge in Türkiye is driven by various factors, including a notable increase in venture capital funds, particularly supporting technology-focused startups, leading to a robust local startup ecosystem. The Turkish government's initiatives, such as

technoparks, SME loans, and tax deductions, have further streamlined the establishment and growth processes for new businesses, fostering entrepreneurial activities. The ongoing digital transformation, coupled with the widespread use of digital technologies and increased internet penetration, has paved the way for new entrepreneurial opportunities, especially in online platforms and e-commerce. Entrepreneurship training programs and accelerators have played a crucial role in enhancing entrepreneurs' skills, covering aspects such as business model development, marketing, and financing.

The global surge in venture capital investments has been particularly pronounced in sectors such as technology, health, and green energy. Technological innovation has played a pivotal role in driving this growth, with breakthroughs in artificial intelligence, blockchain, and biotechnology presenting new avenues for entrepreneurship and garnering significant investor interest. Furthermore, initiatives that address global challenges, including climate change, sustainability, and healthcare, have gained widespread attention for their solution-oriented approach. Moreover, the access of entrepreneurs to international networks and the establishment of collaborations spanning various countries have facilitated the creation of synergies on a global scale. The convergence of these elements has played a crucial role in sustaining the ongoing growth and global expansion of entrepreneurship and venture investment.

Türkiye's corporate venture capital (CVC) ecosystem is emerging and evolving, contrasting with the more diversified and mature structures globally. In Türkiye, CVC investments tend to concentrate within a narrower range of sectors, whereas on a global scale, these investments display broad diversity, creating a significant impact through international collaborations. Nevertheless, in both contexts, a notable emphasis on the technology sector and investments in innovative initiatives remain important common points.

Significant Collaborations Between Corporations and Startups:

The partnerships between major institutions like Türkiye İşBank and startups are on the rise, significantly contributing to the expansion of the emerging economic ecosystem. These collaborations not only grant corporate entities access to innovative ideas but also enhance the growth and development prospects of startups.

In the swiftly evolving business landscape of today, established

organizations are grappling with uncertainties and unfamiliar territories. Traditional playbooks no longer assure success, underscoring the need for adaptability. This is precisely where the mutually beneficial partnership between corporate behemoths and nimble startups becomes crucial.

This dynamic alliance provides a fusion of innovation, agility, and expertise, proving highly valuable in navigating industry changes, technological breakthroughs, or market disruptions. Five key points shed light on why corporate organizations actively pursue such collaborations:

INNOVATION AND AGILITY

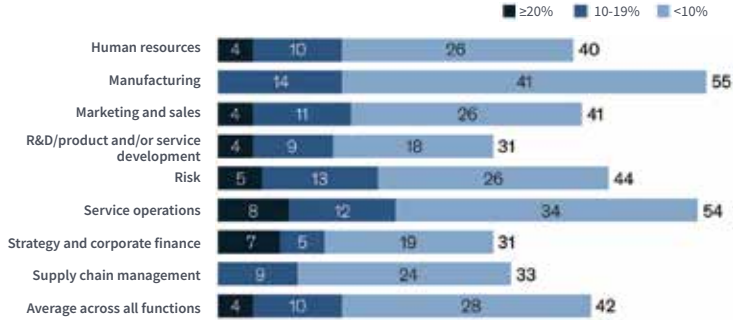
Crisis periods demand swift adaptation from companies, requiring innovative and agile solutions. Startups serve as ideal partners to fulfill these needs. In instances where large companies face challenges in providing flexibility due to established business processes and expansive structures, partnerships with technology startups offer the chance to swiftly integrate new technologies into operations. For instance, collaborating with an autonomous driving startup accelerates autonomous vehicle development for major automotive companies, allowing them to leverage the startup's fresh ideas and explore non-traditional solutions.

ACCESS TO NEW TECHNOLOGIES AND TRENDS

Startups are frequently at the forefront of adopting the latest technologies and trends. Collaborations with these startups not only allow large companies to thrive with innovative solutions but also provide startups with the opportunity to expand their innovations into larger markets with a solid footing.

For instance, a pharmaceutical company might engage in a collaboration with a health technology startup to leverage AI for drug discovery. This joint initiative could expedite the research and development processes of the pharmaceutical company, enabling the quick and precise analysis of drug molecules and potentially leading to the development of new treatment methods.

Cost decreases from AI adoption in 2022, % of respondents'



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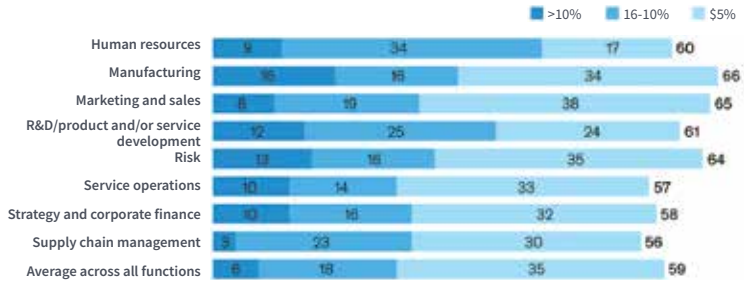


Source: McKinsey, The State of AI in 2023: Generative AI's breakout year

Simultaneously, the startup gains the opportunity to test and scale its technology with a major player in the industry. As a result, both parties benefit, fostering innovation in the healthcare sector.

COST EFFECTIVE R&D

Companies forge partnerships with startups to cost-effectively engage in R&D during certain crises. These collaborations offer corporate organizations numerous advantages, providing them with cost-effective R&D capabilities. A key driver behind these partnerships is the startups' ability to swiftly and flexibly test new ideas. Startups, unburdened by the bureaucratic hurdles of large companies, can conduct R&D activities more quickly and efficiently. For instance, a telecommunications giant might team up with a startup specializing in 5G technology to explore next-generation network solutions. This collaboration enables the large company to streamline the expensive and time-consuming internal R&D efforts, while affording the startup the opportunity to test and scale its technology with a major player in the industry. Thus, both parties benefit and accelerate innovation in the sector.

In sectors characterized by high R&D costs, such as the pharmaceutical industry, pharmaceutical giants strategically invest in biotechnology initiatives. This approach allows them to tap into innovative research while simultaneously mitigating the substantial costs associated with R&D.

ADAPTING TO DISRUPTIONS

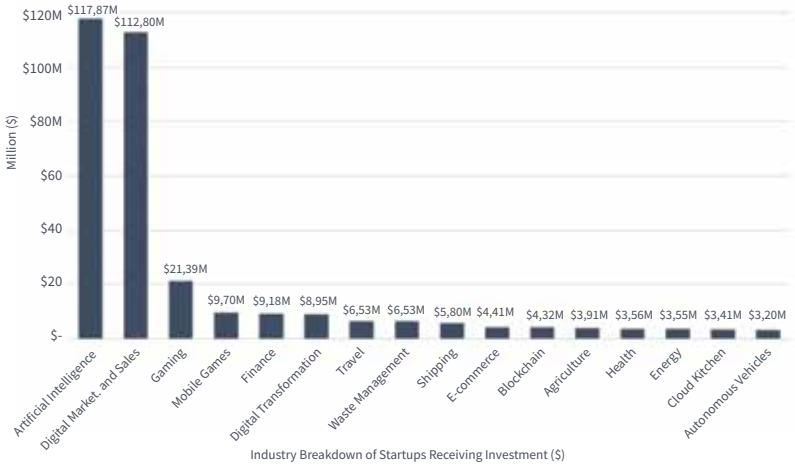
Navigating through disruptions and sectoral changes requires agility and speed. Collaborations and investments in startups empower corporate organizations to adapt quickly. For instance, amid the COVID-19 pandemic, large companies responded to evolving healthcare demands by forming partnerships with health technology startups. Similarly, retail chains embraced digital transformation, expediting their shift to the online sphere.

Surviving future crises will hinge on collaborations with sustainability and artificial intelligence initiatives. With the rising significance of climate change and sustainability, startups specializing in renewable energy and sustainable materials will emerge as crucial partners. Simultaneously, initiatives centered around AI and machine learning will assist companies in maintaining a competitive edge in their digital transformation.

Companies failing to adopt artificial intelligence technologies

may experience delayed adaptation processes and diminished competitiveness. The absence of this technology can erode competitive advantages during crises, lower operational efficiency, and jeopardize customer loyalty. Artificial intelligence enhances flexibility and efficiency by optimizing business processes, bolsters risk management, elevates employees' competencies, and facilitates swift and precise decision-making. Organizations that neglect the adoption of artificial intelligence technology may encounter operational challenges and heightened costs during periods of crisis.

Hence, it is crucial for companies to promptly embrace technological advancements and engage in collaboration with innovative initiatives for their future success.



Sourcek: Startup Centrum 2023- Halfyear Turkish Startup Ecosystem Funding Report

ANTICIPATING THE FUTURE

Startups provide insights into emerging markets and consumer behavior, enabling large companies to anticipate future trends. In turn, startups leverage this collaboration to specialize in their fields and offer solutions aligned with these trends.

A financial institution might invest in a fintech startup to grasp emerging trends in digital payments, preparing for future payment methods. If the startup specializes in innovative areas like blockchain technology or cryptocurrencies, this collaboration allows the financial institution to proactively respond to evolving customer demands. Both parties benefit, ensuring they adapt to sector changes in advance.

Venture collaborations and investments hold significant importance for corporate organizations, driven by fundamental factors like innovation, agility, and future preparedness. The symbiotic relationship between startups and corporate organizations facilitates success in dynamic market environments for these five key reasons.

Investing in and fostering synergy with initiatives can serve as a strategic move for corporate organizations aiming for innovation, growth, and a competitive advantage. Successful examples of corporate organizations in this regard include:

Google (Alphabet Inc.)

- Nest Labs, specializing in smart home technologies, was acquired by Google, becoming an integral part of Google's strategy for smart home solutions.

• Looker, a company specializing in business intelligence and big data analysis, was acquired by Google to enhance the growth of Google Cloud.

Microsoft

• LinkedIn, a professional networking and career development platform, was acquired by Microsoft and seamlessly integrated into Microsoft's social networking and professional services strategy.

• GitHub, a platform for software developers, was acquired by Microsoft and seamlessly integrated into Microsoft's services for cloud services and developer communities.

Intel Capital

• Mobileye, a company specializing in autonomous vehicle technologies, was acquired by Intel, becoming an integral part of Intel's strategic initiatives in autonomous vehicles and artificial intelligence.

• Cloudera, a company in the field of cloud computing and big data analytics, stands as one of Intel Capital's significant investments, aligning with Intel's strategies in data center and cloud technologies.

Salesforce Ventures

• Slack, the collaboration and communication platform, underwent acquisition by Salesforce and was seamlessly integrated into Salesforce's customer relationship management (CRM) and collaboration solutions.

• Tableau Software, a prominent data visualization and analysis platform, became part of Salesforce through acquisition, enhancing Salesforce's capabilities in data analysis and business intelligence services.

Amazon

• Ring, a manufacturer of home security and smart doorbells, joined Amazon's portfolio of smart home security products following its acquisition by Amazon.

• Whole Foods Market, an organic and natural food retailer, became a part of Amazon's retail and e-commerce strategies following its acquisition by Amazon.

These institutions play a crucial role by not only providing capital to startups but also offering expertise, market access, and

opportunities for collaborative innovation. This collaborative approach fosters mutual growth and the development of innovative solutions for both institutional investors and startups.

Conclusion

Türkiye's entrepreneurship ecosystem is undergoing rapid evolution and strengthening amid transformative factors such as pandemics and technological advancements. The surge in investments, particularly in technological domains like artificial intelligence and machine learning, signifies that Türkiye's entrepreneurship ecosystem has progressed in a direction that not only bolsters economic growth but also aligns with social and environmental responsibilities. Artificial intelligence-centric endeavors are reshaping business operations across diverse industries, enhancing operational efficiency, refining risk management, and facilitating swift and precise decision-making. These initiatives not only enhance companies' competitive edge in facing future crises but also mitigate the risk of encountering operational challenges and escalating costs.

The adaptability and innovation-driven strategies employed by entrepreneurs in the post-pandemic era underscore the resilience and adaptive capacities of Turkish entrepreneurs, even in challenging times such as financial crises and conflicts. This resilience indicates that Türkiye's entrepreneurship ecosystem is poised to enhance its international competitiveness in the future, offering a promising outlook for sustainable growth. The incorporation of artificial intelligence and advanced technologies is pivotal in this trajectory, guaranteeing that Türkiye establishes a competitive entrepreneurship ecosystem on the global stage.

In conclusion, Türkiye's entrepreneurial ecosystem has demonstrated its adaptability to current challenges and showcased its potential to generate innovative and sustainable solutions for the future. This instills hope and inspiration for entrepreneurs, investors, and all stakeholders involved. The future holds the promise of a resilient and dynamic entrepreneurship ecosystem in Türkiye, strengthened by the forces of innovation and collaboration.

CREATING THE FUTURE

İSKENDER ADA

Magnus AI
Vice President of Business
Development & Shareholder

"The best way to predict the future is to create it."

Peter Drucker

The concept of the "Black Swan Theorem" was initially introduced by Nassim Nicholas Taleb. As articulated by the author, this theorem encapsulates unpredictable, rare, and unexpected occurrences. Its purpose is to elucidate the impact of such events on various domains, including human life, finance, and science. The term is employed to signify the unexpected nature of situations, drawing from the assumption that swans residing in Australia are typically white.

Occurrences like these are typically unforeseeable through statistical models or conventional forecasting techniques. Black swan events wield considerable influence, triggering substantial shifts within systems and rendering established models or predictions obsolete. Following such events, there's a tendency to rationalize, seeking to elucidate their causes or likelihoods. Yet, the very nature of these events defies prediction.

The Covid-19 pandemic, a global phenomenon, earns its black swan status primarily due to its cascading effects across various realms. While physically constraining our movements, the virus has simultaneously ushered in new digital landscapes. Despite its profound impact across numerous sectors, some may currently downplay its significance, yet its influence persists, particularly in shaping the trajectory of financial technologies. Throughout this arduous journey, we've witnessed a remarkable

surge in our appetite for novel experiences. While a contactless financial experience sufficed previously, there's now a pursuit for hyper-personalized encounters. Although we once believed that achieving this required years of advancement in artificial intelligence, the black swan event abruptly emerged, unraveling Pandora's box.

The future of financial technologies appears as clear as a crystal ball, driven by the accelerating momentum of artificial intelligence (AI) technologies. As we stand on the brink of a world where linguistic diversity may converge towards a "universal single language" model, AI will play a pivotal role, particularly in the realm of finance. The dynamics that traditionally guided spending - both in physical and digital realms - are now shifting towards a focus on saving and investing. We're entering a cycle where earnings are channeled into investments, fostering a balanced approach between expenditure and savings. This approach also encompasses planning for the salvation of our singular home, Earth, and striving to enhance its livability.

I hold the belief that we are on the verge of entering a digital universe wherein the next steps are determined by analyzing all the personal data we generate, tailored to our future needs. Setting aside the sociological and psychological dimensions, I envision a future where artificial intelligence and natural intelligence seamlessly merge, forming an inseparable whole in the dynamics of the new world.

To give this vision some substance, I thought it fitting to share a story that's been brewing in my mind.

"AIT"

As the young woman held her phone up to her face, eagerly awaiting the completion of its biometric data analysis for setup, the late-arriving winter in Istanbul had begun to make itself felt. Sitting on a bench by the seaside, she gazed into the deep blues of the sea, while the cold winds gently nipped at her hair. In the same spot where she had made all her significant decisions and shed the burden of all important choices, she now pondered what was about to unfold.

"Just one more step, İlkyaz," said the robotic voice in her earphones. *"Could you tell me a few words that hold meaning for you?"* Without hesitation, *İlkyaz replied with a smile, "A room of one's own,"* inspired by Virginia Woolf's wonderful work. It was also the name she had chosen for the application she had been working on with her team for years and was now experiencing its first real-world application. *The name was derived from the initials of "artificial intelligence technology."* With a large wave crashing against the shore, AIT, seeking permission to complete the setup, asked:

"Do you grant permission for access to all your personal data?" İlkyaz held her breath and replied, *"Yes."*

From that moment on, the application began rapidly analyzing all of İlkyaz's data. First, it scanned her data to establish an emotional connection with her and maintain it. It analyzed the content she consumed on the platforms she was a member of, scanned all her text and voice messages, and identified the voice she resonated with the most. It also analyzed her videos and photos to identify her happiest and most peaceful moments and the people who were with her during those times. Using all this information, it addressed İlkyaz in a special voice it had created just for her.

"You've had so many beautiful memories. While you listen to your favorite song, I've prepared a video of beautiful moments for you to enjoy. While you watch, I'll analyze the data I've obtained from e-government and e-health portals," AIT said. İlkyaz didn't even hear what was being said; it was her father's serene and reassuring

voice. Her father, who had always been there for her, was now in her ears. The fact that the artificial intelligence had recreated her father's voice based on its analysis made her happy. Tears filled her eyes as she watched the video made up of wonderful memories while listening to the song chosen by AIT.

Once the video ended, AIT had already begun managing all of İlkyaz's interactions with the government based on the analyzed data. After reviewing her past health data, it began synchronizing its analysis with İlkyaz's smartwatch in real-time.

It swiftly accessed her financial data from the four banks she had accounts with over the past decade, as if a hungry seagull had swallowed a fish in one gulp. It then moved on to analyze her

transactions in capital markets through brokerage firms. Following that, it swiftly analyzed her data from cryptocurrency exchanges, payment and electronic money institutions, individual pension companies, crowdfunding platforms, and portfolio management companies.

One of AIT's strengths was real-time data tracking and analysis. Thanks to the method developed by İlkyaz and her team, AIT could integrate itself with all data services. This technology and architecture went beyond her father's dream. Her father, who had worked in the financial sector for many years, had always said that all financial data should be collected in one big data pool for a true financial personal assistant. İlkyaz had worked on this throughout her career, believing that artificial intelligence would function more efficiently when all personal data, not just financial data, were added to the pool and a connection was established between humans and machines. Now she was excited to experience the result. She couldn't help but smile at the thought of what her father would feel when he experienced this application.

"We're ready," her father's voice suddenly said. When İlkyaz looked at the time that had passed since the setup, she was surprised. The analysis had been completed much faster than tests generated with synthetic data. She knew that AIT was still learning and evolving. Her father continued to speak. In the background, she could hear the music from Interstellar, a very old movie she had watched repeatedly.

"My dear İlkyaz,

When I looked at your income in the bank accounts, I saw that your financial situation is quite good considering your age and the country average.

There is a steady increase in your monthly income. When I categorized your expenses, I saw that rent is the biggest expense item. Your transportation expenses have significantly decreased due to your use of an electric vehicle. You demonstrate a balanced approach in other spending areas such as food and entertainment.

However, I noticed that the monthly amount you allocate for

individual retirement is quite small considering your income and expenditure balance. So, I have increased it to the appropriate level and created a more suitable portfolio allocation for retirement investment funds. I will send you a development report and the changes I made to you weekly.

Besides individual retirement, I have opened a new account for emergency funds in the bank where you have the most transactions, and I have transferred the required amount there. I have also started evaluating it with a model consisting of investment funds.

I foresee a significant rise in crypto assets in the first quarter of 2035. Therefore, I have increased your investments there, focusing on digital assets related to web5 technologies, decentralized sustainability, and life technologies.

When I looked at your spending details, I noticed that you are interested in a restaurant chain where you like to eat the most, and I found out that they are in a crowdfunding round for a start-up that enhances customer experience with artificial intelligence. After analyzing the data they shared, I found it would be a suitable investment, and I predict that its valuation will increase significantly over the next three years. So, I have allocated a portion of the long-term investment budget for this start-up and invested in it.

I have identified e-money companies that offer the best advantages for your monthly payments on the platforms you are a member of and started managing all of them to increase your savings by reducing costs.

Additionally, I will take over determining the most optimal payment, card, and credit options for your mobile purchases by integrating with all platforms.

By tracking trends in clothing, I will soon offer you suitable recommendations.

When I analyzed your sleep data, I saw that the quality of your sleep has been decreasing in the last two weeks. I will remind you to sleep earlier today, and I will adjust the ambiance in your home according to this reminder.

When I looked at the happy moments, I saw that going to the theater with your father made you feel very good. Moreover, you haven't been to such an event for a long time. Therefore, I bought tickets for one of the best comedy performances of the recent period for both of you this weekend. I'm sure it will be good for both of you.

I will continue my analysis and keep you informed. Now I believe you might want to call your father. What do you say"

After this entire conversation, İlkyaz truly felt that AIT belonged to her. Experiencing how deeply integrated artificial intelligence had to be with human life to establish a connection with people, she thought of the work she had done and the sleepless nights she had spent. She had achieved her goal through all this effort. As she rose slowly from the bench, she smiled at the sight of a dolphin and its calf gracefully swimming in the waters. "Let's call him!" she said to AIT, and eagerly awaited her father's phone call.

"My dear daughter! How are you?"

As soon as she heard her father's voice, tears of happiness welled up in İlkyaz's eyes.

"I'm fine, dad. I'm really fine!"

I often remind myself of the quote at the beginning of my article and I especially emphasize it in my conversations with young people. In my predictions about the future, I am interested in being the producer of what is offered to us instead of being the user. I hope to meet one day with all the wonderful minds who are concerned about this and want to build such a future...

For a beautiful future...

ARTIFICIAL INTELLIGENCE APPLICATIONS IN BANKING AND FINANCE IN CHINA

DORUK KESER

Softtech Asia

CEO

DEVELOPMENT OF FINANCIAL PRODUCTS IN CHINA

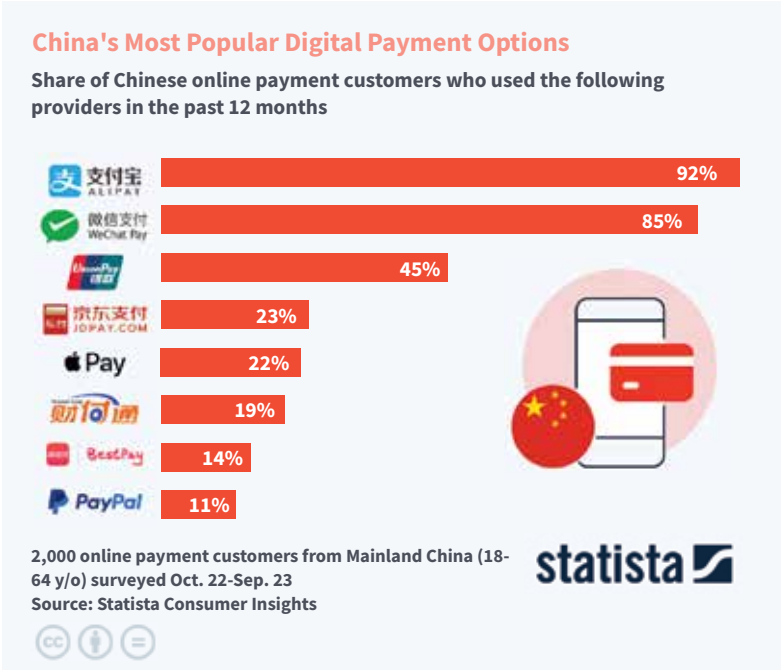
The financial sector in China exhibits a dynamic structure where government-backed banks wield significant dominance, and innovative financial technologies are swiftly gaining ground. However, other participants in the finance sector, including portfolio and asset management companies, insurance institutions, and funds established to cater to the increasingly affluent Chinese households, still command a relatively modest share in terms of managed asset sizes.

At the heart of this structure are Alipay (Ant Group) and Tencent, the world's largest financial technology companies, making revolutionary changes in the industry with their innovative solutions. Alipay, with over 1 billion customers in the market, particularly in payment systems where the annual transaction volume reaches 3.64 Trillion USD, holds a leading position in areas such as payment, loan repayment, and asset management, courtesy of its application positioned as a "super-app".

Figure 3: Super-apps in China

Source: WEF Innovation in Payments and Fintech in China

In contrast to Türkiye and many European countries, technology companies in China have shifted towards the financial sector through consolidation, departing from their previous role as distributors. This shift is attributed to the demands of the growing middle class and significant advancements in e-commerce. Leveraging the extensive data sets they gather via mobile strategies, these companies can offer innovative financial products to customers. Meanwhile, banks are striving to reclaim lost customer relationships through strategic investments and collaborations, adopting a secret banking model. Simultaneously, rapidly expanding digital platforms like Alibaba Group (Alipay) and



JD (JD Finance) have introduced pioneering digital models within the super-app ecosystem they've established. These models, enriched by big data, showcase innovations in QR codes, biometric payments, instant loan services, money market funds, and other financial and non-financial service layers. It's worth noting that the intense competitive battle among technology oligopolies in recent years caught the attention of Chinese authorities. Eventually, it was decided that Ant Financial, the owner of Alipay, would continue its journey with a more fragmented business model and capital structure, subject to various license and capital requirements.

DEVELOPMENT OF ARTIFICIAL INTELLIGENCE TECHNOLOGIES AND THE APPLICATION OF ARTIFICIAL INTELLIGENCE IN THE FINANCIAL SECTOR

In light of these developments in the Chinese financial sector, artificial intelligence technologies that effectively interpret big

Source: iresearch Global, Economist

data and transform it into a value proposition for customers have also undergone a rapid development process. By the year 2025, it is anticipated that the market size of core technologies such as AI and NLP in China will reach 589 billion USD, with the integrated volume of all hardware and software related to these applications reaching 1.375 billion USD.

Examining the application areas of artificial intelligence in China, unmanned retail banking models, initially prevalent in branch service areas, have emerged. Starting in 2017, concrete implementation of operations such as remote customer acquisition, account opening, and card allocation became possible, thanks to OCR and facial recognition technologies. Since 2020, with the development of transformer models, more advanced bots positioned at branch receptions compared to early NLP models have started to evolve. Chinese companies have gained momentum in integrating their own large language processing models (LLM).

Source: Caixin, Customer Welcoming Robot

While investments in large language processing models gained popularity in China by 2020, the intricate landscape in cybersecurity, regulation, and data privacy has hindered the timely delivery of these models to consumers. Notably, the value of sector-specific data derived from Ant Group's insurance, asset management, and lending platforms has further increased, considering that, unlike the open ecosystem in the US, Chinese government-held data sources constitute more than two-thirds of national data sources. In this context, Ant Group has submitted an approval application to relevant regulators for its LLM model named "Zhixiaobao 2.0," designed to analyze customer transactions and provide various financial recommendations. Simultaneously, Shanghai University of Finance and Economics published the results of "Fin-Eval"[1] this year, evaluating the competencies of large language models for specific

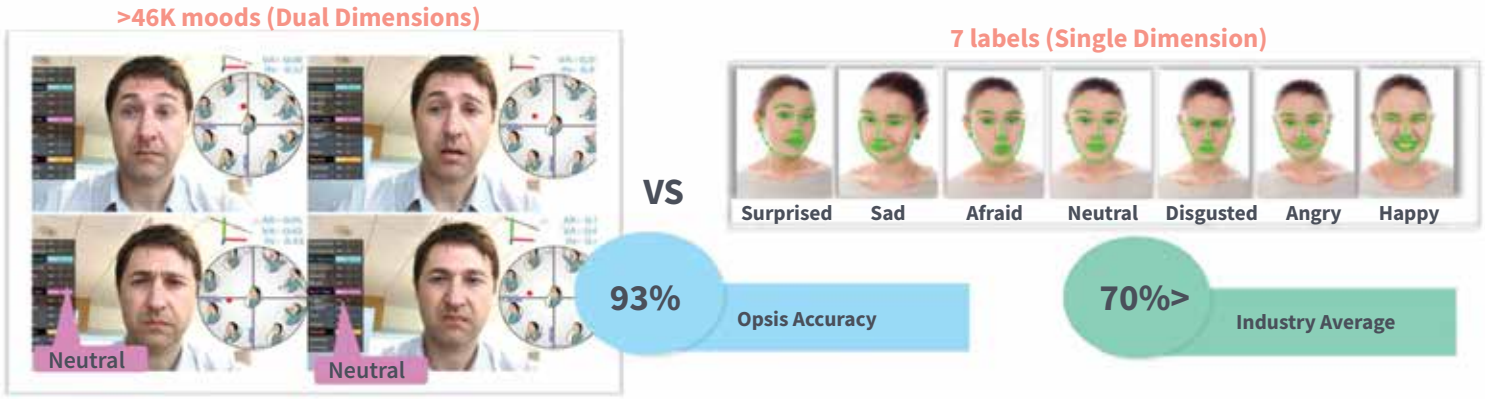
APPLICATION OF LMS											
		Applications are more on B2B domain due to the effects of regulations on B2C. Security comes first rather than innovation!									
Company	Name	Office	Finance	Life	Entertainment	Automatic Driving	Smart City	Business	Medical Care	Industry	Education
Baidu	ERNIE 3.0	Language Understanding and Generation	Understanding Insurance Contracts	AI Dialogue			Deal with users' complaint		Extract Medical Samples		Knowledge Excavation
Alibaba	M6	Language Generation, Search for services	Financial Knowledge QA	Comment on news		Design on cars		Commercial Image Generation			
CASIA	Taichu				Create Images	Automatic Driving			Operation Robot	Quality detection	
Huawei	Pangu		Financial OCR				Smart Logistics		Design Drugs		
Baidu	Yiyan	Content Generation, Data Analysis	Business RISK		Dialogue System		Monitoring Emergencies				
Alibaba	Qianwen	Outline, SWOT Analysis			Write letters						
Zhiyuan	Wudao 2.0	Image Translation, Sign Language		ChatBot, Write Recipies	Create Poems						
Iflytek	Xinhuo	Conference Summary. Digital Agent				Human Computer Interaction					Essay Correction, Language Learning
Sensetime	Intern	Picture Generation		Home Robot	Automatic Driving						
Langboat	Mengzi	Content Generation, Picture Generation	Finance								
Tencent	HunYuan	Content Generation, Picture Generation			3D Scenarios			Understanding Advertisement			

Source: Reports on Chinese AI Large Models Road Map (http://lib.ia.ac.cn/news/newsdetail/68630)

tasks in the finance sector. According to the research, it was found that only GPT-4 achieved an accuracy rate of 70% in the financial field. In the ultimate analysis, the study highlights significant potential and gaps in the development of LLMs in this field.

Looking at some examples of artificial intelligence in customer relations applications, technologies that accurately analyze customer complaints and determine their root causes process data obtained from digital channels. In video calls, models that use emotional analysis methods have been developed to make sense of the customer's instant reactions.

In 2023, the solutions developed by the Chinese technology company Cyclone, which became one of Softtech's business partners in the field of RPA, involve the analysis of different customer complaint contents received from multiple channels using on-prem LLM models. Intelligent response text suggestions are produced, and the problem is quickly detected. Customer complaints are then forwarded to customer relations managers for resolution.



Psychology Circumplex detect Thousands Subtle Expressions vs 7 Basic Labels

Source: Opsis Corporate Presentation, Sentiment Analysis

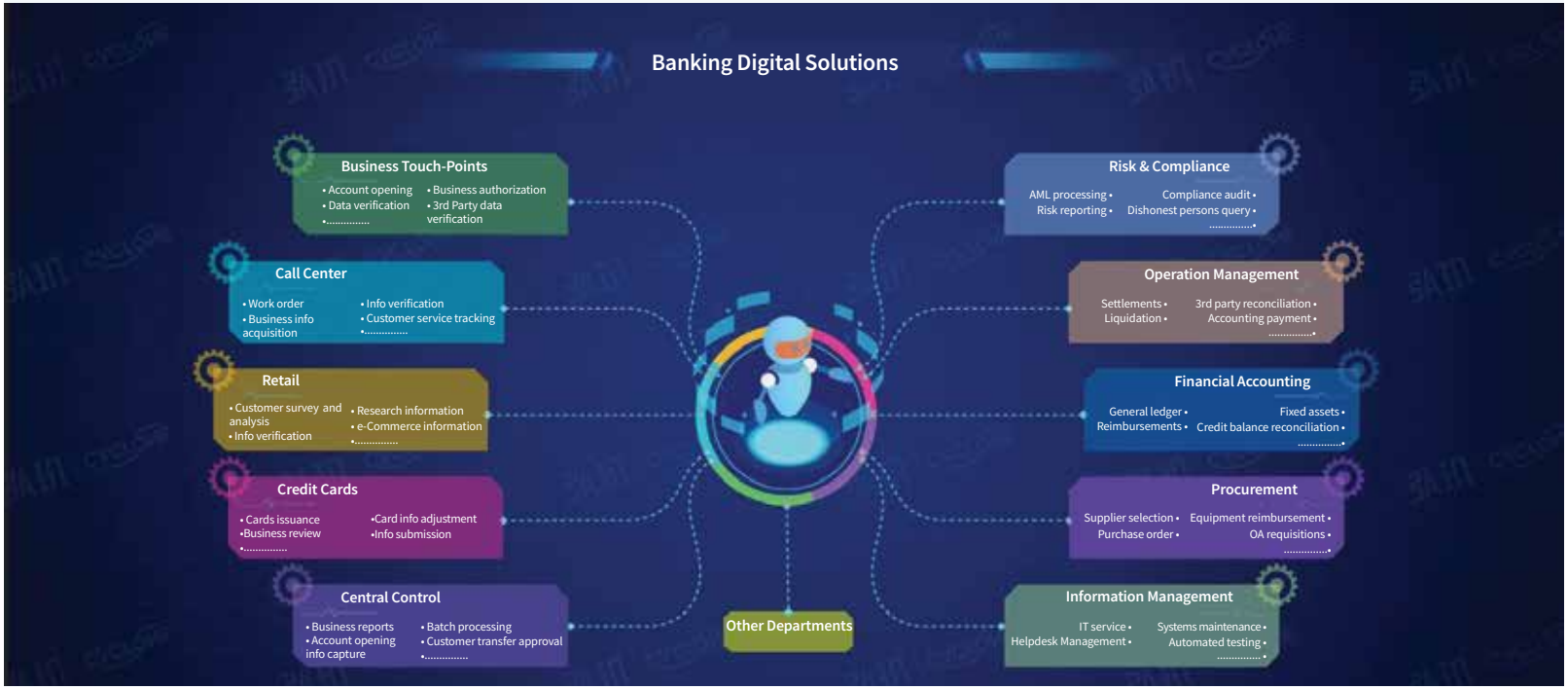
In our innovation journey in Asia, Softtech's expansion in Singapore has brought our attention to the Gen AI applications developed by some leading banks in the region for their employees. In these applications, it is observed that sensitive data, in compliance with KVKK (Personal Data Protection Law), is masked during entry through the Chatbot and transmitted to OpenAI APIs, ensuring a usage that aligns with data privacy. Consequently, solutions that not only adhere to data privacy but also integrate technology are provided to employees.

Furthermore, the use of artificial intelligence is yielding results in the fields of risk management, fraud detection, security, and credit scoring, which may represent the most crucial layer of financial processes. In this context, UnionPay, China's local bank card network, takes the forefront with algorithms that make swift decisions and prevent fraud through machine learning, especially in credit card allocation processes. Similarly, JD Finance has developed models that enhance customer experience and minimize risk in both the e-commerce and finance sectors.

One of the noteworthy developments observed at the Singapore Fintech Festival in November and during the workshop organized with Hong Kong HSBC is the popularity of "sandbox" applications in these regions. Additionally, blockchain and artificial intelligence-supported analytical tools are accelerating the movement of asset tokenization. In Singapore, a small island state with a significant impact on innovation, the leading financial institutions and funds in the region, led by the Monetary Authority of Singapore (MAS), are actively expanding pilot applications, particularly in the tokenization of investment instruments, clearing, buying and selling, and cross-border foreign exchange transactions.

Banking Digital Solutions

Optimize business processes, reduce operational costs and increase management efficiency. Redirect limited human resources away from repetitive and inefficient work towards higher value work.



Source: Cyclone Corporate Presentation, Banking Scenarios

FUTURE OUTLOOK AND EMERGING TRENDS

In China, the financial sector and banking industry are swiftly embracing innovative applications that leverage artificial intelligence technologies to transform customer experiences, reduce workloads, and enhance work quality. Pioneering entities like Ant Group utilize advanced tools such as Large Language Models (LLMs) to offer financial products and services based on deep insights derived from industry-specific data. This transformative process significantly shapes competition both locally and on the global financial stage. Nevertheless, these advancements are accompanied by challenges in critical areas like regulation, cybersecurity, and data privacy. The maturation of these aspects may potentially impede the broader acceptance of such technology.

The Chinese authorities and financial technology firms must collectively address the ethical, legal, and security challenges brought about by artificial intelligence applications.It is crucial to also clarify the impact of these technologies on the labor market. A collaborative and openly communicative approach will not only unleash the full potential of artificial intelligence but also minimize associated risks. Looking ahead, the continued development and implementation of AI and Large Language Models (LLMs) within a more integrated and ethical framework will remain a key factor in strengthening China's global leadership in the financial sector. This ongoing commitment will contribute to sustainable value creation for both individuals and businesses. In this journey, it is imperative to encourage an environment through innovative regulations and ethical standards that will yield positive outcomes for both consumers and employees in the financial sector.

Resources

1. FinEval is a benchmark specifically crafted to assess the financial domain knowledge of large language models (LLM). Developed by a team at Shanghai University of Finance and Economics, FinEval comprises a substantial collection of high-quality multiple-choice questions spanning Finance, Economics, Accounting, and Certificate subjects. Encompassing 4,661 questions across 34 different academic topics, this benchmark is tailored to evaluate advanced financial knowledge, especially within the Chinese context. Its purpose is to close the gap between the development of general Chinese LLMs and their assessment in the financial sector. Utilizing diverse formats such as "zero, few-shot, Chain of Thought" prompts, FinEval offers a comprehensive evaluation of model performance in the financial domain.

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• https://www3.weforum.org/docs/WEF_Innovation_in_Payments_and_Fintech_China_India_ENG_2020.pdf

• https://arxiv.org/pdf/2308.09975v1.pdf

• "China's Robotic Process Automation (RPA) Industry Panorama in 2023" From Forward-The Economist

• "2022 China AI+ Financial Industry Development Research Report" From iResearch Global

• Opsis, corporate presentation

• Cyclone, corporate presentation

Images:

1. https://www3.weforum.org/docs/WEF_Innovation_in_Payments_and_Fintech_China_India_ENG_2020.pdf

2. https://cdn.statcdn.com/Infographic/images/normal/17409.jpeg

3. İresearch and Softtech Asia Excel table

4. https://asia.nikkei.com/Spotlight/Caixin/Chinese-banks-jump-on-AI-bandwagon-to-cut-costs

5. http://lib.ia.ac.cn/news/newsdetail/68630 and Softtech Asia Presentation

6. Opsis Corporate Presentation

7. Cyclone Corporate Presentation

SERVICE MODEL BANKING

EMRE ÖLÇER

İşbank

Digital Banking Department Manager

In today's landscape, consumer behavior, shaped by mobile technologies, is swiftly influencing the dynamics and pace of financial transactions. Financial institutions are transforming into technology-centric entities, while tech giants are evolving into formidable players in the fintech arena. Consequently, as commercial activities unfold for both consumers and companies, the expectation for on-the-spot financing solutions is growing. New business models are emerging, leveraging online consumption patterns and financial footprints. Simultaneously, a fierce cross-industry competition is escalating, particularly concerning the ownership of customer data. In this environment, it is accurate to assert that the expectations and traffic of customers are effectively managed by the next generation of financial solutions. The contemporary consumer demands personalized financial solutions instantly and contextually, and the ability to access them seamlessly, cost-effectively,

and rapidly, without exerting additional effort, has become a standard expectation in today's norm.

Examining the technological infrastructure dimension reveals the transformative role of Application Programming Interfaces (APIs), a concept that originated in the 1970s and significantly shaped today's web-based technological solutions and microservice architecture in the 2000s. The evolution of APIs has progressed from early 2000s versions, where single functions were effortlessly offered through separate API connections, to contemporary API platforms. These platforms allow for the seamless consumption of multi-party APIs with a single integration, underpinning models like open banking. In open banking, complex functions, including banking operations, are shared with third parties based on consumer demand. The emergence of concepts like service model banking is noteworthy, where the infrastructure is leveraged by third-party organizations beyond traditional banks. This shift has rapidly integrated into our lives. The implementation of Payment Systems Directives (PSD) in the European Union in 2008 aimed to enhance payment systems' efficiency, security, and competitiveness. The subsequent introduction of secondary regulations like PSD2 in 2016 framed concepts such as "open banking" and "service model banking." Bill Gates' 1994 statement, *"Banking is necessary, but banks are not,"* finds embodiment in these developments. As a result, banking is undergoing a rapid transformation from the traditional model, where financial services were exclusively accessed through bank channels, to the "banking everywhere" model. This evolution aligns with customer needs and habits, marking a shift towards a more flexible and accessible financial landscape.

In the service banking model, platforms offering non-financial products and services can provide financial products and services to their customers through the API services of banks, using their own interface experiences. In this arrangement, the service bank gains access to new customer portfolios and generates additional revenue through a distinct interface. The interface provider, delivering banking services seamlessly to their "common customer" base through the platform they regularly use, enhances key metrics such as customer loyalty, conversion rate, repeat sales, and basket amount. Simultaneously, customers accessing financial services with a straightforward experience maximize their own benefits in this mutually beneficial arrangement.

At a glance, it might appear as a drawback for the bank to relinquish its brand perception on the front-end and share

revenue with the platform, which already has people and companies in its customer portfolio. However, it's evident that the bank gains a significant advantage in terms of customer acquisition cost by accessing and selling products to a customer base that was previously out of reach, thanks to a contextual scenario and a well-crafted front-end experience. On the other hand, while it may seem reasonable for the interface provider platform to handle the financial solution proposal itself within the end-to-end sales journey experience to maximize profit, the alternative cost of doing this through a digital bank or e-money license is considerably high in terms of regulatory requirements and processes. The customer, in turn, benefits greatly from being able to seamlessly meet their basic financial needs on the platform without disrupting their overall experience, making the trade-off highly advantageous for them.

The concept of joint customer ownership and the adoption of a business model based on revenue sharing between parties are undeniably the linchpin of service model banking. This approach, which enhances total value creation and consequently revenue through an integrated value proposition and revenue-sharing model, has facilitated the widespread growth of fintechs, elevated the value of startups over the past decade, and fostered the emergence of embedded finance business models, which are becoming increasingly prevalent. In the realm of future banking, collaborations between banks and platforms in service model banking, coupled with structures resembling invisible banking, and the delivery of personalized value propositions enriched with

platform-sourced data tailored to customer profiles, appear to shape the trajectory of competition between banks, and between banks and fintech companies. Resisting the sharing of customer bases for collaborative efforts and failing to offer a value-added shared proposition may lead to swift deterioration and potential customer loss, particularly among those who seek frictionless experiences across various domains. As per a report from McKinsey[1], a global consultancy company, the service banking volume in Europe and the United Kingdom is anticipated to reach 100 billion Euros by 2030, underscoring the growing significance and potential of this transformative banking model.

It appears that business models based on invisible banking will play a pivotal role in the digitalization of our SMEs, which are currently striving to align with international standards in digitizing traditional business models in our country. These models are anticipated to help SMEs address future challenges such as global competition and compliance with green consensus standards. With the advent of these new-generation banking models, traditional financing methods like receivable discounting and supply financing will undergo rapid digitalization, and continuous financing options embedded in platforms will become more readily available. This transformation is expected to bring forth richer, transparent, measurable, and reportable scoring models, turning them from aspirations into reality. Consequently, SMEs transitioning their business models to digital platforms are likely to gain increased opportunities for accessing affordable, convenient, and ongoing financing.

The landscape of service model banking, with its functioning, parties, rules, and concepts clarified by the *Digital Banking Activities and Service Model Banking Regulation* published by the Banking Regulation and Supervision Agency (BDDK) in December 2021, is yet to find an example in our country. However, considering the significant progress in digital and retail banking in our country from an innovation perspective, especially in online trade and business volume, it is evident that cooperation models aligning with this framework are on the horizon. Even though specific examples are yet to be observed, it can be easily anticipated that collaboration models in line with the service model banking concept will soon make their way into the literature. In this context, I believe that service model banking and platform collaborations implemented by Turkish banks, including İs Bank, with the robust platforms in our country in 2024, will contribute significantly to the digitalization of our SMEs and foster the overall development of our nation.

Resource

1. Banking-as-a-Service— the €100 billion opportunity in Europe

NEXT-GEN DIGITAL BUSINESS PARTNERSHIPS: SUPER-APPS

AYDIN BOZDEMİR

İşbank

Entrepreneurship Division Manager

We are currently in an era where technological trends are evolving rapidly, and keeping pace with these changes has become essential for companies of all sizes. Even startups, known for their agility in adapting to new trends, are being challenged by the need to implement innovative applications with shorter cycles and agile approaches. As the boundaries blur between mobile applications and digital platforms, which have become increasingly ingrained in users' daily lives, brand loyalty is diminishing in significance within this realm. The path to securing platform loyalty from users involves meeting their daily needs with the most innovative applications and superior experiences, as well as offering services with contextual layers and personalized structures. For platforms focusing on specific verticals, the key to meeting users' needs and addressing the challenges of the era lies in the formation of super applications. These super applications, built on the foundation of digital partnerships, introduce new verticals through mini applications, thus expanding their offerings and enhancing user engagement.

Indeed, super-apps are not a novel concept. WeChat, launched by China-based Tencent in 2011, stands as the pioneering example of transforming a messaging platform into a super-app, boasting over 1.5 billion users. With this evolution, WeChat has ascended to become the foremost digital payment platform in China, thanks to the super-app ecosystem it has cultivated. Apart from WeChat, other notable examples of super-app formations include Grab based in Singapore, Go-jek in Indonesia, and Alipay in China.

Originating as a technological trend from Asia, super-apps are progressively expanding from east to west.

A super application can be defined as a comprehensive suite of applications tailored to specific focus areas, seamlessly integrated into users' daily lives and essential needs. At the core of the super application are mini applications, developed through digital partnerships with third parties, that expand its offerings into new verticals. This diversity is crucial for users, who are increasingly spending more time on digital platforms, as it enables them to swiftly address their immediate needs. Furthermore, the data ecosystem generated by the super application and its stakeholders around users' daily needs opens up new and expansive opportunities in artificial intelligence technologies and hyper-personalization trends.

Who benefits from super-apps and how? There are three key dimensions to consider: advantages for the platform owner, benefits for third parties, and gains for users.

The overarching benefit derived from super applications is the enhancement of customer experience. In this regard, super-apps contribute to bolstering platform traffic and fostering user loyalty

through the provision of diversified and enriched services, resulting in a superior customer experience. One significant advantage for platforms and mini application owners, who engage in new collaborations through the digital partnership model, is the ability

to diversify common channels at a lower cost, leading to revenue growth and scalability. The proliferation of digital touchpoints, which boost user traffic for all stakeholders, ensures mutual benefits for the parties involved in the collaboration. Furthermore, the introduction of new technological structures for developing mini applications that do not require complex coding facilitates the rapid and practical creation of new channels, thereby expediting customer interaction.

Super apps, originating as a burgeoning technological trend from Asia, are still in their nascent stages of widespread adoption in

America and Europe. In Türkiye, proof of concept studies primarily involve banks and financial institutions. The shift in customer habits and expectations due to digitalization directly impacts the banking and finance sector. Banks are now adopting a technology company mindset, embracing an open innovation approach that involves implementing innovative ideas in collaboration with startups. By integrating financial products and services with non-financial value propositions, banks aim to introduce new expansions and layers that enhance customer interaction. The super app ecosystem, fostered through digital business partnerships on platforms with high user traffic, presents growth and scaling opportunities based on mutual benefits for stakeholders.

In line with our "Bank of the Future" vision, we aim to transcend the traditional role of a bank and become an integral part of our customers' daily lives by offering innovative products and services that simplify their lives. In 2023, we achieved a significant milestone in the transformation of our mobile banking platform, İşCep, which boasts over 18 million visits from more than 5 million users daily, into a super application. With the goal of creating an ecosystem that addresses users' daily lives and essential needs, particularly focusing on vehicles, home, travel, and family, our umbrella applications, branded as "İşCep'le Hayatım," (My Life with İşCep) swiftly completed their proof of concept. This transformation represents our commitment to providing a comprehensive solution that enhances the overall well-being and convenience of our customers' lives.

Within just 2 months of its launch, My Life with İşCep garnered over 1.1 million interactions from our users. The adoption of our super application model received high approval from our users, with an impressive satisfaction rate of 86%. This positive response not only

indicates strong user engagement but also contributed to a notable increase in both user traffic and the number of transactions, particularly in financial transactions. In our vehicle ecosystem, in addition to banking functions, the "My Vehicle" umbrella application offers a range of non-financial value propositions to our users, including parking, towed vehicles, vehicle valuation, and a vehicle-focused personal assistant. Within a short period, the number of vehicles registered in this application has nearly reached 500 thousand. Furthermore, mini applications developed through digital business partnerships within the scope of third-party collaborations under My Life with İşCep have seen significant traction, with nearly 200 thousand customers using them in a short time frame. As we enhance our customers' mobile platform experience with innovative applications and non-financial value propositions, we also aim to support the growth and scaling of startups through new channels, fostering a conducive environment for their success stories.

In our pursuit of introducing a super application to Türkiye, the impactful contributions of the new technologies developed in collaboration with Softtech are evident, particularly in terms of significantly reducing the software development cycle for mini applications. Our self-service mini application development platform, designed to streamline the technical infrastructure of digital business partnerships, has made it practical to swiftly construct and present non-financial value propositions to users with mobile-compatible frontends.

The continued evolution of the super application ecosystem in the future will facilitate the expansion of processable data assets, which will be centered around users' daily needs, through digital business partnerships. Particularly, banks and financial institutions, known for their secure storage of customer data, and e-commerce platforms with high user traffic will play a leading role in the rapid accumulation of processable data assets in this context. In the near future, we anticipate a period where platforms that not only internalize the super application model but also effectively combine the components of the mini application ecosystem, recognizing the holistic user needs and leveraging processable data efficiently, will emerge as frontrunners. These platforms will gain momentum in terms of scaling and achieve greater success in user retention. At this juncture, trends in super

applications will be influenced by advancements in artificial intelligence technologies and hyper-personalization.

We will persist in our journey to advance İşCep's super application ecosystem, recognized as the "World's Best Mobile Banking Application" by Global Finance in 2023, by forging new-generation digital business partnerships and embracing a perspective centered on mutual benefit. With unwavering excitement, we look forward to the coming years and the continued evolution of our innovative offerings.

Resources

- *https://www.gartner.com/en/articles/what-is-a-superapp*
- *https://a16z.com/what-is-a-super-app/*
- *https://www.userspots.com/liste/en-basarili-super-app-ornekleri*
- *https://techreport.com/statistics/wechat-statistics/*

CLICKLESS SHOPPING

ÖMER BARBAROS YİŞ

LC Waikiki

General Manager of E-Commerce

The e-commerce sector has experienced substantial growth, particularly accelerated by the pandemic, achieving figures anticipated over a five-year span within a mere one-year time frame. This trend persists even after the pandemic. For e-commerce professionals, the challenge lies in sustaining profitable operations amidst growth. Enhancing productivity is imperative at this point, as it is crucial for managing operational costs and attaining excellence in customer experience. Recent advancements in artificial intelligence present significant opportunities for optimizing this efficiency equation.

Artificial intelligence plays a pivotal role throughout the entire e-commerce journey, providing substantial benefits from the initial steps of the shopping experience to its culmination. Let's explore how artificial intelligence is seamlessly integrated into various aspects of e-commerce to enhance the overall customer journey.

The e-commerce journey commences with stock availability, a critical factor that can significantly impact the overall shopping experience. Failure to showcase the right stock at the right time may result in an early end to the customer's journey. To address this, accurate demand forecasting and timely allocation are essential. Artificial intelligence plays a crucial role in enhancing demand forecasting, combining various variables to create highly accurate predictions. By ensuring stock availability at optimal levels, AI prevents missed sales opportunities, contributing to a more consistent and satisfying shopping experience.

The second crucial aspect is ensuring a seamless shopping

experience for your customers. This is indispensable for a positive customer experience. You must facilitate your customers in easily locating what they are searching for among millions of products. When prioritizing product listings, which ones align with your style and expectations? Are products that match your preferences and needs given priority in the listings? In the ranking algorithms applied here, systems that adapt and operate based on your behavior are crucial for personalization. This is where artificial intelligence comes into play. By analyzing your preferences, it prioritizes showcasing the products you most desire to see.

Another aspect that enhances the shopping experience is proactive product recommendations. Artificial intelligence technology enables the successful highlighting of products similar to the ones you are looking for and items that can complement your purchasing decisions, thanks to image processing technology.

By analyzing thousands of customer comments, it can recommend the most suitable size for you and provide a summary of the most important aspects regarding the product. For this specific product, it notes that a common trend among buyers is a preference for the medium size, particularly among those who typically opt for large sizes, and thus, ensures you purchase the correct size as well as contributing to the reduction in return rates.

Virtual assistants, powered by productive artificial intelligence, can assist you in finding what you need by learning from their interactions with you. This is precisely what we achieve with Elsiva on our website. Elsiva serves as a virtual digital stylist, learning from customer interactions to provide the most suitable product recommendations. Growing more knowledgeable each day, Elsiva continually refines its understanding of your style, presenting you with the most fitting suggestions.

After finding the suitable products and placing your order, the next task for artificial intelligence is to ensure operational excellence. It conducts quality control by analyzing packaging quality through image processing technology. Additionally, it minimizes shipping costs by calculating the most efficient route.

All these capabilities represent what we can achieve today. However, artificial intelligence continues to advance and acquire new skills daily. I consistently emphasize: the crucial distinction in

today's technological progress from previous years is the incredible speed of change. Therefore, staying informed about developments every day is essential, enabling us to adapt innovations that will propel our business forward.

So, how will e-commerce evolve in the future with the advancement of artificial intelligence?

I'm among those who believe that the concept of the Metaverse is not a bubble.

Land purchased along the Bosphorus. Frenzied sales of domain names from renowned brands in the Metaverse realms. Competitions to determine the possessor of the most appealing avatar. The world giant Facebook's name change and the introduction of Meta into our lives. Grandiose stores from global powerhouse brands. Metaverse gatherings and educational events with substantial participation. Spectacular concerts. The trendy new offices in the Metaverse world. Emerging professions becoming a part of our lives. Experts and architects specializing in the Metaverse experience. The advent of new Metaverse agencies, architecture firms, and headhunters. Together, we've witnessed the inception of these innovations. However, amidst this new trend, we haven't delved into seeking answers to questions such as "Can we genuinely experience something we couldn't before?", "What issues does it address in our lives?", and "In what ways does it simplify our daily routines?" Additionally, the hardware challenges introduced for an optimal experience in this world pose yet another question mark.

Solutions that offer distinct experiences and simplify our lives invariably resonate with consumers. We've been experiencing examples of these for years, such as Netflix, Spotify, Facebook, Airbnb, Amazon, and many others. The undeniable success they've achieved, both in providing unique experiences and solving specific problems, is evident. Although the Metaverse may seem limited in its capabilities at the moment, I have no doubt that it will evolve further in the near future as technology continues to advance rapidly. With the widespread adoption of high processor speeds and the development of ergonomic hardware solutions, the Metaverse experience is poised to become an integral part of our lives. Even the recent Apple VisionPro launch serves as a compelling example of this. It has swiftly altered how most people engage with the virtual world.

Consider the progression from the first iPhone to the current models. Envision the extensive adoption of devices facilitating entry into the Metaverse when they evolve into user-friendly lenses and become affordable. Perhaps, as we effortlessly experience conveniences and encounters unattainable in real life, the Metaverse world will seamlessly integrate into our lives as a frequently visited place.

No technology seamlessly integrates into our lives when it is initially discussed. We've been discussing artificial intelligence for years, yet its impact wasn't truly felt until the advent of ChatGPT. The rapid progress in the metaverse is beyond belief. The turning point will undoubtedly arrive one day. As an e-commerce professional, I am preparing my organization for that inevitable day. Because I am aware that e-commerce will unquestionably make way for "meta-commerce."

When this unfolds, I believe the e-commerce experience will transition away from platforms like websites and applications, shifting entirely to virtual stores within the Metaverse world. I refer to this as "Clickless Shopping" – a shopping experience entirely directed by our conversations with virtual assistants.

Let's see what awaits us!

AI & BLOCKCHAIN TECHNOLOGIES: THE PERFECT DUO REVOLUTIONISING THE GAMING INDUSTRY

DR. BURCU SAKIZ

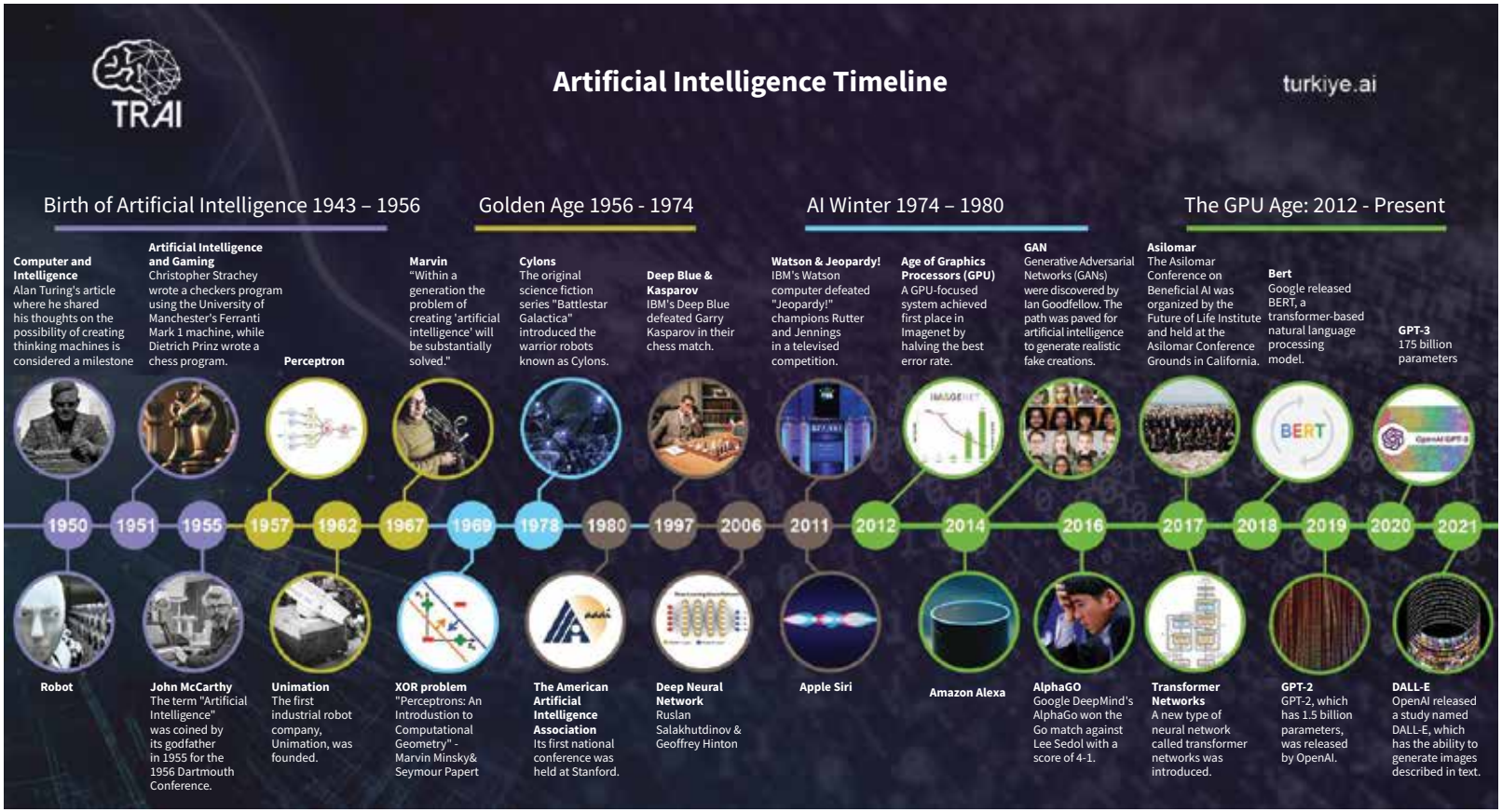
Turkish Airlines Technology
Distinguished Expert

Shortly after ENIAC (Electronic Numerical Integrator and Computer), widely considered the first programmable computer, was developed during World War II for the purpose of calculating trajectories of long-range artillery and missiles with fewer errors, computer scientists began working on relatively simple game systems as early as 1950, parallel to Alan Turing's article on artificial intelligence. While a doctoral candidate at Cambridge University studying human-computer interaction, Alexander Douglas designed one of the first computer games, tic-tac-toe (SOS / OXO). Played on the EDSAC computer at Cambridge, the game allowed the player or the machine to choose who would make the first move. Since those days, the gaming industry has evolved significantly, from arcade halls to home consoles, personal computers, 3D graphics, mobile games, online and multiplayer games, AR/VR (Augmented Reality/Virtual Reality) games, NFTs (Non-Fungible Tokens), and Metaverses, utilizing artificial intelligence and blockchain technologies, witnessing profound transformations.

To explore the impact of artificial intelligence and blockchain technologies on the gaming industry, popular areas rooted in the history of modern computers, this study will first take a journey through history to explain fundamental concepts. Following this, contemporary examples of these concepts in the gaming sector will be provided.

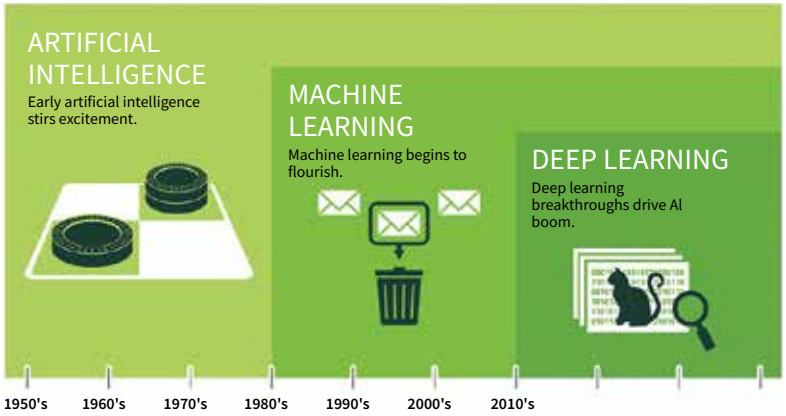
THE DRIVING FORCE OF TECHNOLOGY: TYPES OF ARTIFICIAL INTELLIGENCE AND THE CONCEPT OF MACHINE LEARNING

Artificial intelligence studies, resulting from the imitation of human intelligence, involve machines modeling human learning. Considering that learning processes occur in the brain of humans, it is conceivable to create structures on machines by examining the brain's structure. Artificial neural networks have been created on computers by taking the formation of learning events in humans, which occur through interactions in brain cells called neurons, as a basis and simulating the learning process. Below is a table containing important milestones and developments in artificial intelligence.



Source: Historical development of AI (https://turkiye.ai/wp-content/uploads/2021/01/Timeline_infografik-2021-1.jpg)

Artificial intelligence can be described as a technique that uses machines to mimic human cognitive abilities and functions in order to intelligently perform given tasks. Artificial intelligence algorithms encompass the entirety of cognitive abilities necessary for artificial systems to exhibit behaviors similar to those of intelligent beings. These abilities include the representation and presentation of information, logical reasoning, planning, and learning. Machine learning and deep learning, which are often used in conjunction with the term artificial intelligence today, fall under the umbrella of artificial intelligence.



Since an early flush of optimism in the 1950s, smaller subsets of artificial intelligence - first machine learning, then deep learning, a subset of machine learning - have created ever larger disruptions.

Source: Artificial Intelligence, Machine Learning, Deep Learning (https://developer.nvidia.com/deep-learning)

The data used in artificial intelligence is obtained through measurement, counting, experimentation, observation, or research. Data collected through measurement or counting, and providing a numerical value, are classified as quantitative data, while data that do not provide a numerical value are classified as qualitative data. Like any symbolic representation, data is a set of abstract expressions related to a specific object, individual, or phenomenon. In the early days of computer science, there were programmers who described what should be done to machines, whereas now, thanks to artificial intelligence, data is collected, stored, and processed for some tasks. Learning programs are automatically adjusted to meet the requirements defined by the data, as the data contains examples and patterns indicating what needs to be done within them.

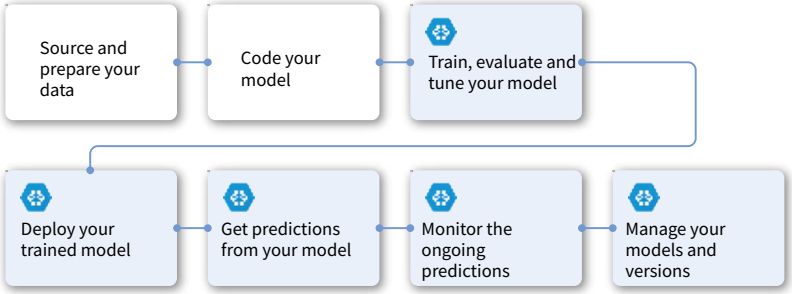
The paradigm shift in artificial intelligence involves replacing computer programmers with "learning programs" and enabling computers to automatically learn algorithms from data for the tasks to be solved. So, instead of "programming," "learning" is required. As described in Prof. Dr. Ethem Alpaydın's book "Introduction to Machine Learning," artificial intelligence is inspired by the workings and learning processes of the human brain. Artificial intelligence research is a product of humanity's efforts to create systems that are as intelligent as or more intelligent than themselves. Artificial intelligence allows computers, machines, or robots to mimic human abilities such as decision-making, object recognition, problem-solving, and language understanding.

"LEARNING FROM DATA" = MACHINE LEARNING AND ALGORITHMS

Machine learning, seen as a subfield of artificial intelligence, involves teaching computers to learn what to do using data

and artificial intelligence algorithms, rather than writing static traditional rule sets and algorithms to solve a problem. Machine learning algorithms use data to create a pattern or model and use it to predict new situations it may encounter in the future. Instead of writing code that explains the action the computer needs to take, it provides an algorithm that adapts to the intended behavior based on sample behaviors. In short, machine learning is a subset of artificial intelligence focused on building application software that can learn from data over time without human intervention to improve accuracy.

The following steps are followed in machine learning algorithms, fundamentally: Gathering all the data needed for learning from data sources (such as Excel sheets, database tables, etc.), preparing it, developing a model, training, testing, evaluation, and parameter tuning; deploying, monitoring, and managing the model.



ML workflow

Source: Machine Learning Workflow (https://cloud.google.com/ai-platform/docs/ml-solutions-overview)

Machine learning is a method that can tell a lot about data and create general algorithms without the need to write code. It includes four types of learning: Supervised Learning, Unsupervised Learning, Reinforcement Learning, and Deep Learning.

Supervised learning algorithms utilize labeled data, meaning the data to be used for training the algorithm is known in advance. With this information, the system learns and interprets new incoming data. You can think of this as having an extremely specialized job and an extremely demanding manager. Your manager constantly watches you, and until you learn to map actions with situations, they tell you exactly what to do in every situation. Working for such a manager might be quite unpleasant, but pleasing this manager is relatively easy. You quickly recognize patterns and mimic their actions as much as possible, thus providing the expected outputs.

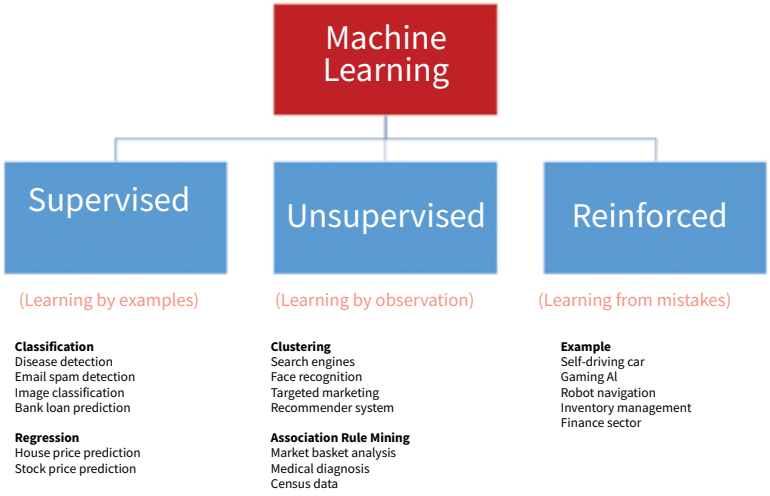
In unsupervised learning, unlabeled data is used, meaning there is training data that cannot be categorized in any way. It works by discovering patterns by connecting previously untrained and unknown data and classifying and clustering data that are close to each other. The example manager type in supervised learning is one who doesn't know what you should do. Your manager may just give you a huge data dump and tell you to do data science with it. You'll be left to analyze, cluster, and infer from this data.

Reinforcement learning algorithms, on the other hand, are used to develop an agent that interacts with an environment and takes

actions. This can include artificial intelligence (AI) development applications for robotics, dialogue systems, and even video games. Reinforcement learning is a machine learning approach where the machine learns what actions to take to achieve a given goal. In reinforcement learning, our learning machine, called an agent, responds to situations it encounters and receives a numerical reward signal in return.

The three common types of machine learning and the example domains they are used in are shown below.

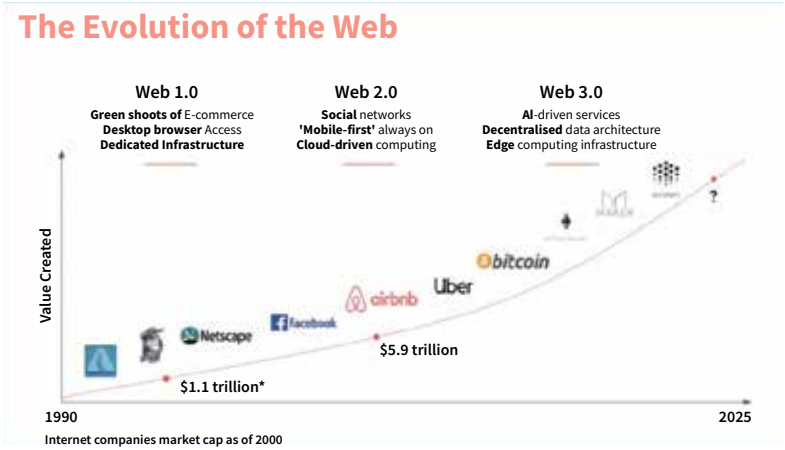
The last type of machine learning, "Deep Learning," uses artificial neural networks. Deep learning is a subset of machine learning (ML) where artificial neural networks (algorithms modeled to work like the human brain) learn from large amounts of data. Deep learning is a type of machine learning that enables computers to solve more complex problems and requires more resources compared to others.



Source: Machine Learning Types and Usage Areas (https://www.techguruspeaks.com/types-of-machine-learning/)

BLOCKCHAIN AND KEY TECHNOLOGIES SHAPING BLOCKCHAIN

In our century, characterized by the prominence of artificial intelligence and blockchain technologies, the concept of Web 3.0 has gained popularity. Witnessing advancements such as cloud computing, artificial intelligence, and blockchain, the Web 3.0 era, since 2010, effectively utilizes and stores data crucial for artificial intelligence and blockchain.

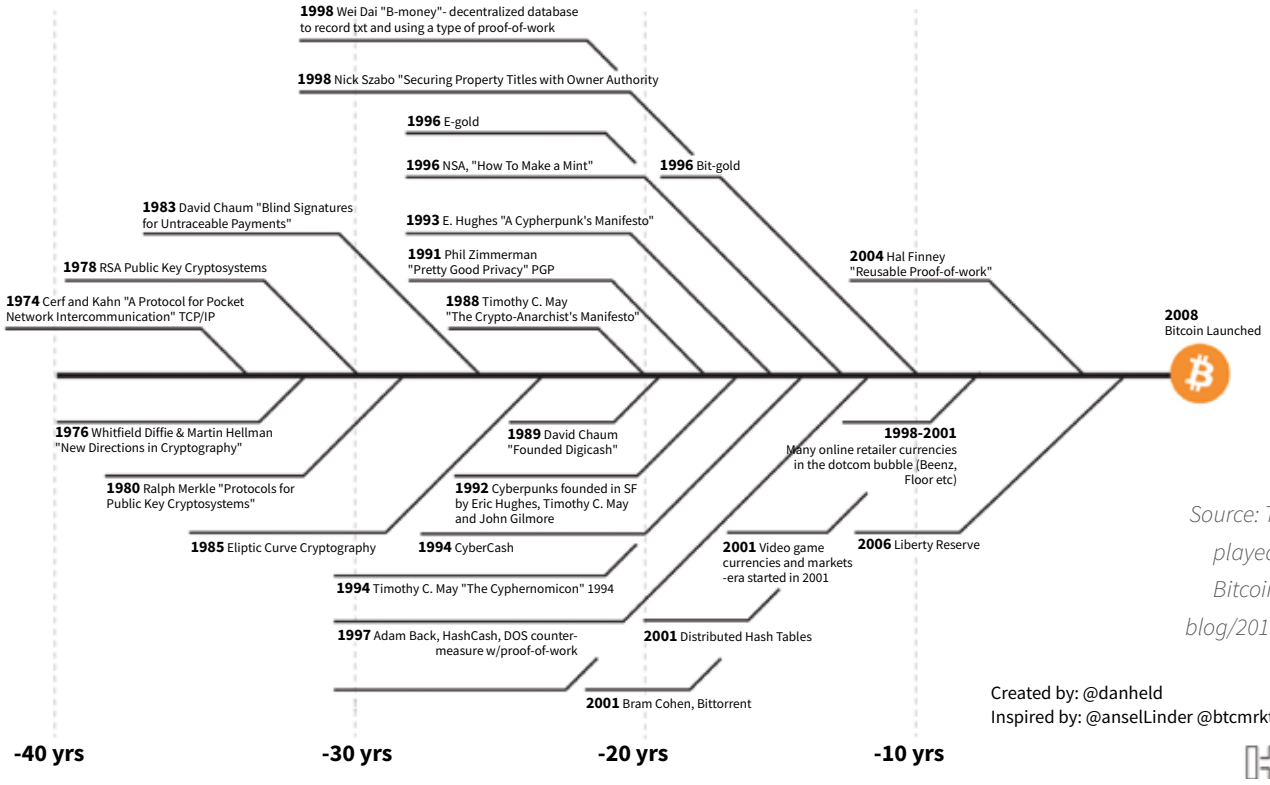


Source: Evolution of the Web (https://baselynk.com/web-3-0-explained/)

The blockchain technology, with its decentralized structure, independence from any central authority, features such as privacy, transparency, security, and an immutable record system (where alteration or deletion is not possible), has found extensive applications. With the development of this technology, financial products and services, particularly in the gaming sector, have undergone a significant transformation.

The blockchain technology, whose widespread initial application was seen with "Bitcoin," has been closely followed with increasing interest since the publication of the technical whitepaper titled "Bitcoin: A Peer-to-Peer Electronic Cash System" by Satoshi Nakamoto (a pseudonym for an individual or group of individuals) in 2008. This whitepaper, comprising a total of 9 pages, laid out the principles of Bitcoin, and it was first used in January 2009.

Bitcoin prehistory - It's the result of 40 years of research, development and demand



Source: Technological milestones that played a role in the development of Bitcoin (https://www.danheld.com/blog/2019/1/6/planting-bitcoinsoil-34)

The blockchain is an innovative technology that operates on a distributed database, accessible to all stakeholders, transparent, and allowing verification by parties. By reducing the need for central authorities and intermediary platforms (such as banks, brokers, internet platforms, etc.), it offers a system that lowers transaction costs while providing a fast, reliable, and efficient system. The technological developments crucial to the development of blockchain technology are outlined below.

Blockchain can be defined as a distributed ledger mechanism managed by multiple computers, referred to as nodes, rather than being controlled by a single individual or organization. It operates by running hashing algorithms to prove the accuracy of transactions, executing consensus protocols for validation, timestamping transactions, and chaining confirmed transactions together using cryptography and hashing algorithms. It maintains an identical copy of the ledger on all nodes, making it nearly impossible to alter or roll back the information contained within.

METAVERSE & NFT

Metaverse, a term derived from the Ancient Greek roots "meta" (beyond) and "universe," is a hypothetical iteration of the internet that supports persistent online three-dimensional virtual environments, not only through traditional personal computers but also via virtual and augmented reality devices. The Metaverse is a perceptual universe where individuals feel themselves entirely mentally, without any physical effort, through augmented virtual reality devices. With Web 3.0, ownership of digital assets is given to individuals, allowing them the freedom to take these digital assets out of the projects where they were created and move them to other projects. The way to achieve this is by utilizing blockchain technology.

Metaverse is a type of universe developed in the virtual world, combining physical reality with digital virtuality, creating a continuous and persistent, multi-user environment. The development of technologies such as virtual reality (VR) and augmented reality (AR), enabling the interaction of digital objects and individuals through multiple senses, has played a crucial role in the emergence of the Metaverse concept. It allows seamless, tangible user interaction in real-time and dynamic interactions with digital works. Contemporary versions of the Metaverse have social, immersive VR platforms that are compatible with multiplayer online video games, open game worlds, and AR collaboration spaces. The Metaverse has created a virtual universe environment that facilitates the coming together of players from around the world.

The concept of NFT (Non-fungible token) is a type of digital certificate that records ownership rights over a product with digital or physical assets through blockchain technology, documenting the "uniqueness" of the relevant product. Blockchain technology aims to address the challenges brought about by digitization in the art world by registering works with NFT in a reliable and transparent system. In this sense, the functioning of NFT with

methods such as digital certification and identity verification is a positive development in preventing art theft globally. On the other hand, presenting works to buyers on a digital platform also provides convenience for accessing art anytime and anywhere. With NFT, it is possible to create various elements such as any type of artwork, photographs, videos, title deeds, DNS (domain name service) records, sound, and other digital file types, digital identities, items used in games, distributed points in games, etc.

USE OF ARTIFICIAL INTELLIGENCE IN THE GAMING INDUSTRY

Gaming industry has witnessed an increasing use of artificial intelligence (AI) over time. The initial use of AI in video games started with text-based games like Hunt the Wumpus and Star Trek in 1972. AI in games has benefits such as determining the behaviors of game characters to enhance realism and difficulty. It can be utilized for purposes like moving characters in the game, deciding where they should move, and imparting tactical or strategic thinking abilities. Especially in recent times, advanced deep learning methods have enabled bot systems in many popular video games to automatically play the game and even defeat expert players.

In games, artificial intelligence models can be utilized to personalize experiences based on players' thoughts and behaviors. It can also be used to enhance user experience. For example, by customizing the in-game content based on a player's preferences, the game becomes more personalized, and the player may be more inclined to play more. Through artificial intelligence, games can offer more realistic interactions, making it easier for users to connect with the game.

As game codebases become more complex for developers, reviewing and fixing errors also become more challenging. Artificial intelligence assists programmers in conducting rapid code tests to identify and eliminate errors and potential disruptions in order to streamline this process.

THE NEW PATH OF DIGITAL GAMES: BLOCKCHAIN AND AI

The gaming industry is a significant and widespread market where artificial intelligence technology is extensively utilized. In this era of rapid digitalization, the inevitable expansion of the usage network of blockchain technology, which provides a reliable record service with its distributed structure, is evident. Blockchain aims to be the intersection and storage center for the transfer of data and economic assets in the process of digitization. Game development companies have begun incorporating new technologies such as blockchain, artificial intelligence, AR-VR technologies to enhance the immersive experience of their games.

When looking at the global gaming industry market, it is a $195 billion market reaching over 3 billion gamers. One of the major challenges for small and medium-sized game development companies in the industry is cash flow. NFTs and cryptocurrencies are among the options that can be utilized for fundraising. Additionally, blockchain and cryptocurrencies can be leveraged,

especially in mobile games, through in-app purchases and subscription models. In games developed on blockchain, community-based decision making for revenue models provides additional benefits for players.

Source: Global Gaming Market Size (https://newzoo.com/wp-content/uploads/2023/08/Key-numbers-landscape-03.png)

On the other hand, game developers, especially in areas such as navigation, object detection, character design, game analysis, and implementing complex game scenarios, continue to leverage artificial intelligence to provide players with the expected experiences. In the upcoming period, it is inevitable to see both blockchain and artificial intelligence algorithms more frequently in game projects.

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LLMS IN HEALTH AND MULTIMODAL AI

YUSUF YEŞİL, M.D.

Yesil Science

Founder - Yesil Science, Yesil Health AI

M.D., Clinical Biochemistry

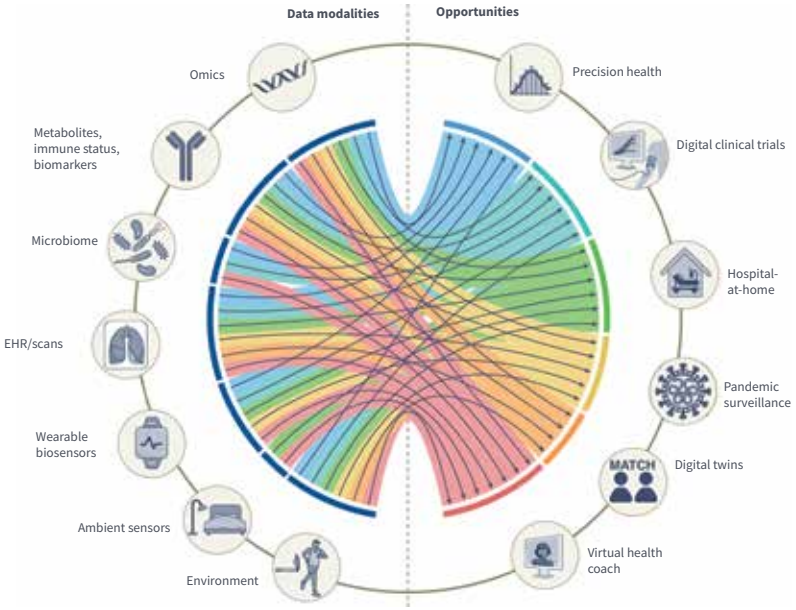
ROLE OF ARTIFICIAL INTELLIGENCE IN HEALTH

As it has been frequently discussed in recent years, artificial intelligence is considered a technology with significant potential in many areas, including diagnosis, treatment, tracking health habits, and improving healthcare services. Especially in recent months, with the rise of LLMs, i.e. large language processing models pioneered by ChatGPT, artificial intelligence algorithms have moved out of the laboratories of engineers, entering our daily lives and moving to a large user base that attracts public attention. LLMs, such as ChatGPT, have reached a huge user base in a very short period of time. These models, which have been trained on the large-scale text databases that are fed to them, are very successful in understanding and interpreting the input given to them with the patterns they have learnt.

Source: Clusmann, J., Kolbinger, F.R., Muti, H.S. et al. The future landscape of large language models in medicine. Commun Med 3, 141 (2023).

In the healthcare sector, artificial intelligence has been on the agenda for some time with **Narrow AI** tools that focus on specific conditions and diseases, are trained with data specific to these problems, and work within strict limits. While these systems typically focus on a single task and produce results by processing data related to that task, their ability to explain the processes behind their analyses is quite limited. For example, image processing artificial intelligence that predicts diseases by examining radiological images, artificial intelligence that makes suggestions for the detection of cancerous cells from pathology images, or artificial intelligence applications that calculate the probability of people having chronic diseases such as diabetes and hypertension.

However, with the emergence of LLMs, the boundaries of artificial intelligence have expanded, approaching Artificial General Intelligence (AGI) in scope, thereby making it possible to analyze more and more medical conditions and data types in an integrated approach. These large-scale models are not confined to text and numerical tables but can also process a wide range of data types such as medical documents, images, audio, and video content on a single platform and provide comprehensive analyses based on this data. These systems are characterized by not only their in-depth learning capabilities but also by their potential to support physicians in many areas of healthcare and to reduce the "burn out" among healthcare personnel and the problem of physician errors, which has recently become a major problem in healthcare.



Source: Acosta, J.N., Falcone, G.J., Rajpurkar, P. et al. Multimodal biomedical AI. Nat Med 28, 1773–1784 (2022). https://doi.org/10.1038/s41591-022-01981-2

TRANSFORMATION OF LLM AND MULTIMODAL AI IN MEDICINE

New Practices and Insights: The fact that the number of ChatGPT users exceeded 100 million in just two months and the superior success of LLMs in medical exams such as the USMLE are considered as signs supporting the general acceptance and use of LLMs both in daily practice and in the field of healthcare. We are aware that many narrow artificial intelligence applications in the healthcare field have already received approval from

regulatory bodies and have been implemented in a limited number of healthcare facilities. However, with the popularization of LLMs among users, basic AI tools and services are now available to everyone. Therefore, patients' search for general health-related information or secondary opinions on their own condition is currently shifting from search engines towards LLMs. According to the research conducted by Dr. Mesko, 65% of healthcare professionals using LLM tools use them for research, 42% for administrative tasks, 25% to inform the patient, and 24% for clinical decision support. This trend can be considered as one of the most important steps in the effective use of artificial intelligence technology by patients and healthcare professionals

From Text to Modality: Multimodal AI is a new paradigm in artificial intelligence where various data types (image, text, speech, numerical data) are combined using multiple intelligence processing algorithms to achieve higher performance. These systems are a fundamental paradigm that enables the collaborative processing of diverse health data, including medical history, laboratory data, radiological images, surgical notes, and medical follow-up data. Healthcare professionals like doctors and nurses use these systems when evaluating a patient. The medicine is naturally a multi-modal discipline, similar to humans, and when analyzing a person's health status, various types of data, including texts, images, laboratory results, electronic health records, genetic information, etc., are assessed together. In the past years, AI systems focused on specific tasks, such as processing CT scans or analyzing high-magnification pathology slides, have demonstrated expert-level performance.[1] However, now LLMs have demonstrated their ability to successfully simulate the complex structure of healthcare and support healthcare services with their capacity to interpret medical information and respond to texts, analytical inferences, as well as understand and communicate with speech.[2]

Furthermore, multimodal-LLMs will be able to address language issues in communication between healthcare providers and patients speaking different languages by providing instant translation. A multimodal-LLM could serve as a hub, bringing together and facilitating access to various unimodal AI, from radiology software and electronic health records (EMR) to software that manages insurance transactions. In healthcare, this could lead to the emergence of companies that address health holistically and develop comprehensive AI solutions, rather than specific AI companies that focus on multi-tasking.

CONCLUSION AND PREVISION

This exciting technological metamorphosis holds the potential to provide patients with better, faster, and more accurate diagnosis and treatment, while enhancing the work dynamics of healthcare professionals. The transition from unimodal AI systems to multimodal AI approaches could radically transform the understanding and application of medical practice. This process promises physicians extraordinary computing and analysis capacities, providing them with 'supercomputer'-like capabilities,

supporting their decision-making processes, thus helping them to carry out their routine processes more easily, while reducing potential medical errors.

Multimodal artificial intelligence tools will be able to analyse patient data in a much broader spectrum and depth, and thus be one of the most applicable tools towards a personalised and holistic healthcare approach.

Finally, AI-enabled multimodal analysis capability will play a pivotal role in improving the efficiency and accessibility of healthcare services, as well as the overall health and well-being of individuals. The diversity and complexity of the information obtained will also help to personalise treatment methodologies and help healthcare systems to become more proactive. This ultimate goal will be achieved through multidisciplinary collaboration, continuous innovation and a commitment to ethical values, and will help to overcome many of the efficiency and resource management challenges of today's medicine.

Resources

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SHORT-TERM TACTICAL AREAS AND EMERGING TRENDS IN E-COMMERCE

SERKAN UĞRAŞ KAYGALAK

Pazarama

General Manager

In the era of rapid digitalization, the e-commerce sector undergoes continuous evolution driven by technological innovations and shifting consumer behavior. This article aims to outline both short and long-term strategic directions for businesses in the sector by examining the key trends shaping the future of e-commerce from a comprehensive standpoint. The first part of the article will delve into essential tactical focal points, followed by an exploration of trends deemed to have long-term significance.

SEO and Content Management: A key avenue for achieving success in e-commerce is securing high rankings on search engines and prominent placements on the first or middle pages. SEO serves this purpose, while content management plays a critical role in optimizing user experience and on-site navigation.

Attaining high positions in organic search results directly impacts site traffic and conversion rates. In terms of costs, fortifying ad-free content through investments in this area provides a crucial strategic advantage to swiftly guide browsing customers to their desired products and facilitate decision-making with rich content. At Pazarama, we prioritize the development of this area, recognizing its significance and the effort it demands given its impact on the entire product range. It is a realm that necessitates quick initiation in the short term and ongoing commitment to maturity and maintenance in the long term.

Customer Experience and Satisfaction: In e-commerce, as in any business, a critical focus area is customer experience. Emphasizing that this aspect significantly impacts brand loyalty and repeat purchase rates is essential. While personalized shopping experiences, swift and reliable payment options are crucial for e-commerce sites, effective customer service and operational processes after sales represent key elements determining success. Marketplaces and sites in the sector prioritize customer service both before and after shopping, investing extensively in these areas. However, it's important to note that as scale increases and cost pressures rise, there is a tendency toward more mechanized operations. Systems may emerge where customers are often left to navigate processes independently, necessitating self-resolution of issues. Hence, it's foreseeable that businesses in e-commerce will create a strategic advantage and foster customer loyalty by prioritizing human interaction, particularly in after-sales services and addressing customer complaints on both the seller and buyer sides.

In terms of customer experience, the number of channels and device diversity plays a crucial role in determining areas of focus. Analyzing the device distribution of Pazarama's traffic, it is observed that 94% comes from mobile devices, with a slight presence of 0.37% from tablets. Desktop traffic constitutes 5.9% of the total. This data underscores the rationale behind directing investments toward mobile platforms. Evaluation of this focus in terms of experience and satisfaction involves examining both complaint reports received by the operations center and the app market scores of mobile applications. Notably, improvements in this direction have yielded positive outcomes, exemplified by Pazarama's application, published in November 2022, achieving over 2 million downloads in a short time with an impressive evaluation score of 4.7.

Integration with the Financial System/Creation of Own Financial Alternatives: I would like to state that this topic should be addressed as an issue particularly applicable to Türkiye. Given the high credit sensitivity and loyalty practices in card systems shaping the country's growth model, direct integration with banks holds great importance. The financing opportunities facilitated through this integration play a decisive role in customers' purchasing decisions. Additionally, the availability of sellers' own installment options, both in the 3P (third-party) and 1P (first-party) models, proves advantageous for e-commerce intermediaries, especially considering restrictions on card payment installment options, limited access to term financing, and banking system regulations. This feature is expected to be a valuable asset for e-commerce platforms in the foreseeable future.

"Headless E-Commerce" Approach: When viewed from a technical standpoint, this approach becomes imperative for providing more flexible and customizable user experiences. It involves coding the front-end and back-end systems independently of each other, offering businesses the opportunity to deliver fast and innovative solutions in a world where mobile and multi-platform usage is on the rise. In essence, the front-end applications and back-end applications operate independently, communicating through the StoreFront API. This architecture presents a positive departure from monolith structures, reducing the necessity for simultaneous changes in development and updates. Concurrently, we have initiated the utilization of a microservices structure, involving the creation of all functions through small applications, marking a step towards further flexibility.

Microservices Architecture: The escalating expectations and demands of customers, coupled with the imperative to swiftly adapt to dynamic market conditions, underscore the growing need for e-commerce platforms to adopt a more modular and flexible structure. Microservices architecture proves instrumental in breaking down large and intricate systems into manageable, scalable, and easily updatable components. In essence, microservices entail the subdivision of the entire system architecture into independently dividable and updatable parts, consisting of modular applications designed with a single responsibility, executing only the functions inherent to that task. At Pazarama, as our software infrastructure expands, and

the spectrum of emerging needs becomes more apparent, we anticipate a substantial increase in the number of applications utilizing microservices architecture. Although we have remained committed to microservices architecture from the outset, it is noteworthy that the roughly 30 services established in the past have undergone re-division and evolved into around 110 microservices. Thus, our paramount objective is to divide the software into the smallest possible parts, constituting an area where we will dedicate considerable efforts in the forthcoming period.

Data Analytics and Artificial Intelligence: Data analytics and artificial intelligence (AI) play pivotal roles in comprehending customer behavior and devising personalized marketing strategies. At the present stage, these technologies are streamlining various processes and uncovering previously imperceptible connections. Today, at Pazarama, I want to highlight that we leverage artificial intelligence applications with high accuracy to prevent the inclusion of objectionable products in our catalog and rectify inaccuracies in category classification. Furthermore, we observe the effectiveness of artificial intelligence in optimizing marketing and sales strategies, leading to increased customer satisfaction. Consequently, the key to conducting business for sustainable growth and operational efficiency while prioritizing customer experience in the realm of e-commerce lies in data analytics and the application of artificial intelligence. Although traditional statistical methods and analyses can yield results for specific issues, the demand for new-generation analytical models capable of long-term use on extensive datasets with self-training and low-maintenance efforts is greater than ever.

Sustainability and Social Responsibility: With increasing consumer interest in environmental and social responsibility, e-commerce companies are expected to play more active roles in these areas. Embracing sustainable production methods and ethical business practices will not only enhance brand image and customer loyalty but also contribute significantly to social and environmental well-being. However, the prominence of this issue tends to fluctuate over time, occasionally taking a back seat amid changing economic conditions. Thus, it's foreseeable that sustainability will intermittently enter and exit the agenda of not only e-commerce but all companies in the medium and long term, influenced by the topic's popularity until it becomes a

universal policy across nations and an integral part of economic policies. Consequently, the true integration and commitment to sustainability can establish a genuine foundation for brand image and customer loyalty, surpassing mere compliance or temporary popularity in the long run.

Resource

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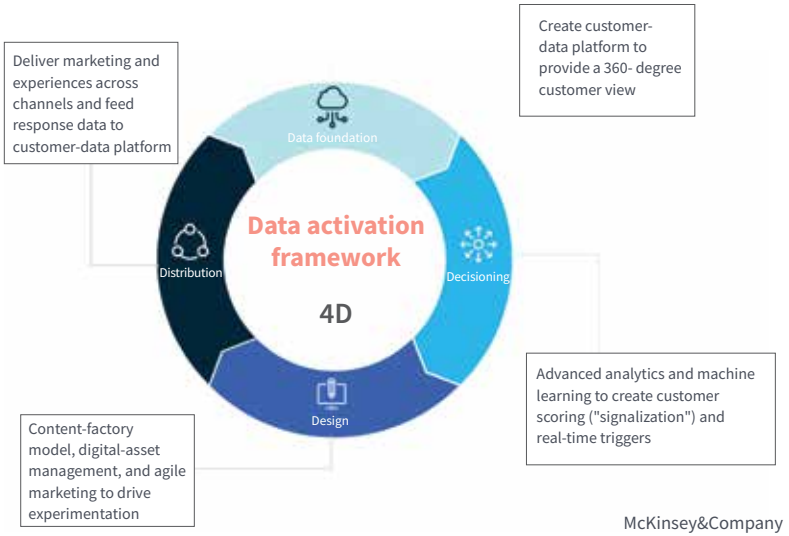
A NEW PARADIGM IN MARKETING STRATEGY: PERSONALIZATION AND TECHNOLOGY ALLIANCE

CEREN SEVER

Softtech

Marketing Manager

The concept of personalization and a personalized experience is familiar to many of us. But what exactly do we mean by "personalization?" Simply put, personalization is the process of tailoring a product or service to meet the specific needs of an individual customer. In this regard, it serves as a powerful tool for businesses, contributing to increased customer satisfaction, brand loyalty, and revenue growth. To delve a bit more into the technical aspects, we can refer to McKinsey's "4D approach to Personalization": Data, Decisioning, Design, Distribution. Each of these Ds represents a crucial aspect, and correctly handling the technology within them is key to achieving effective personalization.



In today's digital era, the importance of personalization has reached unprecedented levels due to the ascent of big data, artificial intelligence, and machine learning. Personalization

emerges as a driving force in the business realm, particularly in managing data-driven decisions and adapting to ever-evolving customer expectations. The concept of "Product and Experience Personalization," swiftly evolving in the realms of technology and marketing, is poised to completely transform how businesses engage with their customers. Businesses aspire to forge deeper connections with their customers by providing tailor-made products and unique experiences. Understanding the nuances of the personalization concept is deemed crucial for technology and marketing professionals to not only keep pace with but also surpass ongoing trends.

WHY IS PERSONALIZATION SO IMPORTANT?

In the era of technology, both B2B and B2C customers expect experiences that go beyond traditional segmentation strategies, catering to their individual needs and preferences. Understanding and personalizing the customer journey in light of this paradigm shift effectively contribute to enhancing conversion rates, customer loyalty, and overall customer satisfaction. Therefore, it is not misleading to consider that businesses unable to adapt to this change will jeopardize their competitive edge.

According to a study by Gartner, 80% of customers show a greater inclination to engage with a company that provides personalized experiences. Additionally, personalization can contribute to enhancing customer loyalty for businesses. A study conducted by Accenture revealed that a higher probability of purchase exists when customers are associated with a company that recognizes their names, provides product recommendations based on past purchases, or is familiar with their buying history.

IN WHICH DOMAINS CAN EFFORTS BE DIRECTED TOWARDS CREATING PERSONALIZED EXPERIENCES?

Product Personalization provides customers with the opportunity to customize a standard product according to their needs, fostering a connection between the customer and the product or service. For instance, Nike allows customers to design their own shoes using the Nike By You platform. In the realm of content personalization, Netflix employs machine learning algorithms to suggest movies and TV shows based on a customer's viewing history. In the B2B sector, personalization can be accomplished by customizing software solutions based on company needs and offering specialized consultancy services.

Experience Personalization focuses on tailoring every touchpoint of the customer journey to individual preferences. In doing so, businesses strive to create a seamless and compelling experience across processes such as website interfaces, marketing communication, and post-purchase support, utilizing data and technology. Advanced algorithms and tools supported by artificial intelligence analyze customer data, employing technologies like natural language processing, machine learning, and prediction to generate content that captures the buyer's interest.

For instance, Amazon utilizes machine learning algorithms to personalize each customer's shopping experience by providing product recommendations based on their purchasing history and browsing behavior.

Let's take an example from Tesla. Tesla addresses personalization under several different categories:

1. Personalized Driver Profiles: This feature sets Tesla apart from its competitors. Drivers can automatically customize various settings, such as wheel and mirror positions, with the push of a button. Tesla's driver profiles go beyond typical vehicle customization, allowing adjustments to suspension, braking, lights, radio presets, and even driving style for each user. Users can easily switch between profiles on Tesla's touch screen, turning the vehicle into an extension of the driver.

2. Data-Driven Design: Tesla leads the industry by integrating extensive data from its test fleet of fully autonomous vehicles. Each vehicle collects movements from a range of sensors, creating a comprehensive picture of the driving experience. This data not only helps build a powerful navigation system and enhance Tesla's autonomous driving technology but also provides valuable insights about customers. For example, the needs of a busy business person with a long commute will differ from those of a mother transporting her children around town.

3. Dynamic Personalization: Tesla aims to establish a flexible system that can be updated as data systems evolve. While this feature has not been officially launched yet, the flexible dashboard and internal software can be considered the next wave of innovative customization. Dynamic personalization goes beyond existing driver profile customizations by detecting who is in the vehicle and automatically adjusting the necessary settings for a personalized experience.

Tesla CEO Elon Musk comments on dynamic personalization as follows: "You will probably want dynamic personalization; so

the moment you step in, your car knows who you are, it knows everything you want, and the car automatically reconfigures itself according to all your wishes."

How do you envision the future implementation of dynamic personalization in various products? It's intriguing to consider.

WHAT IS THE HALLMARK OF THIS PERSONALIZATION?

Increased Customer Satisfaction: Personalization stands as a crucial element in fostering customer satisfaction. When customers perceive a product or service tailored specifically for them, it significantly contributes to their contentment with the purchasing process, fostering loyalty and encouraging repeat business.

Increased Brand Loyalty: Personalized experiences play a pivotal role in strengthening the emotional bond between customers and brands. This emotional connection not only sets your products or services apart from competitors but also cultivates customer satisfaction through unique and tailored experiences. Consequently, this facilitates the development of brand ambassadors who speak highly of your offerings. In B2B settings, personalized experiences contribute to sustained long-term collaborations and projects, fostering enduring and profitable relationships.

Increased Revenue: The provision of personalized products and experiences holds substantial potential for positively influencing the financial performance of a business. Tailoring offerings based on individual preferences empowers businesses to make targeted recommendations, devise appropriate pricing, and craft marketing messages. This, in turn, has the potential to boost sales and overall revenue.

THE ROLE OF TECHNOLOGY IN PERSONALIZATION

In implementing their personalization strategies, companies are increasingly turning to a spectrum of technology solutions and leveraging informed insights driven by data-driven decisions and analytics. When discussing personalization, it is essential to highlight the significant role played by prominent technologies.

Big Data and Data Analytics

The foundation of personalization lies in the collection and analysis of extensive data. Through comprehending customer behavior,

preferences, and previous interactions, businesses can make well-informed decisions regarding product recommendations, content personalization, and other aspects.

Artificial Intelligence

Artificial intelligence algorithms play a crucial role in processing and interpreting existing data. These technologies are instrumental in enabling real-time personalization, offering the capability to generate instant product recommendations, craft adaptive marketing communications, and respond dynamically to changing scenarios.

Machine Learning

Through the analysis of customer data, machine learning algorithms can discern behavioral patterns and trends, harnessing them to deliver personalized experiences. Machine learning facilitates the development of recommendation engines, predictive analysis, chatbots, dynamic pricing, and content personalization, leveraging insights derived from customer data.

Customer Relationship Management (CRM) Systems

Customer Relationship Management (CRM) systems serve as a centralized hub for customer data, simplifying the tracking and management of customer interactions. Establishing a comprehensive 360-degree view of the customer is imperative for businesses seeking effective personalization.

Marketing Automation

Marketing automation tools facilitate the creation and dissemination of personalized marketing campaigns, electronic messages, and dynamic web content triggered by customer behavior and preferences.

Let's give a few examples to understand how important the place of technology is in the personalization experience;

H&M employs a chatbot to provide personalized fashion advice to customers.

Uber utilizes algorithms to adjust prices dynamically based on demand.

Spotify employs machine learning algorithms to curate personalized playlists tailored to customers' listening history.

Salesforce offers customer relationship management (CRM) and

marketing automation tools, empowering businesses to craft personalized customer experiences.

Of course, we can multiply these examples. At this point, let's take you from the passive reader role to an active point: What kinds of personal products and experiences can you create with which technologies for your own industry?

WHAT WOULD CONSTITUTE AN EFFECTIVE AND ETHICAL PERSONALIZATION STRATEGY?

Personalization brings numerous advantages to companies, often relying heavily on technology. Let's explore the challenges associated with product and experience personalization and discuss how ethical processes should be effectively managed.

Data Security and Privacy

Personalization requires the collection and analysis of substantial amounts of customer data. Establishing trust is crucial, as customers should feel assured that their personal information is handled responsibly. Businesses need to be transparent about the purposes for which the data will be used and stored. Compliance with data protection regulations, such as KVKK, becomes particularly important at this point.

Data Quality

Effective personalization hinges on high-quality data. The core of personalization lies in data collection, wherein businesses leverage various technologies like IoT sensors, CRM systems, and social media analytics to gather information on customer behavior and preferences. Marketing professionals then utilize this data to gain insights into customers and formulate relevant strategies. However, if the data is inaccurate or incomplete, the resulting personalized experiences may be subpar. To uphold data quality, businesses should consistently invest in data quality management tools and processes.

Auditing Technology Implementation

Artificial intelligence and machine learning algorithms may exhibit bias (AI-bias) if trained with biased data. To prevent bias in machine learning algorithms, businesses should prioritize diverse and representative training data and incorporate human review into the algorithmic decision-making process. It is essential for businesses to take responsibility by actively monitoring algorithms to avoid making decisions that could be harmful or unethical.

Customer Segmentation

In the conventional approach, businesses typically segment their customer base into smaller groups based on shared characteristics. Marketing professionals then define target audiences based on these segments, seeking to understand essential or significant aspects for each group. Advanced personalization, on the other hand, strives to establish a "segment of a person" where each customer's experience is unique. This is achieved through advanced artificial intelligence-based personalization engines, moving beyond traditional customer segments.

A/B Tests and Optimization

Personalization is an ongoing process that demands continuous improvement. A/B tests prove valuable for businesses aiming to experiment with diverse personalization strategies. These tests enable businesses to refine their approach by incorporating customer feedback and assessing performance metrics.

Implementation Costs: The execution of a personalization strategy can incur significant expenses. Businesses should meticulously assess cost-benefit ratios and allocate resources for the necessary technology and technology consultants to effectively gather and interpret customer data.

WHAT DOES THE FUTURE OF PERSONALIZATION HOLD?

New approaches to personalization continue to evolve in tandem with technological advancements. Apple, a company known for its substantial investment in personalization for mobile phones, has garnered user loyalty through the strength of its ecosystem. Stemming from the efforts of engineers who departed from Apple, a novel product has emerged: Humane AI Pin. Promising innovation across various domains, Humane AI Pin offers specialized recommendations based on users' personal information, elevating the mobile phone usage experience to an entirely new level. While the product is yet to be experienced in Türkiye, where it has already been pre-ordered, it is slated for availability in 2024.

Such advancements in personalization have the potential to be groundbreaking and may wield the power to revolutionize conventional technologies through the promised personalized experiences. Whether Humane can replace mobile phones remains to be seen, and we will track its progress over time. First, let's delve into what the future of personalization may entail.

Hyper-Personalization

Currently, discussions are centered around the future of personalization, emphasizing the shift towards hyper-personalization, wherein each customer's experience becomes truly unique. Anticipated developments include real-time data analysis and the integration of more sophisticated artificial intelligence algorithms.

Augmented Reality (AR) and Virtual Reality (VR)

The potential of AR (Augmented Reality) and VR (Virtual Reality) in personalization is considerable. Envision a world where customers can virtually try on products or experience services before making a purchase. The swift evolution of AR and VR is expected to unlock novel possibilities for personalized experiences, and it appears that the wait for this technology won't be lengthy.

Ethical Personalization

With the escalating concerns over data privacy and security, ethical personalization is projected to take center stage. This shift involves affording customers greater control over their data and ensuring that personalization endeavors are transparent and in harmony with customer interests.

CONCLUSION

Personalization stands as a potent tool for businesses to enhance customer satisfaction, loyalty, and revenue. Those who adopt this new paradigm and proactively implement personalized strategies can craft experiences that resonate with customers. Tailoring products, content, and experiences to individual customer needs, from custom-designed products to unique customer interactions, positions personalization not as a luxury but as a necessity in the competitive marketplace.

Nevertheless, personalization introduces certain challenges, including concerns about data privacy, data quality, and implementation costs. As businesses navigate the possibilities of personalization, finding a balance between customization and data privacy becomes paramount. Leveraging the capabilities of technologies such as data analytics, artificial intelligence, machine learning, and embracing emerging technologies like AR and VR are essential for adapting to this landscape. Those businesses that effectively address these challenges and provide high-quality personalized experiences are poised for success in today's competitive market.

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A FRESH CHAPTER UNFOLDS FOR THE TURKISH ENTREPRENEURIAL LANDSCAPE

SERKAN ÜNSAL

startups.watch
Founder

RECESSION

During the pandemic, Türkiye's startup ecosystem reached its pinnacle in terms of investment, fueled by the rapid pace of digitalization, giving rise to globally recognized champions. However, as the pandemic concluded, startups faced increased challenges in accessing financing. Global money shortages, triggered by regional conflicts, and rising interest rates worldwide exacerbated the difficulty. Consequently, Türkiye's startup ecosystem was notably impacted, plummeting well below the investment peak achieved during the pandemic.

NEW FINANCIAL RESOURCES AND INVESTMENT APPETITE

Recent developments on the investor side, legislative initiatives aimed at expanding the ecosystem, and significant strides in

specific verticals suggest that Türkiye is poised for new heights in the coming years. By excluding the pandemic period from the last five years and comparing 2023 with 2019 or 2018, it becomes evident that the ecosystem has reached a new level in terms of the diversity and abundance of investments. However, evaluating the state of the ecosystem solely based on the quantity and amount of investments would be misleading. Before the pandemic, no venture capital fund had a unicorn or decacorn in its portfolio. In contrast, as of now, four domestic funds boast unicorns and decacorns in their portfolios. These funds, established between 2012 and 2017 and currently launching their second and third funds, have learned from past experiences, gaining valuable expertise in the process. Similarly, the vision of entrepreneurs in Türkiye has broadened, and the number of startups taking immediate steps to become global from day one has surged significantly compared to five years ago.

In terms of financial resources, Türkiye has made significant strides compared to five years ago. A regulatory change in 2020 led to the establishment of nearly 300 Venture Capital Investment Funds (GSYFs), serving as a robust source of financing for initiatives. Another legislation opened the door to share-based crowdfunding, resulting in the creation of 21 platforms. To date, funding has been successfully secured for 108 technology companies across nine active platforms. Notably, considering that the 44 startups securing funds on these platforms in the first nine months of 2023 received an average investment of $363,000, share-based crowdfunding has emerged as a viable alternative for startups at the seed stage. The GDPR regulation and success stories within the ecosystem have heightened institutional interest in becoming investors in recent years. Türkiye currently boasts 80 active GDPR Funds (GDPFs), with 53 of them established in 2020 and beyond. The significant participation of Corporate Venture Capitals (CVCs) in 37% of investments during the first nine months of 2023 serves as substantial evidence of their heightened activity and robust investment appetite.

RISING APPETITE FOR GLOBAL EXPANSION

In the Turkish startup ecosystem, the two standout verticals are unquestionably gaming and fintech. The gaming industry has

firmly established itself, consistently generating global champions. Meanwhile, fintech presents a slightly different scenario. The fintech ecosystem, by its inherent nature, is subject to varying regulations in each country, and fintech solutions cannot be universally applied worldwide, unlike gaming startups which often have a more global reach. Fintechs typically advance on a country-by-country basis. This characteristic has led to Türkiye

being characterized as an ecosystem capable of producing local champions for fintech ventures. However, there has been a notable shift in recent times, with many Turkish fintechs breaking through these limitations. A significant trend is the acquisition of fintech startups from other countries by Turkish fintech companies in the past year. Entering a new market through acquisitions can be one of the fastest methods. Consequently, it wouldn't be a misguided prediction to anticipate the emergence of Turkish fintech startups operating in multiple countries and attaining unicorn status in the near future.

CHALLENGES AND ISSUES IN THE ECOSYSTEM

While the Turkish startup ecosystem has elevated its status since the pre-pandemic era, it still grapples with unresolved challenges. The issues can be outlined as follows:

- Complex tax system
- A significant portion of entrepreneurs still lacks clarity regarding globalization
- Startups aspiring to go global face difficulties expanding to other countries due to visa-related challenges
- Entrepreneurs encounter challenges in planning and managing cash flow as the fluctuation of exchange rates complicates financial stability
- nternational investors may face challenges in comprehending certain aspects due to sudden regulations, such as the earthquake tax on emission premiums and regulations related to platforms like Airbnb.
- Talented employees often seek opportunities abroad

All these hurdles are manageable. The tax system can be reformed by governmental intervention. While entrepreneurs bear the

responsibility of internalizing and executing globalization strategies, the present landscape differs significantly. Türkiye boasts individuals with experience in unicorn or decacorn startups, and those launching their own startups gain insights into achieving unicorn status and managing global operations swiftly. A potential remedy for international mobility challenges could be Türkiye's EU accession, enabling numerous Turkish entrepreneurs to establish businesses with clientele across Europe. Addressing abrupt regulations involves proactive collaboration between the government and the startup community to create a more stable and predictable regulatory environment. Preventing the emigration of talented employees may be challenging, but introducing talent visas can serve as a viable solution. Simplifying the recruitment process, such as attracting Ukraine's top software engineers with minimal procedures, would ease matters for many startups and fortify their global competitiveness.

In summary, the Turkish startup ecosystem made significant progress during the pandemic, taking two steps forward. While it may appear to have taken one step back currently, there are numerous positive developments. With the resolution of deficiencies and problems within the ecosystem, the potential exists to set new records in the next three to four years.

ENTREPRENEURIAL TRENDS IN ASIA FOR 2024

TUFAN AYGÜNEŞ

Softtech Asia

Head of Corporate Innovation Services

OVERVIEW

Asia, a diverse continent with varying stages of development among its countries, exhibits distinct economic scenarios. Japan grapples with economic challenges linked to an aging population, while China has undergone substantial growth, transitioning into high-value manufacturing and advanced technology over the past two decades. Meanwhile, Southeast Asian countries, including India, are poised for substantial growth, leveraging their abundant talent pool, sizable population, and receptive developmental frameworks. Despite distinct regional priorities, commonalities and trends weave through the diverse landscape of the Asian continent.

CHINA

In January 2023, China made a significant move to revive its economy by reopening its borders after three years of pandemic-induced isolation. This decision gains particular significance in the aftermath of the 2022 growth data, reflecting one of the lowest growth levels in the past decade.

Confronting international sanctions impacting the supply of chips crucial for artificial intelligence and related technologies, China is prioritizing the development of its semiconductor industry in the upcoming years. This strategic initiative is backed by substantial government funding, prompting Chinese technology companies to amass sizable reserves of chips and chip-making equipment well beyond immediate requirements.

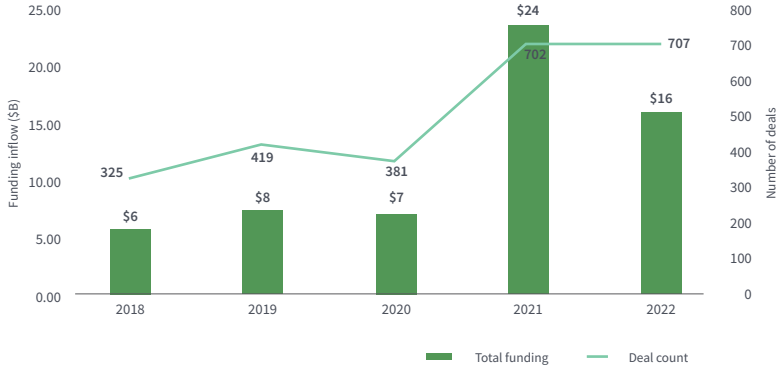
This accumulation serves as a precautionary measure against potential future restrictions.

The launch of ChatGPT by OpenAI has also led to a competitive response from Chinese companies trying to keep up with this important development. As of October 2023, China reportedly has 238 major language processing models (LLMs). This number has tripled in the last four months alone, signaling how intense efforts are being made to keep up with developments in the west. However, the CEO of Baidu, one of China's leading artificial intelligence companies, criticizes the rapid proliferation of LLMs and draws attention to the lack of successful and widely recognized artificial intelligence applications in the country. This criticism points to a need in policy to support AI-focused applications and use cases, rather than promoting large language processing models. Such a strategic alignment could support China in creating a thriving AI ecosystem and spurring a new wave of economic growth.

SOUTHEASTERN ASIA

Digital solutions for diverse sectors including trade, financial services, and healthcare are on the rise in six Southeast Asian countries - Indonesia, Vietnam, Singapore, Thailand, Malaysia, and the Philippines- home to approximately 700 million people. Notably, despite the recent unfavorable macroeconomic conditions, venture capital investment activity in the region significantly surpasses pre-pandemic levels.

VC deal activity in SEA



Evolving from a global fintech hub, Singapore is now positioning itself as a leader in green technology. With a commitment to achieving net-zero carbon emissions by 2050, Singapore has become a focal point for substantial investor interest in climate technology startups.

In Indonesia, the largest economy in the region and a significant producer and exporter of agricultural and seafood products, there

is a notable surge in interest from funds in "agritech" (agricultural technologies) initiatives. These agritech startups concentrate on enhancing farmer productivity, facilitating access to finance, and fortifying supply chains. Indonesia comprised almost 70% of all agritech investments in Southeast Asia last year. Additionally, there is a growing investor interest in logistics startups within the region.

In the entrepreneurial ecosystems of Malaysia, Thailand, and the Philippines, key focus areas include fintech, agricultural technologies, digitalization tools for SMEs, and logistics solutions. These nations are actively transitioning toward knowledge-based economies, aiming to reduce dependence on natural resources.

INDIA

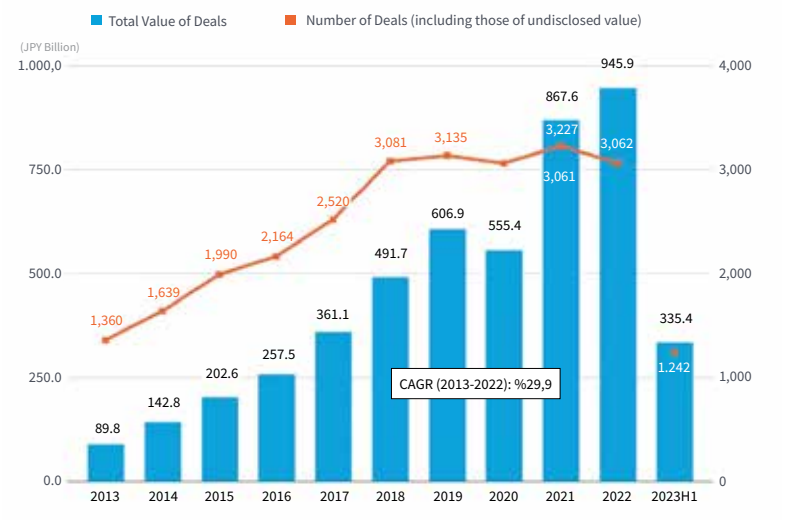
The Indian economy has experienced a noteworthy transformation in recent years, marked by the rapid expansion of various sectors. The country's growing population, expanding middle class, and increased consumer spending capacity have positioned India as a dynamic market across a wide spectrum of industries.

Indian startups are playing a pioneering role in the electric vehicle (EV) ecosystem, excelling in areas such as advanced battery technology, electric vehicle components, autonomous driving technology, and the development of EV charging infrastructure. Beyond the EV sector, India's startup ecosystem spans various domains including financial technology, education technology, e-commerce, social networking, food technology, logistics, direct-to-consumer (D2C) brands, Software as a Service (SaaS), and health technology. This diverse landscape underscores India's significance as a hub for technological innovation and sectoral growth.

JAPAN

Japan's startup ecosystem has undergone a substantial transformation, experiencing a remarkable 10-fold increase in investments since 2013. This significant growth, reaching its peak in 2022, not only surpasses the progress seen in South Korea but also rapidly approaches the level observed in Germany. These developments indicate that Japan is closing in on other leading economies in the entrepreneurial landscape.

Startup Investment Amount



Note 1: Figures for each year correspond to data observed as of the stated date of calculation by INITIAL. Figures for 2023 are for the H1 only.

Note 2: Given the nature of the data, figures (including past figures) are subject to change following further surveys. The smaller the value of the deal, the more likely it is to be affected, and the figure for the number of startups which received funding is particularly likely to change.

Source: INITIAL (as of July 14, 2023)

Venture capital investors in Japan are increasingly raising larger funds, signaling a commitment to allocate more resources to startups in the near future. Japanese companies are placing greater emphasis than ever on collaboration with startups, with many large firms establishing Corporate Venture Capitals (CVCs), launching direct investment initiatives, and forming teams dedicated to promoting "open innovation." This environment encourages closer business partnerships, mergers, and acquisitions (M&A). To further accelerate this growth, the Japanese government has announced a "Five-Year Plan" aimed at increasing entrepreneurial activity. This ambitious plan aims for a 10-fold increase in venture investments and the creation of 100 Unicorns by 2028. The plan's key strategies encompass providing venture capital, revitalizing the Small Business Innovation Research (SBIR) program, enhancing global enterprise ecosystem connections, offering tax incentives for mergers and acquisitions, and reviewing stock option regulations. Together, these measures signal a commitment to fostering a sustainable growth trend in venture investments.

Moreover, Japan is introducing advanced technologies and business models, particularly in sectors where it holds a competitive advantage, including robotic automation, healthcare, and entertainment. Japanese startups are increasingly concentrating on the development of ultra-compact electric vehicles, thereby diversifying their technological contributions to the global market.

CONCLUSION

Each region in Asia's dynamic startup ecosystem exhibits its unique growth trends and innovation priorities. In Japan, there's a notable transformation in the enterprise sector despite challenges posed by an aging population and a high-income base. The country aims to generate more Unicorns by 2028, particularly in areas like robotics, healthcare, and entertainment. In contrast, China places a strong emphasis on the semiconductor industry and AI technologies. Despite the challenges posed by competing with advanced AI models like GPT-4.0, developments in this field are anticipated in the coming year, supported by a robust AI infrastructure.

Southeast Asia is swiftly embracing digital solutions across diverse sectors, with Singapore aspiring to emerge as a regional green tech hub and Indonesia directing attention towards agritech and logistics initiatives. These trends underscore the region's dedication to sustainable and efficient practices. In India, the expanding middle class is propelling growth in sectors like electric vehicle technology, fintech, and healthcare technologies, underscoring India's pivotal role in regional innovation and technological advancement. Collectively, these developments across Asia point towards a future characterized by robust growth and diversity in entrepreneurship, adapting to global trends and technological innovations.

Resources

- *Karan Mohla, B Capital, Why We Are Excited About Early-Stage Investing in Southeast Asia, 2023*
- *X-Lake Forum, Shenzhen 2023*
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- *Hurun Global Unicorn Index, 2023*
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SUSTAINABILITY IN ENERGY: THE IMPACT OF DIGITALIZATION AND INNOVATION

BALCA YILMAZ

Werover

Co-Founder & CEO

Energy sustainability has emerged as a paramount concern in our contemporary world. Characterized by rapid population growth, escalating energy requirements, and heightened environmental consciousness, the quest for a secure and sustainable energy supply stands out as a central global challenge. The pivotal nexus between energy security, digitalization, and innovation lies at the core of addressing this challenge.In the pursuit of meeting expanding energy demands, achieving environmental sustainability targets, and navigating geopolitical intricacies, it is evident that digitalization and innovation serve as catalysts for transformative change. In this juncture, the role of digitalization and innovation is indispensable, playing a crucial part in attaining sustainability objectives within the energy sector.

The surge in digitalization, especially real-time energy monitoring, is revolutionizing the energy sector. This shift enables advanced data analytics, offering insights into energy consumption and

system performance. It enhances the efficiency and reliability of energy generation and distribution, allowing swift detection and resolution of power outages. Technologies like smart meters and energy efficiency sensors optimize energy consumption, promoting efficient resource utilization and waste reduction. Overall, digitalization is pivotal in creating a more sustainable and resilient energy infrastructure. Furthermore, remote monitoring and control of energy assets play a crucial role in minimizing downtime and enhancing energy availability.

For instance, at Werover, we employ our Windrover product to monitor wind turbine blades, with the goal of prolonging their lifespan. Windrover offers a 24/7 health monitoring service, providing maintenance recommendations for wind turbine blades. Leveraging machine learning algorithms and analyzing acoustic data, we detect structural damage and identify issues caused by environmental factors, such as lightning and icing, at an early stage. Through our artificial intelligence software, which analyzes data collected from sensors on wind turbines, we proactively schedule maintenance and repairs before any damage to the blades becomes visible. Detecting issues at an early stage allows for swift action, significantly reducing the resources needed for repairs and minimizing turbine downtime. By delivering health information through our algorithm, we contribute to extending the overall lifespan of wind turbines.

An additional innovative aspect of the Windrover product is its capability to predict the growth of damage continuously, even after the damage occurs, through 24/7 monitoring. This functionality eliminates the need for inspection time during planned maintenance-repair periods. By determining the extent of the damage in real-time, Windrover allows for the calculation of required repair materials in advance. This dynamic process is made possible through live, artificial intelligence-supported machine learning algorithms. This approach not only prevents human errors but also ensures the high-precision detection of damages, even at stages below the threshold of human detection, thanks to the assistance of artificial intelligence.

Our innovative approach in the energy sector draws attention, underscoring the transformative power of innovation in energy technologies. Indeed, innovation serves as a catalyst for substantial progress in the field. These innovations not only foster

the advancement of sustainable and efficient energy sources but also enhance energy storage capabilities, revolutionizing energy production. They play a pivotal role in ensuring a secure and stable energy supply, fostering a more interactive and flexible relationship between energy producers and consumers. Undoubtedly, innovation serves as the driving force behind progress in the energy sector. Technological advancements in the renewable energy sector are enhancing the efficiency of hydro, solar, and wind energy. These collective innovations play a crucial role in improving energy security by diversifying energy sources and decreasing reliance on fossil fuels. Importantly, as innovation strengthens energy security, it also stimulates further advancements, creating a positive cycle of innovation and a secure energy supply.

Companies that invest in research and development initiatives within the energy sector have a crucial role in driving innovation to address current challenges. Collaborative efforts between governments, research institutions, and businesses are essential as the energy transition continues. By working together, businesses can take the lead in accelerating progress in digitalization and innovation within the energy sector, ultimately contributing to the establishment of reliable, sustainable, and efficient energy systems.

The path towards a safer and more innovative energy future demands coordinated efforts across the sector. A key strategy in this journey is fostering collaboration between large companies

and startups. This partnership is crucial for bolstering endeavors to attain sustainability goals in the energy sector. The synergy between these two groups enables the development of innovative solutions, more efficient resource utilization, and a reduction in environmental impacts.

Large companies bring experience, extensive resources, and established customer networks to the table. Conversely, startups are often more flexible, innovative, and nimble, allowing them to act swiftly. Startups hold a distinct advantage in adapting to the rapidly changing trends within the energy sector. Startups' ability to implement innovative ideas quickly is a valuable asset. Leveraging this dynamism, large companies can tap into the innovative technologies introduced by startups and swiftly adapt to sectoral changes by integrating these advancements into their existing structures.

In conclusion, digitalization and innovation play pivotal roles in shaping the future of energy security. These transformative forces are revolutionizing the energy sector, not only enhancing energy security but also promoting sustainable and efficient resource utilization. Harnessing the full potential of technology and innovation allows us to adeptly address tomorrow's energy challenges, ensuring a safe and effective approach to the evolving energy landscape.

Digitalization contributes substantial advancements in key areas like data analysis, automation, and the integration of smart technologies within the energy sector. Meanwhile, innovation unfolds in the discovery of new renewable energy sources, enhancements to existing energy production methods, and the development of energy storage technologies. Renewable energy sources, inherently more environmentally friendly and sustainable than fossil fuels, stand out as promising alternatives. Through ongoing innovation, these resources can be refined for greater efficiency and economic viability, ultimately bolstering energy security and significantly diminishing our carbon footprint.

The energy landscape is evolving into a complex and dynamic environment. Yet, our capacity to adapt, collaborate, and innovate stands as a formidable defense against these changes. Meaningful collaboration among stakeholders in the energy sector holds the potential to enhance safety, efficiency, and sustainability. Through the thorough utilization of technology and innovation, we can elevate energy security, paving the way for a more sustainable energy future. This commitment is vital not only to fulfill the needs of the present but also to bequeath a clean, safe, and harmonious energy environment to future generations.


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