Application of the UNIVERGE Remote Consultation Solution to Elderly Care

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Abstract

A system closely ties the high usability of smart device terminals to Unified Communications can reinforce human-to-human bonds and bring innovation to work styles and lifestyles.This paper demonstrates that a system suitable for health consultation and monitoring services for the elderly can be realized by integrating tablet terminals to the UNIVERGE Remote Consultation Solution through a case study of the use of such system and clarifies how it can offer safety to the lives of elderly persons.

Keywords

Unified Communications, remote consultation, monitoring service, preventive care, healthcare

1. Introduction

In contrast to legacy communication tools, which handle voice and data separately, Unified Communications (UC) [1], which provides deeper human-to-human communication by closely integrating voice and data, is proposed as a new communication trend to accelerate the work- and life-styles evolution. The usability improvement from the legacy type "mouse and keyboard" operations to intuitive operations through the touchscreen panel interface on smart devices leads to the solution of digital divide problems. The improvement, hence, is expected to be the breakthrough for those who are unaccustomed to PCs, including elderly persons with low IT literacy.

In this paper, we will describe a system that will lead to lifestyle innovation providing remote monitoring and health consultation services to the elderly persons by incorporating with UC capabilities. UNIVERGE 3C [2] will provide the UC capabilities in the system.

We will first analyze the requirements for remote health consultation and monitoring services for home care of the elderly (hereinafter referred to as watch services) and then demonstrate how the UNIVERGE Remote Consultation Solution can meet these requirements. Through this case, we will clarify how a combination of smart device and UC can contribute to improving the lifestyles of the elderly by enhancing safety and offering daily, weekly, monthly, or annual cycles of activities.

2. Requirements Analysis for an Elderly Watch Service

In villages and islands isolated from urban zones, the aging population, population decline and doctor-less regions have recently been on the rise simultaneously, posing an threat for local governments. In order to maintain and promote the health of residents from the viewpoint of disease prevention, some local governments have begun installing terminals in community halls to use for administrative services.

It has been increasingly required to provide in-home health care services for elderly persons who have difficulty going out. Though a numbers of Medical Alert IT systems applied to elderly in-home watch services are on the rise, there exist the following issues;

- Lack of need to leave home may lessen the number of-communications,
- Possible difficulty for elderly persons to handle IT equipment such as PCs leading to low usage rate of the introduced services.

To solve these issues, elderly watch services need to meet the following requirements.

(1) Enrichment of communications

Many elderly persons are feeling insecure about the deterioration of health as a result of aging or about the economic future. As households composed of single persons or elderly persons are increasing, many people are losing the bonds with their families and/or local communities [3]. In order to reduce the feelings of insecurity, the watch service operator (hereinafter referred to as a "watcher") in a remote location should communicate with

elderly persons in a multimedia style such as a videophone to enrich the communication as much as possible.

(2) Simplified interface and alternate control

In the communications between the elderly person and the watcher mentioned above, it is sometimes difficult for the elderly persons to perform complicated IT operations. This makes it necessary for this service to provide communications through a simple user interface and to allow the watchers to execute alternate control of a PC from a remote location in case the elderly person is unable to perform accurate control.

Since each elderly person must install an in-home terminal to use this service, it is also necessary to consider privacy, for example by getting consent from the elderly person being monitored and displaying images around the elderly person on the watcher's monitor only when the consent is given.

(3) Linkage with various services

Various use cases can arise for a watch service and the functions provided by this service may be covered by many kinds of applications. Therefore, a watch service should be easy to cooperate with various applications, For example, a videophone can be easily handled by various applications, and so on.

3. UNIVERGE Remote Consultation Solution

The UNIVERGE Remote Consultation Solution is a bidirectional communications solution supporting rich media including audio, video and web. It connects the end user with consultants with expertise and enables near-face-to-face consultations even at distant locations.

As shown in **Fig. 1** , this solution is implemented through the use of user terminals, consultant terminals and a remote consultation server that controls the connections between the above two types of terminals. Each terminal has the ability to handle audio and video communications and has an application sharing feature. The media are controlled through UNIVERGE Concierge Client (browser) on each terminal. Audio is connected through UNIVERGE 3C and other media are connected through the UNIVERGE Concierge Server.

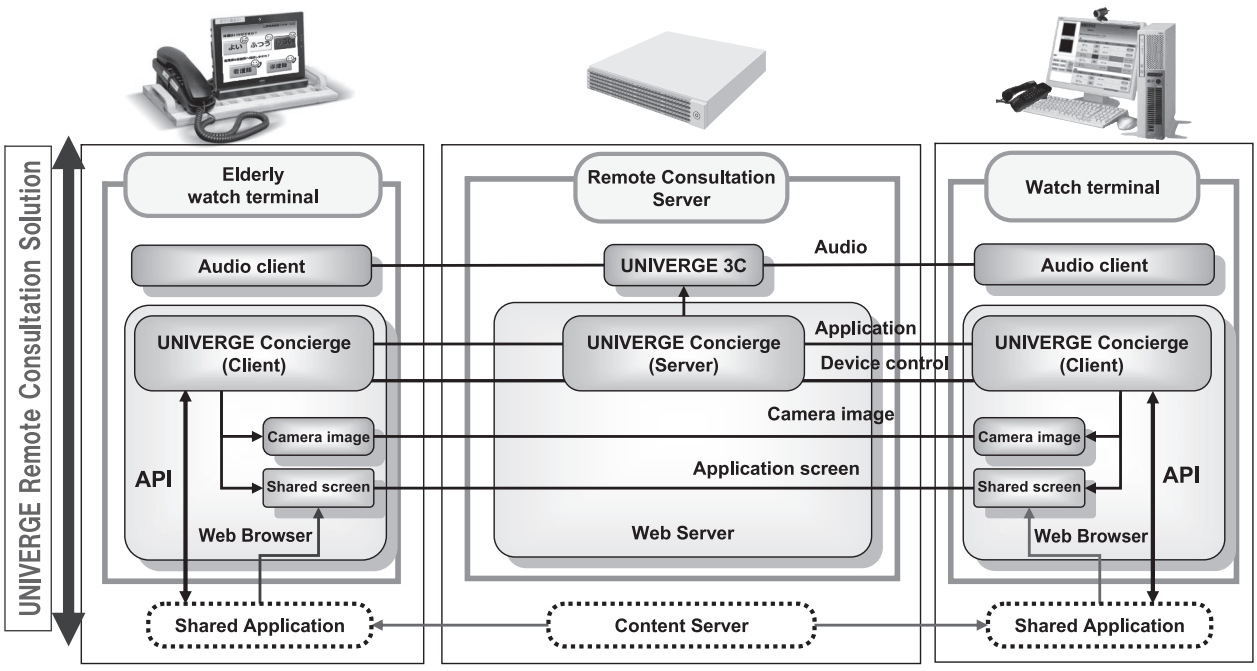

Fig. 1 UNIVERGE Remote Consultation Solution components.

In this paper, we will refer to the user terminals as “elderly watch terminals” and the consultant terminals as “watcher terminals.”

The solution can satisfy the watch service requirements discussed in the previous section by the use of the following outstanding features of the UNIVERGE Remote Consultation Solution.

(1) Rich media communications with audio, video and applications

Provision of various information, including audio and video streams of both sides and application sharing windows, makes it possible to feel as if talking face to face.

(2) Touchscreen panel that enables easy operation even for novice users

ICT can become a source of stress for the elderly if not utilized adequately. The elderly watch terminal screen has the minimum number of buttons, which can be easily controlled by the use of the touchscreen panel. Complicated operations can be executed by alternate control by the watcher after the connection is established. By having the watcher execute relatively advanced functions, including operations on the shared screen of the elderly person's terminal and video device switching, the elderly person can be protected against ICT stress.

(3) Easy linkage with existing systems

In combination with other systems, more advanced consultation services can be implemented. The API (Application Program Interface) provided by the UNIVERGE Remote Consultation Solution makes it possible to add the consultation service onto various web applications.

4. Use Case

In this section we will explain about the watch service that we introduced in Mishima-mura village, Kagoshima Prefecture, Japan together with the opinions and comments collected from the users.

The Mishima-mura municipality decided to introduce this service to reduce the insecurity of being doctorless and to create an environment in which elderly persons can live securely in their homes. The service will ensure smooth communications between elderly persons and public health nurses and clinical nurses in remote locations, such as municipality offices, and provides a fine watch service helpful for the early discovery and prevention of diseases. As you can see the service operation flow shown in **Fig. 2** , this service can be classified into the following two functions.

The first function is a physical condition check function based on reports given by elderly persons (1, 2, 3 and 6 in Fig. 2). The elderly persons press the buttons on the screens of the elderly watch terminals in their homes to report on their

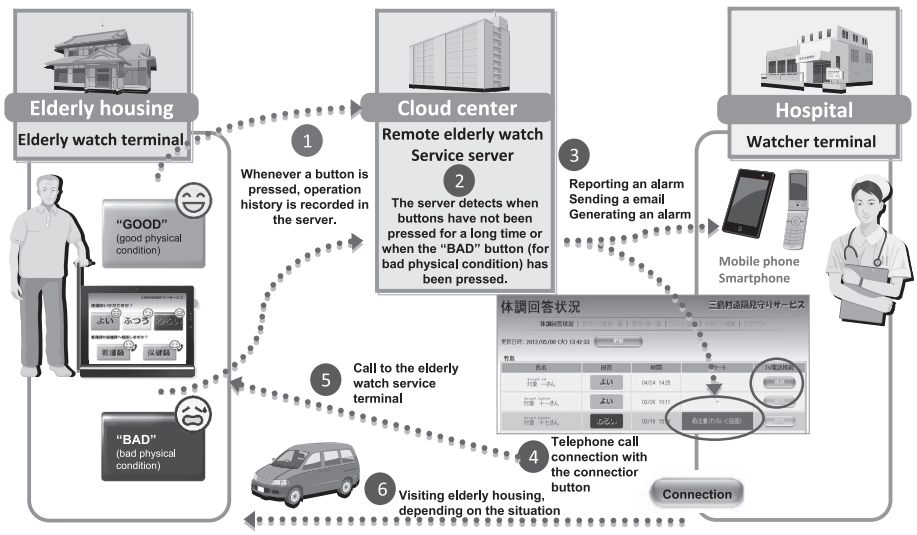

Fig. 2 Operation of the Elderly Watch Service.

Fig. 3 Elderly Watch Terminal.

current physical condition. These reports are recorded in the server so that public health nurses and clinical nurses can check them from their watcher terminals in remote locations. If a report on bad physical condition is found, or if no buttons have been pressed for a long time, a mail is sent to the registered address. This function realizes a "participatory watch," which is not composed of one-way checks of the conditions of elderly persons by clinics and municipality offices, but is also participated in by the elderly persons themselves.

The second function is communication function with rich media (4 and 5 in Fig. 2). In case of doubt of the health of an elderly person, a public health or clinical nurse can call the elderly person by videophone from the watcher terminal. During the videophone conversation, near-face-to-face consultation can be held by sharing web pages, materials and application screens between the nurse and the elderly person. Though not shown in Fig. 2, if an elderly person wishes to consult with a public health or clinical nurse, the elderly person can call the nurse by videophone with a single click of a button on the elderly watch terminal.

The most important feature of the service is its enhanced usability to facilitate use even by elderly persons not familiar with PCs. As shown in **Fig. 3** , the elderly watch terminal has only the buttons displayed on the screen. An elderly person can execute basic actions with a single touch, such as reporting physical condition, making a videophone call and so on. To prevent touch mistakes, the buttons are given larger sizes and colored in more vivid colors than usual. The buttons also has illustrations showing their functions at a glance.

The audio interface for the videophone does not use a built-in microphone, but rather a USB handset is provided so that elderly persons can talk with the same feeling as with the telephone they are accustomed to. In order to take advantage of the high portability of smart devices, the terminal is connected through wireless LAN. This enables elderly persons to carry the terminal anywhere in the home, for example in the living room in the daytime and in the bedroom at night.

The comments sent by elderly persons using this service included "it gave me a secure feeling that I can be connected anytime, or a feeling as if my family has increased," "the habit of reporting my physical condition gave a rhythm to my life," "using a machine foreign to me is a good stimulation for me," and so on. Public health nurses who watch elderly persons evaluated the service with comments such as "it shortened the distance between us and elderly persons," "I felt secure to talk with them by seeing each other's face on the videophone because it is hard to visit them frequently," and so on.

For the present, this service has been introduced in some aged families composed of members aged 70 or more. As it is highly appreciated by its current users and many elderly persons are requesting to use it, it is planning to increase the number of households introducing it. For the future, municipalities are studying expansion of this service in the field of preventive care by increasing applications contributing to the prevention of dementia and introducing the watching function between elderly persons and their families living separately from them or between elderly persons.

5. Conclusion

In this paper, we explored how the high usability of smart devices and the Unified Communications (UC) function of the UNIVERGE Remote Consultation Solution can give elderly persons secure feelings and rhythms in life and contribute to reform their lifestyles.

UC is capable of bringing lifestyle and work style innovation to many usage scenes other than that described in this papaer. The UNIVERGE Remote Consultation Solution has been been applied to the videophone guidance system of the Narita International Airport Corporation supporting the improved efficiency and advancement of the airport's foreign visitor guidance service. It is also applied to the integrated communications service of Taketomi-cho island, Ishigaki-shi municipality, Okinawa Prefecture , for a broad area of administration-related operations of a local government.

In the future, we are planning to provide vertically-integrated solutions with the integration of smart devices and UC.

Application of the UNIVERGE Remote Consultation Solution to Elderly Care

Through the solutions, we would like to contribute work- and life-style innovations for various business scenes.

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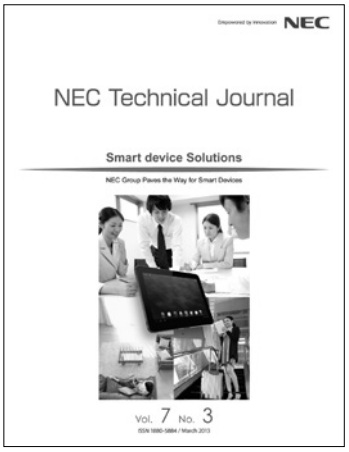

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