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Short Curriculum Vitae) Akio Onishi

Specializes in systems and policies of innovations, technology assessment and regulation, and insurance in the healthcare field. Graduated from the University of Tokyo School of Engineering and The Wharton School of the University of Pennsylvania (MBA). After working at the Ministry of International Trade and Industry, McKinsey & Company, the Organisation for Economic Co-operation and Development (OECD), and in communications/IT venture company management, he became Vice-President of Medtronic, Inc. in 2003, a role which he served in until 2012. Since 2011, he has served as a University of Tokyo Graduate School of Public Policy Specially Appointed Professor, his present post. From 2012 to 2013 he was Deputy Director General of the Medical Innovation Promotion Office, Cabinet Secretary. Since May 2013, he has been Managing Executive Officer of Solasto Corporation. He has also served as a temporary member of the Ministry of Internal Affairs and Communications Commission on Policy Evaluation and Evaluation of Incorporated Administrative Agencies, a National Institute of Advanced Industrial Science and Technology Research Unit Assessment Committee member, a Japan Science and Technology Agency Center of Innovation Visionary Team Member, and a trustee of the Pharmaceutical and Medical Device Regulatory Science Society of Japan (general incorporated foundation).

AI and Healthcare

Talk ofArtificial intelligence (AI) is gathering momentum. News of the AI Go player developed by Google defeating a professional go player in March will be fresh in the

memory.   Domestically, the RIKEN, Institute of Physical and Chemical Research established an AI center in June as part of national strategy.   In addition, 8 companies including Toyota and DWANGO have established an endowed chair at the University of Tokyo, and announced that they are promoting AI related human resources development. There is extensive coverage both domestically and overseas of manufacturers developing automatic driving technologies, and it appears that the competition is growing in intensity.   In terms of the societal impact of these developments, at the Davos Forum in January they were dubbed "the Fourth Industrial Revolution," and a prediction emerged that progress in automization and robotization due to advances in AI and robots may lead to the disappearance of work equivalent to that of 5 million individuals in the world's 15 major industrial nations and developing nations by 2020. Trends in AI and robots have also come to be an important factor in anticipating the society of the future.   In this connection, I would like to present some discussion of AI in the healthcare field.

The IBM system named Watson became a popular topic of conversation from around 2011 for its ability to understand natural language, tackle quizzes and so forth, but since then its application to medical care has been proceeding in earnest.   Searching through vast amounts of data and references, sifting through them and comprehensively evaluating them, is perhaps one of the most appropriate fields of application for AI 1. The domains of medical treatment and healthcare hold the potential for those kinds of functions to be most effectively utilized. By way of example, Watson has come to be used in the selection of anticancer drugs whose development and clinical trial is advancing worldwide, as well as the review of clinical trial participation, and so forth. Watson checks against data showing the characteristics and condition of patients for whom drug use is under consideration, as well as the conditions of use and clinical trial participation conditions of anticancer drugs for which development is ongoing and so forth, and is able to pick out suitable anticancer drugs and candidate clinical trials for the patient.   In the US it is involved in clinical settings, and practical application in these kinds of fields is progressing.

Domestically, Jichi Medical University announced in March of this year that it has put a general practitioner support system utilizing AI into practical use.   General practitioners are expected to comprehensively evaluate patient complaints and symptoms, examination data, past medical records and information, perform diagnoses

and proceed with treatment.   AI named "White Jack" possesses functionality to select and display multiple possible disease names based on information on pre-examination cards filled in by patients and physicians' consultations, as well as electronic health record information.   By making use of the mechanism which displays multiple possible disease names, it supports doctors' judgments.

From April of this year the computerization of the medication notebooks long used in medical settings has also begun in earnest.   The gradual advancement from 2018 of a medical treatment oriented number system was also laid out in May of last year, and the computerization of medical treatment and healthcare data easily comprehensible to AI is steadily progressing.

Further, in the health field various companies are already providing healthcare advice using smart phones, and diet support and health management services making use of these are also beginning to utilize AI.   An example of that is a service which presents a menu based on vast amounts of data and tailored to individual dietary and exercise habits, and monitors the execution status and results of a menu presented on a day-to-day basis using a smart phone, then provides appropriate advice.   For professional coaches and advisors, it is not possible to constantly monitor and give timely advice to each and every customer, but AI may be capable of fulfilling that role. Although it is unknown that how common services will become and whether they will be successful, they are undoubtedly being proposed in the format of healthcare services to supplement traditional shortcomings.   In health consultations and doctor's diagnoses of the future, as well as in dieting and getting in shape, we may first come into contact with AI.

Incidentally, how will the papers and knowledge that AI searches and evaluates be discovered and disseminated?   AI appears to be capable of searching, evaluating and learning, but I have yet to hear of AI submitting a paper.   Will knowledge, after all, continue to be discovered and propagated by humans?   It appears that there was, however, an instance of AI writing a novel...   What indeed will the future ultimately hold?

1 The evolution of "Deep Learning" technology, which is applied in voice, image and object recognition, robot movement and operating control, as well as for Go and automatic driving, is also said to be a characteristic of recent AI. By processing using "neural networks" comprising multilayered algorithms which break down input information on the basis of characteristics, the machine repeatedly learns, and becomes able to derive optimum conclusions.