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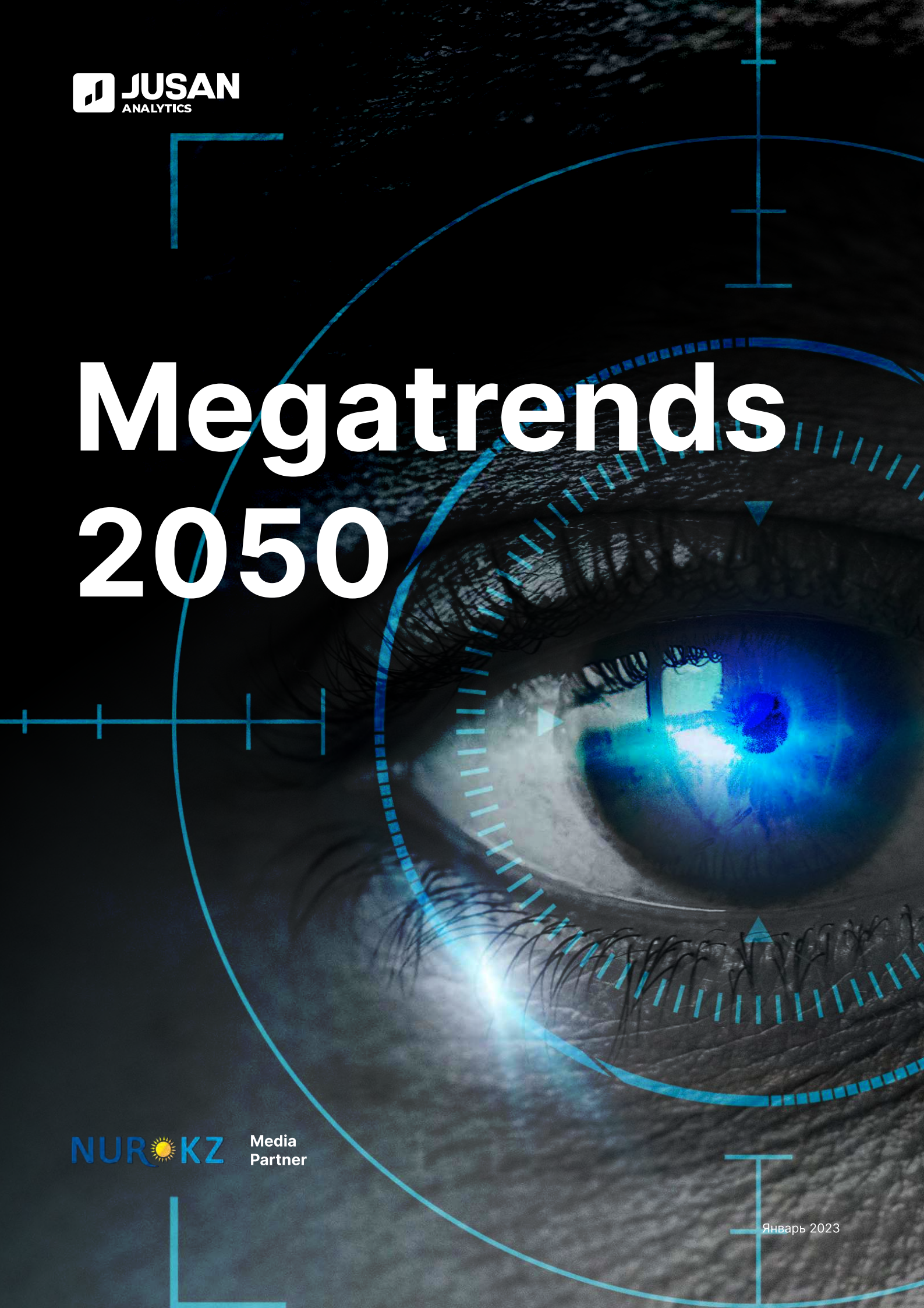
Megatrends 2050



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Foreword

Our world is in constant movement and transformation: economic cycles come and go, and technologies develop replacing each other. In a cascade of changing events, we do not notice how many things that once seemed incredible are now familiar and ordinary.

Despite the multidirectional nature of the events taking place in the world, they are all on the trajectory of large-scale megatrends. We have analyzed a large amount of information, and various studies and have determined that newsworthy megatrends are caused by economic prerequisites, the technology development level and the needs of people.

We have concluded that drastic changes will occur soon while studying how the world is developing now. The COVID-19 pandemic and subsequent geopolitical confrontations have already launched the inevitable process of curtailing the second era of globalization. Transit years of high turbulence and uncertainty are coming to us, and they will set out a new chapter in mankind's development.

We have identified 7 main directions in which there will be significant changes in the next 30 years – megatrends of the new era.

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3 historical periods that have made up the last 240 years

We are on the cusp of the beginning of a new era of artificial intelligence. As a rule, the change of epochs comes immediately after a global crisis, including military conflicts.

1780
I. STEAM ENGINE
use of water and steam energy for mechanization of production

Local agricultural economies
Population growth and effectiveness increase in agriculture, consolidation of non-agricultural production, the industry origin

1860
II. ELECTRICITY
differentiation of labour, mass production (conveyor), industrialization and urbanization

1860 The 1st era of globalization.
Dynamic growth of world trade, population and urbanization

1914 Great wars and depression.
Two world wars and the most ruinous economic crisis, the growth of government debts

1946 The Bretton Woods system.
Low inflation, debt reduction, increased taxes and government expenditures

1970
III. AUTOMATION
production automation, electronics, IT, communications

1970. Paper money and inflation.
Abandonment of the gold standard, economic turbulence, high inflation, and the latest wave of debt reduction

1980 The 2nd era of globalization.
The Revival of China, the growth of trade, and asset prices have increased. Low rates and deregulation of financial systems have led to a rapid increase in debt

2020 Uncertainty.
The period of military conflicts and economic shocks, the growth of debts in the world. The main battlefield is the market of modern technologies and energy sources

WE ARE HERE

2030
IV. THE ERA OF ARTIFICIAL INTELLIGENCE
will fully enter a new stage of human development

THE ERA OF ARTIFICIAL INTELLIGENCE

The AI and neural networks will change the world.

The computer will learn to express and understand emotions with the penetration of artificial intelligence into all spheres of human activity, and there will be a bio revolution, a new financial architecture will be created, and clean energy will be atop.

Source: Mckinsey outlook, Deutsche Bank

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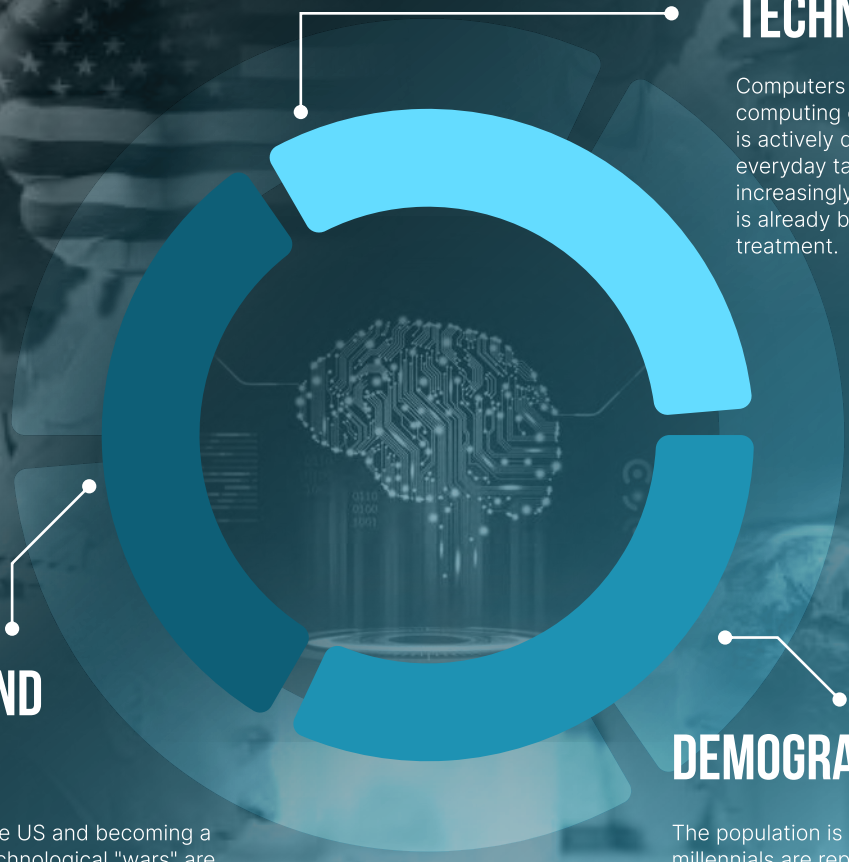
Why should we expect changes?

The main drivers of the changes are people and their needs, provided with a sufficient level of technological development.

Countries are engaged in a competitive political and economic struggle for primacy. The combination of all three factors leads to a worldwide change.

A similar situation took place during the transition from the pre-industrial to the industrial era, which was marked by a decline in the power of Great Britain.

Preconditions:



TECHNOLOGICAL

Computers already have high enough computing capacity. Artificial intelligence is actively developing and used to solve everyday tasks. And communication is increasingly going online. Bioengineering is already being stepwise applied for treatment.

POLITICAL AND ECONOMIC

China is closing in on the US and becoming a new force, trade and technological "wars" are expanding

DEMOGRAPHIC

The population is getting older, and millennials are replacing baby boomers

China challenges the USA

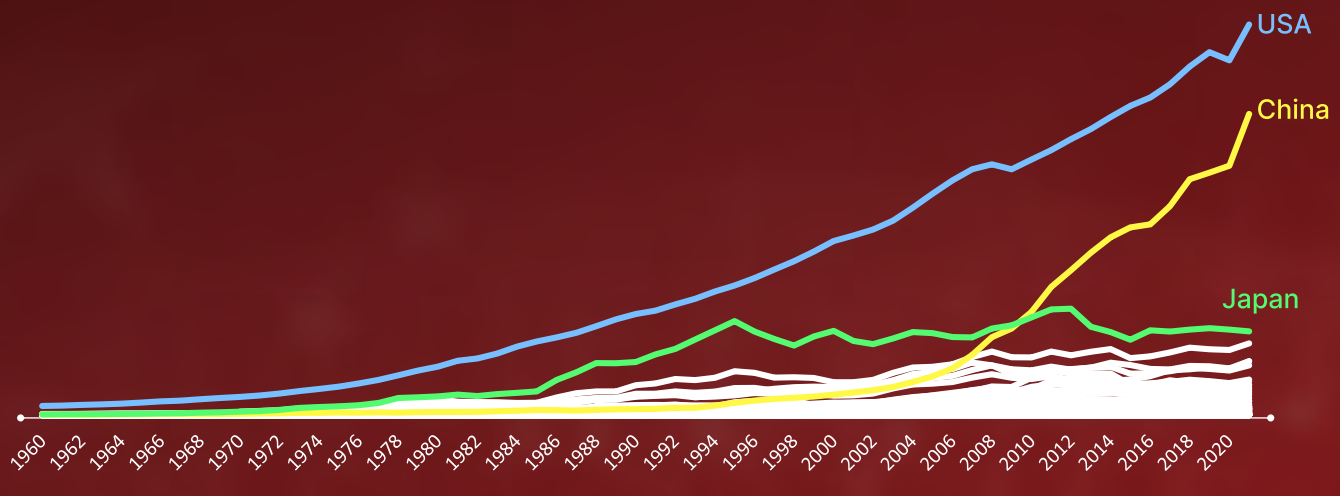
China is striving to get its economy back on track. China's share of global GDP has grown from less than 4% in the 1960s to 18.5% in 2021. China has been the second economy in the world after the United States for more than 20 years in nominal GDP. And the gap between them is narrowing.

The risks of global stability increase as the gap narrows.

We also note that 16 times the rising power challenged the ruling one at that time over the past 500 years, and in 12 cases it has led to war.

We expect that there will be an economic and technological battle that will lead to a significant change in the current economic architecture.

Nominal GDP of countries, trillion US dollars



Source: International Monetary Fund, Jusan Analytics calculations

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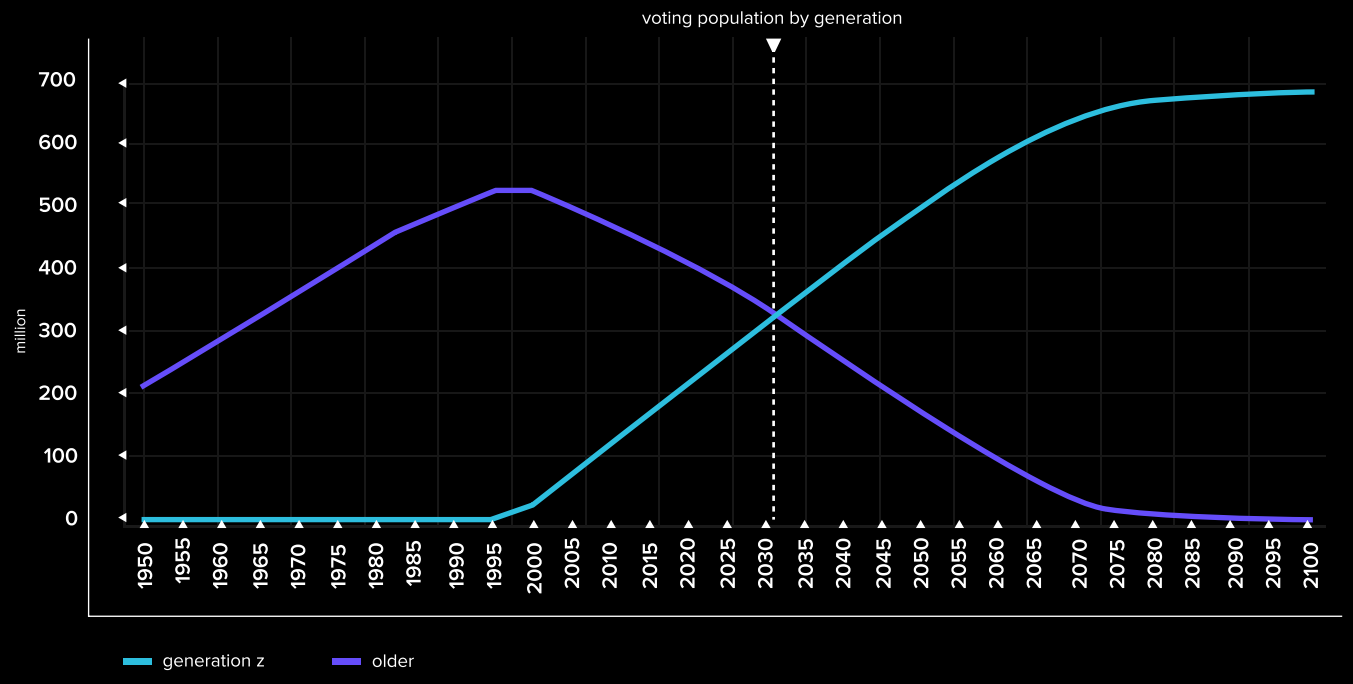
Millennials demand change

2,750 people controlled 3.5% of the world's wealth in 2020, this share was 1% in 1995.

High housing prices and the slow income growth of millennials and generation Z are causing discontent. The number of millennials and representatives of generation Z will reach half of all electoral mass in the next decade.

This will contribute to a more "left–wing" agenda formation - **more taxes on corporations and moneyed people, more social guarantees, and climate and environment protection.**

Number of voters by generation in G7 countries



Source: United Nations, Deutsche Bank

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The Fourth Industrial Revolution

The beginning of the Fourth Industrial Revolution took place in the middle of the last century. The first analogue integrated circuits appeared in the early 1960s. They opened the way for automation. Computers allowed faster calculations, and the spread of the Internet has greatly simplified and accelerated data transmission.

But why is the large-scale effect being felt only now?

All the elements were scattered, the computing capacity of computers was extremely low, and data transmission channels could only provide the forwarding of emails. Therefore, these technologies were only a service component of the traditional economy up to the present time.

Everything has changed dramatically in the last 10 years.

1. **the power of computing systems doubles every 2 years** thanks to the development of microelectronics, and this has been happening for the past 60 years. And the computing capacity of computers significantly exceeds the abilities of the human brain now. This allows us to create complex analytical systems, primarily based on artificial intelligence and crunchers of unstructured data.

2. the Internet bandwidth has significantly increased due to the development of fibre-optic infrastructure and new-generation wireless networks. In the last 10 years alone, the capacity of cross-border **data transmission networks has grown by more than 45 times** and is projected to increase by another 10 times in the next 5 years. Now we can instantly transfer huge amounts of data and use them from anywhere in the world due to cloud storage and computing.

3. the penetration of the Internet into all spheres of our life has significantly increased. For example, at its birth in 1984 only about 1,000 devices were connected to the network, then in 2005 their number increased to 500 million, and today **about 20 billion devices transmit data to the network every second**. And according to forecasts, this figure will increase to 500 billion in the next 10 years.

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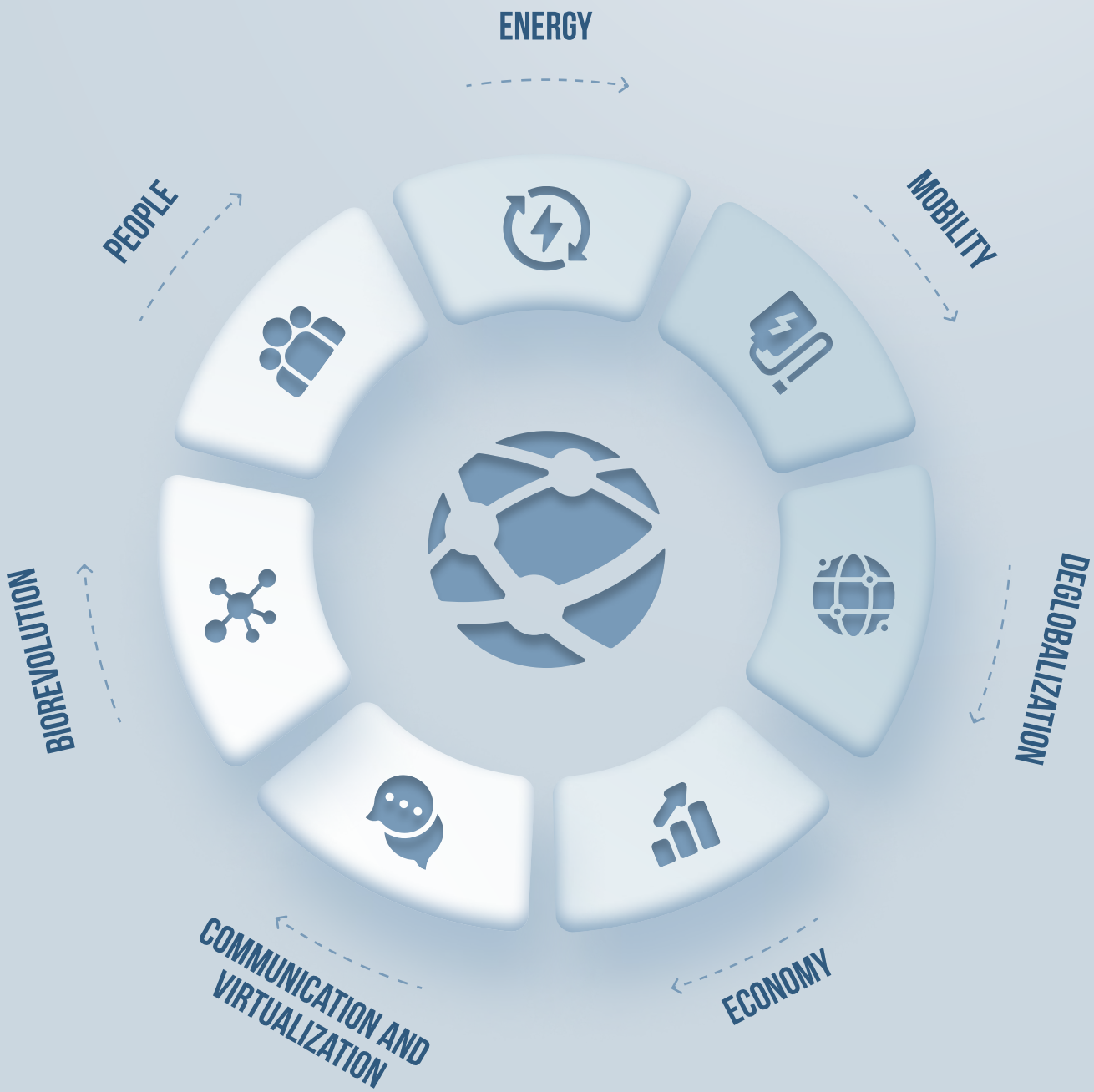
The main directions of a new era formation:



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Megatrend No. 1. Energy

Humanity will almost fully abandon fossil fuels

Energy is an important element in creating a new era of world development. A twofold increase in energy generation is necessary for the full functioning of modern technologies and the economy. By 2030, about 1 billion people will still not have access to electricity with current trends.

Traditional fuel energy cannot ensure development for several reasons. Firstly, because of the new generation's demand for "greening", secondly, because of the instability of fossil fuels, and thirdly, that renewable energy sources are becoming cheaper.

The world is on the verge of an **energy revolution**, which is comparable in transition level from a pre-industrial to an industrial society. The main characteristics of the new energy are the following:

Energy efficiency – improving the efficiency of generation, transportation and storage;

”Smart” energy – energy saving, smart distribution and use, etc.

Decentralization of energy sources – a new trend in energy system development that consists of the emergence of a large number of smaller electricity and heat local sources.

Climatic adaptation – technologies for emission absorption and disposal both at the source and that is already in the atmosphere.

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Oil. A new beginning

What will happen to oil?

Oil consumption will be backed by the **development of petrochemical capabilities**, as well as its processing. According to various estimates, about 96% of goods are produced with petrochemicals.

Oil will be the raw material **for the production** of roads, pipes, clothing, furniture, housing, cars, medicines and even food.

However, further **electrification** and "**greening**" will reduce the demand for oil, 60% of whose consumption is covered by vehicles.

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Megatrend No. 2.
Mobility

Transport will gradually become autonomous

Transport has always played an important part in saving time and increasing labour efficiency. The importance of mobility for people is changing with the digitalization and transformation of economic processes. Transport will become unmanned and regulated by a single smart control centre. And consequently, the need for a personal car will disappear over the years.

Main prerequisites:

- The EU plans to reduce the number of harmful emissions into the atmosphere **by 50% by 2030.**
- **2/3 of US consumers** expect an increase in shared consumption services (sharing).
- The number of trips around the city by carsharing cars increased by 60% per year from 2019 to 2020.

Source: Mckinsey outlook

Electrification

Demand for electric vehicles will grow 6 times by 2030, and annual sales will grow from 6.5 to 40 million units.

Self-driving

As the regulatory system is formed and transport routes are digitized, the first functional autonomous vehicles may be seen on the roads in 2025.

Sharing

Autonomous cars will no longer be a personal necessity

Smart Mobility

The integration of information and communication technologies variety, including IoT systems for urban transport management, will make it possible to completely go to smart mobility

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Megatrend No.3. Deglobalization and the economy

Globalization will continue, but in the other form

Globalization will continue in a kind of "Integration interaction" of the world regions form. The main driver is the technological confrontation between China and the USA.

Characteristics:

- The main battlefield is the market of modern technologies: microelectronics, artificial intelligence, quantum computing and energy.
- Technological segregation: the world will be set apart into different regions. Companies and countries will have to choose which integration to join.
- Decentralization of energy sources and reduction of its international trade (the TOP 3 in world trade is oil) will strengthen the regionalization trends.
- Localization of production chains

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Megatrend No.4.
Banking World

Banks will be forced to change their business models: build ecosystems, rent and lease infrastructure

Banks will feel competition in the following major areas of activity:

- **Introduction of digital currencies. Central banks will displace commercial banks in the transactional business, partly in the holding money. We also expect the decline of decentralized cryptocurrencies (as money).**
- **Эффект бигтех-компаний:**
  - **Big-data.** IT giants know more information about their customers compared to banks.
  - **Alternative lending.** IT companies will enter the lending market more actively. Their products will be flexible and more personalized thanks to Big-data. Also, P2P lending will get a new development.
  - **Stablecoins issued by big tech.** The growth of the big techs will allow them to create own monetary infrastructure, with their virtual currencies and alternative banking systems

Banks will change their business models from vertically integrated to horizontally one architecture: they will build ecosystems by leasing their infrastructure (bank as a service) or renting it from other players.

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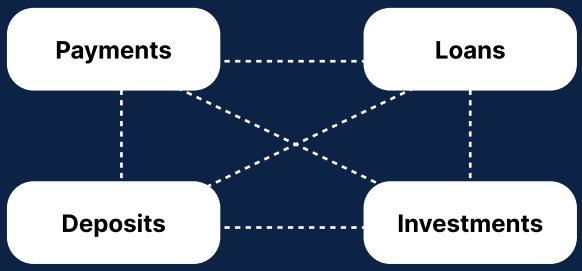
What will be the bank of the future?

Old model is linear, vertically integrated

Classic banks now sell only their products

Managing the entire business process along the chain from start to finish Payments, Loans, Deposits, Investments



The classic banks focus on their following core services:

1. Working with credit risk;
2. Managing client assets;
3. Client money and data security.

Source: Accenture

The new model is nonlinear, horizontally integrated

To create new offers by using non-linear business models

To build ecosystems by combining several activities and interrelated resources.

To rent out its infrastructure (bank as a service). To provide financial infrastructure for companies operating in retail, insurance and other areas. Banks will get new opportunities through the conclusion of partnership agreements with interested businesses, fintech and big techs.

To rent infrastructure. Fintech and big techs come between clients and banks, they simplify services and also make them as accessible as possible. Other intermediate players are cybersecurity and scoring companies, technical providers and aggregator platforms

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Megatrend No.5. Communication and virtualization

The borderland between the real and virtual worlds will almost be gone, and metaverses will become an integral part of human life

New communication technologies will be a step towards covering the most inaccessible regions, low a large amount of data lagging, lower energy consumption and increasing efficiency spectrum. The communication facilities will be developed primarily for IoT and artificial intelligence, as well as for virtual worlds.

In 2025, a person will interact with digital data every 18 seconds on average: 20% of the data will be generated in real-time, and 95% will come from IoT devices.

- The Global Immersive Reality market yield will reach 1.2 trillion US dollars by 2035 (the volume of investments in AR/VR amounted to 3.9 billion dollars in 2021).
- The number of patents in virtual reality has increased by 2 times from 2018 to 2021.
- Trends are VR, AR & MR, metaverse. Mixed Reality tools will be used in many industries, and greatly simplify communication.

VR
The VR technology offers the client to "try on" the product in a virtual space and decide whether it fits with the size, colour and style or not.

AR
The AR technology by pointing the camera at anything, allows the user to see a virtual 3D object with animation and video, and it can be controlled in real space.

MR
The Mixed Reality is a combination of the real and virtual worlds

Source: Mckinsey outlook, Data Age 2025

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By 2050

50%

of routine work will be done by robots

of professions will be changed

of people will work remotely

Source: Atlas of New Professions, RBC trends

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Megatrend No.6. Biorevolution

Bioengineering will be doubled down on to solve medical issues. New technologies will make it possible to create nutritious and cheaper artificial food.

The main trends will be as follows:

1. **Neuroprosthetics** is a treatment and a modification of a person in future.

2. **Organ printing** is a promising technology for growing healthy and living organs to replace damaged or missing ones.

3. **Gene therapy** is a preventive diagnosis and disease treatment.

4. **Creating real synthetic embryos** that will be grown from stem cells. The research is already being carried out on mice, and, according to the results, the grown brain began to originate, and the heart began to beat.

Source: Mckinsey outlook

Projected figures

60% The share of the world's products that can be obtained using bioengineering is

45% of all diseases can be cured by bioengineering

30% of the private sector R&D investments can be spent on the bioindustry development

70% while the overall demand for food will increase by 35%, the demand for cattle meat will decrease by 70% due to bioengineering by 2030.

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Megatrend No.7. Man 2.0

PEOPLE WILL BECOME MUCH HARDIER AND SMARTER AND LIVE LONGER THAN THEY DO NOW. IT WILL BE POSSIBLE TO CORRECT YOUR APPEARANCE WITH THE HELP OF BIOENGINEERING (PRINTING AND REPLACING ORGANS) AND DNA CORRECTION.

THE BORDERLINE BETWEEN THE SEXES WILL ALMOST BE ERASED, AND PEOPLE WILL BE BORN IN BIOLABS BY ORDERS.

MOST CURRENT DISEASES WILL BE EASILY CURABLE, BUT THE NUMBER OF MENTAL DISORDERS WILL INCREASE.

THE ECONOMY WILL BE BUILT AROUND PERSONALIZATION, SPEED, SIMPLICITY AND COMFORT (ECOSYSTEM LIFE-CYCLE IS AN INTERACTION WITH A PERSON ALMOST EVERY SECOND, CREATIVE ECONOMY) AND ENVIRONMENTAL COMPATIBILITY.

ON THE OTHER HAND, FURTHER DEVELOPMENT IS STRONGLY CONNECTED WITH A DECREASE IN "PERSONAL" AND "PRIVATE".

UBIQUITOUSLY ACCESSIBLE AUTOMATION WILL SHIFT PEOPLE FROM THE LOWER AND MIDDLE LEVELS.

THE URBANIZATION GROWTH RATE WILL DECREASE WITH FURTHER DEVELOPMENT OF REMOTE INFRASTRUCTURE.

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Man 3.0: Digital Immortality

The next stage of human development is the person and computer integration. Any biological body wears out, and one of the likely paths to immortality is the transfer of a person's brain or consciousness into a computer (or other artificial body).

Brain scanning technologies are already developing today. In 2014, in the framework of the OpenWorm project, the worm's brain was scanned and reproduced as software for a Lego robot that had moved like a worm. But this is 302 neurons, and a person has almost 100 billion of them.

With the development of metaverses and computing power, people's lives will gradually move into the digital world, where the real body is no longer needed. And this will change our life conception and the world around us.

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Disclaimer:
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