Trends in National Information Technology Strategy for Healthcare

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The crisis facing Japanese medical care is becoming more evident with the rapid aging of society and the accompanying issues of rising public health expenditures, lack of and uneven distribution of doctors, collapse of regional medical care, and overworking of healthcare personnel. It threatens the security of Japanese citizens in their daily lives. In light of these social issues, the Japanese government views the medical/health field as a growth industry. While laying out an economic growth scenario, it is emphasizing the healthcare field in its national information technology (IT) strategy and engaging in proactive use of IT as an effective solution. IT strategy has been restarted under the new Democratic Party of Japan (DPJ) administration: in May 2010, a new IT strategy was approved by the Cabinet. Efforts in the healthcare field continue to play an important role. This article looks at trends in the national IT strategy for healthcare, focusing on the government's new growth and new technology strategies.

1. Introduction

Japan is moving toward a "super-aged society" at a speed unseen anywhere else in the world. The percentage of the population 65 years old or older exceeded 20% in 2005 and is estimated to exceed 30% by 2030. This rapid advance of a super-aged society is bringing about a variety of structural changes in Japanese society. This is particularly true in the field of healthcare, where social problems are arising in the areas of medical-care financing, balance in supply and demand between patients and medical personnel, and the management of medical care.

Public health expenditures, which exceeded 35.3 trillion yen for fiscal year 2009, are increasing at a annual rate of 1 trillion yen, which is placing considerable pressure on public financing. At the same time, some elements of regional medical care are beginning to collapse: the shortage or uneven distribution of doctors is becoming a particular problem in pediatrics, obstetrics, and emergency medical care, creating serious concern among local residents. It is said that 90% of all municipal hospitals are operating in the red, causing hospitals in some regions to close down or merge.

In the face of these social problems, the Japanese government is drawing up scenarios for stimulating economic growth by turning medical care and other health-related fields into growth industries while treating the proactive use of information technology (IT) as an effective approach to solving these problems. In short, the government is positioning healthcare as a priority field in its national IT strategy.

This paper looks at present trends and future developments in national IT strategy within the healthcare field, focusing on the government's new growth strategy and new IT strategy.

2. Japan's growth strategy

In December 2009, the Japanese Cabinet

approved a New Growth Strategy (Basic Policies)¹⁾ in advance of an IT strategy. Looking forward to 2020, Japan's New Growth Strategy aims to expand the economy by creating over 100 trillion yen in new demand and generating employment for four million people. It plans to achieve this by making the most of Japan's strengths in the environment and energy fields and healthcare (medical care and nursing) and opening up new frontiers in Asia, tourism, and local revitalization.

The Japanese government views healthcare as a priority field. The problem of a declining birthrate and aging population, which can appear, at first glance, to be of negative benefit to society, can present Japan with an opportunity to create a healthy and long-life society. By taking a world-leading position in solving healthcare issues and demonstrating an advanced model for the aged society as a prescription for healthcare woes, Japan can drive social change, create new value, and generate new sources of employment.

In more concrete terms, the government proposes the following principal measures to promote "life innovation" (innovation in medical care and nursing).

- 1) Transform medical care, nursing, and other health-related fields into growth industries.
- 2) Promote the expansion of these industries to Asia and other overseas markets.
- Fortify the foundations of medical care and nursing to enable the Japanese people to lead enjoyable, anxiety-free lives.
- 4) Achieve secure and comfortable lives for the elderly in regional cities and towns.

Central to these measures is a growth strategy for creating value through the skillful application of IT, which can be used to create a network among medical institutions, nursingcare facilities, and homes and construct and maintain personal databases.

3. Japan's IT strategy

Next, in May 2010, the Japanese Cabinet

approved a New IT Strategy²⁾ as a new basic IT strategy. Originally drafted under the Democratic Party of Japan (DPJ) administration, this new strategy is not simply an extension of past IT strategies. Rather, it represents a quantum leap for establishing a new citizendriven society. Together with the New Growth Strategy described above, the New IT Strategy is positioned to support sustainable growth for the Japanese nation.

The timeline for Japan's recent IT and growth strategies is shown in **Figure 1**. The New IT Strategy has three objectives: achieve a citizenoriented electronic administration, recreate bonding in local communities, and create new markets and expand internationally. Healthcare is viewed as a prime means of recreating bonding in local communities. For this purpose, four specific measures have been presented, as shown in **Figure 2**. The direction of IT-based solutions is described in terms of these four measures in the following four subsections.

3.1 "My Hospital Anywhere"

3.1.1 Background

At present, a patient's examination data, laboratory-test data, and prescription data are scattered across a number of medical institutions. As a result, the patient may end up having to take certain tests more than once at different hospitals or clinics, with each test incurring a payment. In turn, a doctor who is unfamiliar with a patient's past diagnoses and/ or prescriptions at other medical institutions and the patient's case history, contraindications, and other relevant data runs the risk of encountering problems when treating the patient, performing surgery, or administering drugs.

3.1.2 Application of IT

The plan is to use IT to set up a personal health record that will enable an individual to electronically manage and use his or her own lifelong medical-care and health-related



Figure 1

Timeline of Japanese IT and growth strategies.





information from anywhere in the country. This measure can prevent the duplication of laboratory tests and help reduce the psychological and physical distress and economic burden associated with taking tests. It will also let any doctor in the country refer to a patient's prescription history, treatment history, and personal health data even if the patient has recently moved, is currently on a trip, or becomes a victim of a natural disaster or other calamity. The patient, in turn, has the option of selecting a doctor that matches his or her own preferences anywhere in the country. Moreover, the ability to view one's medical and healthrelated information in an integrated fashion will help raise the individual's awareness of health issues and associated costs. The My Hospital Anywhere measure will therefore play a useful role in promoting personal health management.

3.2 Achieving seamless community-linked medical care

3.2.1 Background

Some elements of regional medical care are beginning to collapse due to a shortage or uneven distribution of doctors, problems in emergency medical care, and the closing or merging of municipal hospitals. As a result, residents of some regions in Japan are finding that access to medical services is becoming restricted and that their lives are being threatened in terms of healthcare.

3.2.2 Application of IT

The plan is to use IT to set up medicalcare and nursing networks between secondary medical regions or prefectural hospitals and to optimally allocate and use human resources in medical care and nursing. This measure will enable the construction of a community-linked critical-path platform on which patient guidance becomes dispersed among different medical institutions in accordance with the patient's current condition (acute, recovery, or chronic phase). It will also enable the construction of a telemedicine platform via which a small number of medical specialists will be able to advise and consult remotely with regional doctors. Thus, if a patient with a certain condition finds that there is no diagnosis and treatment department for that condition in the immediate area, he or she will still be able to receive a certain level of medical services. Coordination between medical-care and nursing personnel will also become tighter, enabling services for patients to evolve from point-based (one medical institution or nursing facility) to area-based (community-linked), which will improve the quality of care.

3.3 Raising medical care efficiency by using medical-insurance claim data3.3.1 Background

At present, the analysis of medical-care expenses is performed exhaustively. The analysis of diseases and treatment, however, is based not on exhaustive surveys but rather on sampling surveys from which estimates are made. This makes it difficult to determine and analyze the prevalence of lifestyle-related diseases and to analyze diseases in detail by municipality. As a result, the Japanese government and local governments cannot adequately plan for and evaluate medical insurance and healthcare measures.

3.3.2 Application of IT

IT will be used to database all medicalinsurance claims and all cases of specific medical examinations and specific health guidance and to set up an environment in which such data can be easily accessed and used. This will enable detailed analyses to be performed by disease and treatment type so that effective and efficient measures can be drawn up and evaluated on the basis of extensive evidence. It will also enable detailed analyses and evaluations to be performed on a prefectural basis, which will enable local governments to draw up measures that match the conditions in their regions. To protect patients' personal information, this database will be of the anonymous type so that the patients associated with the data cannot be identified.

3.4 Promoting pharmaceutical safety through the use of medicalinformation databases

3.4.1 Background

At present, safety measures related to the side effects of pharmaceutical products are implemented on the basis of reports issued by doctors and others of their own accord. This state of affairs makes it difficult to obtain accurate data on the incidence rate of side effects.

3.4.2 Application of IT

The plan is to database medical-care data such as medical-insurance claims, diagnosis procedure combination data, and electronic (EMRs) and create medical records an environment in which pharmaceutical product users and drug-administration data can be monitored in real time. This measure will enable the incidence rate of side effects associated with pharmaceutical products to be monitored continuously, enabling safety measures to be implemented at the right time. It will also enable information about side effects to be provided promptly to patients, thereby halting the occurrence and spread of adverse drug reactions and keeping patient treatment on track.

4. National IT budget for healthcare

The Cabinet Secretariat; Ministry of Internal Affairs and Communications; Ministry of Health, Labour and Welfare; and Ministry of Economy, Trade and Industry are all working on projects for bringing healthcare into the information age. The main projects being undertaken by these ministries for the 2009 and 2010 fiscal years are listed in **Table 1**. Among these, the Fund for Revitalizing Regional Medical Care³⁾ at the Ministry of Health, Labour and Welfare and the Social Security Card (provisional name) project,⁴⁾ which aims to provide a mechanism for a new social-security information-linking platform, are medium- and long-term projects, respectively, of the IT strategy for healthcare. These two projects are outlined below.

4.1 Fund for Revitalizing Regional Medical Care

To solve problems in regional medical care such as insufficient provision of emergency medical care and a shortage of regional doctors, this fund aims to provide financial support over a number of fiscal years. This support will target projects on themes such as "specialization and linking of medical-care functions," "improvement of working conditions for hospital-based doctors, nurses, and other healthcare personnel," "dispatching of doctors," and "promotion of telemedicine" on the basis of the Regional Medical Care Revitalization Plan with prefectural governments as secondary medical regions.^{note)}

Among the regional medical care revitalization plans adopted by 94 regions throughout the country, 79 regions (about 84%) are planning projects that apply IT for such purposes as sharing patient information and implementing telemedicine.

The Medical Care Evaluation Committee set up by the Cabinet Office as part of the Evaluation and Specialized Investigation Committee of the IT Strategy Headquarters has presented a number of points to consider in this application of IT. These include a "continuously operating information-linking network system," "low-cost, extendible Internet-based connections," and "implementation of functions for exchanging information with outside systems

note) A region established to support the demand for general medical care centered on hospital treatment (excluding specialized treatment), i.e., a regional unit for setting up hospitals consisting mostly of general beds and beds for long-term care.

Ministry	Project	Scale	Outline
Ministry of Health, Labour and Welfare	Linking of regional medical information	¥130 million FY2009 main budget ¥560 million FY2010 main budget	Set up an information-linking platform among collaborating medical institutions by developing and implementing a Web-based EMR system in core regional hospitals.
Ministry of Health, Labour and Welfare	Fund for Revitalizing Regional Medical Care	¥235 billion FY2009 1st supplementary budget	To solve problems in regional medical care, provide financial support and revitalize regional medical care based on the "Regional Medical Care Revitalization Plan" with prefectural governments as secondary medical regions. (10% of fund allocated to IT-related expenses)
Ministry of Health, Labour and Welfare	Establishment of an environment for implementing the social security card	¥280 million FY2009 main budget ¥2.2 billion FY2009 1st supplementary budget	Check qualifications for medical insurance via a smart card, test information linking between institutions using a relay database, and test supplementary service functions using the social security card.
Ministry of Internal Affairs and Communications	Wide-area linking to promote regional use of information and communications technology (ICT)	¥8.2 billion FY2010 budget	Achieve wide-area linking among regional bodies in public fields such as medical care, nursing, welfare, disaster prevention, and crime prevention and provide extensive regional pubic services through the use of ICT.
Ministry of Economy, Trade and Industry	Research survey of regulatory reform and industry creation in medical care, nursing, and other fields	¥2 billion FY2010 main budget	Create and activate highly sustainable industries to support interaction among diverse occupations (linking between fields such as medical care, nursing, welfare, and life enhancement), which bear the burden of local care.

Table 1 National IT budget for healthcare (main items).

and standardization of medical information." In this way, the creation of an environment for advancing and spreading the linking of medical information is progressing.

4.2 Social Security Card (provisional name)

The idea behind this project is to set up a social-security information-linking platform to make procedures associated with the social security system more efficient and to make social security information more visible and transparent. As a smart card having functions such as proof of medical insurance, the social security card will enable citizens to enjoy one-stop services related to pension matters, medical care, nursing, and other social security matters and to view their personal social security information at any time.

As a member of the "Izumo Social Security Card Promotion Consortium," Fujitsu applied to to do so in August 2009. In this pilot project, Fujitsu provided a social-security informationlinking platform as a core system and basic services via the social security card such as checking qualifications for medical insurance and viewing personal pension information. Fujitsu also enabled users to view personal consultation and examination information from their homes by linking this system with "Medical Care Net Shimane," an EMR system in Shimane prefecture, as a supplementary service. Fujitsu performed this technology-verification work up to July 2010 and presented its results to the government (**Figure 3**).

work in technology verification and was selected

The review of the social security card scheme by the Government Revitalization Unit in November 2009 included a statement to the effect that social security as studied by the government was compatible with the tax identification number system in Japan.⁵⁾ A common numbering



Figure 3 Overview of Social Security Card pilot project in Izumo area.

system is currently being studied by the "Study Team on a Social Security and Tax ID Numbering System"⁶⁾ established by the National Policy Unit in February 2010. The plan is to introduce this system in fiscal year 2013.

With regard to the protection of personal information, the idea of threading dispersed information held by different institutions is essentially the same as the idea behind the social security card. In the above study team, the Ministry of Health, Labour and Welfare is presently giving its opinion on a number linking system by making use of the studies performed to date on the proposed social security card system.

5. Healthcare IT promotion environment

Ensuring security in the handling of medical

information is extremely important, and it has been decided that EMRs should, in principle, be stored within medical institutions just like paper medical records. As a consequence, the installation and operation of such a system by medical institutions themselves, who lack specialized IT knowledge, has become a hurdle to the spread and promotion of IT.

This issue has been studied by the "Study Team on a Medical Information Network Platform" at the Ministry of Health, Labour and Welfare. In February 2010, the Ministry issued a notification to the effect that approval would be given for the external storage of EMRs provided that "Guidelines on Secure Management of Medical Information Systems"⁷⁾ were observed and that the scope of the responsibilities of both medical institutions and private enterprises was clarified by contract. This approval opens the way for medical institutions to dispense with the installation of servers and make use of EMR systems via services from application service providers (ASPs) or software as a service (SaaS) from private enterprises. It makes the application of IT in medical institutions much easier to promote.

As the application of IT to individual medical institutions progresses, the electronic storage of patients' medical information will likewise progress and an EMR-conducive environment will take form. This development should lead to improvements in the quality and safety of medical care and should enable the public to receive safer and more secure medical services.

6. Conclusion

The Japanese government views healthcare as an important field in its national IT strategy and is establishing policies by setting budgets and setting up systems. Nevertheless, there are still many issues that need to be addressed. System-related issues include

- establishing and using personal identification numbers,
- establishing a system of medical and nursing insurance claims to promote information sharing and regional collaboration, and
- establishing and using a scheme for collecting personal information related to the workings of the human body.

Operations-related issues include

- creating standards to facilitating the linking and exchanging of information held by different medical institutions,
- specifying the roles of government and private enterprises (determining the contributions to be made by private enterprises and the range of the services that they provide), and
- eliminating the digital divide between the elderly and the rest of society by providing universal services.

Technology-related issues include

- establishing a rigorous personal authentication system,
- establishing a scheme for threading multiple identification numbers taking security into account, and
- establishing a scheme for linking dispersed databases.

To achieve citizen-oriented medical and healthcare-related services that are more convenient, safer, and more secure, the Japanese government looks forward to breakthroughs in the solving of these problems.

References

- Cabinet Office: New Growth Strategy (Basic Policies) Toward a Radiant Japan. http://www.kantei.go.jp/foreign/ topics/2009/1230strategy_image_e.pdf
- Cabinet Office: A New Strategy in Information and Communications Technology (IT). http://www.kantei.go.jp/foreign/policy/ it/100511_full.pdf
- Ministry of Health, Labour and Welfare: Fund for Revitalizing Regional Medical Care. (in Japanese). http://www.mhlw.go.jp/bunya/iryou/ saiseikikin/index.html
- 4) Ministry of Health, Labour and Welfare: Social Security Card (provisional name). (in Japanese). http://www.mhlw.go.jp/shingi/2009/04/ s0430-4.html http://www.mhlw.go.jp/shingi/2009/07/ s0717-1.html
- 5) Government Revitalization Unit: Screening Process—Results of Evaluating the Social Security Card (provisional name). (in Japanese). http://www.cao.go.jp/sasshin/oshirase/ h-kekka/pdf/nov12kekka/2-11.pdf
- 6) National Policy Unit: Study Team on Social Security and Tax ID Numbering System. (in Japanese). http://www.kantei.go.jp/jp/singi/ kokkasenryaku/kaigi/syakaihosyou.html
- Ministry of Health, Labour and Welfare: Guidelines on Secure Management of Medical Information Systems, Ver. 4.1 (February 2010). (in Japanese). http://www.mhlw.go.jp/shingi/2010/02/dl/ s0202-4b.pdf



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