Global Standardization Activities

The ITU Workshop on eHealth and the Fourth Meeting of ITU-T FG-DR&NRR in Tokyo

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Abstract

The International Telecommunication Union (ITU) workshop on eHealth and the fourth meeting of the ITU-T (ITU-Telecommunication Standardization Sector) Focus Group on Disaster Relief Systems, Network Resilience and Recovery (FG-DR&NRR) were held in Shinjuku, Tokyo, February 4–8, 2013. These ITU events were held together in order to promote mutual understanding between working areas in healthcare and disaster response, and to increase NTT's presence in both fields. This article describes the main results of these events.

1. Introduction

The ITU workshop on eHealth was held in Tokyo, Japan, on Monday and Tuesday, February 4–5, 2013. This workshop was hosted by the Ministry of Internal Affairs and Communications (MIC), Japan, and was attended by 135 people from more than 20 countries. The workshop included an introduction to the needs and expectations of developing countries with regard to eHealth and the advanced technology that may have to be considered for standardization in the future.

Following this workshop, the fourth meeting of the ITU-T Focus Group on Disaster Relief Systems, Network Resilience and Recovery (FG-DR&NRR) was held at the same venue from Tuesday through Friday, February 5–8, 2013. This meeting was hosted by the National Institute of Information and Communications Technology (NICT), and attended by approximately 80 people from 15 countries. In addition to the usual discussions on standardization, this event included a visit to the disaster-affected area in Tohoku and the NICT Resilient ICT Research Center.

The schedules of the ITU events are shown in **Fig. 1**. Part of the workshop (in the afternoon on February 5) was organized as a session on eHealth in the event of a disaster to promote mutual understanding between people working in eHealth and in disaster response.

2. ITU eHealth workshop

2.1 Background

In developed countries including Japan, the aging society problem is causing a chronic shortage of doctors. Meanwhile, developing countries also have a chronic shortage of doctors but for a different reason, namely, the limited availability of medical services.

Tele-medicine and eHealth are being studied as solutions to these problems. In ITU-T SG16 (Study Group 16) and ITU-D (ITU-Telecommunication Development Sector) SG2, studies are being pursued with the aim of standardizing eHealth and making it widely available in developing countries. In November 2012, the ITU and World Health Organization (WHO) launched a partnership called the mHealth initiative, which aims to use mobile phones to deliver eHealth services to combat non-infectious illnesses [1]. Since 2012, an ITU-T focus group called FG-M2M has been studying the standardization of eHealth as a machine-to-machine (M2M) application.

Schedule	Feb. 4 (Mon)	Feb. 5 (Tue)	Feb. 6 (Wed)	Feb. 7 (Thur)	Feb. 8 (Fri)
e-Health workshop	Held in Tokyo; about 130 participants (20 countries)				
FG-DR&NRR			Held in Tokyo; about 80 participants (15 countries)		Technical visit to Sendai

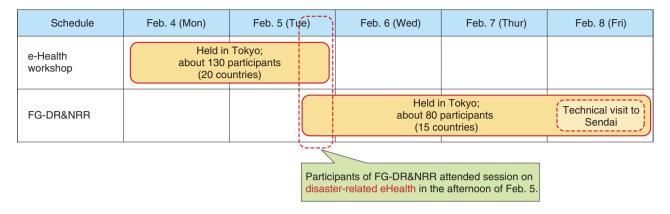Participants of FG-DR&NRR attended session on disaster-related eHealth in the afternoon of Feb. 5.

Fig. 1.   Schedules of ITU events.

With the aim of ensuring that eHealth standardization proceeds smoothly in the future, ITU-D and ITU-T held a joint eHealth workshop [2] to provide a forum for dialogue and to exchange information between their members. In this way, we aim to clarify the special requirements of developing countries, and to specify the items for future standardization as part of efforts to implement eHealth using advanced technology.

2.2   Overview of the workshop

(1)   Opening and keynote speeches

Opening speeches were made by Eiichi Tanaka, Vice-Minister for Policy Coordination of MIC, Japan (**Photo 1**), and by Sameer Sharma of the ITU Asia-Pacific regional office on behalf of the ITU Secretary-General. These were followed by keynote speeches from Tetsushi Sakamoto, the State Secretary for MIC, Japan, on the subject of Japan's eHealth policies, and Kiyoshi Kurokawa of the National Graduate Institute for Policy Studies, who gave a presentation entitled *Global Agenda in Post Fukushima*, in which he raised issues that should be addressed not just by Japan but by the whole world in the wake of the Great East Japan Earthquake. This speech stressed the importance of resilience based on the assumption of diverse risks. It also pointed out that as the world evolves from the Web 2.0 era into the Web 3.0 era, mobile devices such as tablet computers will come to play a more important role. Mark Landry of WHO Western Pacific regional office in the Philippines gave a speech on behalf of WHO in which he described some examples of eHealth policies across Asia, and the current status of cooperation between WHO and government in Asian countries.

Photo 1.   Opening speech made by Eiichi Tanaka, Vice-Minister for Policy Coordination of MIC, Japan.

(2)   Requirements from developing countries

Under the theme of implementing eHealth in a low-resource setting, representatives from India, Sudan, Uganda, Algeria, the United Arab Emirates, Bangladesh, Vietnam, and Myanmar gave presentations on the current situation of eHealth in their respective countries, the issues that need to be addressed, and the requirements in each case. The requirements of developing countries are characterized by delayed development of infrastructure not only for medical care but also for insurance, sanitation, and health management, and by a shortage of healthcare workers coupled with a poor educational environment. Instead of the advanced eHealth systems that are being considered in developed countries, these presentations introduced solutions such as Web-based sharing and education of medical information, using video

conferencing to facilitate collaboration between medical workers including doctors, and using mobile phones for medical consulting (mHealth), whereby eHealth is expected to provide a broad range of benefits.

(3) Items for standardization from developed countries

Representatives from Japan, South Korea, Singapore, and the United States introduced some advanced examples of eHealth initiatives and discussed the challenges of implementing eHealth. NTT DATA gave a presentation introducing use cases of personal health record (PHR) management and monitoring as examples of mHealth services in Japan, and stressed the importance of security and privacy protection. The representative from Singapore introduced a Smart TV (television) health management system based on ITU standards, and showed that interactive eHealth using TV sets and remote control devices may be suitable for an aging society since these devices can be easily used by elderly people. The US representative also introduced the importance of considering eHealth for people with disabilities; NICT introduced the possibility of a body area network (BAN) that people can wear in order to connect to healthcare equipment; and Fujitsu introduced the research of a heart simulator that aims to improve healthcare technology. These presentations highlighted the need for standardization of the data structures and protocols required for the transmission of PHR and other data, of the application interfaces and transmission methods used between medical/healthcare devices and telecommunication networks, wireless devices, and fixed devices, and of security, which is essential when exchanging PHR data.

(4) eHealth in the event of disasters

The lessons learned after the Great East Japan Earthquake with regard to the use of eHealth in disaster situations were also introduced. A presentation was made by a representative of A&D Co., Ltd. on a system for monitoring health information such as blood pressure for use in health management of people affected by disasters. This system was actually put to use after the Great East Japan Earthquake. Professor Isao Nakajima of Tokai University—who is also the ITU-D vice rapporteur for eHealth and co-chairman of this workshop—described eHealth items that need to be studied in the event of radioactivity disasters in relation to the nuclear power plant incident. These presentations demonstrated the useful-

ness of eHealth in the event of a disaster and made a case for the importance of preserving two-way communications.

(5) Future direction of work with the ITU

One of the authors (Kawamori), who also acted as co-chairman of this workshop, drew up the following summary of the results of this workshop and the future direction of eHealth standardization at the ITU.
  - To promote the spread of eHealth, it is important to provide education in order to eliminate misconceptions about the circumstances of developing countries.
  - From the viewpoint of standardization, it is necessary to establish cooperation between ITU and related organizations with regard to requirements, terminology definitions, and data sets/applications.
  - In particular, a terminology database is necessary since the technical terminology relating to eHealth covers many fields including medicine, healthcare, and ICT.
  - For eHealth related regions, it is necessary to study how this technology can be best applied to elderly patients, disaster victims, and disabled people.
  - In the future, information should be supplied to the ITU website including the content of speeches given at this workshop, and an enlightenment event should be held in cooperation with the WHO.

2.3 Other related events

In addition to the workshop, there were demonstrations related to mHealth by NTT Secure Platform Laboratories (**Photo 2**). A simple health management system was introduced where healthcare equipment including blood pressure gauges and SMS (short message service) is used to implement mHealth with low initial investment. These demonstrations drew a great deal of interest from many countries, including African nations.

3. The fourth meeting of ITU-T FG-DR&NRR

3.1 Background and purpose of the fourth meeting of FG-DR&NRR

In the wake of the Great East Japan Earthquake and Tsunami of March 2011, the ITU-T established a focus group (FG) in June 2012 to clarify the role of ICT in disaster situations and to investigate the need

for international standardization at ITU-T [3]. One of the authors (Araki) was appointed as the chairman of this FG. This meeting provided a forum to introduce Japan's disaster resistance research to the world. In addition to the usual FG meeting, the event also included an introduction to eHealth activities needed during a disaster, demonstrations of disaster-resistant ICT, and even a technical visit to the region affected by the Great East Japan Earthquake.

3.2 Overview of the meeting

(1) Speeches at special sessions

The Internet Engineering Task Force (IETF) gave a presentation on the provision of information relating to technical specifications (RFC: Request for Comments) for emergency situations, and demonstrated technology for transmitting high-priority traffic without delays, which has been proposed as an effective way of avoiding congestion in a disaster. A representative of the University of Tokyo's Earthquake Research Institute proposed an earthquake/tsunami monitoring system using submarine optical fiber cables and reported on the installation and planned operation of a new system off the Sanriku coast (total length: 120 km, node interval: 25–40 km). NTT DOCOMO introduced an early warning system called Area Mail that uses CBS (Cell Broadcast Service) to allow alerts and email warning messages to be transmitted to all mobile terminals in a specified region. It was agreed that the FG should hold further discussions on these technologies, and that the research items should reflect the requirements documents and other deliverables.

(2) Introduction to the state of disaster response research in Japan

In Japan, many technologies for strengthening disaster resistance have been designated for research and development (R&D) by the MIC, Japan. After the Great East Japan Earthquake, organizations including NTT, Tohoku University, SKY Perfect JSAT, NEC, NTT DOCOMO, and KDDI R&D Laboratories proposed technology for the rapid recovery and restoration of telecommunications, which can provide a lifeline during a disaster. An emergency communication system for people with disabilities was proposed by the TTC (Telecommunication Technology Committee). In order to share information about this technology and gather information on similar systems in other countries, it was agreed that a liaison statement would be sent to ITU-D, ITU-R (ITU Radiocommunication Sector), and ITU-T SG16 and JCA-AHF

Photo 2. Demonstrations related to mHealth by NTT Secure Platform Laboratories.

(Joint Coordination Activity on Accessibility and Human Factors). NTT proposed a way of configuring networks by assembling and reconfiguring resource units, and it was confirmed that ongoing discussions will continue in order to further clarify the requirements for providing people with the means of communication in disaster situations. It was agreed that this information would be partly reflected in the deliverables, including the overview and requirements documents.

(3) Updates of the deliverables

The meeting participants discussed the updated draft overview document based on the results of this meeting and the previous meeting and added a list of technical specifications of IETF emergency/disaster communications, requirements for disaster message board and voice messaging services for mobile devices, and requirements relating to technology for the construction and reconfiguration of resource units. The first draft of the requirements document was also discussed, and the draft table of contents was approved. It was also agreed that requirements would be added for disaster message board services for mobile devices and evacuation guidance systems.

3.3 Technical visit to Sendai

This FG included a technical visit to Sendai, including stopovers at NTT offices that had been affected by the tsunami, and at the NICT's Resilient ICT Research Center. It was felt that a visit to the affected area during a period of cold snowy weather would help to highlight people's fears of disasters and the need for countermeasures, and would show the

Photo 3.   Visiting the affected area (Nobiru area).

Photo 4.   Visiting NICT's Resilient ICT Research Center
(at Tohoku Univ.).

importance of working towards a rapid recovery after a disaster occurs. At the NICT center, the visitors were introduced to the R&D efforts being made by the MIC, Japan, and by NICT in order to deal with large-scale disasters, and they were given the chance to see the state of research in areas including communication devices and satellite communication equipment for ensuring regional communications after a disaster (**Photos 3** and **4**).

3.4   Future plans
The fifth meeting of the FG-DR&NRR was held in

Thailand, May 20–24, 2013. In the future, we aim to continue holding meetings in countries that have experienced major disasters such as floods, hurricanes/typhoons, earthquakes, or tsunamis. Since the lifetime of this FG has been set to one year, it was confirmed that the extension of this period would be discussed at the next meeting.

4.   Conclusion

eHealth is a medical care and health management solution that has been globally recognized as important by developing and developed countries alike. It is expected that this field will continue to grow in the future. For its efficient global development, international standards, with appropriate consideration of the regional characteristics and environmental conditions of each country, are essential. It is hoped that this workshop will contribute to the expansion of developing countries, which is the scope of ITU-D, as well as the further development of ICT standardization, which is the scope of ITU-T.

Disasters such as earthquakes, hurricanes, floods, tsunamis, and landslides occur all over the world. The responses to the unprecedented earthquake and tsunami that Japan experienced will be helpful for all the disaster-affected countries of the world. The establishment of international standards for dealing with disasters is essential for the construction of a safe society, so there are great hopes pinned on this FG. We are sure that the FG meeting in Japan has raised awareness of standardization efforts relating to disaster response.

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He received the B.E., M.E., and Ph.D. degrees in electrical engineering from Mie University in 1985, 1987, and 2001, respectively. After joining NTT Telecommunication Network Laboratories in 1987, he engaged in research on fiber optic access network architecture and network operation process reengineering methods. From 1996 to 2003, he worked on enterprise resource planning (ERP) systems integration as a consultant in the Solutions Business Division of NTT Communications. Since 2004, he has been involved in NGN standardization work at ITU-T. He was the Rapporteur of Question 1 of Study Group 13 during 2007–2010. He has also played an active role in IPTV standardization work at ITU-T. He is currently in charge of standardization strategy in the NTT Group. He received the ITU-AJ Award from the ITU Association of Japan in 2009. He is a member of the Institute of Electronics, Information and Communication Engineers (IEICE) and the Society of Instrument and Control Engineers.

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He joined the Information Science Laboratory, NTT Basic Research Laboratories in 1989, where he first engaged in R&D of artificial intelligence. He then focused on researching multimedia services in the converged environment of broadcasting telecommunication and fixed/mobile systems. Since 2009, he has been the Rapporteur of Question 28 (Multimedia Framework for eHealth Applications) in SG 16 of ITU-T. He has spoken at several conferences on eHealth, including IEEE-ICC, WSIS, and Telecom World, all in 2011. He participated in the collaboration between ITU-T, ITU-D, and WHO, and in the Joint ITU-WHO Workshop on e-Health Standards and Interoperability, Geneva, 2012.