

Healthcare Systems

1 Big Data Analysis Platform for the Medical Field

The Japan Agency for Medical Research and Development (AMED) is a Japanese organization that promotes medical research and development. The Institute for Health Economics and Policy (IHEP) acts as the representative institution of an AMED-sponsored program on ICT Infrastructure Development for Clinical Research called “Research on Super-fast Super-interdisciplinary Next-generation NDB^{*1} Data Research Infrastructure Development to Enable the Rapid Creation of Evidence.” Hitachi was in charge of developing the initial version of the Super-fast Super-interdisciplinary Japanese Medical Insurance Claim Bigdata Analytics Platform System (SFINCS) based on a basic design by the University of Tokyo, which is affiliated with the IHEP.

The SFINCS uses Hitachi Advanced Data Binder^{*2}, a super-fast database engine developed by Hitachi based on the out-of-order execution principle^{*3}, which was developed at the University

of Tokyo. Hitachi Advanced Data Binder acts as the database infrastructure for enabling more effective utilization of the NDB stored by the Ministry of Health, Labour and Welfare.

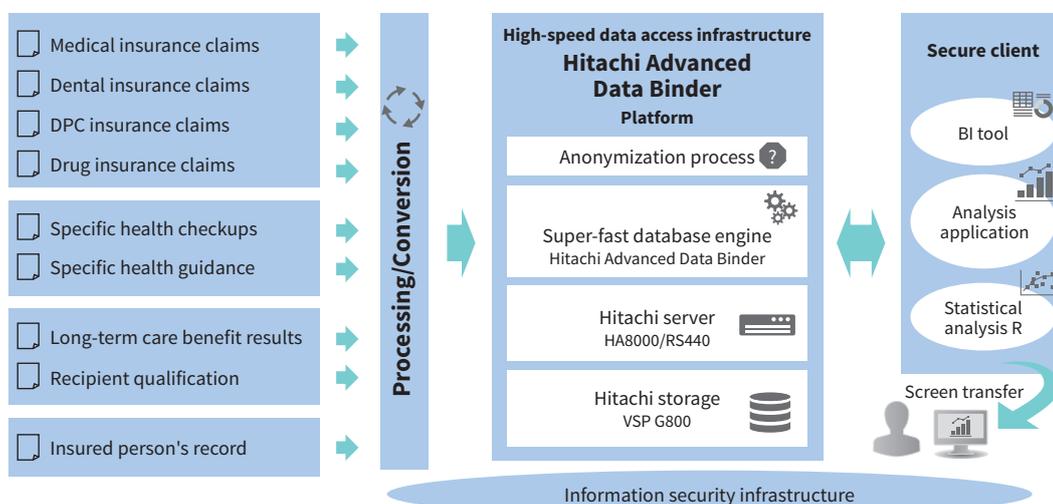
*1 NDB: National Database of Health Insurance Claims and Specific Health Checkups of Japan

*2 Using the results from the study “Development of the Fastest Database Engine for the Era of Very Large Database and Experiment and Evaluation of Strategic Social Services Enabled by the Database Engine Project” (Principal researcher: Masaru Kitsuregawa), which was supported by the Japanese Cabinet Office’s Funding Program for World-Leading Innovative R&D on Science and Technology.

*3 Principle devised by Masaru Kitsuregawa (Professor at the Institute of Industrial Science, The University of Tokyo, and Director General of the National Institute of Informatics) and Kazuo Goda (Project Associate Professor at the Institute of Industrial Science, The University of Tokyo).

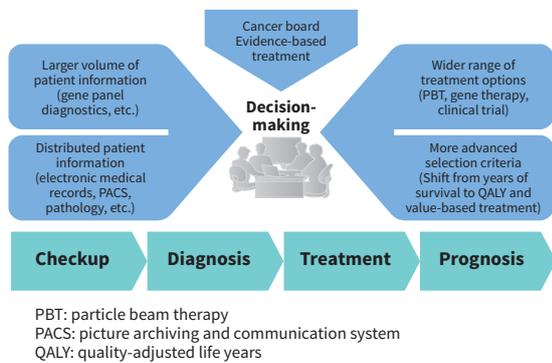
2 Total Solution Provider for Cancer Treatments

As discussed in the Ministry of Health, Labour and Welfare’s “Working Group to Specify Requirements for Designated Cancer Care Hospitals” and other forums, current cancer treatments are about to change significantly as 2019 approaches. Specifically, the following changes are expected.



DPC: diagnosis procedure combination BI: business intelligence

1 Overview of the SFINCS System



2 Changing cancer treatments

- (1) Larger volume of patient information with the adoption of gene panel diagnostics and other technologies
- (2) Wider range of available cancer treatment options, including precision medicine, immunotherapy, particle beam therapy, and more
- (3) More advanced treatment selection criteria incorporating, not just the 5-year survival rate, but also long-term quality of life (QoL)
- (4) Wider application of multidisciplinary decision-making methods such as cancer boards
- (5) Participation of patients through informed consent and other means
- (6) Regional treatment tie-ups

Until recently, the Hitachi, Ltd.'s Healthcare Business Unit has provided the latest technology in In-Vitro Diagnostics, image diagnostics, and radiation therapy. Moving forward, to respond to the above-mentioned changes occurring at clinical sites, Hitachi's strengths in digital technology and medical technology will be merged to assist in supplying higher-quality medical services and developing businesses by providing solutions that enable efficient visualization of patient information customized for the clinical site, decision-making support using artificial intelligence (AI) and other technologies, information sharing and communication across sites and job positions, and case study databases for Big Data analysis.

3 Initiatives in Regenerative Medicine

Beginning in March 2016, Hitachi Chemical Company, Ltd. formed a partnership with PCT [PCT, LLC, a Caladrius Company (currently



3 Working in a cleanroom

Hitachi Chemical Advanced Therapeutics Solutions, LLC)], which is a contract manufacturer of cells used in regenerative medicine in the United States, and in May 2017, Hitachi Chemical purchased 100% of PCT's shares to acquire PCT as a full subsidiary. This acquisition allows Hitachi Chemical to fully leverage PCT's brand power, wide-ranging manufacturing locations, robust sales network, and other resources to expand PCT's contract manufacturing business of regenerative medicine cells in North America, Europe, and other regions around the world. In Japan, Hitachi Chemical announced an investment of approximately 2 billion yen for establishing new contract development and manufacturing facilities for regenerative medicine cells and other products in Yokohama, Kanagawa prefecture, and it is expected to begin full operations in fiscal 2018. The Hitachi Chemical Group intends to combine PCT's resources with its own expertise in the life sciences business and its manufacturing technologies for cleanroom environments gained from its semiconductor materials business. This combination will provide higher QoL to patients and establish technologies for manufacturing products with the highest quality and safety in the cutting-edge medical field of regenerative medicine.

(Hitachi Chemical Company, Ltd.)