

A hand is shown at the bottom, holding a glowing digital globe. The globe is composed of a grid of white dots and lines, with a bright light source in the center. The background is a soft blue gradient with abstract digital patterns.

**Realizing a “Well-Being Society”
through the Digitalization of
Government and Finance**

— The Future of DGDF —

Introduction

Digital Government and Digital Finance (DGDF) is one of our focused growth business sectors for NEC. Through our DGDF operations, various software services are deployed to government and public bodies in the United Kingdom, Denmark and some other countries. We also serve the financial sector, where we supply advanced software mainly centered on wealth management, a market expected to grow in Switzerland and other parts of Europe as well as Asia. Moreover, we supply DGDF solutions built with cutting-edge NEC technologies like biometric authentication and artificial intelligence (AI) for governments, police forces, any public and aviation sectors in the United States, Latin America, Asia, India, Australia and the rest of the world. We believe that within these achievements are found numerous undertakings that can prove useful to many countries, including the Japan of the future.

Now we can foresee new trends of the market and change of world economy and environments. Therefore, this white paper shows examine how, amid various environmental changes (megatrends) occurring around the globe, the DGDF market will grow as society advances toward the 2030s. We also created it as a tool for exploring NEC's roles in this regard.

At NEC, we define our Purpose with these words: *"NEC creates the social values of safety, security, fairness, and efficiency to promote a more sustainable world where everyone has the chance to reach their full potential."* Within this context, our goal with respect to DGDF is, as stated in this white paper's title, to realize *"a well-being society where no one is left behind"* through the advancement of digitization in government and finance. We believe that using ever-growing volumes of data safely and efficiently will allow people throughout the world to benefit from various administrative and financial services fairly and equitably and without the constraints of time and place. This, in essence, describes the *"well-being society"* we aim to achieve.

We hope this white paper will serve as a springboard for *"seizing the future"* with our customers and stakeholders worldwide.

Naoki Yoshida
President
DGDF Business Unit

DGDF Vision

"A well-being society where no one is left behind"

Table of Contents

Chapter 1: Moving Toward the 2030s

An overview of five trends that will significantly impact people's lives.

Chapter 2: A View of Society in the 2030s

A description of the kind of society NEC hopes to create in the 2030s based on the five trends.

Section 1: Depictions of How the Fusion of DGDF Will Change Life

A presentation of *"stories"* describing future lifestyles.

Section 2: An Ideal Social Vision for *"Government and Enterprises"*

A look at what will be required of government and enterprises to bring about future lifestyles.

Chapter 3: A Look at NEC's Accomplishments

A review of NEC's accomplishments in Digital Government and Digital Finance and the businesses and technologies that support them.

Chapter 4: NEC's DGDF Vision and Future Contributions

A look at NEC's DGDF Vision and where NEC will make its presence felt in the years to come.



Chapter 1: Moving Toward the 2030s

We believe the environments enveloping our world and society will undergo dramatic change as we approach the 2030s. In considering the future of Digital Government and Digital Finance, we arranged the changes that we believe will affect governments, businesses, and people into five trends (megatrends) in terms of politics, economics, social issues, and technology.

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- I. A society dramatically altered by climate change
 - II. Ebbing globalization and the start of a new phase of cooperation
 - III. The arrival of a “*sustainable society*” and diversifying values
 - IV. Expanding economic spheres in the virtual world and their fusion with the real world
 - V. The establishment of ethics in AI/data use and changes in lifestyle
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In the following, we present our take on how the world will change as we approach the 2030s.

I. A society dramatically altered by climate change

Climate change's effects will likely become even more pronounced as we move toward the 2030s. As higher temperatures rise, we will see more forest fires, heat waves, greater storm damage, and more droughts. These effects will go beyond the disaster-caused destruction of infrastructure, as the United Nations and other organizations warn and predict that people's lives will be affected by various consequences. They include food shortages due to reduced harvests of grains and other crops and involuntary migration due to deteriorating living conditions that will eventually lead to increased health risks. In addition, soaring raw materials costs and reduced production capacity will affect corporate management in various ways. Moreover, current financial markets do not fully incorporate climate change risks. Consequently, some believe the appearance of risks associated with worsening climate change effects could affect the global economy, as they could cause the prices of financial products to plummet and thereby trigger a financial crisis.¹

To address these climate changes, all 196 parties to the United Nations Framework Convention on Climate Change (COP) adopted the Paris Agreement in 2015 as the world's first shared international action goal. Under the Paris Agreement, each country, without exception, must prepare and submit reduction targets every five years and submit reduction targets that advance with each passing year.

Furthermore, countries are beginning to take steps toward achieving their targets.

Economic damage attributable to climate and extreme weather events is increasing year by year.

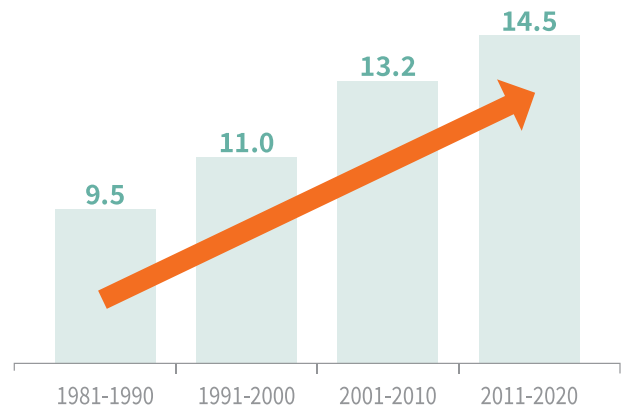


Fig. 1: Average annual economic loss attributable to climate and extreme weather events in EU member states (billion EUR)

*Indicators are calculated based on numbers of fatalities, economic losses, and insurance payouts due to weather and weather-related phenomena in European Economic Area member countries.

Source: Prepared by NEC based on European Environment Agency, "Economic losses from climate-related extremes in Europe"

For example, the European Commission is promoting the "European Green Deal," an initiative seeking to achieve climate neutrality and reduce environmental pollution in order to protect human life, plants, and animals. This initiative also serves as the EU's new growth strategy. Such efforts and rules to address climate change are expected to spread worldwide.

Meanwhile, as the impacts of climate change become more widely felt, the idea that nations should work together so that countermeasures can be implemented in more countries will likely spread. As a result,

richer countries will assist countries that lack the resources to combat climate change by providing them with financial assistance and technology. We anticipate that, by the 2030s, new approaches will emerge as countries take action and assist each other. For example, technology to track and record the whereabouts of funds without alteration will ensure the reliable delivery of such funds

to those requiring assistance. We may also see the issuance and circulation of carbon currency² as part of efforts to achieve decarbonization.

By the 2030s, a world will emerge where all nations recognize climate change as a common global challenge and take action to tackle it.

Six of the ten major risks the World Economic Forum expects to emerge in ten years concern climate change.

(Risk summary)

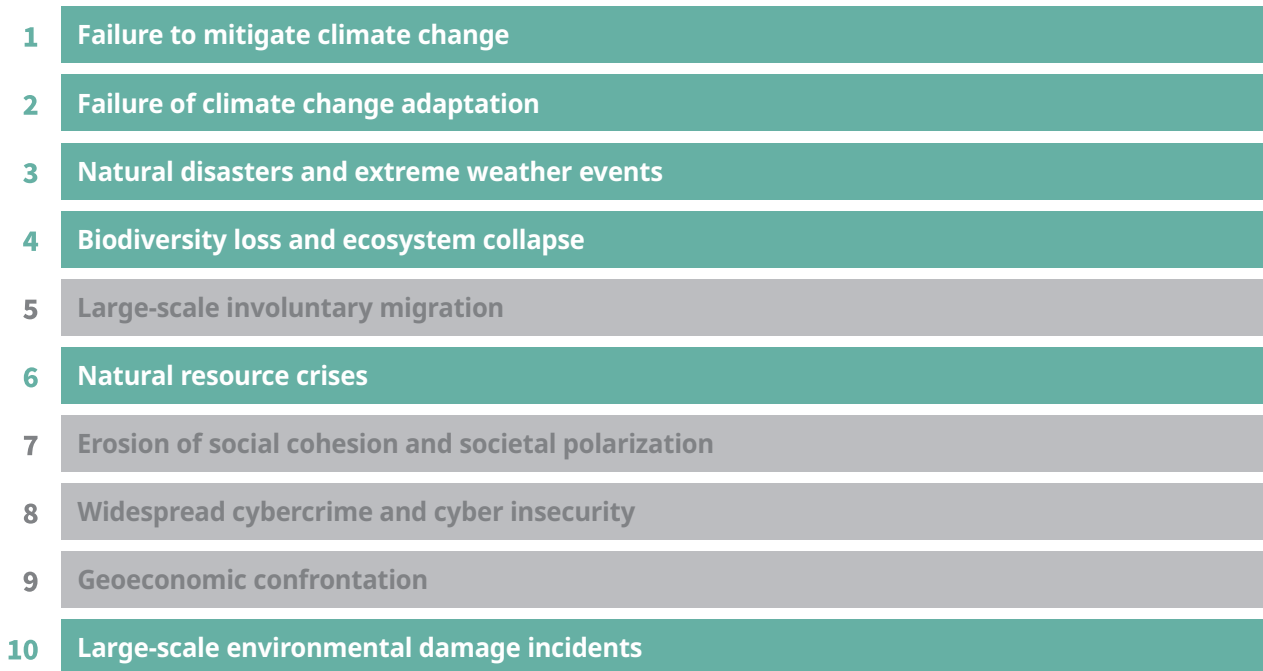


Fig 2: Ten global risks to exist after ten years

Source: Prepared by NEC based on World Economic Forum, "The Global Risks Report 2023"

1: *Breaking the tragedy of the horizon – climate change and financial stability*, Bank of England, 2015

2: "Representative currency" through which carbon dioxide emissions that have not been emitted are visualized, Global Carbon Reward

II. Ebbing globalization and the start of a new phase of cooperation

Industrial development in individual countries has led to increasing globalization of the world's economy. As countries focus on producing the goods in which they excel and exchanging goods and services through trade, they have benefitted from increased corporate productivity, lower costs, and technological development.

On the other hand, some have called attention to a recent trend toward *“de-globalization.”* This trend is seen in the rise of nationalism, economic decoupling, and other changes in the international situation.

The Intelligence Unit of the British business publication *The Economist*³ suggests that the world is becoming tri-polarized into the Western economic bloc (which includes the United States, European countries, Japan, and South Korea), the Sino-Russian economic bloc (led by Russia and China), and neutral countries that belong to neither. The formation of blocs is evident in such areas as food, energy, resources, and technology, particularly in the first two groupings.

Countries are becoming increasingly aware of economic security risks. Consequently, they tend to implement protective trade measures and promote *“local production for local consumption”* to safeguard and stabilize their domestic industries and economies. They are also walling off their advanced technologies through the internal production of components and materials in high-tech fields.

However, fragmentation is not the only trend taking place. Recent developments show that countries are taking steps to cooperate in dealing with global economic issues. Examples include the World Economic Forum's announcement of Principles for Strengthening International Cooperation⁴ in 2021 and the adoption of a Leaders' Declaration at the G20 Bali Summit in 2022.

We anticipate the need for people to work together to address issues common to all humankind—such as the aforementioned climate change—by reaching beyond national boundaries and viewpoints will be even greater in the 2030s and that international discussions on social and economic activities will gather strength. With the support of international organizations and others, the movement toward cooperation rather than confrontation will likely regain momentum. We believe steps will be taken to cooperate in finding solutions to common global issues by acquiring and utilizing data on greenhouse gas (GHG) emissions and cross-national and cross-industry issues.

The World Economic Forum presented principles for strengthening global cooperation amid growing distrust of globalization.

Strengthen global cooperation	Renewed global cooperation is necessary to advance universal priorities of peace, prosperity, health, and sustainability.
Advance peace and security	Long-term security and humanitarian objectives must be advanced by promoting peace efforts, capital investments, good governance, strong institutions, and social cohesion.
Re-globalize equitably	All people should be able to benefit from globalization. It is necessary to quickly increase economic activity, ensure that societies are inclusive, and address racism and discrimination (e.g., by closing digital divides, supporting robust education, and reducing inequity).
Promote gender equality	Measures to prevent gender-based discrimination and violence and reduce barriers to women's financial and professional advancement and enjoyment of their human rights must be put in place.
Rebuild sustainably	Measures that promote recovery, including extraordinary stimulus funding, should advance carbon-neutral products and practices and be undertaken in a way that is consistent with the 2030 Agenda for Sustainable Development.
Deepen public-private partnerships	Government and business need to pursue financing mechanisms and partnerships to promote innovation and create enabling environments for investing in and efficiently directing resources towards societal and global priorities.
Increase global resilience	Increased information sharing is necessary, as are revitalized trade networks and a more rules-based global trade system.

Fig. 3: The World Economic Forum's Principles for Strengthening Global Cooperation (2021)

Source: Prepared by NEC based on World Economic Forum, "Principles for Strengthening Global Cooperation 2021"

3: *Russia can count on support from many developing countries*, Economist Intelligence Unit, 2022

4: *Principles for Strengthening Global Cooperation*, World Economic Forum, 2021

III. The arrival of a “sustainable society” and diversifying values

In recent years, the need for ESG (environmental, social, and governance) management by companies has been growing more than ever as a means of enhancing society’s sustainability.

One reason for this is that an increasing number of institutional investors recognize the importance of initiatives to strengthen society’s sustainability as a criterion for investment and financing. Each year, more and more companies are becoming signatories of the Principles for Responsible Investment (PRI), an organization that requires institutional investors to consider ESG issues in their investment decision-making. As of 2022, approximately 5,000 companies⁵ have become signatories and are thereby influencing company investment.

Another factor behind the growing demand for ESG management by companies is a change in people’s thinking and behavior. Information on social media, news reports, and impacts on daily life has driven people—and especially the younger generation—to become more aware of consumption that is less harmful to people, society, and the environment (called “*ethical consumption*”), and as a result, they are now tending to proactively choose products and services from companies that contribute to ESG. A survey conducted by the European Parliament in 2021 (European Parliament Youth Survey 2021) revealed that approximately 40% of young people believe that higher priority must be given to ESG-related issues, including poverty and inequality.⁶

In response to this trend, international organizations and individual countries are beginning to lay the groundwork for a sustainable society. One example is Europe’s draft Corporate Sustainability Reporting Directive (CSRD), which was approved in 2022.⁷ The CSRD will require large companies and listed small- and medium-sized enterprises (SMEs) to make detailed reports on sustainability-related issues, such as environmental rights, social rights, human rights, and governance factors. It will be applied in a phased manner. In another instance, the IFRS Foundation, an organization that sets international accounting standards, announced the establishment of the International Sustainability Standards Board (ISSB) in 2021 to “*develop standards for a global baseline of sustainability disclosures.*” These examples suggest that standardization of ESG information disclosure standards will likely gain momentum internationally.⁸

In the 2030s, ESG and sustainability’s presence will grow among governments, companies, and people as society attempts to become more sustainable. Corporate awareness of ESG will gain even more traction as companies recognize the value that ESG brings to corporate management in terms of long-term growth, avoidance of business risks, cost reduction, productivity improvement, and brand image enhancement. This will encourage not only large corporations but also SMEs to become active ESG management practitioners. Of course, such a phenomenon will not be limited to the private sector, as ESG will also take root in gov-

ernment activities. We anticipate that mechanisms for assessing and monitoring ESG will also come into use to improve the transparency of ESG activities undertaken by private companies and governments. Innovative technologies (such as AI and blockchain) will secure traceability and enable compliance verification and tracking to ensure that ESG activities are free of falsehoods in their descriptions and communications by, for example, preventing the falsification of activity history and other data.

As the idea of ESG permeates more deeply into society, people will gain a stronger sense that “wealth” refers not only to economic wealth but also ESG-conscious and altruistic behavior. And as they do, their social values with respect to “wealth” and “affluence” will change and diversify.

With the arrival and permeation of such changes in social values will come further advancements in society’s acceptance of diversity. Although the degree of acceptance and the development of associated support systems will vary depending on the country or region, we anticipate that, by the 2030s, local governments and companies will be promoting diversity and acceptance and that a wide range of services will be available to meet the specific needs of a diverse range of people.

Each year, more organizations are signing the UN Principles for Responsible Investment (PRI), and more institutional investors are engaging in ESG-oriented investment activities.

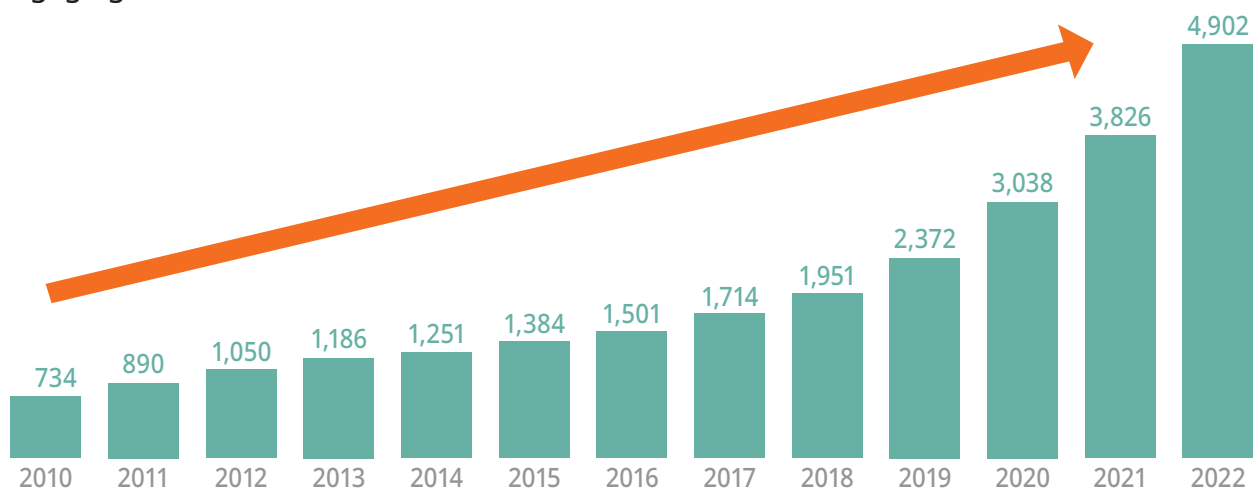


Fig. 4: Changes in the number of PRI signatories

*The United Nations Principles for Responsible Investment (PRI) presents six principles for institutional investors, including “We will incorporate ESG issues into investment analysis and decision-making processes” and “We will seek appropriate disclosure on ESG issues by the entities in which we invest.” It urges institutional investors to sign the principles and cooperate in adhering to them.

Source: Prepared by NEC based on data published by the UN Principles for Responsible Investment (PRI)

Forty percent of young believe that poverty, inequality, climate change, and environmental protection should be given priority.



Fig. 5: Issues that young people in the EU (aged 16-30) feel should be given priority (27 EU nations; N=18,156)

Source: Prepared by NEC based on European Parliament, "European Parliament Youth Survey 2021"

5: Annual Report 2022, Principles for Responsible Investment (PRI) website, 2022

6: European Parliament Youth Survey 2021, European Parliament, 2021

7: Sustainable economy: Parliament adopts new reporting rules for multinationals, European Parliament, 2022

8: International Sustainability Standards Board, IFRS website

IV. Expanding economic spheres in the virtual world and their fusion with the real world

Steady advancements in diverse technologies are expected to fuel the rapid growth of the metaverse and other forms of the virtual world. For example, virtual reality (VR) technology, which provides a means to experience the virtual world, will further penetrate the market, enabling more realistic experiences in virtual space with high-resolution images, eye movement tracking technology, and the like. Meanwhile, VR goggles will become smaller and lighter, making them wearable for longer periods. In addition, advancements in digital twin technologies that reproduce people, things, and events in the virtual world will also expand the range of activities of companies and consumers in that world.

On the other hand, people are becoming increasingly concerned about safety and security in the use of the growing virtual world. In light of this, we anticipate that international standards for the protection of privacy during data use and the prevention of fraud, violence, and other crimes will be developed within the virtual world. In 2022, various companies and standards organizations came together to establish the Metaverse Standards Forum. The forum holds discussions on privacy, interoperability, and other topics, the results of which will likely lead to the development of safety and security standards for the virtual world.

The applications that consumers have expectations for in the virtual world cover a wide range.

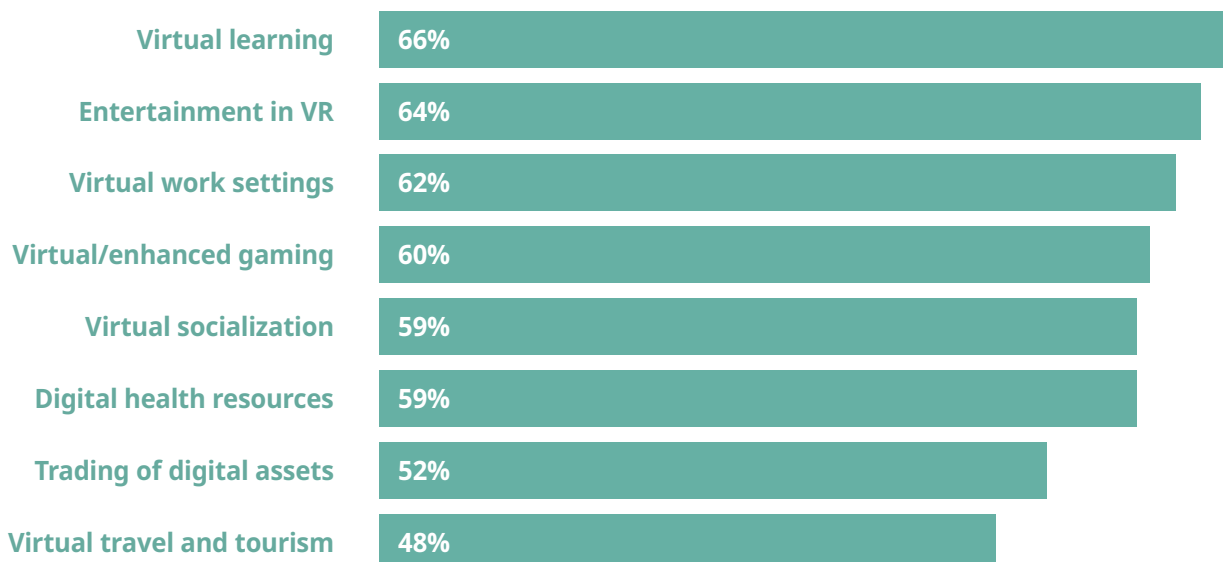


Fig. 6: Virtual world apps that respondents expect will change people's lives in the next ten years (survey of more than 21,000 people in 29 countries)

Source: Prepared by NEC based on World Economic Forum/IPSOS "How enthusiastic is your country about the rise of the metaverse?" Davos 2022

Advances in technology and the development of standards will lower barriers to the virtual world's use and increase the number of users. Some experts predict that by 2030, more than 2 billion people⁹ around the world will be routine users of the virtual world, and that people will be able to move between the real and virtual worlds at will.

The virtual world will become more than just a place for entertainment, interaction with friends and strangers, and shopping. It will become an environment where new forms of "work," "education," "civic participation," and the like are possible.

As digital IDs also become more commonplace, administrative services will become available in the virtual world, possibly turning it into an Economic sphere where people to lead their lives without inconvenience. In addition, the virtual world will not exist individually but will be connected to various other spaces as interconnectivity is secured. And as it does, it may become an economic sphere that transcends national and regional boundaries.

As the things that can be done virtually increase and the virtual world's convenience improves on the one hand, people will gain a renewed appreciation of the real world's value from various aspects on the other. For example, in the area of entertainment, many people who experience a sightseeing tour in the virtual world may feel the desire to visit the actual places. Similarly, people who enjoy a virtual concert may want to experience the excitement in an actual stadium. The same thing may happen in the area of work. When it becomes standard practice to hold meetings in the virtual world, many people may realize the importance of casual communication and tasks that take place in an in-person environment. With the virtual world's pervasion leading to rediscovery of the real world's value, we can expect to see the advent of lifestyles that are not solely dependent on the virtual world but rather are a more seamless fusion of the virtual and real worlds.

9: Gartner Predicts 25% of People Will Spend At Least One Hour Per Day in the Metaverse by 2026, Gartner, 2022

V. The establishment of ethics in AI/data use and changes in lifestyle

With AI technology making great progress, it is said that the “singularity”—when AI will surpass the intelligence of all humankind—will arrive in 2045.¹⁰ Today, AI is beginning to be used in some cases to support human decision-making. However, the basis for AI’s decisions is often opaque and can be diffi-

cult for humans to accept. In light of this, it is probable that the development of “explainable AI” (AI that can explain its answers) will proceed to take the technology further, and that AI’s spread will pick up momentum with the creation of mechanisms to ensure its transparency and accountability.

The European Commission envisions classifying AI utilization into four categories and imposing regulations according to the level of risk.

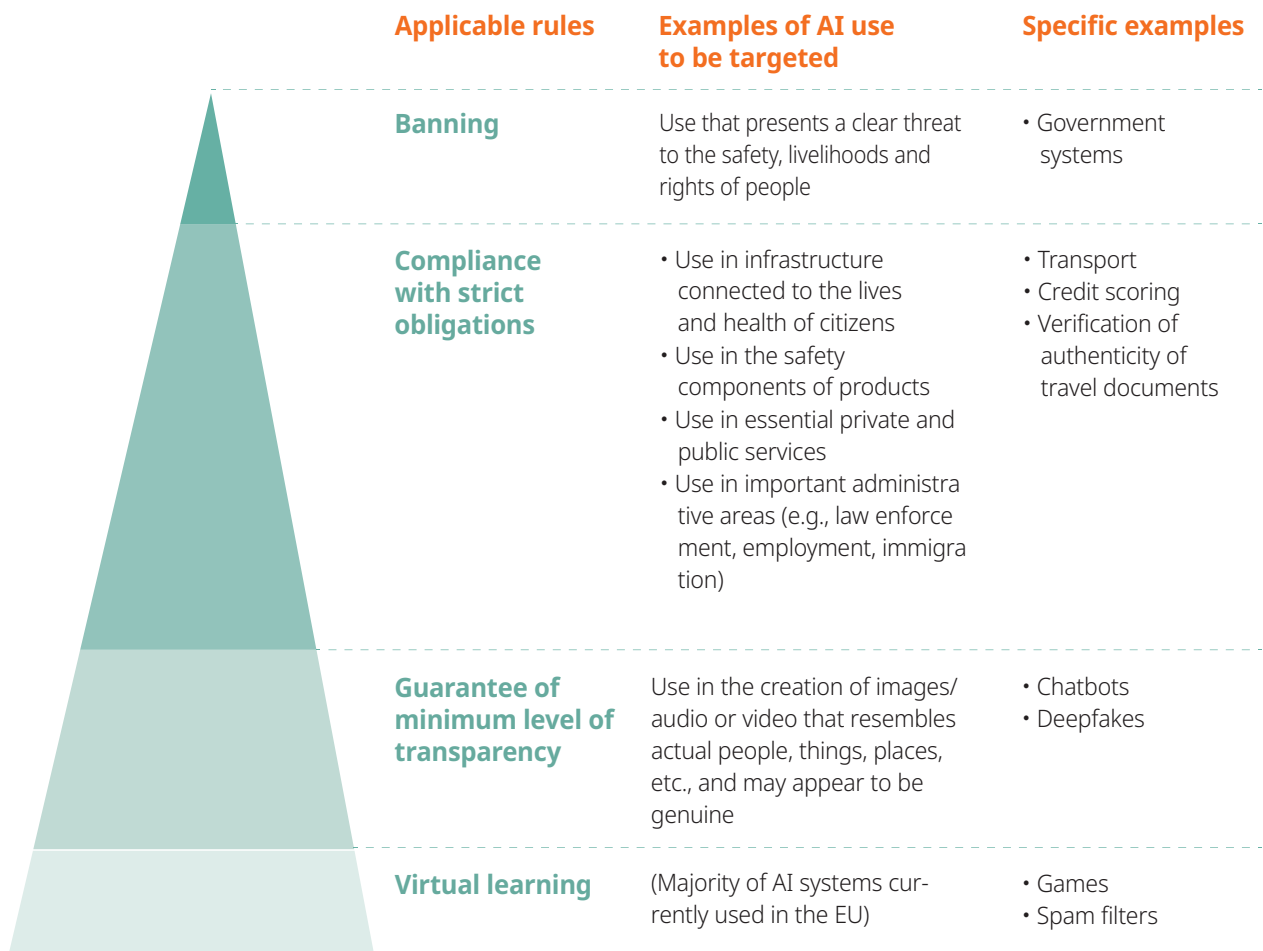


Fig. 7: AI to be subject to regulation under the European Commission’s proposed framework

Source: Prepared by NEC based on European Commission, “Regulatory framework proposal on artificial intelligence”

On the other hand, as AI becomes more widespread, its harmful effects are also receiving more social recognition. Deepfakes, automatic generation of ransomware, and other negative aspects that have adverse effects on individual privacy, companies, and nations are also coming to light.

Governments and international organizations are taking steps to put controls in place against AI risks. Companies are also taking voluntary action to achieve the same. In fact, in 2021, the European Commission proposed a legal framework for AI¹¹ that aims to eliminate risks in AI systems and foster people's trust in them. The U.S. White House Office of Science and Technology Policy also published a Blueprint for an AI Bill of Rights¹² in 2022 that outlines principles to be considered when designing and using AI-based systems.

Just as science and technology have both bright and dark sides, AI can help bring about a happier society by assisting human decision-making but, if misused, could also have negative effects at both the individual and national levels. If the appropriate use of AI can be encouraged through the successful establishment of strict regulations, AI has the potential to become an unmatched partner for humankind.

AI is not the only thing bringing changes to human life, as we are also seeing technological advances and discussions with respect to data. One example is a trend toward returning ownership and handling of

personal data to the individual, rather than entrusting it to governments and companies. The European Commission is requiring member states to issue a “*European Digital Identity Wallet*” with the goal of having at least 80% of EU citizens using digital identity by 2030.¹³ As it is tied to this digital ID, the wallet will allow users to add to it not only basic personal information but also other forms of personal information, such as a driver's license and bank accounts. This will not only give people control over their personal information, including who they share it with and to what extent. It will also allow them to track the personal information they provide. Under current plans, EU citizens will be able to use their digital ID-linked wallets to receive administrative services and services of a highly public nature not only in their own countries but anywhere within the EU.

If such trends accelerate, it is conceivable that even more data distribution will take place in the 2030s. For instance, governments may, after obtaining individuals' approval, use data to provide efficient services to the public across the jurisdictions of individual government ministries and agencies. On the other hand, it is also possible that people will provide information (after controlling the scope of disclosure) to serve as basic data for the provision of more beneficial services and policy formulation. Data will be used across the public and private sectors—and under established data governance—to make people's lives more convenient, and this will make the use of personal data more socially acceptable.

10: *The Singularity Is Near*, Ray Kurzweil, 2005

11: *Regulatory framework proposal on artificial intelligence*, European Commission, 2021

12: *Blueprint for an AI Bill of Rights*, White House, 2022

13: *A trusted and secure European e-ID – Regulation*, European Commission, 2021



Chapter 2:

A View of Society in the 2030s

Section 1: Depictions of How the Fusion of DGDF Will Change Life

How will people's lives be transformed as the world moves toward the 2030s?

In this chapter, we will shine our spotlight on six people to see how their values will change—and specifically how they will live their lives—in the 2030s.

Case 1: Anthony, who is living more comfortably now that he has access to administrative services that were previously unavailable to him

Case 2: Bella, who finds life has become more convenient because her views on personal data changed and she became more accepting of appropriate data use by government and enterprises

Case 3: Charles, whose daily living is being supported by a variety of services that continue even during a pandemic

Case 4: Daniel, who is enjoying self-fulfillment by contributing to society with a new set of values that goes beyond economic values

Case 5: Emily, who is living an affluent life with the support of various life stage-oriented services while managing a small yet diverse range of assets

Case 6: Faz, who lives as he pleases by moving freely between the real and virtual world to escape restrictions

Case 1: _____

Anthony, who is living more comfortably now that he has access to administrative services that were previously unavailable to him



Anthony worked several jobs, so he constantly had his hands full and did not have time to bother with administrative services. On top of that, it never occurred to him that the government could provide him with services that would be useful to him, so he never took advantage of administrative services that would have been available had he simply applied for them.

Now, however, administrative services are available in digital form, and there are systems in place through which appropriate information on them is sent from the government to each individual in advance. This lets Anthony receive notifications about admin-

istrative services that he was previously unaware of. He now receives the subsidies he needs to manage his living situation, something he did not know he could do before.

Administrative services are more efficient and administrative resources across regions have been optimized, resulting in a world where there is less burden on people. Anthony still works multiple jobs and is as busy as he ever was. But now he has a better understanding of how beneficial social security is and feels he can now live life with peace of mind.

Case 2: _____

Bella, who finds life has become more convenient because her views on personal data changed and she has become more accepting of appropriate data use by government and enterprises



Bella felt uneasy about the way her and her family's data was being handled, and she was therefore very reluctant to disclose her personal data. Today, however, Bella has far fewer concerns about the use of her data. This is because laws concerning personal data and mechanisms to ensure transparency have been put in place throughout society, and governments and companies are using data in strict compliance with them.

The government often uses AI in making policy decisions, and although the government's reasons for using AI are not entirely explained, Bella trusts the government because regulations on AI use are established in law, and a system is in place for presenting reasons. She has become willing to provide her data if it makes her life better.

Nowadays, as the use of data in administrative services progresses, people are able

to receive preventive and individually optimized services. For example, Bella receives recommendations via a portal concerning checkups and vaccinations that she should receive based on her attributes and lifestyle. This leads to early detection and prevention of diseases. In addition, Bella's daughter can receive an education based on her own test scores and learning progress, which helps her maintain good grades.

Once, when Bella was on a month-long vacation abroad, she was rushed to a hospital when a pre-existing medical condition flared up. However, she received treatment without difficulties because her digitally managed medical data in her home country was provided to the local medical facility.

Bella feels that life is much more convenient in a world where personal data can be safely used for her own benefit.

Case 3:

Charles, whose daily living is being supported by a variety of services that continue even during a pandemic

A factory worker, Charles lived a fulfilling life while maintaining a good balance between work and private life.

That was until a global pandemic broke out.



The situation led to a community-wide lockdown that required people to keep their trips outdoors to a minimum. Charles feared that his life would change drastically and become more difficult. However, various services were

quickly made available, and it was not long before he was back to his normal routine.

Under the lockdown, Charles was prohibited from going to the factory, which had shut down. Even so, he experienced no financial difficulties because the government deposited a uniform benefit to his account within a few days. Although Charles has a pre-existing medical condition, his electronic medical

records and electronic prescriptions were linked to his ID, which allowed him to easily receive medical treatment remotely as long as the communication infrastructure was in place. He could also pick up his medication at the nearest pharmacy. Charles has renewed appreciation that, thanks to the government's digitalization of its services, he can get by without significantly lowering his own standard of living, even in the midst of a pandemic.

Case 4:

Daniel, who is enjoying self-fulfillment by contributing to society with a new set of values that goes beyond economic values



Although Daniel had always thought that economic value had a direct relationship with his happiness, it seems the public's mindset is undergoing a change in this respect. Amid progressing climate change and environmental destruction, people of all generations, not only young people, are giving more emphasis to the global environment and social contribution in addition to economic value.

Like many others, Daniel understands how much being aware that he is contributing to society and the planet by choosing environmentally friendly products and services of

his own accord leads to his own happiness. In addition to his concern for environmental issues, he also supports efforts to address social and regional issues in the form of regional tokens as well as decentralized autonomous organizations (DAOs) and non-fungible tokens (NFTs), which not only bring him monetary returns but also give him a sense of satisfaction that he is contributing to society. Daniel's thinking that "*wealth is not limited to economic wealth*" leads him to the realization that, even in our capitalist world, there is a place where his values can be acknowledged objectively.

Case 5:

Emily, who is living an affluent life with the support of various life stage-oriented services while managing a small yet diverse range of assets



Although Emily was interested in asset management, she perceived it as a service for a limited number of wealthy people and did not engage in it herself. Now, however, the variety of asset types has expanded beyond traditional financial products to include tokens and other assets, creating an environment in which anyone can easily invest according to their preferences. In addition, not only has the variation of asset types expanded, but with the increased sophistication of forecasting and prevention, people are now in a better position to protect their assets from various risks by forecasting geopolitical and natural disaster risks and analyzing scenarios based on those risks.

Even Emily, who has a standard income, is now able to manage multiple assets with more peace of mind by successfully utilizing not only financial advisors but also AI-enabled robo-advisors. By receiving advice on asset building and management for milestone events—such as study abroad and marriage—as well as for later life, she can now plan for a prosperous future in an age when people can expect to become centenarians. These services are now much more convenient, as they are available outside of traditional financial institutions in both the

real and virtual worlds. It is also much easier to consolidate various managed assets and complete administrative procedures, such as filing income tax returns. And because services provided by private companies are now linked with the government, she does not have to go through those procedures by herself. Emily feels that her life has become freer and richer because she no longer has to go through complex procedures and can live her life while using services that give her the support she needs.

Case 6: _____

Faz, who lives as he pleases by moving freely between the real and virtual world to escape restrictions



Faz has a job at a company, but he also runs a side business in the virtual world in his free time. Because he can sell his strengths and skills in the virtual world without the physical and social constraints associated with location, attributes, physical ability, and the like, he no longer needs to depend on his main employer like he used to do. Faz has no problem opening a bank account in the virtual world when he starts a side business. And he can receive his income from the business in a secure form in the virtual world. Moreover, he can file his tax returns all together—taking into account income from both the real and virtual worlds—in the virtual world.

Additionally, as a person interested in e-sports and who desires to socialize with people from other countries, Faz is now interacting with various kinds of people through e-sports in the virtual world, transcending national boundaries and without language barriers.

Meanwhile, Faz's wife designs children's clothing as a hobby and recently gave some to a neighborhood friend. The friend was so pleased with the clothes that she asked about using them in the virtual world as well. This led Faz's wife to sell her clothes in the real world and also make it possible for the people who buy them to dress their virtual world avatars in them. Her clothes are now worn by various people/avatars, bringing her income and a sense of fulfillment.

Faz's family is experiencing a broader lifestyle and greater enjoyment as a result. No longer facing physical limitations and with restrictions on his way of life gone, Faz has become keenly aware that achieving financial and social self-actualization is now much easier.



Column:
**Denmark, a Country
Leading the Way in
Digitalization**

Denmark is among the world's leaders when it comes to the promotion and widespread use of digitalization in government. This status is evidenced by its ranking first in the world in 2020 and 2022 in the "*E-Government Survey*," a global e-government ranking published by the United Nations. Denmark is also known as a welfare state, where a high standard is achieved in the provision of social security services. Such services include free medical care and education, social security benefits with a high income replacement rate, and substantial childcare support. The country's highly digitalized administrative system plays a significant role as the foundation for this system. In this column, we present some of the public and private digital services that are provided in Denmark based on this administrative system.

Digital Post “e-Boks”

- Denmark’s Digital Post “e-Boks” is a system for receiving official documents and notices from the government that was launched in 2014. Registering with e-Boks is mandatory in principle for citizens aged 15 or older, and as of 2019, 92% of Denmark’s citizens had done so.
- Recipients can choose to have notices sent as push notifications via NemSMS (the government’s social media service), forwarded to their email, or sent by post.
- The system can also be linked to individuals’ social media accounts using their cell phone numbers. The content of notices covers a broad spectrum and is tailored to each recipient’s life circumstances, ranging from health care-related issues, such as health examinations for infants and vaccinations, to notices concerning traffic violations and fine payments, notices of benefit entitlements, and more.

Public bank account “NemKonto”

- NemKonto is a system that manages bank accounts based on the CPR number, a national ID number issued to all Danish citizens. The system is used for pension benefits, tax refunds, receipt of benefits, and other transactions.
- In principle, all citizens over the age of 18 have their bank accounts registered with NemKonto. The system is set up to handle not only public benefits but also salaries and other payments from private companies.

Medical information gateway “Sundhed.dk”

- In Denmark, a healthcare portal called Sundhed.dk allows both healthcare users and healthcare professionals to access the users’ medical information.
- During the recent COVID-19 outbreak, people were able to access their PCR test results from Sundhed.dk. Those people who tested positive were sent a pamphlet titled “For People who Tested Positive for COVID-19” via e-Boks and notified of subsequent procedures and how to deal with the disease. This allowed them to seamlessly complete procedures online following their test.
- Healthcare users can use Sundhed.dk, to make appointments with their family doctor, report test results, view their own electronic medical records, and share information on prescription drugs. At the same time, healthcare professionals can access the personal data of patients undergoing treatment securely and in a controlled manner (patients can check logs to see who viewed their treatment data and when) and use it for treatment.

Income tax return filing portal “*skat.dk*”

- Danish citizens can file their tax returns easily and without complex procedures.
- The Danish Customs and Tax Administration receives reports from employers containing the data it needs to calculate taxes along with their employees’ CPR numbers. It then prepares tax returns by aggregating the data for each citizen.
- Documents prepared by the Customs and Tax Administration are then sent to citizens through a dedicated tax portal site called “*skat.dk*.” Citizens need only to review and approve those documents to complete the tax return procedure.

An aerial photograph of a city at sunset. The sky is a mix of orange, pink, and blue. The city below is densely packed with buildings, and a river flows through the center. A prominent tower is visible in the distance. The overall mood is serene and contemplative.

Chapter 2: A View of Society in the 2030s

Section 2: An Ideal Social Vision for "Government and Enterprises"

In the previous section, we explored changes in values and behavior as seen from the perspectives of individuals and the lifestyles they will lead. Reassessing these points from the perspective of government and enterprises (financial institutions and business companies), what do government and enterprises consider important? And what will be required of them to make such lifestyles possible? With an eye to life in the 2030s, we will use this section to look at our ideal social vision from the standpoints of government and business enterprises.

I. An ideal social vision (government)

We believe government will need to make the following three changes if the future presented in the previous section is to be achievable.

Provision of people-centered administrative services tailored to each individual

Government will need to provide individualized, optimized, people-centered administrative services to people of all kinds. This will mean not only considering diversity and ensuring that no one is left behind but also proactively providing the administrative services demanded by each individual in accordance with his or her own circumstances and changing life stage. Also required will be flexibility in various situations, not only during normal times but also in emergencies, and not only in the real world but also in the virtual world.

System coordination across national ministries/agencies and local governments, and the establishment of infrastructure for data distribution and utilization

To provide individualized, people-centered services, it will be necessary to eliminate cumbersome procedures and develop operations and systems that allow people to receive administrative services using the same procedures anywhere. To this end, systems must be coordinated among national ministries/agencies and local governments. In addition, providing optimal services to each individual will require more than just linking data. It will necessitate the building of AI-based analysis and prediction infrastructure to make maximum use of that data.

Privacy considerations will also be essential for achieving these goals. Using something already being considered in some advanced countries in Europe and elsewhere as an example, countries and enterprises will be required to provide access based on personal authentication, and individuals will be able to demand the verification of certain personal attributes when they desire it. Moreover, traceability must be ensured in ways that include being able to check the access history of data and certificates.

Implementation of transparent, data-based policymaking and monitoring

Realizing people-centered living will require change not only with regard to administrative services but also to how policy decisions are made. As people's values change and their awareness of sustainability grows in the ways explored in the previous section, government will need to set policies and monitor the results of those policies based on that change in awareness. Examples of this could include enhancing the nation's economic security by accurately ascertaining natural disaster and geopolitical risks with AI and then engaging in policymaking based on those risks. To this end, it will be necessary to build a framework for making and disclosing policy decisions transparently based on data while presenting options, as well as systems for this purpose.

Such a transformation in the nature of administrative services and government activities will not only improve people’s well-being but also stabilize society as a whole. Raising social circumstances with wealth redistribution—through, for example, tax allocation and benefit payments, which are important elements of policymaking—crime caused by economic disparities will diminish. Not only that, but by putting in place mechanisms that help high-income earners to fulfill their social responsibilities, society will achieve greater stability, and more people will be able to contribute to society.

II. An ideal social vision (mainly financial institutions)

We believe enterprises will need to make the following five changes if the future presented in the previous section is to be achievable.

Expanded access to wealth management services

If financial institutions are going to help raise people's well-being, they must make wealth management more affordable and easier for the "mass segment" of the population that earns standard incomes. Wealth management has traditionally been a service confined to certain wealthy individuals and inaccessible to most people. However, if financial institutions were to facilitate access to asset management by utilizing FinTech (including WealthTech), the mass segment would also enjoy its benefits. Specific examples here could include offering smaller and more diversified investment products, providing efficient asset management advice using AI and other technologies, and providing asset-building advice tailored to each individual's life stage.

At the same time, financial institutions must further streamline their business processes by fully applying digital technologies in order to efficiently provide services to a larger number of customers.

Provision of asset-building services utilizing various types of data in line with diversifying values, and contributions as financial institutions

Like government, financial institutions must

also undergo transformations in response to people's changing values. As we saw in Section 1, people will place importance on new values, such as consideration for the environment and social contribution, in addition to their traditional emphasis on economic values. As this trend progresses, financial assets may take new forms that are outside traditional financial assets. In light of this, it is probable that mechanisms to formulate fair evaluations of consumers and enterprises in terms of their contributions to social and regional issues as well as mechanisms for distributing them as tokens will be required. Furthermore, some tokens, such as carbon currencies, will be incorporated into the financial system as new assets along with crypto assets and become subjects of investment. And as they do, financial institutions will develop investment products that meet the needs of a wider range of people and offer various forms of asset management.

Additionally, people will demand that financial institutions act like a company. Financial institutions will need to transparently demonstrate to people that they are contributing to the effort to realize a sustainable society by presenting in visible form the environmental costs of their business activities, including the entire lifecycle of their products and services from development to disposal.

Provision of financial services by enterprises more familiar to people with support from financial institutions

The way in which financial services are provided to people will change, as business enterprises will adopt a business model whereby they provide financial services as a form of "added value" to their core business services. As enterprises respond to the diversification of their customers and values by providing business services more closely aligned with people's life events and lifestyles, some will strive to enhance their customers' experiences by offering financial services as well. When they do, financial institutions will provide them with secure and reliable financial functions as APIs and service applications that make full use of the technologies and know-how they have cultivated. Thus, they will have to not only build cooperation with business cooperations but also reexamine their own businesses and the added value they provide.

Provision of financial services that include the virtual world

Increasing movement between the real and virtual worlds will require the provision of financial services in the virtual world as well. Financial institutions will utilize such technologies as blockchain, DeFi, and encryption of financial data to encourage the spread of various financial services in the virtual world alongside those of the real world.

Closer cooperation with government

Financial institutions will be required to enrich people's lives from a private-sector perspective. To do this, they will need to expand their customer base by diversifying their asset management, provide services aligned with people's life stages and lifestyles in partnership with business enterprises, and support people's efforts to build the society they desire. Achieving these aims will likely require financial institutions to work with government to, for example, establish mechanisms for exchanging with government only that information that is necessary in accordance with people's wishes.



Chapter 3:

A Look at NEC's Accomplishments

NEC assists governments and private enterprises by combining the business assets and technologies it has come to possess over the years. In this chapter, we present NEC's global achievements.

Digital Government

NEC develops administrative systems and provides solutions in Japan and around the world, including Denmark, a leading country in digital government, other countries of Europe, and other regions (North America, Latin America, the Middle East, Africa, China/East Asia, and APAC). Here we provide a selected overview of our services and achievements.

I. For central and local governments and auxiliary organizations

- ▶ We provide taxation and social security benefits-related solutions in such areas as tax collection and social welfare as well as permit and license management solutions to central and local governments in the United Kingdom. We also provide a public housing management platform to 200 companies (2.2 million units) of auxiliary organizations in the U.K., Australia, and Canada, and have the No. 2 market share in the U.K. (NECSWS-UK)
- ▶ In Denmark, we provide IT services to government ministries and agencies, the central bank, NGOs, universities, and other bodies. We also provide ERP cloud services supporting back-office operations and educational cloud services for learning content and student-teacher communication to local governments and related sectors, such as schools and commercial training centers. We have captured over 50% of Denmark's local government market. Moreover, we provide software for content/data management and analytics to the government, central bank, utility companies, and others. We hold a 40% share of the Danish utility data management software market and a 30% share of the government content management software market. (KMD)

II. For police

- ▶ We have a long 50-year track record of doing business with U.K. police forces. We develop the CONNECT crime case management platform for the national police forces and individual systems (fine collection, license plate recognition, etc.) for the Home Office. We hold a 50% share of the crime case management platform market in the U.K. (NECSWS-UK)

III. For health care business

- We provide software and related IT services for the digitization of business operations to the National Health Service, the U.K.'s government health service agency. We add value to accumulated data and provide data analysis services to medical device manufacturers. Specifically, we are promoting healthcare-related digitalization by providing a clinical data storage platform for implants, screening management platforms for diabetes testing and newborn hearing screening, a platform for digitalizing referral forms sent from family doctors to specialist hospitals, and other services. (NECSWS-UK)
- Denmark, where all hospitals are under public management, we provide a health-care and social welfare cloud service that manages hospital operations and nursing/home care for local governments that manage hospitals. We provide an integrated management system for nursing/home care-related services to 48 local governments and 50 medical institutions in Denmark. These achievements have led to our capturing a 50% share in Denmark. (KMD)

Digital Finance

In the area of digital finance, NEC does more than just promote system integration for financial institutions, which traditionally has been the company's main business. It also engages in the global development of core platforms for financial institutions by utilizing products of the NEC Group companies Avaloq and Banqsoft. Below is a selected overview of our services and achievements.

I. For wealth management business (Avaloq)

- **Core:** We support reliable middle- and back-office operations with fast and reliable processing by providing a core banking platform for people working in banking and securities. The platform handles a wide range of asset management products, covering everything from crypto assets to commodities. We are particularly proud of our No. 1 market share in Europe and the No. 2 market share in APAC for core banking systems for wealth management.

- **Engagement:** We provide digital communications linked to various chat applications to help salespersons and advisors enhance their daily engagement with clients. We also offer self-service functions for clients through web/mobile banking and other digital channels.
- **Insight:** We provide a platform for wealth management data analysis and business intelligence using AI and machine learning. It rapidly delivers news analyses, virtual assistants, portfolio recommenders, and other solutions for each use case.
- **Wealth:** For salespersons and advisors, we provide digital solutions that integrate front-office operations by centralizing asset management advisory, discretionary investment portfolio management, and client service desk functions. We also provide an API for self-trading by clients.

II. For financial institutions (including those in leasing) (KMD/Banqsoft)

- We provide software for digital banking, asset finance and receivables management to banks and leasing companies in Norway, Denmark, and other locations. These software products carry out a series of operations undertaken by customers. We have an 11% share of Northern Europe's finance-related software market.

Column:
**Overseas Group Companies
Involved in DGDF**



<https://www.necsws.com/>

NEC Software Solutions UK is a U.K.-based public services software company that was founded in 1969. It develops solution platforms for central and local government and police in the U.K., as well as public housing management platforms in the U.K. and elsewhere. It is contributing to government digitalization through the provision of software-based SaaS in the digital government domain.



<https://www.kmd.net/>

KMD is a Denmark-based public service software company that was founded in 1972. It has supported Danish local governments for more than 50 years. With more than 300 IT solutions, it provides software services for local governments and the central government and for financial institutions.*

Acquired by KMD in 2015, Banqsoft is a Norway-based company that provides software for digital banking, asset finance, and bond management to banks, leasing companies, and other financial institutions.



<https://www.avalooq.com/>

Avaloq is a Switzerland-based provider of financial software and services to private banks and wealth managers that was founded in 1985. It maintains a customer base of 80 global financial institution groups and 160 financial institutions in 35 countries. It supports its customers with a wide range of business models, ranging from software license sales to SaaS and BPaaS.*

*As of March 2023

NEC's Key Technologies

At NEC, we offer a diverse range of services to meet our customers' needs. Within those services are key elemental technologies that are important in the DGDF domain. The technologies presented below play a role in the building of infrastructure that supports digital government and digital finance, including eKYC, national ID and benefit payments, newborn vaccination and management, and identity verification required for seamless boarding procedures at airports. NEC also has a strong track record in providing DX support to libraries and managed services to tax bureaus around the world.

Biometrics

- ▶ We possess world-leading technologies in the major biometric authentication areas of facial, iris, and fingerprint recognition. For more than 40 years, we have devoted ourselves to developing biometric authentication technologies. This effort has allowed us to deliver more than 1,000 systems to over 70 countries and regions. NEC was ranked No. 1 in the world in benchmark tests conducted by NIST,* and was similarly rated No. 1 in the world in a survey by a research firm that examined business from the standpoints of growth and innovation.

Digital ID

- ▶ We offer a digital ID platform that integrates biometric authentication and ID linkage. By linking IDs assigned to each service provider to biometric information and providing a platform that seamlessly connects various solutions, we are striving to bring about a society in which people can receive services securely and easily.

AI

- ▶ Utilizing "*NEC the WISE*," a set of cutting-edge AI technologies that maximize human intellectual and creative activities, we strive to resolve the challenges our customers face at the visualization, analysis, and response phases. In the area of analysis, in particular, our technologies in heterogeneous learning, invariant analysis, and automated predictive analysis will make it possible to make highly accurate forecasts with reduced manpower.
- ▶ At the same time, in our effort to resolve the challenges customers face, we aim to provide "*trustworthy AI*" that takes account of human rights, including privacy, and quality, including AI that can explain the basis of its prediction results (= "*white box AI*"). "*Trustworthy AI*" will facilitate customers' use of "*responsible AI*."

Blockchain

- NEC offers a blockchain that applies hardware security technology (Intel® SGX) for secure and high-speed consensus building. NEC Blockchain is based on the open-source Hyperledger Fabric. It provides scalability and security for high performance and large-scale environments by incorporating (as a plug-in) a high-speed consensus-building function with a synthesis algorithm with transaction performance and attack preparedness (Byzantine fault tolerance) in large-scale environments. It can be used in the enterprise domain.

Personal data distribution

- We can safely distribute personal data held by individual businesses in a cross-market manner in accordance with approval policies governing the distribution of end-user data. In addition to improving the functionality of existing services, we support the creation of new value-added service businesses through new data utilization and improve quality of life by providing new services to users and optimizing existing services.

Cybersecurity

- At NEC, we believe that in order to respond to new cyber risks, *"create properly"* and *"maintain normalcy"* are as important as the traditional *"protect against attacks."* Based on the concept of *"Security By Design,"* which involves ensuring security from the design stage through to the construction and operation stages, we provide systems that consider and deliver security throughout the entire service life-cycle, from planning and design to development and operation.

**The U.S. National Institute of Standards and Technology (NIST). A NIST appraisal does not constitute an endorsement by the U.S. government of any particular system, product, service, or company.*

Column:

Digital ID/DX-related Achievements on the Global Stage

I. Providing a biometric system to India's Aadhaar program

The Unique Identification Authority of India (UIDAI) uses a registered person's name, address, and multimodal biometric information to provide a unique ID that allows equal access to public and financial services that are essential in daily life. UIDAI's Aadhaar program uses NEC's three biometric identifiers (fingerprint, face, and iris) to prevent double registration and duplicate issuance of IDs to the same person, prevent identity theft, and simplify procedures. The number of registered program users reached 1.365 billion in March 2023.

III. DX support for Singapore's libraries

We support the digital transformation of libraries by providing the National Library Board of Singapore with automated systems that streamline library operations. Among the specific ways we do this are by providing Auto Sorter (a system that automatically sorts 3,000 books and other items by category per day), Mobile Book Drop (a robot that automatically moves returned items to the sorting room when it becomes full), and Shelf-reading Robot (a system that reads the books on shelves and notifies staff if any are stored in incorrect categories).

II. Providing a biometric system to Star Alliance to facilitate a seamless passenger experience

We are working with the Star Alliance airline alliance to develop a biometric identification platform (Star Biometrics Hub) to ensure seamless passenger boarding procedures and make for a better passenger experience. The system lets passengers register their facial image and passport information with their airline's mobile app in advance and then check in using that app. From there, they can complete baggage check-in, enter lounges, and pass through boarding gates using only facial recognition to confirm their identity.

IV. Supporting the provision of managed services by the Australian Taxation Office


NEC Australia, a local NEC subsidiary, and Optus, a major telecom operator, are in a partnership to provide Managed Network Services (MNS) to the Australian Taxation Office (ATO). As a strategic partner providing long-term support for Optus' services (14 years since 2009), NEC Australia collaborates with Optus on three of the six MNS services Optus provides: Network Manager, Contact Centre, and Unified Communication.

V. Demonstrating the usefulness of a newborn vaccination management system using biometrics in Kenya

In collaboration with Kenya Medical Research Institute and Nagasaki University Institute of Tropical Medicine, we developed a system that combines infant fingerprint identification and parent voice recognition to verify newborns' identities and to reliably manage vaccination histories and plans, and we conducted a demonstration test of the system at a Kenyan hospital. For newborn identification, instead of using conventional

fingerprint authentication technology, we developed a technology that extracts only the pattern information from fingerprint images and then identifies the individual by combining the pattern information of multiple fingers. This was the first time in the world that biometrics were used to identify newborns, including those just born, at the time of vaccination at a hospital.¹

¹: NEC data (As of February 2023)

The background of the page is a dark, atmospheric image of a city at night. The city lights are visible through a complex, glowing network of thin lines and nodes, resembling a digital or data network. The colors are primarily deep blues and purples, with warm orange and yellow lights from the city buildings and streets. The overall effect is one of a high-tech, interconnected urban environment.

Chapter 4:

NEC's DGDF Vision and Future Contributions

NEC's Concept of DGDF and Vision

"A well-being society where no one is left behind"

As Chapter 3 outlined, NEC has been supporting governments and private enterprises by focusing on the building of administrative systems for national and local governments in Digital Government, and the building of systems for financial institutions—mainly in the areas of core banking and wealth management—in Digital Finance.

However, as society moves toward the 2030s, we believe we should not view these domains individually as in the past. Instead, we envision a world in which these two domains are fused when viewed from the public's perspective, and we believe we should support our customers by considering the kinds of services that should be provided by government and enterprises to realize people's happiness. Based on this concept, our company, NEC, intends to play a role in actualizing the Vision of a *"well-being society where no one is left behind"* by positioning digital government and digital finance as a single business domain (DGDF).

In fact, as Chapter 2 described, a world of connected government and finance is emerging in some digitally advanced countries such as Denmark. As this trend picks up momentum into the 2030s, people will be able to use government and financial services without distinction based on their digital IDs. Moreover, with the integration of financial services into various government and private services, it will become possible to resolve problems people face and, simultaneously, to realize affluent lifestyles for people holding diverse values.

This world will not exist only in the real world. By the 2030s, services based on connected data and infrastructure will expand into—and be available in—the metaverse and other corners of the virtual world. And as the metaverse gains a greater presence as a new living space for people, services receivable in the real world will become similarly receivable everywhere in the virtual world, with safety and security guaranteed, by everyone, regardless of their region or country. NEC hopes to realize its DGDF Vision through support for government and enterprises in both the real and virtual worlds.

We believe translating the Vision into reality will require forming an ecosystem with various stakeholders. The NEC Group already provides a broad range of services in countries like Denmark and Switzerland, where digital government and digital finance are moving forward. Specifically, as Chapter 3 noted, KMD in Denmark, NECSWS-UK in the U.K., and Avaloq in Switzerland are NEC Group companies that support local customers on a global scale. We will engage in co-creation through partnerships with various stakeholders outside the NEC Group, while also taking full advantage of the NEC Group's businesses and technologies.

Challenges in Realizing the DGDF Vision and NEC's Contribution Areas

We believe that in striving to fulfill the DGDF Vision of *“a well-being society where no one is left behind,”* we must first work to realize social values and solve social issues in three areas

-
- I. Sustainable society and response to climate change
 - II. Diversification of society/values
 - III. Diversification and broader access to wealth management services
-

As we saw in Chapter 1, problems attributable to climate change are becoming more serious, and in an external environment where social and economic frameworks are undergoing great change (sustainable society and response to climate change), individuals will place just as much importance on such social values as sustainability and mutual aid as they do on economic values and consumption activity (diversification of society/values). In addition, realizing well-being will require more than just approaches from government, such as wealth redistribution through the provision of benefits. Approaches from the private sector—the diversification of wealth management services and expanded access to them, for example—will also be indispensable.

Therefore, NEC will endeavor to realize the social values and solve the social issues mentioned above by establishing six *“contribution areas,”* providing services to governments and enterprises, and proposing and participating in the development of mechanisms and regulations.

Contribution Area 1: Cooperation with Government, Digitalization Support

Relevant social values/issues:
“Sustainable society and response to climate change”
“Diversification of society/values”

We will utilize digital technology to support the provision of administrative services and administrative activities that meet residents' needs. Amid great changes in society and the living environment, we will provide digital service infrastructure that supports the provision of administrative services and government policymaking that leave no one behind for people possessing diverse values, while also identifying various needs and supporting administrative decision-making based on predictions.

**Contribution Area 2:
Achieving Sustainability with
Digital Technology**

Relevant social values/issues:
*"Sustainable society and response to
climate change"*
"Diversification of society/values"

We will support the achievement of carbon neutrality in government activities and support the transition to a sustainable society and response to climate change by applying digital technology. Responding not only to demand for environmental responsiveness but also to changing values and growing awareness of sustainability among the public, we will bring visibility to the environmental impact of government activities and the effects of environmental measures and work to spread environmental values.

**Contribution Area 3:
Expanding the Range of Provid-
ed Wealth Management Services**

Relevant social values/issues:
*"Diversification and broader access to
wealth management services"*

We will contribute to the provision of asset management and asset building services to a wide range of clients that includes not just the wealthy, who are traditionally targeted by such services, but also the mass segment of the population that earns standard incomes. While maximizing the use of FinTech (including WealthTech), we will diversify the types of investment products available by making new assets eligible for investment and, at the same time, make traditional investment products smaller and more accessible to the population's mass segment (=ordinary income earners). We will also expand our support to include both financial companies and non-financial companies.

**Contribution Area 4:
Digital Life Service Support**

Relevant social values/issues:
"Diversification of society/values"
*"Diversification and broader access to
wealth management services"*

We will integrate administrative services that *"leave no one behind"* (Contribution Area 1) and wealth management (Contribution Area 3) to provide people-centered administrative and financial services that create more affluent lives. While sharing information between the public and private sectors as necessary, we will provide services that lead to the happiness of each individual at various points of contact and in various forms for people possessing diverse values.

Contribution Area 5:
Global Intelligence Support

Relevant social values/issues:
"Sustainable society and response to climate change"

We will contribute to economic security analysis and early identification of global risks. In the face of increasing damage to social systems brought by climate change and "de-globalization" in some regions and intensifying competition over food and resources, we will provide an analytical infrastructure to support the resolution of issues related to national security from the standpoint of DGDF.

Contribution Area 6:
Building a Trusted Virtual World and Economic Sphere

Relevant social values/issues:
"Diversification of society/values"

We provide government and financial institutions with an environment for building a trusted virtual world that can be used with peace of mind. As lifestyles involving coming and going between the real and virtual worlds become more widespread and the nature of society changes, we will realize a seamless linkage between government and private enterprises and provide administrative and financial functions that allow people to receive services in the virtual world that are comparable to those in the real world.

The Key Concepts Behind NEC's Contributions

NEC sees *"interconnection"* and *"orchestration"* as two key concepts in providing services in the six Contribution Areas. We will support governments and enterprises by developing these key concepts.

Key Concept 1:

Interconnection

Looking first at digital government, to create a world where *"no one is left behind"* and provide support in line with people's lives, it is important that individual organizations (central government, local government, etc.) and the infrastructure, assets, and data they possess be interconnected rather than closed off.

The workload of each local government entity and central government entity will be reduced as the infrastructure and data of these entities become linked and their systems become standardized. Specifically, the standardization of local/central government systems should make system implementation easier and lower implementation costs. Additionally, when the employees of local government entities, etc., are able to use the same system no matter where they are transferred, the burden on them will be alleviated, and operations will become more efficient. We believe such changes in government will ultimately lead to reductions in the time and economic burdens placed on taxpayers.

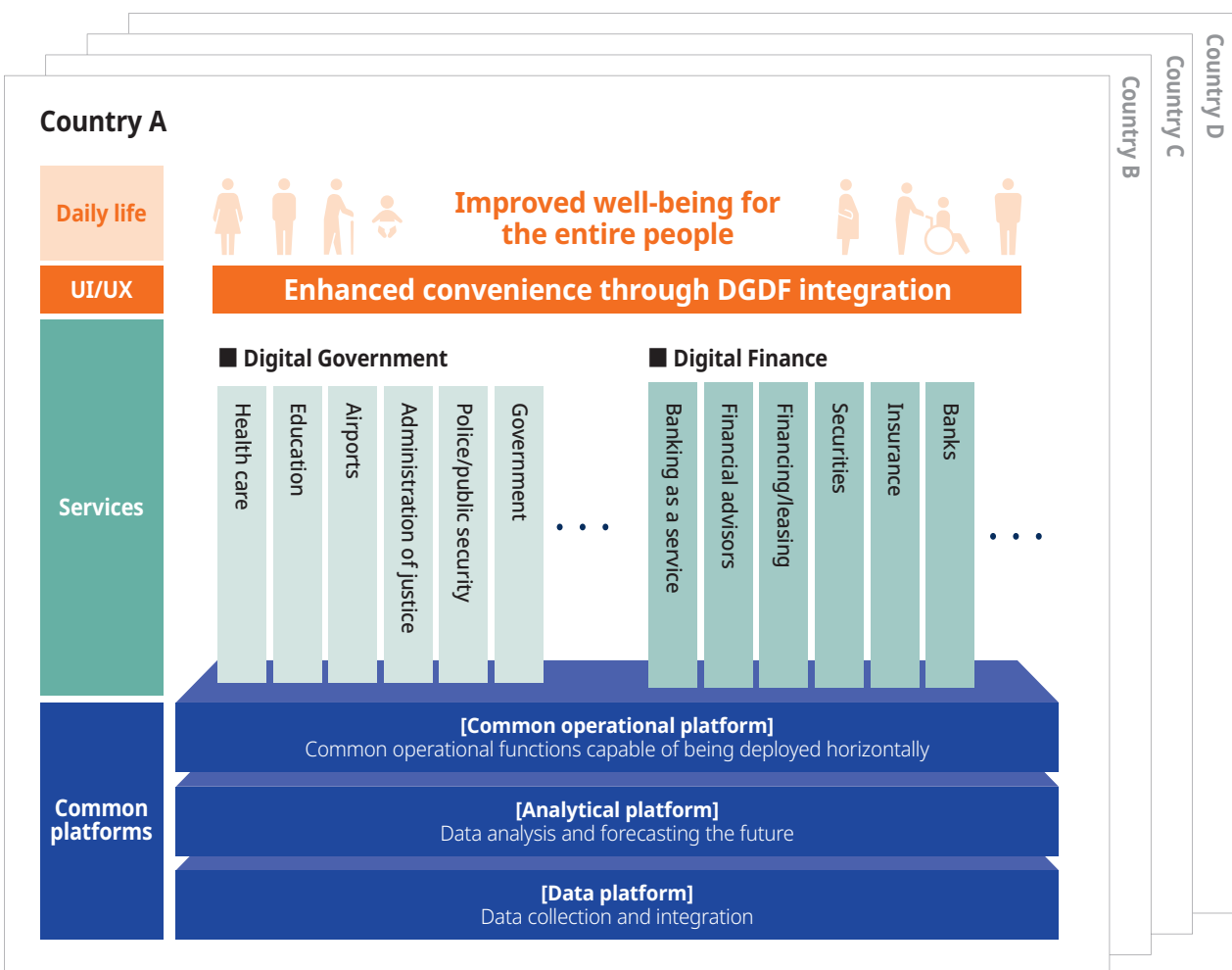
Of course, standardized services will not be the only services provided. A mechanism will be established under the common system to also provide services tailored to the characteristics of each region and its residents. This will allow each local government to provide services that serve its residents by being matched to the actual conditions of specific regions.

In addition, it will become possible to provide appropriate services with appropriate timing according to individual attributes and lifestyles—for example, by providing necessary information based on predictions derived from data on various life events to people through push-type notifications—which will enhance convenience for the people who use those services. Such changes will not be limited to services, as they will become evident in policies as well. It will become possible to plan policies on rational grounds built on various forms of accumulated data and present them to the public transparently.

At NEC, we possess software and services for administrative services, social security benefits, tax collection, security, healthcare, education, public housing, and other areas in our group companies, NECSWS-UK and KMD. In addition, we utilize digital ID, biometrics, AI, and blockchain technology to our advantage as NEC elemental technologies.

Leveraging these assets, we will link administrative infrastructure and services over a wider range to interconnect departments within local governments, interconnect neighboring local governments, and interconnect entities at the nationwide and central government levels.

Partial standardization is underway in individual countries



Key Concept 2: Orchestration

In the area of digital finance, we wish to go beyond traditional wealth management for the wealthy to realize a world in which we *“create affluent lives for a diverse range of people”* by staying close to them and supporting their lifestyles.

This will require making full use of FinTech (including WealthTech) and other digital technologies to expand access to asset management services—which have traditionally been the domain of the wealthy alone—so that a broader segment of the population can enjoy the benefits of capital and economic growth. In addition, as we described in Chapter 1, “III. The arrival of a ‘sustainable society’ and diversifying values,” we anticipate that a variety of financial assets will emerge as diverse values that are not limited to economic values are born. Financial institutions will become capable of providing appropriate services, including their traditional functions and assets for investment, in the virtual world as well as in the real world.

KMD and Avaloq—members of the NEC Group—possess digital banking and wealth management platforms for enterprises. In addition, we apply eKYC, digital ID, blockchain technology, and other NEC elemental

technologies as strong points. By expanding targeted customers, customer contact points, and assets for investment based on these resources, we will provide services and technology to a wide range of businesses—including not only financial institutions but also non-financial institutions—so that they can provide digital finance services along various lifestyle directions in response to people’s diversifying values.

Although we presented interconnection and orchestration as key concepts within the separate domains of digital government and digital finance, we believe NEC can contribute to both government and the private sector in the DGDF domain, where digital government and digital finance are not only separate but also fused. Based on this idea, we will realize *“a well-being society where no one is left behind”* by connecting a wide range of platforms for the public and private sectors with a focus on government (interconnection); expanding the values, products, and services provided based on changes in people’s values (orchestration); and further integrating these two concepts from the public’s perspective.

		Until now	From now on																	
Values		<ul style="list-style-type: none"> • Pursuit of economic wealth in a capitalist world • A single set of values 	<ul style="list-style-type: none"> • Not only achievement of economic wealth but also contribution to others/society and pursuit of self-fulfillment • Diverse values among individuals 																	
	Extent of role	<ul style="list-style-type: none"> • Expansion of assets, particularly among Wealthy individuals 	<ul style="list-style-type: none"> • Democratize access to wealth management 																	
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Expanded orchestration

Conclusion

The world will undergo great transformation in the 2030s due to changes in the external environment, such as climate change and ebbing globalization, as well as the development and diffusion of the virtual world, AI, and other technologies. The lives of people in various countries and regions will also change dramatically. In preparing this white paper, we began by considering megatrends and how the needs and wants of people living within them will change. We then summarized our ideal social vision for the 2030s and NEC's role in achieving it.

We reassessed Digital Government (DG), which supports the digitization of public administration, and Digital Finance (DF), which supports the digitization of financial institutions, from the standpoint of the people who live in society to present a single domain called DGDF. We then established the realization of *"a well-being society where no one is left behind"* as our Vision for this domain.

At NEC, we will strive to bring about the future we envisioned here while *"seizing the future"* with our stakeholders and fine-tuning our view of the ideal society.

