

Nursing Care Cloud Computing Solution towards Construction of Integrated Community Care System

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The population in Japan is aging at an alarming rate. According to the Annual Report on the Aging Society 2014 by the Cabinet Office of Japan, 31.9 million people were aged 65 or older as of October 2013, while the number of people in this age bracket is estimated to reach as high as 38.78 million in 2042. Given this situation, the Ministry of Health, Labour and Welfare aspires to establish an integrated community care system designed to allow elderly citizens to stay in the communities they are attached to and lead dignified, independent lives. An array of laws are in development, such as the Act for Securing Comprehensive Medical and Long-term Care in the Community that was passed in June 2014. The integrated community care system must address the increasing need for maintaining the quality of nursing care against the background of the growing elderly population requiring care at home. At the same time, it needs to establish a system to enhance efficiency in service provision and information-sharing among key players such as physicians and nursing care providers. This paper describes the efforts at Fujitsu to develop an integrated community care system that is built upon a Fujitsu's solution to assist care providers in their service provision and management.

1. Introduction

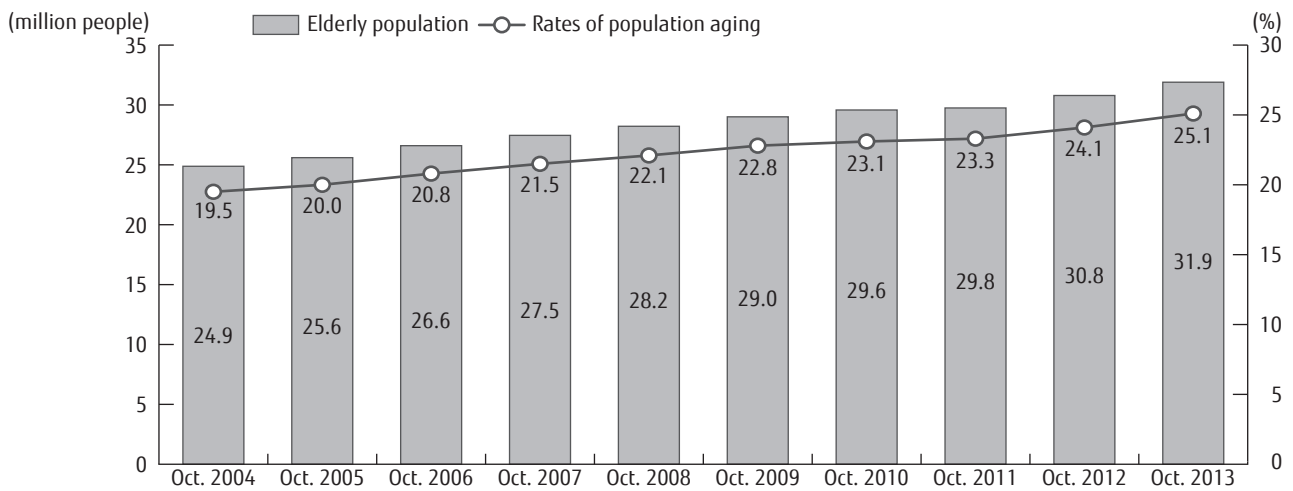
The national population of Japan was 127.3 million as of October 2013, of which 31.9 million people were 65 years old or over (1.11 million increase on the previous year). The population aging rate was 25.1%, an increase of 1.0% from the year before (**Figure 1**), and this rate is very high among the world's developed countries and other nations. Thus, Japan is in the unprecedented state of having a rapidly aging society.¹⁾

In 10 years' time, the baby-boomer generation will be over 75 years old and demands for medical and nursing care will further grow. The Ministry of Health, Labour and Welfare of Japan aspires to establish communities that provide comprehensive support and care (hereinafter, integrated community care system)²⁾ by 2025, designed to allow elderly citizens to stay in the communities they are attached to, and lead dignified, independent lives. A legal framework is also in development, with the Act for Securing Comprehensive Medical and Long-term Care in the Community passed in June 2014, aiming to facilitate a system that offers medical and nursing care comprehensively through

the establishment of the integrated community care system.

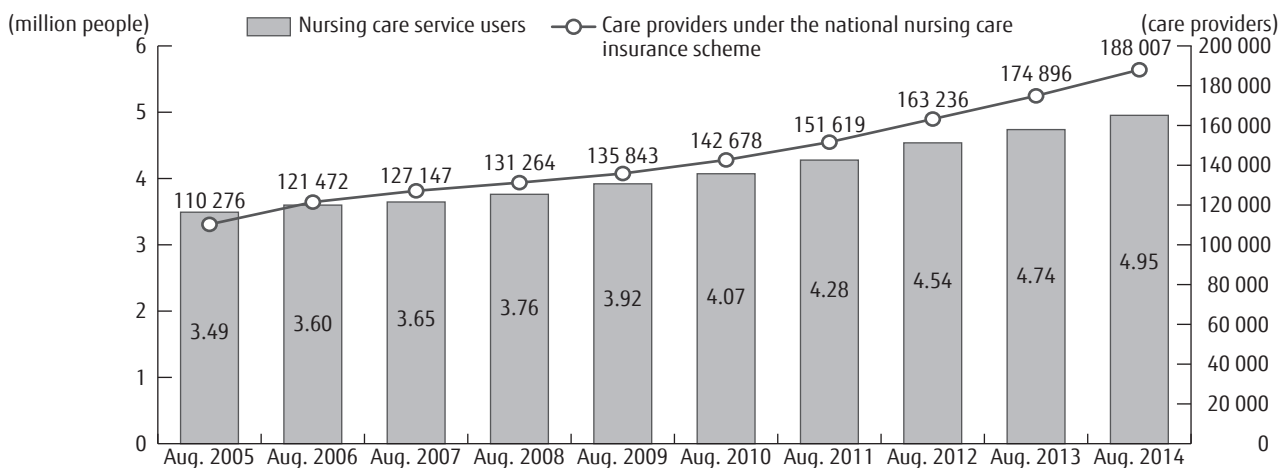
Meanwhile, 4.95 million people are on nursing care benefits and there are 188 000 care providers who operate under the nursing care insurance scheme, as of August 2014,³⁾ and these figures are constantly increasing (**Figure 2**). However, there is a perpetual staff shortage and high job turnover in the field, leaving care workers overburdened.⁴⁾

Given this situation, there is an increasing demand for an integrated community care system which helps care providers to maintain the quality of their care services while allowing for efficient job execution. It also helps efficient collaboration with the relevant home-care/nursing care providers and information-sharing across different sectors. Against this background, Fujitsu started offering a healthcare solution in July 2010. It is called FUJITSU Healthcare Solution HOPE WINCARE-ES, and it helps care providers to achieve better efficiency over the entire work flow of care provision. Fujitsu further launched HOPE Cloud WINCARE in May 2014, a cloud-based solution for care



*Data source: Annual Report on the Aging Society by Cabinet Office, Government of Japan
<http://www8.cao.go.jp/kourei/whitepaper/index-w.html>

Figure 1
 Changes in elderly population and rates of population aging.



*Data source: Survey of Long-term Care Benefit Expenditures Monthly Report Summary by the Ministry of Health, Labour and Welfare
<http://www.mhlw.go.jp/toukei/list/45-1b.html>

Figure 2
 Changes in care service users and care providers under the national nursing care insurance scheme.

providers that they can install while reducing an initial cost and maintenance loads.

This paper describes the development of an integrated community care system constructed on this care-provider solution and its future direction.

2. Challenges in developing integrated community care system

2.1 Systematization for care providers

Digitized data-sharing is the most efficient and effective way for local agents in different sectors to share information about care service users.

Most home-care providers in the integrated community care system are small-scale operators, except

for a very few major businesses with sizable revenues.⁵⁾ They often find it difficult to procure sufficient funds to install new systems. And they are often without a dedicated information and communications technology (ICT) section or expert personnel, and lack the resources and know-how necessary for stable system operation.

2.2 Enhancing efficiency at home-care sites to account for increasing number of person requiring care

Care providers are faced with a perpetual staff shortage, and often suffer from a high job turnover, that leads to constant changes of staff members. Therefore, it is crucial to streamline the care workers' routine tasks in order to maintain service quality and provide efficient care services.

Take the home-visit and service records for example: staff take notes while they are on site providing the care, and prepare visit records and service reports from the notes when they are back in the office. This way of executing the routine task does not help them to work more efficiently. High job turnover means they cannot afford to dedicate a substantial amount of time to learning the system's operation. They need a system that is simple to use.

2.3 Realizing cross-sector data-sharing

For the integrated community care system, it is important that information about care service users is shared among all local players, in terms of the state of disease and prescription as well as general living conditions, so that care providers can discuss the desired arrangements for treatment and care. To achieve this, it is important that various parties involved in home-care and nursing care services build up a rapport and promote information exchange across the borders of their professionals.

Measures to offer such opportunities include local care providers' meetings, briefings attended in person, and communication by telephone or fax, among others. However, these are often restricted in terms of time and place, making it difficult for these people to share information in a timely way.

3. Efforts to develop integrated community care system

In this section we describe Fujitsu's response and solution to these challenges in developing a community-based integrated care system.

3.1 Realizing low-cost system installation and easy system operation through the cloud

HOPE Cloud WINCARE has been developed based on HOPE WINCARE-ES, a solution Fujitsu has been offering since the state nursing care insurance system started. It offers services for care providers via the system based at Fujitsu data center. HOPE Cloud WINCARE comes in an affordable package for small-scale operators with the following merits:

1) Service based on monthly fee

The fee is charged on a monthly basis, without any need to commit to year-long contracts. This allows care providers to easily install the service at a low initial cost.

2) High availability

The system offers high availability with the Fujitsu data center's highly reliable facilities. Pieces of data are stored on the data center's highly secure dataspace, and this helps to enhance clients' business continuity plans.

3) Maintenance-free service

Since it is a cloud-based service, the clients do not need to carry out system management such as data backups and regular server maintenance, as Fujitsu will perform it for them.

4) Variety of features

The system offers services modelled on HOPE WINCARE-ES in terms of the features and operability, covering all tasks ranging from user management, care planning, visit records and invoicing.

5) Educational contents

It offers a self-learning tool, providing contents that show a work flow together with video manuals for each care service category. It is designed to allow the care providers to efficiently learn and understand the system features step-by-step along the work flow.

3.2 Streamlining care tasks through smart device solutions

The system needs to offer a solution that allows

nursing care staff to complete administrative work without having to return to the office (keeping home-visit records, service history, reports, etc.). Fujitsu started offering a smart device solution from June 2014. Designed to leverage mobile smart devices, the solution offers both an intuitive user interface that allows care staff to keep records on site easily, and high network security for preventing personal information leaks in the event of stolen or lost devices.

In developing the system, we conducted a thorough validation and evaluation of the device usability and operability through piloting on site with a care provider that employed about 300 care staff members. The resulting system is optimized for home-care on-site use with robust network security (Figure 3).

Major features of the smart device solution are described below:

- 1) Record-keeping and service performance records
The feature allows users to register their visit records and patients' vital data (blood pressure, pulse, respiration, body temperature, etc.) as well as photographic and video images, using the touch panel. The vital data can be viewed in a chronological graph. The data is linked to an accounting system, which reduces the burden of accounting administration work.
- 2) On-site data entry
The home-visit records may be entered using the touch screen, directly onto the templates that are

provided according to the care service user's conditions and disease statuses. The template items are shared with different smart devices, so that the formats may be easily standardized among the care providers.

- 3) Referencing information on care service users
Care staff can browse information on care service users (emergency contact details, home doctor, prescribed medications, care plans, etc.) while on site.
- 4) Note keeping
Notes other than the home-visit records (e.g., conversation memos with the user's family members, home doctor's comments) may be saved and managed like a filing system for medical records. The visit records and notes can be arranged in chronological order for viewing.
- 5) Messaging and notice board
This feature allows messages to be sent to on-site staff members. The sender can also check the message statuses (unread, read, completed) in real time.
- 6) Schedule management
This feature allows visits to be scheduled using the Drag & Drop function while checking the spare time of nursing care staff in either a daily or weekly view.
- 7) Mobile printer
The care staff can print out the visit record on site for the care service user or their family members.
- 8) Robust security features
Care staff handle users' personal information. The

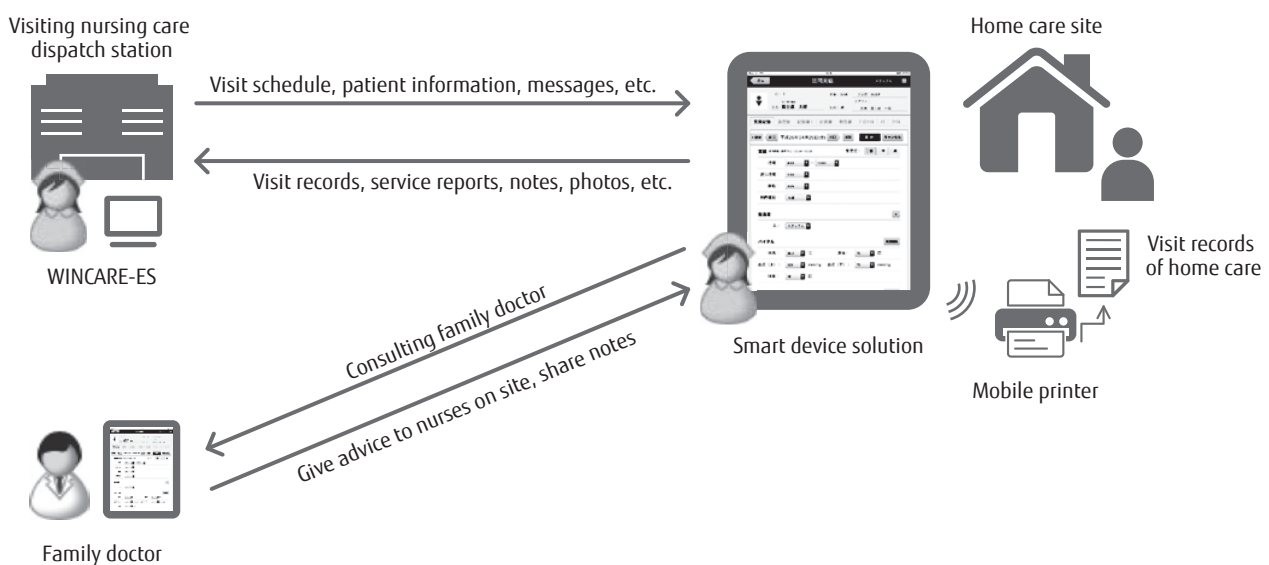


Figure 3 Utilization of smart devices at home care site (concept illustration).

system offers the following features so that the home-care staff can use the smart devices with peace of mind regarding the risk of lost devices or confidential information leakage.

- Data encryption using IPsecVPN (virtual private network structure that uses encrypted IP) to prevent data leakage.
- The smart devices are designed not to save care-related data (photos, access history, etc.) in order to prevent problems in case the devices are stolen or lost.
- A terminal authentication feature prevents the system from being accessed by unauthorized smart devices. In case the devices are stolen or lost, the authentication record may be cancelled to prevent unauthorized access.

3.3 To realize social network for home care

In order to adapt to the integrated community care system, Fujitsu pursues the development of a social network system (SNS) for home care (Figure 4) which facilitates cross-sectional collaboration for the various care providers involved in providing services to local persons requiring care. The home-care SNS will offer a variety of communication tools for timely information-sharing among different sectors without

restrictions on place or time, and thus facilitate the information exchange necessary for coordinating medical treatment and home care.

The major features of the home-care SNS are as follows:

- 1) Cross-sector communication tools
A chat feature with a time-line interface that is easy to use and free from time/place constraints, with an intuitive user interface, connecting medical personnel and care staff as well as other players in different sectors.
- 2) Medical/nursing care profile sharing
Care service users' profile data (basic information, insurance, care requirement levels, house, family members, medical consultations, treatments, prescription medications, care information, etc.) are made accessible for different players when providing a care service. Also, the registered profile data are liaised between HOPE Cloud WINCARE, HOPE WINCARE-ES and Fujitsu's medical care and electronic medical record system for clinics, FUJITSU healthcare solution HOPE EGMAIN-RX.
- 3) Notice board

This feature offers a calendar-style event notice board for system users. It also allows for targeted communication such as messaging to specific individuals or groups. The sender can check the message statuses

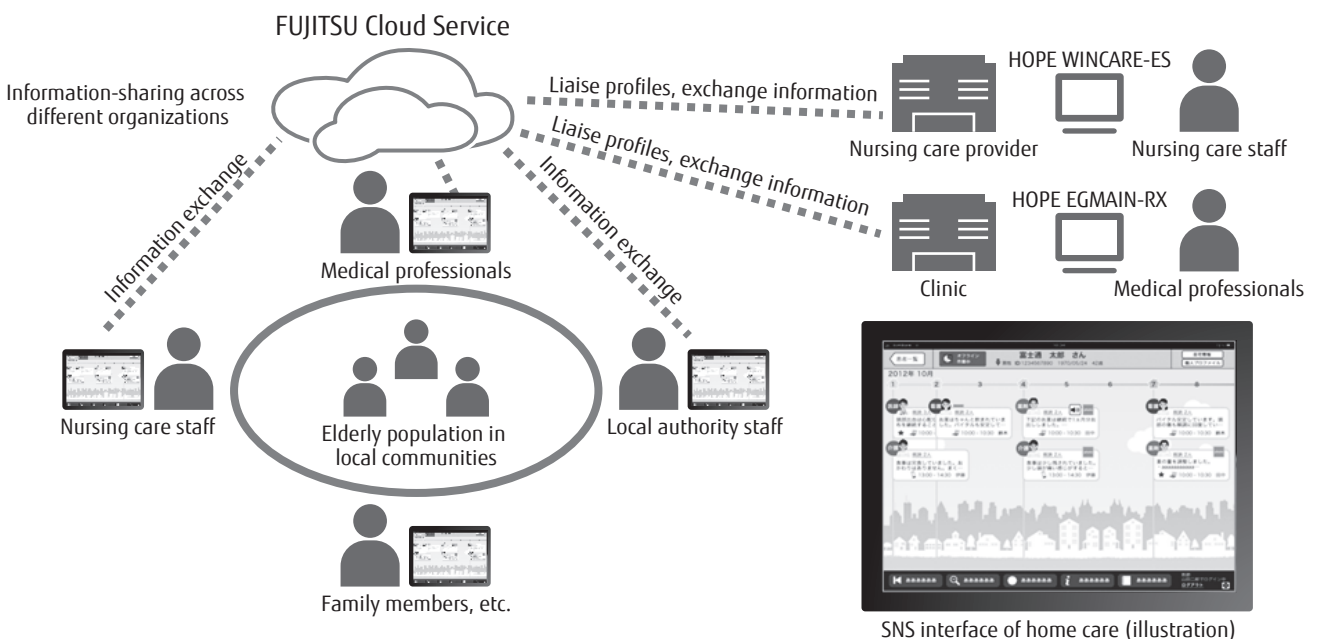


Figure 4 SNS deployment of home care (concept illustration).

(read, unread, completed) in real time.

4) User grouping

This feature makes it possible to create groups in the communication forum and select participants by user or topic. The group administrator can send invitation e-mails, moderate participation requests, and configure access ranges for each group member.

4. Conclusion

In this paper, we described the development of an integrated community care system based on Fujitsu's nursing care provider solution. In developing an integrated community care system, it is important to cater for local and specific needs, respecting the autonomy and individuality of local communities. As the agents providing domestic support for elderly people and the provided services increase in the future, demands for data-sharing and communication will become diversified. Fujitsu will strive to understand the diversifying needs precisely and contribute to the development of a community-based integrated care system through creating solutions with value for customers.



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