

Conversations for tomorrow

Quarterly review
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**Intelligent Industry:
The Next Era of
Transformation**

#GetTheFutureYouWant



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A JOURNEY TO INTELLIGENT MANUFACTURING

HITACHI
Inspire the Next

Dr. Suzuki received his PhD from the University of Tokyo and began his career in research in digital-image signal processing and embedded software systems, later leading research projects in Japan and the Americas. He is a

member of the Institute of Electronics, Information and Communication Engineers (IEICE), the Institute of Image Information and Television Engineers, and a Senior member of the Institute of Electrical and Electronic Engineers (IEEE).

The Capgemini Research Institute spoke to Dr. Suzuki about Hitachi's journey to adopting intelligent operations, using emerging technologies and its determination to use these technologies for social good.

IT-OT CONVERGENCE

What are the best practices that you want to share with manufacturing organizations with regards to integrating cutting-edge technologies into production processes?

— At Hitachi, we focus on our strengths: information technology (IT), operational technology (OT), and product. Omika Works, a factory of ours in Japan, manufactures information-control systems for societal infrastructure such as railway systems, electricity grids, and water-supply and sewerage networks. In 2020, this factory was recognized as



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Omika Works [one of our factories recognized by the WEF] uses the internet of things (IoT) for designing and manufacturing hardware to reduce production lead times; a decentralized autonomous framework for the design and development of software, and digital twins for quality control.”

a “lighthouse factory” by the World Economic Forum (WEF) owing to its use of advanced digital technologies in all aspects of its operations. The factory uses the internet of things (IoT) for designing and manufacturing hardware to reduce production lead times; a decentralized autonomous framework for the design and development of software, and digital twins for quality control. We are now working on automation and unmanned operations using 5G, robotics, and artificial intelligence (AI). This integration of IT and OT systems helps us to find solutions to various issues and create new products. Our Lumada platform focuses on analyzing the combined data from our customers’ IT and OT assets and uses that to generate new insights that can help resolve significant business issues.

EMERGING TECHNOLOGIES AND THE WAY FORWARD

What do you think are the most promising use cases for 5G in the manufacturing sector? And what are Hitachi’s key focus areas for 5G initiatives and investments?

— We are now focused on the real-time control aspects of 5G, particularly telepresence and interactive remote collaboration between workers and machines. The advanced sensing technology of Augmented Reality (AR) glass and the low-latency video transmission enabled by 5G afford 360° high-resolution vision in real time, thereby allowing remote workers to monitor developing situations and take appropriate preventive or reactive measures. This will have applications not only in manufacturing but also in the fields of mobility and energy. We have established 5G networks for testing applications with our partners at our Kokubunji co-creation center in Japan and also at our Silicon Valley site in California.

A couple of years ago, Hitachi announced it was teaming up with the World Economic Forum and government organizations to accelerate blockchain deployment across supply chains. Could you talk about its progress and shed light on emerging areas for blockchain deployment in Hitachi?

— Hitachi R&D was an anchor partner for blockchain in supply chain from 2018 to 2020. The Forum and other large organizations came together to develop the “Redesigning Trust with Blockchain in the Supply Chain” project to guide supply-chain executives and decision makers in the deployment of blockchain technology. The group planned to co-design an open-source toolkit to highlight the requirements, technical and non-technical drivers of success, and risks involved. The blockchain deployment toolkit was released as a web tool in April 2020. It garnered quite a bit of interest from supply-chain and trade stakeholders, and we registered 24,000 access requests and 15,000 users in the first three months. The next step in this process is addressing the challenges of interoperability. This includes looking at accessibility for users at scale.

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At Hitachi, we are interested in the application of blockchain as an authentication platform, including biometric authentication. We have already released a contactless authentication solution that uses finger vein pattern for personal identification. Amalgamating this with a blockchain platform could be a good use case for self-sovereign identity (SSI), an approach that allows individuals to control their digital identities.

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REQUESTS FOR
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MAKING TECHNOLOGY WORK FOR SOCIETY

Could you tell us about Hitachi's Social Innovation Business program?



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— We want to create a sustainable and human-centric society built on three pillars: social, economic, and environmental values. For instance, in sectors such as mobility, we are developing ideas in fields as diverse as smart-city transportation, rail, fleet management, and Mobility-as-a-Service (MaaS). In manufacturing, we are harnessing IoT and big data to transform the structure of industry, making it both sustainable and more efficient.

Which initiatives has Hitachi taken to move towards carbon neutrality and how does it plan to extend these initiatives across the entire supply chain?

— Hitachi announced a target to make all its business sites (factories and offices) carbon neutral by end-2030, extending to the entire value chain by end-2050. Our facility at the Kokubunji site achieved carbon neutrality in 2021, and now runs entirely on renewable energy. A prototype was developed using smart meters to manage the use of renewable energy and blockchain technology to visualize how much renewable energy is needed by a building or production line. This can provide companies with assurance that 100% of the electricity that they are using is generated from renewable sources. We believe that data will be key to realizing a fully sustainable value chain, and are developing a digital integrated management service to collect the factory data, as well as the process, depot, goods, and equipment data, and a full simulation tool to achieve this optimization, from procurement up.

What is your advice to other organizations who want to adapt their technologies for social good?

— There are a number of initiatives that we are undertaking to help create a more sustainable society. Our CDP (Carbon Disclosure Project) score¹ for fiscal year 2020 for water security is “A,” the highest rating possible, and for climate change, it is “A-,” so we’re making progress. One thing we realized is that we, Hitachi, cannot make this happen by ourselves. That’s why we are working with numerous communities and consortiums to build innovation ecosystems. We partnered with the University of Tokyo to establish the Hitachi University of Tokyo Laboratory (H-UTokyo Lab) for collaborative creation to realize “Super Smart Society.” One area of collaboration is future energy systems. Our goal is to realize carbon neutrality by 2050 but this will not be easily achieved. So, we are working with our customers, both on the demand and supply sides, such as the energy companies, automotive manufacturers, and steel manufacturers, on how to achieve this carbon neutrality. We are discussing countermeasures and will advise government as to which initiatives they should look at, and what support is required for industry to realize this vision.

2050

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¹ The CDP (formerly the Carbon Disclosure Project) score is indicative of a company's environmental awareness, advanced sustainability governance, and leadership to address climate change.

OUTLOOK: A SMARTER FUTURE

How do you see smart manufacturing evolving?

— Current ways of working and production processes will change dramatically. The effective use of technology will mitigate location constraints on factory employees, allowing them to work remotely, and evolving robotics technology (i.e., collaborative robots or “cobots”) will enable advanced on-site work collaboration between people and the machines.

The digital transformation of industry, partly owing to the impact of COVID-19, will continue to accelerate globally and there will be more emphasis on collecting data in all industries. By looking at the data from manufacturing systems in real time and optimizing production using advanced technologies, industry will be able to achieve resilient operations.

We see the Japanese concept of *kizashi* – which broadly speaking, means recognizing and understanding the early signs of change – as essential to future success. As the focus shifts for manufacturing organizations from selling products to creating more value for customers, co-creation – sharing solutions and visions with customers and partners; designing business models; and realizing them through verification and simulation – will be crucial. And *kizashi* will be paramount to lead in the new age.



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