Daily Life Support and Widely Applicable Living Arrangement System under the Internet Environment

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Abstract: - A simple technology in principle is proposed on the basis of its safety, reliability and flexibility, reflecting past technical achievements for the well-being in ageing society. Hereby, the active use of the Internet environment is described for the wide provision of convenience and help of daily life on public benefits. We propose some methods concerning system management and software provision to start up the computer from a distance, which can help better use of these networks. We present technical viewpoints from our studies with comprehensive engineering issues related to development and practical utilization of basic functions required by the Internet. From the progress in information and communication technology, appropriate systems were systematically developed for the help of daily life, amusement, guidance, health care, rehabilitation, nursing and medicare. They enabled the beneficiaries not only to ask neighbors in emergency and to have daily necessities, but also to cover effective activity and communications in remote islands and/or depopulated area where sufficient resource of medical staff might not be provided. In order to bilaterally communicate with beneficiaries, an extended functions of the proposed basic system are utilized for all the various systems, which we propose as the concrete methods and apparatus to communicate their concerning data. In the present study, important methods for the help of everyday life and rescue of a lonely living person with sudden illness threatened to life are realized by the combination of the additional button type computer with the proposed communication techniques without any complicated manipulation under the Internet environment.

Key-Words: - Welfare, Remote, Daily life support, Communication, Button computer, Internet.

1 Introduction

In order to cope with a rapid shift of our society to the *ageing and little birth rate*, daily life support system for everybody is regarded inevitable at the local and individual levels. In other words, effective simple help is necessary over a wide area to expect various cares of the elderly, the sick and even the healthy in everyday life including their fair and impartial care in the situation of changing social structure. On such occasion we may widely contribute to the better living environment without boosting a burden of beneficiaries, including the prevention and management of a lifestyle-related disease.

The present authors have ever built the physically and mentally activating system of senile dementia and supporting system of social activity in a sickbed, introducing the telemetry and remote operation based on systematic functions in accordance with hardware of information technology[1]-[7]. We offered better arrangement for the health guidance, training, working, amusement, rehabilitation, medical treatment and rescue in emergency [8].

Reflecting limits and vulnerability of past technical achievements, our approach is mainly for the persons who are in their need (beneficiaries, hereafter) in a different policy of the small technology with safety, reliability and flexibility.

From this point of view, the wide networks are utilized because of their importance, easy replacement and overall convenience for public benefits inclusive of favorable economics and easy-to-handle equipment, considering the systems boasting both high-tech and multiple functions do not necessarily lead to their widespread use [8].

Hereby, we propose policies aimed at hardware development, software improvement and system management, which can help better use of the networks, presenting technical viewpoint and equipment derived from our trials with

comprehensive engineering issues related to developing and practical utilization of functions required by such networks.

Although our argument and views cover some, not all, pertinent aspects, we try to illustrate and advocate the roles and possibilities that the engineers can play in welfare, from the viewpoint of desirable progress in information and communications systems. Thus, we provide appropriate methods not only for everyday life support of the persons, but also for substantial support of community health, prevention of disease, emergency medicine by helper, caretaker, nurse, health nurse and physician.

In consequence, such technology would further lead to the intended build-up of new future welfare culture.

2 Welfare System Using Information Technology

2.1 Required communication for daily life support

The present authors have ever developed the network communication system based on the same principle, which has many possible applications to various situations of well-being and medicare. Thus, beneficiaries can establish communication only by connecting a browse through the Internet because of provision of the system with high availability and applicability. That is, the standard type of personal computer is only necessary for the basic communication among the beneficiaries, requiring its easy operation without any special expense burden. Therefore, it sufficiently well supports daily necessary communication to form essential kernels of social safety network in the mutual assistance.

However, in the emergency such a sudden illness threatened to life, the most essential function was not included in the system to reach the definite person in a higher priority of communication under the ordinary network environment with a standard type of computer at home.

In the present study, we propose the method of communication by sending appropriate signal for start-up of the definite computers of neighbors. This is a very important function for beneficiaries to provide closely related persons such as family members with appropriate means of communication.

It is one of the most important for everyday life and necessary for the care of health, stepping on a troublesome procedure at a distance. Thus, our basic posture of a remote system mainly provides the lonely living persons at various life stages with an appropriate environment of the life support using the information and communication technology.

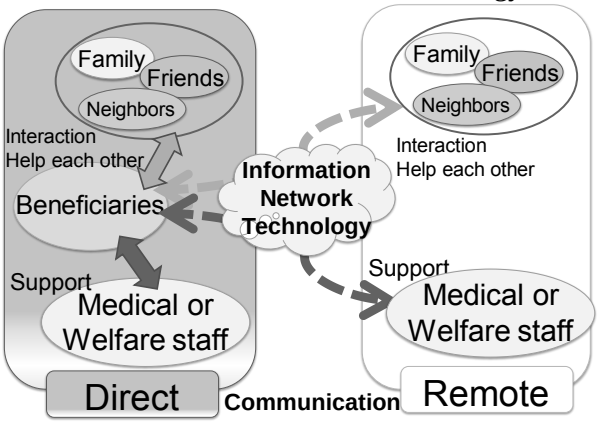

Fig.1 Basic concept of welfare support by the Internet.

Meanwhile, we had also developed the remote technique to cover various kinds of life support comprehensively. Figure 1 shows the basic idea of essential support of the persons by their family, neighbors and caretaker by use of the network. The beneficiaries living in remote and/or depopulated areas may well communicate with closely related persons and transmit the data of daily life to medical staff at their free will. If some more functions are introduced, even an intellectual remote work and social participation will be possible [8].

Hereby, we concerned the systems relating to current information technology using the Internet, which makes it possible to communicate multilaterally among them on the basis of various kinds of highly developed technology [9]-[12].

2.2 The basic information system

The system on Flash Media Server (FMS) ensures beneficiaries real time multimedia communication under the Internet environment. That is, the various appropriate systems are realized

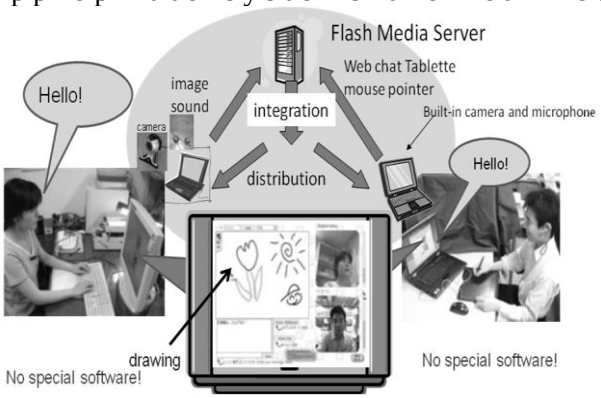

Fig.2 The basic multi-purpose system on the general principle (image).

as its variation for the definite interactive communication of persons from distant areas.

In order to utilize suitable methods in the well-being, we realized such a simple communication system as shown in Fig.2, of which variations was applied on the basis of same principle to various aims such as amusement, physical exercise, rehabilitation, social participation and so on [8],[13]-[16].

2.3 The personally basic needs as an extended telephone

We will mention a system just as a simple extended telephone for multiple persons to use, by which for instance a young mother with difficulty in speaking Japanese would use it, who recently came from a foreign country to live in Japan.

Suppose that she would like to consult with a medical specialist about the state of her baby in sudden illness threatened to life as shown in Fig.3. It is convenient, if the both persons well utilize this kind of extended function with the help of an interpreter at a distance. However, a kind of interpreter's station must be taken into consideration, as a beneficiary (mother) usually has no closely related persons who speak her own language and Japanese around her or even aboard.

It is however useful to prepare a personal computer for a direct connecting facility to rescue such emergency of sudden illness, in the case of not only babies but also the ordinary people.

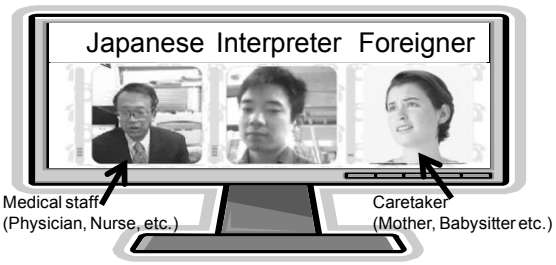

Fig.3 communication between a foreigner and a Japanese with the help of an interpreter (image).

2.4 Necessary equipment for the use of proposed system

As represented in Fig.2 necessary devices for beneficiaries are only personal computer or personal digital assistant (PDA) with web-camera, speaker & microphone or headphone (where all in one built type is favorable) in the basic communication system under the Internet environment. A mobile phone can be used for the automatic transmission and management of necessary message and record. The system is designed in a favorable manner by public facilities for beneficiaries without any financial burden on its utilization. Anyone may utilize the above mentioned function as a part of this general software by giving only the website address anywhere he/she lives, because all functions are supported by a server system.

3 Fundamental Support of the Information system

3.1 Development of a new type of computer

Here, we propose a new type of computer to reach definite destinations as depicted in Fig.4. The psychological hesitation of machinery operation is avoided by just pushing the buttons or the marks on touch panel. If the definite button of a sender's computer is selected from his/her own need, the signal is sent to connect the receiver's computer in destination for its start, consequently calling for him/her by the alarm of computer. Such kinds of functional series were confirmed realizable by the technique of Virtual Private Network (VPN) secured by cryptic communication. This kind of proposed system is easily provided in low cost. Thus, it is useful for the lonely living persons to utilize it, e.g. for their shopping of daily necessities, and especially for the rescue of their sudden illness threatened to life.

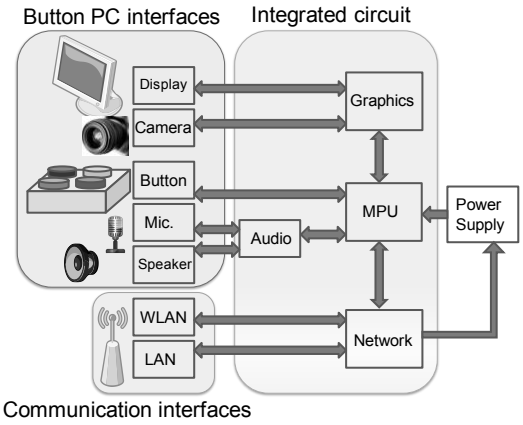

Fig.4 Block diagram of integrated power management system.

3.2 Automatic connection to target computer using power management system

It is quite usual from the viewpoint of the energy conservation that the electric power is thought not supplied to the counterpart computer before the start-up of communication, so that the signal of its state cannot be acquired by the sender beforehand. Thus, power management system (PMS) is necessary in order to realize the bilateral communication, even in the case that the counterpart computer remains shutdown. The PMS should have

the function of dynamic DNS which is necessary for home communication environment to have corresponding dynamic IP. Furthermore, VPN must be realized and private and MAC addresses of receiving terminal are required by the PMS. That is, the PMS sends the receiving terminal a signal for Wakeup On LAN(WOL) by the connection of sending terminal to start up its power supply, so that VPN may be appropriately connected. Then, the sending terminal attains the connection via VPN connection to the PMS. In consequence, the PMS realizes the start-up of the receiving terminal by WOL. The above mentioned process realizes VPN connection and start-up of the receiving terminal by way of the PMS. Thus, the receiver realizes communication with the sender from its state of shutdown as shown in Fig.5.

For emergent communication by the previously mentioned button computer, the electric power must be most surely managed by the compact hardware as integrated circuit for the receiving side. This logical circuit system receives an emergent signal from the client sending computer to let the receiving computer start up. Then, both terminals are connected by virtual network, kept in a secret during communication. In addition to it, the PMS should be also integrated to all-in-one-type together with personal computer, in consideration of its less energy consumption and easy application.

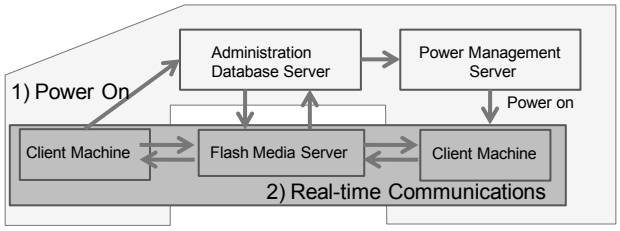

Fig.5 Start-up of a counterpart computer from a distance.

3.3 Network facilities at home

As the pertinent system is based on the communication environment at home, dynamic IP corresponds to the address by IPv4 provided from the present internet service provider. In order to identify the definite person as a receiver in an emergent communication, the method must keep its secret, using VPN with dynamic DNS service. If only an emergent signal is for the transmission to start-up of the destination, 56kbps is sufficiently enough speedy in communication line using analog high speed modem. However, it is desirable to prepare the higher speed line than DSL, when we take into account our communication system of safety confirmation inclusive of image and sound by bilateral communication.

3.4 Unification of FMS and button computer

Hereby, we realize the effective bilateral communication by the FMS system with the combination of a button computer. After the start-up of receiving terminal as mentioned before, the receiving computer can send the image and sound as its reply by direct use of a browse through FMS to the sender. This procedure is performed by a button computer including relevant software, then, the desired communication with a destination is automatically established by the acknowledgement to communicate together with simple operation to send image and sound of the receiver. Thus, we can see both faces of the sender and receiver each other on their screens at the same time from a distance as illustrates by Fig.6.

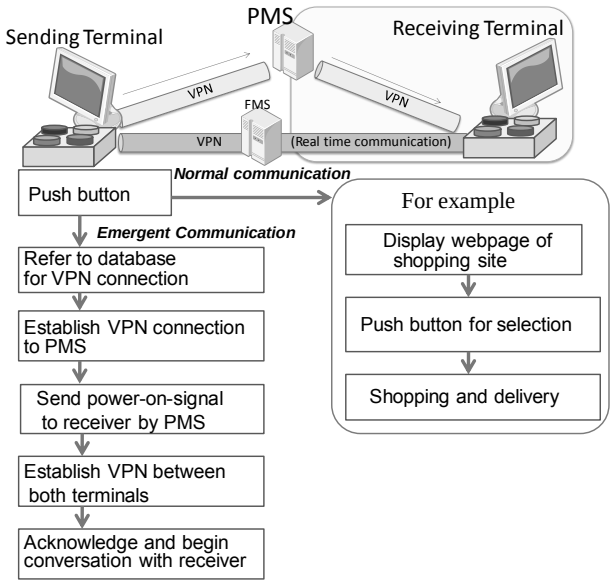

Fig.6 Unification of the FMS system and a button computer using the PMS for switching of receiving terminal.

The receiver's computer finally driven by the sender recognizes who would like to connect to him/her and what happened on the side of the sender. The receiver may refuse the connection to reply to the sender in appropriate recognition of the image and sound sent from the sender.

4 Substantial Needs in Everyday Life

4.1 Conversation with familiar persons

We will now mention the necessary functions for the everyday life of the living alone at home. The

well-being system is substantially relied on the easy communication with familiar persons [13]-[16]. It is very important from the psychological viewpoint for the lonely living person to easily realize the communication to the closely related person and to have a positive stimulation due to the relation with the vicinity under the well-resourced circumstance of the simple operation of a machine. This kind of concept ensures the lonely living persons spiritual relaxation, comfort and peace in mind being with their friends and/or family members. Figure7 shows a pleasant chatting with the friends at a distance, as if they were together in the same room, which follows the simple operation of the button-push from one side.

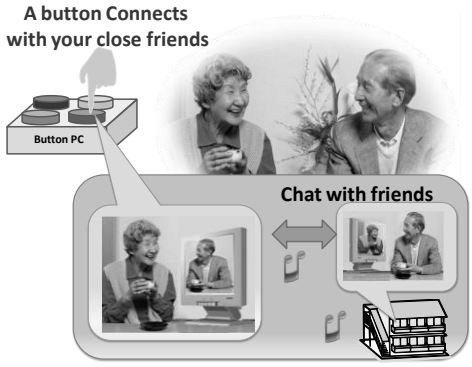

Fig.7 Communication with lonely living friends through the Internet (image).

4.2 Shopping and delivery of daily necessities

The proposed button type computer is also used to connect to the service of daily necessities, especially for the choice and purchase of some food menu of the day, which is quickly prepared for the beneficiaries by such a microwave oven.

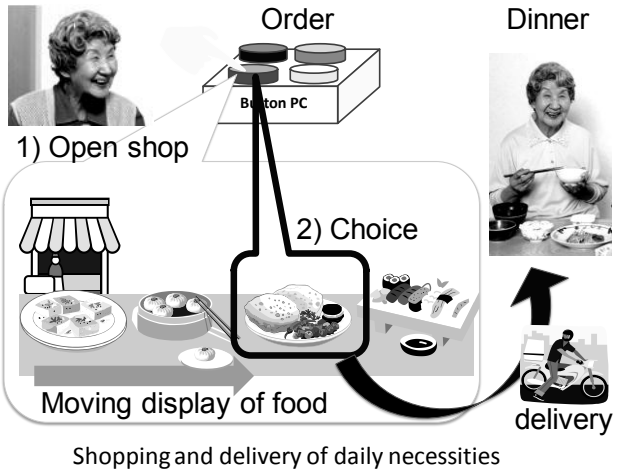

Fig.8 Shopping and delivery of daily foods (image).

In order to get their favorite dish, we adopted the system with a button-choice from various moving CG samples of cooking on the belt as shown in Fig.8.

4.3 Remote emergency support system

It is important to think sudden illness threatened to life of the lonely living in the situation being never helped by anyone at home. It is essential to arrange all the process of rescue automatically.

We have ever developed an assist-respirator, which could start to work according to air pressure change within the air mask and gives a patient standard treatment with inhalant medicine[4]-[7]. The patient is informed to the ambulance simultaneously, while a registered physician acknowledges the signal for help and has appropriate visual, acoustic diagnosis of his/her state by using the FMS system [8],[13]-[16]. If the physician regards that a patient needs further care and treatment, helpers and/or nurses from their stations are asked to visit a patient at home.

However, it is more important for a patient to be able to ask the definite person in emergency to come near him/her for help immediately, so that a patient may inform familiar neighbors about his/her sudden illness threatened to life as illustrated by Fig.9.

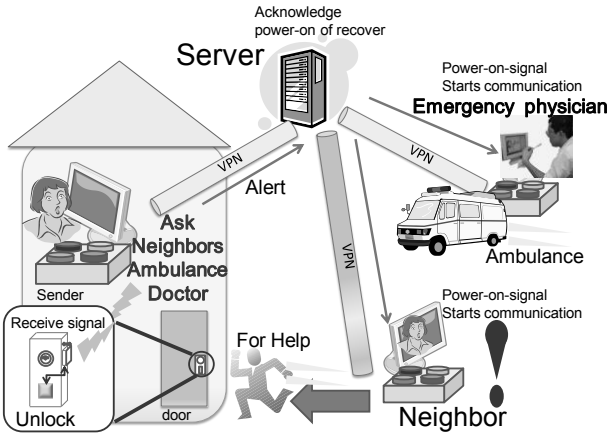

Fig.9 For the help of sudden illness of the lonely living at home with the unlock of entrance (image).

4.4 Joint ownership system for remote family

This is also for the mutual help of the living alone and their family member by their visual and acoustic communication from a distance. A feeling of unity to their own family member is provided with joint common space by sending their image and voice bilaterally covering necessary area of their rooms by the roundly movable web-camera as illustrated in Fig.10. It is only for the use of the

persons in particular relation of such as family members, who do not interfere with privacy of

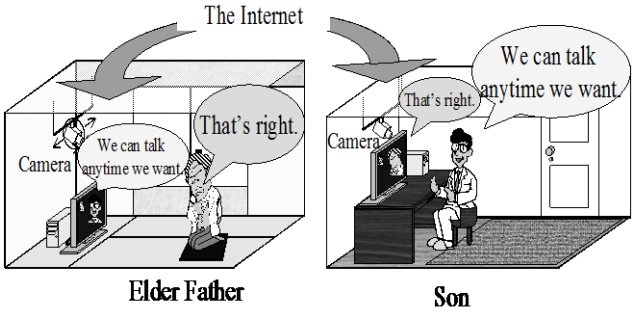

Fig.10 Concept of remote common family space.

Beneficiaries. No special equipment and expense are required except for some apparatus as mentioned before.

It is then possible to use, for example, for a virtual trip by "a father" together with an actual trip by his son in an application of higher performance wireless LAN [17]. For instance, as in the case that father (beneficiary) remains difficult in making a trip. In place of his father, his son makes a trip using a wireless FMS communication system. By wearing web-camera with microphone, he occasionally sends his father what he looks at and listens to while his travel as shown in Fig. 11. Father may ask his son to see some more precisely, if he has an interest in something special, inquiring his son to visit somewhere special or to zoom up the scenery sent from a distance.

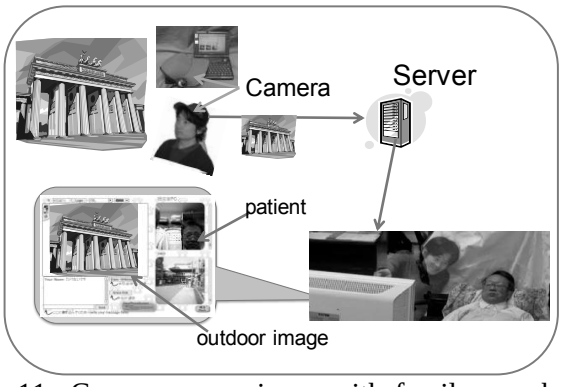

Fig.11 Common experience with family members by virtual trip (image).

5 Amusement, Rehabilitation and Advice Systems

5.1 Playing system based on image and sound change

By using the same principled system, the playing system was designed for the direct entrance of players (beneficiaries) into the screen, in which they control the movement of virtual object on the screen using a driving engine by image and sound change from their own movement and/or sound without any special wearing, equipment and operation [1]-[3], [13]-[16]. That is, the image and sound acquired respectively by web-camera and microphone are transformed into numeric amount to drive a virtual object. The movement of players is simultaneously displayed for visual recognition.

Then, this system is used for the assessment of physical rehabilitation of beneficiaries, because a virtual object moves according to the amount of their movement. As an example given by Fig.12, it was designed so that numbers of virtual cherry pedals and their moving speed could be changed by motion in image and level of sound, looking at her own figure. It is remarked in the system for two players that the moving objects are controlled even to the opposite directions by the players' own movements from distant places.

The upper left illustration explains an amusement on the ceiling screen, so that even the person lying on the bed can play together with friends through the Internet. In addition, not only the plays in virtual space but also appropriate entertainments such as movies and reading on the screen ensure them to promote their physical and mental state in the bed.

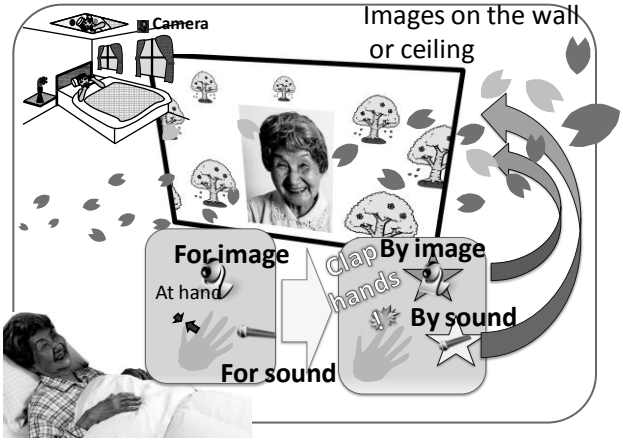

Fig.12 Schematic explanation of the play from the bed, looking at moving image on the ceiling (image).

5.2 Rehabilitation system based on image and sound change

A person tries physical exercise for rehabilitation together with a helper under a remote instructor projected on the screen through the Internet. That is, the physically and mentally handicapped may have the rehabilitation with helpers such family members, enjoying games in parallel, while being instructed and/or consulted with at home as well as at hospital. This rehabilitation system is available not only for

an individual but also for a group, for which only provider of the system has financial privilege, while beneficiaries have no responsibility for economic expense.

From the observation and the playback of patients' motion, some important suggestion or medical view may be obtained and applied to the appropriate treatment including assessment of rehabilitation. They can check and manage the effect of rehabilitation by themselves with the recognition of their own figures and movements on the screen. Nurses and physiotherapists communicate with patients and give their direct instruction with demonstration for the comprehension of patients' state at a distance, using two windows as represented by Fig.13. The automatic reporting function is also designed in the system so that the analysis of the movement and behavior of the patients may be transmitted to medical and welfare staff, including the description of chronic data by its graphic display.

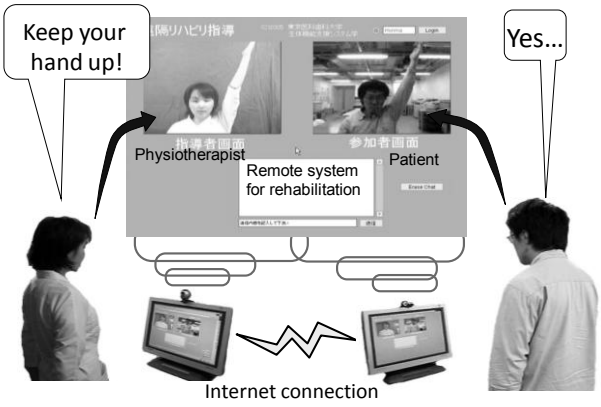

Fig.13 Principle of remote rehabilitation from a distance (image).

5.3 Additional remote functions

As for the care and prevention of lifestyle-related disease, appropriate advices were provided to beneficiaries with their long term concerning records. It is hereby convenient to use the systems based on FMS and PHP (Hypertext Preprocessor) with simple operation for the consultation of health state of beneficiaries, because their information can be referred by medical staff through the network, having graphic display of time course of concerning data. Data in statistics are also automatically informed to beneficiaries, if there are some problems with them.

Figure 14 is one of the concerning systems taken as an example, by which some medical advice is given to a beneficiary. The average aspect of food intake

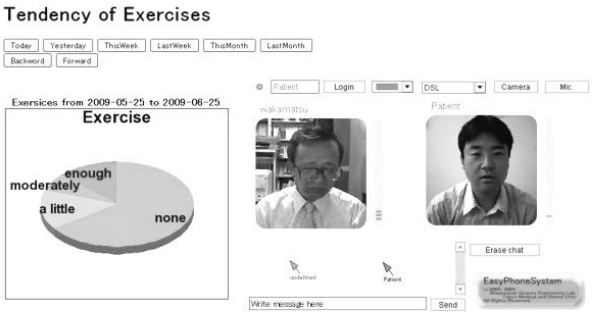

Fig.14 Advice by physician about relative amount of exercise averaged in a month (image).

of cooking and tastes of a beneficiary during a certain period was checked and if necessary consulted with a specialist by using the FMS system with this kind of graphic display after the simple input of category data of his/her everyday diet meal, and if necessary, data of a lifestyle such as work, sleep, exercise and so on [18]-[22].

The proposed FMS system was not only for the everyday life communication of the beneficiaries, but also for subjectively various care of them, in the difficult activities of health care institutions in remote islands and/or depopulated area, where there are limit of high level human resources of specialty. That is, we designed them due to systematic role in remote support where medical workers such as physicians, visiting and community health nurses may not be provided sufficiently enough, so that the system may enhance communication and support them in such a situation.

In this connection, we have provided particular care of the security concerning about a leak of personal information as an inevitable problem of this kind of system [23].

6 Technical Verification of the Systems

6.1 Verification of the basic FMS system

Here, we discuss the availability of various telecommunication systems under the Internet environment, which have been introduced in the present paper. Their various functions are based on the same concept of the fundamental system approach mentioned in section **2**.

Thus, it is quite natural and reasonable to inspect the functional ability of the fundamental system, which determines their functions of individual systems in the same way. Here, taking into account the plan to install the individual systems in near future, we think, it is primarily necessary to discuss only the basic FMS system with its feasibility in applications, considering the running state of all the

individual systems on the common functions represented by Fig. 2.

First of all, we discuss the fundamental system of communication as an extended telephone based on the simple principle according to Figs.2 and 3 from the different places by multiple participants. The functional ability was basically confirmed with not bad results of a transmission delay within 1.0 [sec] in average, when we tried to examine the transmission in three following cases: among (a) Seoul(Korea)- Abiko(Japan)- Chigasaki (Japan) – Tokyo (Japan), (b) Abiko (Japan) – Yokohama (Japan)- Kaufbeuren (Germany) and (c)Tokyo (Japan) –Chigasaki (Japan)-Chattanooga (USA)[13].

Consequently, we confirmed in all cases that the proposed systems were mainly dependent on the data-carrying capacity of the Internet.

6.2 Verification of systems on the same principle of FMS system for personal use

The concept of joint common space for the family can be easily realized as indicated by Fig.10 from a distance. If the wireless web-camera and device such a Bluetooth are used together, the common space will be readily enlarged.

If such technique is further extended to wide area by long distance wireless LAN as depicted in Fig.11, it will be possible to make a virtual trip with family member. The experiment in principle using High Speed Packet Access (HSPA) was successfully performed, although the quality of the communication was not sufficiently enough in the present situation [24].

In the case of Fig.12, the play using the change of image movement and sound volume was already confirmed at home. The application of the system in a group at welfare institutions was also confirmed well as in the case of the play by using stand alone amusement system[1]-[3], so that the patient lying on the bed might play the game looking at the ceiling in this case.

As for the rehabilitation indicated by Fig.13, we basically tried it from a distance in connection with physiotherapists of Nago-city and Ie-island in Okinawa prefecture of southwest Japan together with our laboratory in Tokyo [13].

Some health and/or medical advices are supported by the FMS and sent to a beneficiary whenever, after his/her subjectively choice of the simple categorized style of cooking, taste and ingredients by picture icon as explained by Fig.14. The graphic display of habitual trends of food intake is obtained in an arbitrary term, e.g. in a month or longer period [18]-[22].

Thus, the every proposed FMS system was useful for the everyday life communication in various care of the beneficiaries.

6.3 Verification of other systems on the same principle of FMS system for public use

It was experimentally proved that our present FMS systems were applicable to the nursing and medical advice system at a distance, considering more privacy of beneficiaries [23],[25]

For our further interest, as explained by Fig.15, our FMS system were applied to the remote lectures for the graduate students in Okinawa from our institute in Tokyo and remote conferences of US-Japan and also Finland-Japan, in which audience could participate at the same time after the basic rehearsal, considering time difference and signal traffic state of the Internet line between two countries. The actual process in both cases had no special inconvenience and/or impediment, except that the communication was partly affected by the fluctuating influences cased by conditions of communication lines.

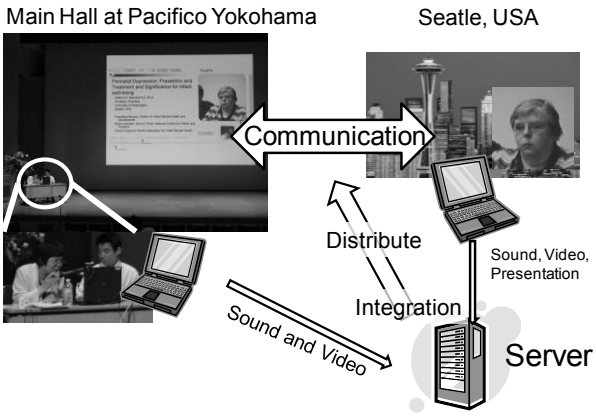

Fig.15 Remote session at the international conference between US and Japan.

6.4 Button type computer and its application

A button computer for specific purpose with simple operation can be easily designed as a ROM-computer. Thus, the start-up time can be shortened with more effort. Nevertheless, the reliable access to the receiver is, in emergency, substantially much necessary request in comparison with the access time. The capability of the FMS combined with the specific button computer is much important after the connection to the destination.

Then, the similar discussion of fundamental FMS is valid, if the result of the similar experiment confirms the reliability of connection with the sufficient speed of transmission in a present situation, which fulfils the original aim of transmission system.

As for the system illustrated by Fig.3, only the button operation is necessary to drive a computer and to transmit data. The simulation experiment successfully confirmed its operation from our laboratory to definite places through the Internet as well realized, even though it had a delay time around 30 [sec] in automatic connection with a necessary arrangement of actual communication.

The shopping and delivery procedure of daily necessities using the proposed button computer was experimentally confirmed. And in the case of sudden illness of the lonely living, only the button push gives the start-up of computer. Then, the direct correspondence to closely related persons are ensured with the following-on process such as necessary self-care, emergency treatment and request for help by physicians and medical facilities as explained in section 4.3 by the remote rescue system [5]-[7].

Thus, the present method fundamentally ensures the lonely living under the emergent state of illness to inform the neighbors about his/her situation. It was confirmed useful for the rescue of the lonely living person, if the neighbors have their precise knowledge about the pertinent system including unlock of entrance beforehand. Nevertheless, it requires the shortening of start-up time of both terminals and the appropriate design of easy operation from the practical standpoint.

6.5 Power management system

In order to inspect capability of our unified system, we introduce three computers for the PMS, sending and receiving terminals in the platform of Linux (Debian4.0). For encrypted communication by VPN, OpenSSH is used together with address administration by iptables and dynamic DNS. VPN was established between both terminals in around 30 [sec] after the WOL signal from the PMS, taking into account the time for check of BIOS, the start-up of OS and services for the establishment of VPN. By the connection of sending terminal from a distance to the PMS, it was confirmed that the receiving terminal in sleep is switched on and VPN connection is realized before communication.

In this case, Windows as OS is also possible for the platform of developing pertinent software, which has general convenience to develop for the ordinary use in the present situation.

6.6 Performance of the unified system

The pertinent standby state of the unified system needs only very small electrical power consumption, comparing with the usual method such as standby switching-on of televisions. There were very few mistakes of simple button operation, even when the receiving side accepts the image and sound of the sender before giving its acknowledgement by the image and sound connection to the sender. It was avoided to have annoying wrong transmission and infringement of the privacy for even most friendly and closely related persons, in which we would like to insist on an important feature of the proposed system. In addition, the standby energy consumption of a button computer together with the PMS will be much less, if we introduce the integrated subsystem including the PMS. From the above consideration, its cost performance is expected superior to the ordinary communication tool or computer. However, there are still lots to be improved for the actual application to everyday life, such as the start-up time and the design of easier system manipulation.

6.7 Present state of communication line in Japan

It is necessary for the beneficiaries to send characters, sounds, images and movies in order to realize our FMS with bilateral smooth communication whenever and wherever. For such ubiquitous communication we need today's adequate-capacity broadband networks. But there are still places where the necessary networks are unavailable, thereby not capable of wide-spread use of long-distant well-being and medicare services.

Japanese IT-strategy has been carried over to the present-day "u-Japan," with the name indicating realization of ubiquitous networks. Furthermore, the new policy dubbed "Next-generation broadband strategy 2010" has two declared goals. First, it aims to eliminate "zero broadband areas," secondly, the plan is to raise to more than 90% the number of households equipped with a super-fast broadband network. This will be made possible by "focusing on regions with unfavorable conditions and with poor investment prospects." As for the actual spread of broadband in Japan, 95.8% of all homes had access to it as of December 2007, compared with 85.3% for super-fast broadband [24].
Therefore, our system is generally realizable almost everywhere in our country.

7 Discussion

The main function of the FMS system was repeatedly confirmed useful by beneficiaries as a

fundamental information system. In addition, all the individual systems derived from the FMS system are available in a little expense, as they work without installation of special software.

In the present study, we proposed very important calling-on function by the button type computer, which easily enables us to inform the emergency to some related person such a neighbor and to operate the electromagnetic unlock of entrance usually opened only manually. This substantial concept, but sometimes a blind point in such an emergency will lead us to rescue smoothly the lonely living person in almost incapable of doing anything by oneself. Furthermore, the proposed systems with a button computer and some additional devices may be applied to the management of home electric apparatus from a distance.

In any case, they were confirmed at least available in the present situation for the request of help and well-being not only in everyday life but also in various possible cares.

The amusement and rehabilitation systems from a distance were also confirmed effective in experimental use at various institutions for the care of the sick, the handicapped, dementia and the elderly [1]-[3]. It is hereby remarked that the basic techniques have been established inclusive of necessary devices to transmit the information about beneficiaries for the care of health.

Thus, it is more expected for the promotion of well-being of beneficiaries on the basis of their social participation by the operation of appropriate proposed systems, because they would like to actively play substantial roles in their life and society.

8 Conclusion

The present welfare systems consists of a Flash Media Server system, a button type computer and a power management system including their pertinent software, which support daily life of the beneficiaries by the inevitable functions to transmit various concerning information. Each functional system with a little design change of the basic FMS system is provided for beneficiaries according to their demand in a little expense.

In any case, the functions of the communication system are controlled to keep bilateral relation by the simple manipulation from a distance, which are essential even for the care, nursing, medical and their relating actions.

Consequently, our concerning systems using multimedia infrastructure surely reduce the growing medical expenses in our *ageing* and *little birth rate* society. Thus, they are now ready to be put in a practical use for the welfare promotion and the button computer is also prepared for emergency in depopulated area as well as in the absence of medical staff, as they are readily set wherever by different providers for multilateral communication among beneficiaries.

By the further improvement of interface reflecting the needs from the concerning field organizations, our various systems are much expected to be widely applied to the actual use of communications by the people in the different situation of our society.

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