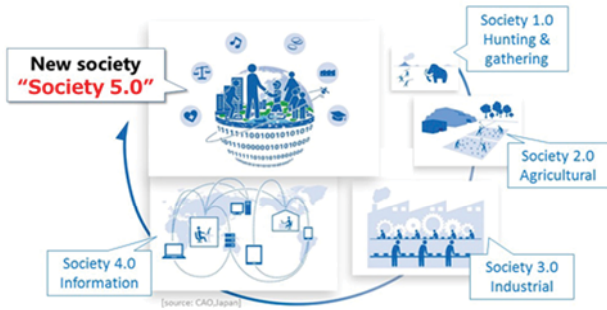# Society 5.0
Advanced Convergence Between Cyberspace and Physical Space

Tawhidur Rahman
PCSS EnCE CCISO ACE, CFIP SCCISP, CCTA

What is Society 5.0?

One definition: "A human-centered society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space."

Society 5.0 was proposed in the 5th Science and Technology Basic Plan as a future society that Japan should aspire to. It follows the hunting society (Society 1.0), agricultural society (Society 2.0), industrial society (Society 3.0), and information society (Society 4.0).
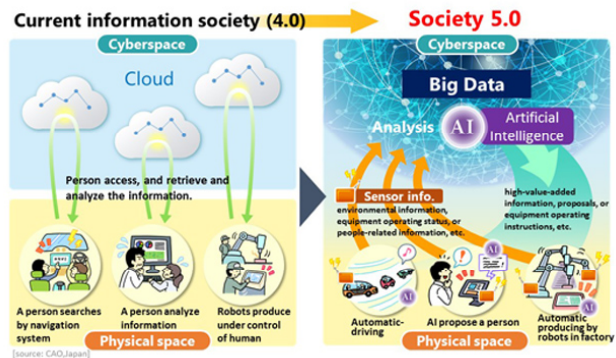
Achieving Society 5.0

In the information society (Society 4.0), cross-sectional sharing of knowledge and information was not enough, and cooperation was difficult.Because there is a limit to what people can do, the task of finding the necessary information from overflowing information and analyzing it was a burden, and the labor and scope of action were restricted due to age and varying degrees of ability. Also, due to various restrictions on issues such as a decreasing birthrate and aging population and local depopulation, it was difficult to respond adequately.

Social reform (innovation) in Society 5.0 will achieve a forward-looking society that breaks down the existing sense of stagnation, a society whose members have mutual respect for each other, transcending the generations, and a society in which each and every person can lead an active and enjoyable life.

How Society 5.0 works

Society 5.0 achieves a high degree of convergence between cyberspace (virtual space) and physical space (real space). In the past information society (Society 4.0), people would access a cloud service (databases) in cyberspace via the Internet and search for, retrieve, and analyze information or data.
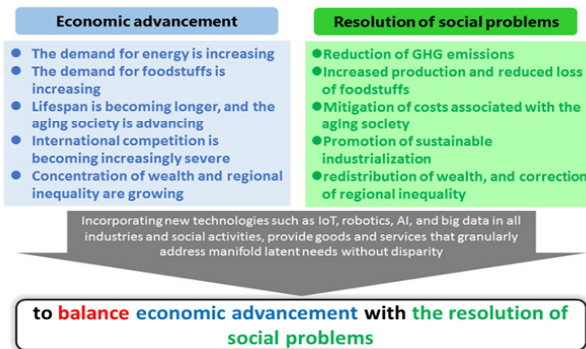

In Society 5.0, a huge amount of information from sensors in physical space is accumulated in cyberspace. In cyberspace, this big data is analyzed by artificial intelligence (AI), and the analysis results are fed back to humans in physical space in various forms.In the past information society, the common practice was to collect information via the network and have it analyzed by humans. In Society 5.0, however, people, things, and systems are all connected in cyberspace and optimal results obtained by AI exceeding the capabilities of humans are fed back to physical space. This process brings new value to industry and society in ways not previously possible.

Society 5.0 Balances Economic Development and Solves Social Issues

It can be said that the environment surrounding Japan and the world is in an era of drastic change. As the economy grows, life is becoming prosperous and convenient, the demand for energy and foodstuffs is increasing, lifespan

is becoming longer, and the aging society is advancing. In addition, the globalization of the economy is progressing, international competition is becoming increasingly severe, and problems such as the concentration of wealth and regional inequality are growing. Social problems that must be solved in opposition (as a tradeoff) to such economic development have become increasingly complex. Here, a variety of measures have become necessary such as the reduction of greenhouse gas (GHG) emissions, increased production and reduced loss of foodstuffs, mitigation of costs associated with the aging society, support of sustainable industrialization, redistribution of wealth, and correction of regional inequality, but achieving both economic development and solutions to social problems at the same time has proven to be difficult in the present social system.

In the face of such major changes in the world, new technologies such as IoT, robotics, AI, and big data, all of which can affect the course of a society, are continuing to progress. Japan seeks to make Society 5.0 a reality as a new society that incorporates these new technologies in all industries and social activities and achieves both economic development and solutions to social problems in parallel.

Economic Development and Solutions to Social Problems in Society 5.0

In Society 5.0, new value created through innovation will eliminate regional, age, gender, and language gaps and enable the provision of products and services finely tailored to diverse individual needs and latent needs. In this way, it will be possible to achieve a society that can both promote economic development and find solutions to social problems.

Achieving such a society, however, will not be without its difficulties, and Japan intends to face them head-on with the aim of being the first in the world as a country facing challenging issues to present a model future society.

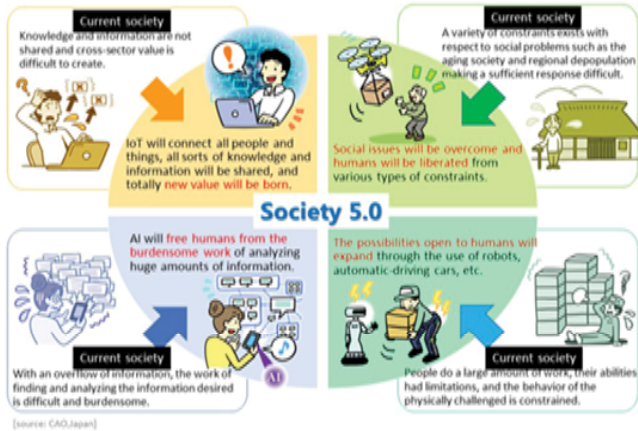## The challenges set by Industry 4.0 for companies

The high level of competition in the current market forces the companies to overcome new challenges regarding the best prices/costs, quality and delivery time. Industry must be the ability to respond to innovation and bring new products to market within a short time due to current competition around the world. In order to guarantee process competitiveness along the value chain, it is mandatory to design productive, efficient and flexible methods. The main aspect to promote the fast adaptation to changes in production is the connexion between processes, products and equipment with artificial intelligence.

Companies will include storage systems, machines and productions plants from Cyber-Physical Systems (CPS) in a global network. CPS is considered as a high-tech technology to handling systems where could integrate computer skills and physical resources. Furthermore, CPS integration with production, logistics and services in current industrial practices will promote evolution in the implementation of Industry 4.0 in factories with significant economic impact. The life cycle of a mutable product could be managed with a dynamic production and delivery by a challenge of digitization and automation of production processes and promotes a creation of new opportunities for industries. The continuous growth and evolution in the industry has promoted the implementation of high-tech methodologies. According to [18], Industry must learn first to walk before it could dream of flying.

Society 5.0 Will Bring About a Human-centered Society

In society up to now, a priority has generally been placed on social, economic, and organizational systems with the result that gaps have arisen in products and services that individuals receive based on individual abilities and other reasons. In contrast, Society 5.0 achieves advanced convergence between cyberspace and physical space, enabling AI-based on big data and robots to perform or support as an agent the work and adjustments that humans have done up to now. This frees humans from everyday cumbersome work and tasks that they are not particularly good at, and through the creation of new value, it enables the provision of only those products and services that are needed to the people that need them at the time they are needed, thereby optimizing the entire social and organizational system. This is a society centered on each and every person and not a future controlled and monitored by AI and robots.

Achieving Society 5.0 with these attributes would enable not just Japan but the world as well to realize economic development while solving key social problems. It would also contribute to meeting the Sustainable Development Goals (SDGs) established by the United Nations.

Japan aims to become the first country in the world to achieve a human-centered society (Society 5.0) in which anyone can enjoy a high quality of life full of vigor. It intends to accomplish this by incorporating advanced technologies in diverse industries and social activities and fostering innovation to create new value.

CONCLUSION

The fourth industrial revolution or Industry 4.0 emerged in 2011 with new technological developments and digitalization of full supply chain and the network connection between systems, objects and people.

Reducing costs, energy, improving production process efficiency, responsiveness to customer needs and product quality are all promote by the evolution of production systems with the latest technology and tools developed by Industry 4.0.Industrial companies go through digital transformation in order to join with the constant evolution and to react to the challenges imposed by society.

Nowadays, production industries are undergoing a huge digital transformation so that they can keep up with the constant evolution and respond to the challenges imposed by society itself. There is a growing network of products, machines and people with the massive use of the internet. The new technologies of Industry 4.0 could be use in benefit of humanity. Recently Japan encountered with the ageing of its population and felt the need to create a system to improve the quality life of society and adopt immediate actions to promote advantages with this high technology. The use of technology to benefit the society has promoted a new industrial revolution called Society 5.0.Society 5.0 focuses on application of technology in constant development and innovation stimulated for Industry 4.0 to solve mankind problems such as population ageing, natural disasters, social inequality, security and improving people's quality of life. The integration of technology with society will be crucial as it is relevant to use drone deliveries, artificial intelligence, big data, autonomous trucks and robotics in the near future for the benefit of humanity.
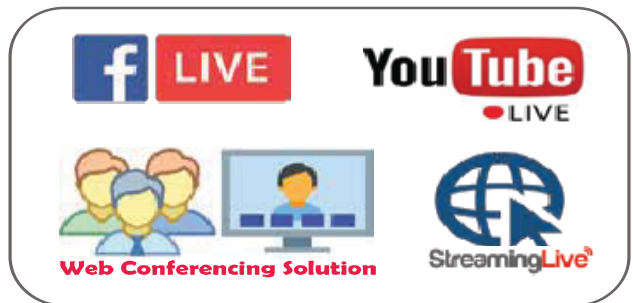
Ref:

https://society6.com/
https://www8.cao.go.jp/cstp/english/society5_0/index.html
https://www.i-scoop.eu/industry-4-0/society-5-0/
https://techcrunch.com/2019/02/02/japans-society-5-0-initiative-is-a-roadmap-for-todays-entrepreneurs/
https://think.taylorandfrancis.com/society5-0/ CJ

Feedback : pialfg@gmail.com