GLOBAL
INNOVATION
REPORT

A Platform for Dialogue, WEF

A Trip in Contemplation of Social Richness

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Creating a Shared Future in a Fractured World

Monday January 22, 2018

At a little after four in the afternoon, not long after leaving an overcast Zürich Airport, a sleeting rain began to fall just as we were entering a series of woods interspersed with Switzerland's distinctive gabled-roof wooden chalet-style homes. The rain progressively worsened, turning into a downpour as we approached a hillside highway with views of Lake Zürich to the left. This fierce drumbeat of raindrops turned out to be a foretaste of the debates to come.

Although the rain relented as we passed through the series of long tunnels that took us into the mountains, what awaited on the other side was one of the worst snowfalls and traffic jams to have struck the Swiss Alps in the last several decades. Two hours later, after passing through three checkpoints manned by Swiss soldiers carrying machine guns, we were still about 5 km short of Davos itself.

Davos covered by some of the heaviest snow in decades
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Welcoming party hosted by the WEF
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We finally arrived in Davos another two hours after that, at eight-thirty in the evening, just in time for a welcoming dinner party put on by the Indian government. The party was hosted by the Indian prime minister, Narendra Modi, who was due to give the keynote address the following day. Although Hiroaki Nakanishi, Chairman of the Board, Hitachi, Ltd., was also named as one of the 30 leaders among the invited guests, he only just made it to the venue on time.

Technology and Society

Each October, the World Economic Forum (WEF), the organization that hosts the annual Davos Meeting, issues a preview of the coming year's meeting for the benefit of its partners. Dr. Sebastian Buckup, the WEF's head of programming, announced that the theme of Davos 2018 would be "creating a shared future in a fractured world."

Dr. Buckup explained the organization's thinking behind the theme and said that it drew on the example of plants, noting that their growth always stops at some point. Corporations and cities too, he said, reach a stage where they stop expanding, and that this is because organizations die more quickly than they grow. Plants, corporations, and cities all begin to fracture on reaching a certain size.

Plants are unable to take the nitrogen that is crucial to their growth directly from the atmosphere. The root nodule bacteria that attach themselves to legumes such as clover, however, can convert atmospheric nitrogen into ammonia. The Norfolk crop rotation system takes advantage of this ability, and its widespread adoption led to a boost in agricultural productivity and an increase in population in 18th-century Britain, making it one of the driving forces behind the first industrial revolution.

During the second industrial revolution, increasing population pushed agricultural productivity to the limit. Sir William Crookes made a presentation to the British Association for the Advancement of Science in 1898 warning of an impending food crisis, saying that chemical fertilizers would be needed to overcome it. That was when an invention by Fritz Haber and others made such chemical fertilizers possible, and the food crisis was averted.

The Industrial Revolution, population growth, and the progress of agricultural technology. The long, four hours or more spent struggling to reach Davos through heavy snow were time enough to ponder the impact that technology has on all areas of society.

Prime Minister Modi, the "Third Man"

Tuesday January 23, 2018 - 11AM

Much of the talk at the previous year's meeting was focused on Xi Jinping, President of the People's Republic of China, who gave the keynote address, and on President Trump of the

USA, who gave his inaugural address just as the Davos Meeting was closing. It was Indian prime minister, Narendra Modi, however, who captured people's attention this year, giving the opening address.

As the Davos meeting also serves as a showcase for leaders, people seek to stand out in a variety of ways.

Prime Minister Modi appeared wearing a black stand collar suit with a dotted saffron-colored handkerchief protruding from his breast pocket. Inspired by the traditional Indian *achkan*, the garment is also known as a Nehru jacket because of the fondness that Jawaharlal Nehru, India's first prime minister, had for the style. Successive generations of the nation's leaders have since donned such jackets when engaging in diplomacy.

"दावोस में वर्ल्ड इकोनॉमिक फोरम की इस अड़तालीसवीं वार्षिक बैठक में शामिल होते हुए मुझे बेहद हर्ष हो रहा है।" ("I am very happy to be present in this forty-eighth annual meeting of the World Economic Forum in Davos.") Prime Minister Modi began his address in Hindi. When people representing their country give a speech at the Davos meeting, there are two ways they can go about it: they can either follow international custom and use English or else speak in their own language as a point of national prestige.

Although fluent in English, Prime Minister Modi chose the latter course, speaking about how fractures between people impeded action on climate change and terrorism as well as the global and inclusive economic progress that serves as a counter to protectionism, emphasizing the importance of dialogue, cooperation, and empathy. He also covered policies such as e-governance, Digital India, financial reform, and infrastructure development, and appealed for investment in India where the economy is enjoying steady growth.

Platform for Dialogue

While Prime Minister Modi headlined the first part of the meeting, unsurprisingly it was President Trump who dominated its latter half. There were also reports of a demonstration in the Swiss capital, Bern, opposing the president's appearance at the meeting. Such actions do not fit well with the views of WEF founder Professor Klaus Schwab. Debate and handshakes between leaders of opposing nations are a common sight at Davos.

Born in 1938 on the eve of the Second World War in Ravensburg, Germany, near the Swiss border, and schooled in Switzerland, Professor Schwab has seen how that country has had to struggle to maintain its neutrality. Switzerland is essentially a country governed by direct democracy. Appenzell, a town near Davos, has retained a tradition since the Middle Ages of *Lanz Gemeinde* (blue sky meetings) at which all eligible citizens have an equal right to speak. Professor Schwab was brought up amid this history and custom. In Switzerland, they had 500 years of democracy and peace. And what did that produce? A platform for dialogue, the WEF.

Heart of the Fourth Industrial Revolution

Tuesday January 23, 2018 - Noon

The 1930s, when Professor Schwab was born, were the time when the social contradictions of the Second Industrial Revolution erupted. For this reason, Professor Schwab is highly sensitive to the relationship between technology and society. Not only has he written a book, entitled "The Fourth Industrial Revolution," about the challenges arising from the spread of innovative technologies through society, but he has also established the Center for the Fourth Industrial Revolution in the USA last year to work toward resolving these challenges.

Hiroaki Nakanishi, Chairman of the Board, Hitachi, Ltd., appearing at a press conference
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After the address by Prime Minister Modi came a press conference entitled "The Fourth Industrial Revolution in Japan." Representing the Center for the Fourth Industrial Revolution, Murat Sönmez spoke about the center's aims and its plans for establishing sister centers in other countries, including Japan and India. Mr. Nakanishi also appeared at the press conference along with Mr. Sönmez and Yōichi Funabashi, a journalist known for his publications on such subjects as financial diplomacy.

The Japan Center is to be managed by the Asia Pacific Initiative (AP Initiative), an organization established by Mr. Funabashi, with support from the WEF and the Japanese government (the Ministry of Economy, Trade and Industry).

Wearing a Sustainable Development Goals (SDGs) lapel pin on his collar, Mr. Nakanishi spoke about how, while the Davos meetings of the past few years have looked at the bright and dark sides of digitalization, the task now is to find ways of amplifying those bright sides; how he sees the Center for the Fourth Industrial Revolution as an organization for putting this ideas into practice, something it has in common with Japan's proposed Society 5.0; and how he wants also to share this vision with the WEF.

The Invisible Hand of Data

The social unrest that occurred around the time of Professor Schwab's birth is depicted in many works of art from that era.

The Grapes of Wrath published in 1939 by John Steinbeck is a story of the struggles faced by farmers after being chased off their land by the forces of capital and mechanization. The use of tractors, the adoption of which predated an adequate understanding of appropriate cultivation practices, led to the phenomenon known as the "dust bowl" in which the fertile topsoil in the great plains of the Midwest was stripped from the ground, forming intense dust clouds that spread environmental damage as far as the east coast.

Farmers from Oklahoma who moved in large numbers to California owning nothing but the clothes on their backs were treated as outcasts, creating social problems that echo modern-day immigration concerns.

In the 1936 Charlie Chaplin movie *Modern Times*, the hero became the guinea pig in an automatic feeding machine at a factory that hoped to achieve higher productivity by shaving time off lunch breaks, and he ended up being sucked into the machines when the conveyor belt speed was increase too much. Both scenes satirized the pursuit of mechanization in ways that ignored people.

In a data-driven digital society, a different approach is possible. It is understood that, rather than shortening lunch times, encouraging conversation among employees provides a better way to improve productivity. Data has the power to expose problems. The aim of Society 5.0 is a human-centric society that utilizes this power to improve people's wellbeing.

Growth Rooted in Communities

Tuesday January 23, 2018 - 2:30 PM

The Davos meeting provides an excellent opportunity for national and corporate public relations, with this year's event including a trade show put on by the Indian government and industry. This included a demonstration of e-governance and solutions jointly staged by Hitachi and the Indian company, MGRM, something that Prime Minister Modi talked about in his speech.

Hitachi, meanwhile, is helping the financial economy of India to develop by working with that country's financial institutions through its involvement in cash and non-cash payment services that include automated teller machine management and point-of-sale payment processing. In infrastructure, Hitachi has embarked on proof-of-concept testing aimed at using digital technology to reduce hospital-wide electric power consumption by 30% at the New Delhi school of the All India Institute of Medical Sciences (AIIMS), India's largest public medical institution.

The Invisible Hand of God

Perhaps in response to President Trump, Prime Minister Modi was also joined by other national leaders in a steady stream of statements given in support of ongoing free trade, including Prime Minister Angela Merkel of Germany and President Emmanuel Macron of France.

Adam Smith was probably the first person to make the theoretical case for the benefits of free trade and the downsides of protectionism. Smith's publication of *The Wealth of Nations* in 1776 came at a time when the first industrial revolution was just getting started. He demonstrated how the monopoly on the India trade held by the British East India Company and the guilds' stranglehold on professions detracted from the overall welfare of society.

The book does not actually contain any reference to the "invisible hand of God." The expression "invisible hand" itself appears only once. The term is used to express how, thanks to market mechanisms, people engaging in trade out of their own self-interest end up benefiting society as a whole. However, this self-interest referred to by Smith did not mean unfair practices. In another publication, *The Theory of Moral Sentiments*, Smith admonished the use of unfair practices in competition and wrote about empathy for other people. In *The Wealth of Nations*, too, Smith laments how benefits to India and the East India Company that might have arisen had the business been run with the benefit of the local community in mind were instead lost due to nabobs (persons of great wealth or prominence) adopting a short-term perspective and operating the business for immediate profit to fill their own pockets.

While Kojin Nakakita, Chairman of Hitachi India Pvt. Ltd., attended the meeting on behalf of Hitachi, that company's managing director, Bharat Kaushal, was part of the Indian economic delegation. Rather than pursuing short-term profit, Hitachi operates its business with the aim of improving the nation's quality of life, seeing itself as part of Indian society.

Innovation Ecosystems

Wednesday January 24, 2018 - 5:30 PM

At the previous meeting, President Xi Jinping of China spoke about the Belt and Road initiative, defending free trade and referring to the importance of innovation. This year, China's activities were a topic of discussion throughout the meeting, including a Wednesday session entitled "the Belt and Road Impact" that provided an

Toshiaki Higashihara, President & CEO, Hitachi, Ltd., giving the keynote address at a meeting session

opportunity to hear what people thought about the initiative, which seeks to turn Eurasia into one large ecosystem.

That evening, Toshiaki Higashihara, President & CEO, Hitachi, Ltd., gave the keynote address at a session entitled "A Search for Unicorns and the Building of Society 5.0" hosted by Reuters, a British media agency, and supported by the Japanese government. Unicorns are defined as unlisted companies with a market valuation exceeding one billion dollars, of which about 80 exist worldwide.

Wearing an SDG lapel pin, like Mr. Nakanishi, Mr. Higashihara spoke about the importance of the SDGs and of Society 5.0, which shares the same goals; its conceptual basis in the five key fields identified by the Japanese government, including fintech and the extending healthy life expectancy; and the habitat innovation work by the Hitachi The University of Tokyo Laboratory, which serves as a joint industry-academia ecosystem.

This year's Davos meeting has also been notable for its involvement of women. Women filled all seven of the co-chairs, Christine Lagarde of the International Monetary Fund (IMF) among them. The Hitachi delegation included Renée McKaskle, chief information officer at Hitachi Vantara, who served as moderator for a session on Thursday, January 25 entitled "Scaling Technologies in Production."

Innovation and Diversity

Living at the time of the First Industrial Revolution, Adam Smith had intense interest in the relationship between technology and society. He claimed that trade provides a collective boost to the countries involved and leads to technical innovation through the exchange of ideas. He also saw China's physiocracy (the belief that wealth derives from the land) and lack of interest in trade at that time as impediments to technical innovation, drawing the conclusion that, had China engaged in trade on its own behalf, it would likely have developed more of a manufacturing industry.

Modern-day China, in contrast, makes effective use of the platform provided by the WEF, including promoting its the Belt and Road initiative at the Davos meeting and collaborating with the WEF on holding Summer Davos meetings that focus on technology and entrepreneurship,

Renee McKaskle, CIO of Hitachi Vantara
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and alternate each year between the Chinese cities of Tianjin and Dalian.

The development of fertilizer provides another demonstration of the idea that intercultural exchange leads to technical innovation. Germany at the end of the 19th century was more tolerant of Jewish people than other European countries. The city of Karlsruhe in particular, where the Jew, Fritz Haber, found work, was home to many talented Jews, with an enlightened attitude that included its world-leading establishment of an institute of technology and its hosting of the first ever international conference of chemists. The company, Badische Anilin und Soda Fabrik (BASF SE), was located in the nearby town of Ludwigshafen, and it was BASF's Carl Bosch who developed the fertilizer plant based on Haber's invention. This same mix of an enlightened civic atmosphere that respects diversity together with the establishment of an ecosystem that links industry and academia can be found in modern-day Silicon Valley.

Agile Governance

Thursday January 25, 2018 - 5:00 PM

Mr. Nakanishi also appeared in the session entitled "Agile Governance in the Fourth Industrial Revolution," once again wearing his SDG lapel pin.

The term "agile" is found also in ideas such as agile software development. This is an approach to software development that shortens development times while also responding quickly to changes by dividing the development process into small parts and working iteratively through tasks like planning and design. Agile governance seeks to formulate appropriate regulatory practices in a flexible manner to promulgate technology in digital societies where change is rapid.

During the session, Mr. Nakanishi used the aging of Japan's population as an example to describe how the use of data can uncover the issues associated with maintaining a healthy lifestyle rather than simply living longer, and to

Hiroaki Nakanishi (last on the right) participating in a meeting session
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express the importance of business and government sharing a common vision. When the discussion strayed away from the term "agile" toward the issue of short-termism, Mr. Nakanishi emphasized that, while agility was important, what mattered above all else was that society as a whole take ownership of the challenges and goals.

Uncovering Intangibles

Left unchecked, the steady stream of new businesses emerging from our digital society will lead to new monopolies or oligopolies to the detriment of society as a whole. Prime Minister Merkel in her address spoke about the risk of certain unicorn companies establishing a monopoly on data. What is needed is new mechanism designs that are fit for use in a digital society.

Adam Smith also shows up in the movie, *A Beautiful Mind*, which won four Academy Awards in 2002. A group of young men, post graduate students, at a bar encounter a second group of young women of a similar age. When the men start talking about who should approach whom, one of the students reminds them of Adam Smith's claim that, "in competition, individual ambition serves the common good." Aware that they all have their eye on the same woman, the protagonist responds by saying that, "Adam Smith needs revision. The best result will come from everyone in the group doing what's best for himself and the group."

The protagonist in the movie was John F. Nash and the scene portrays how he came up with the idea of the "Nash equilibrium," for which he was to win the 1994 Nobel Prize in economics. This concept, which plays an important role in game theory, refers to situations in which any change in strategy by an individual leaves both themselves and all other participants either the same or worse off. In addition to being featured in a movie, the Nash equilibrium has found extensive applications that include anti-trust cases in the USA and the design of a system intended to maintain fair market access in the mobile telephony business that is being introduced by the US Federal Communications Commission (FCC).

In game theory, each participant pursuing his or her own short-term interest leads to a "prisoner's dilemma" in which the optimal distribution of gain between those participants (Pareto optimality) is not the same as the Nash equilibrium. It is also known, however, that the dilemma can be resolved by the participants adopting a long-term, never-ending perspective and acting for their mutual benefit.

That policy makers and companies with knowledge of data analysis jointly adopt a long-term sustainable vision for regulatory design also will likely be vital for agile governance.

Future of a Fractured Society

Friday January 26, 2018

President Macron roused his audience by starting his speech with a joke about how being in snowbound Davos made one doubt global warming. In fact, this year's Davos was warmer than usual, with muddy patches forming where the snow had melted, conveying a sense of the difficulty of navigating a fractured world.

President Trump had arrived at Davos the previous evening, and security had become tighter than ever, with helicopters once more patrolling the skies from morning. To avoid the chaos, we decided to leave Davos early without waiting for the meeting to conclude. The snow now all but melted away, I spent the return trip of about two hours thinking over what I had just experienced.

What Does it Mean to Enrich Society?

In recent years, the WEF has strengthened its involvement in practical measures. Along with the Center for the Fourth Industrial Revolution, the WEF has also established a facility for cybersecurity research and 14 working groups on topics such as "Digital Economy and Society," "Energy," and "Food Security and Agriculture," which it calls system initiatives. This is a manifestation of Professor Schwab's fear that misuse of technology will only make society more fractured.

During the First Industrial Revolution, Adam Smith treated the wealth of nations as being the

sum of those things their citizens wanted. During the Fourth Industrial Revolution, in contrast, for all its success at matching the goods needed to the people who need them, one of the indicators of society's wealth will be whether we are able to supply the utility and value of goods equitably.

Fritz Haber won the Nobel Prize in chemistry for inventing a method for fixing atmospheric nitrogen. However, the same man, who was described as a genius by his esteemed friend, Albert Einstein, went on to utilize technology in misguided ways out of selfishness, directing the development of poison gas as a weapon during the first world war.

When Showa Hiryo (what is now Showa Denko K. K.) succeeded in the production of fertilizer in 1931, Hitachi, then a unicorn company, supplied them with 2,500 water electrolysis units. Speaking before the young employees, Naosaburo Takao, one of Hitachi's managers at the time, advised them that, "Our founder Namihei Odaira established Hitachi for the benefit of the people and therefore you should always give thought to the continuity of the company. This means it is permitted to defer immediate profit."

To avoid making the same mistake as Fritz Haber, we should utilize the WEF in our own ways, share goals with international society, and take a long-term perspective toward market design.

The Hitachi Corporate Credo devised by Odaira and Takao is to "contribute to society through the development of superior, original technology and products."

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