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NTT Press Releases

January 28, 2014

"ICT Car" enables communication to promptly recover after large-scale disasters

Based on lessons learned from the Great East Japan Earthquake, NTT have developed an ICT Car that enables communication to promptly recover after a large-scale disaster as a product of the R&D project in which NTT, Tohoku University, Fujitsu Corporation and NTT Communications are engaged.

Our ICT Car is a van-type vehicle in which equipment for providing ICT (Information and Communication Technology) services such as telephone calls and information processing are installed.

By transporting and installing an ICT Car in a disaster-struck area, we can promptly establish a Wi-Fi available area with a radius of 500 m assuming unobstructed visibility and provide afflicted people in the ravaged area with communications access. People in the Wi-Fi area can be contacted via their original phone number regardless of the carrier they subscribe to. Also, they can communicate with people outside the afflicted area or use various network services once the ICT Car is connected to a wide area network via a photonic link or satellite circuit.

In addition, our ICT Car has a system for collecting and distributing social data. In the wake of most large-scale disasters, we are normally forced to record and manage the information on the well-being of the survivors by hand-written documents. The new system can promptly register people into the system's data base with their information (name, address, sex, age, etc.) after uploading their face photos and photos of certificates taken by a tablet PC with a camera.

Also, we have taken the prompt communication recovery provided by the ICT Car and implemented it in the "attaché case size ICT BOX" which is more portable. As the ICT BOX has a PC with basic switching equipment, batteries and Wi-Fi access points, we can use it to promptly provide telephone call service in an afflicted area.

Future Plan

On February 2014, we will, with the support of the local governments and the inhabitants, perform demonstration experiments in Nankoku city and Kuroshio town (Both located in Kochi Prefecture) in order to prove our ICT Car's usefulness under disasters. We are aiming at delivering our ICT Cars to NTT's ICT facilities and/or local governments hopefully within 1 to 2 years after these experiments and follow-up investigations.

Recently, the Philippines government has expressed their interest in NTT's ICT Car for its use in the areas afflicted by the great typhoon Yolanda (Haiyan) of November 2013. We are now discussing about the support approach with the Ministry of Internal Affairs and Communications, and related organizations.

This R&D project is partially supported by Ministry of Internal Affairs and Communications.

Brief overviews of the functions of our ICT Car are shown below.

Figure: Our developed ICT Car

1.   Brief overview on the functions installed in the ICT Car

(1)   Communication recovery system

Our ICT Car has compact switching equipment and self-contained Wi-Fi access points with solar panels and batteries. By setting an ICT car in an afflicted area, we can instantly get a Wi-Fi area with a radius of 500 m assuming unobstructed visibility.

A local person can use his or her own smartphone to download special application software by connecting to the ICT Car through a Wi-Fi connection. After installation, any person in the Wi-Fi area can be contacted using their original number without regard to their

carrier. Also, communication with people outside the afflicted area is possible once the ICT Car is connected to a wide area network via a photonic link or satellite circuit. Our ICT Car can continue to work for 5 days starting with a full load of gasoline.
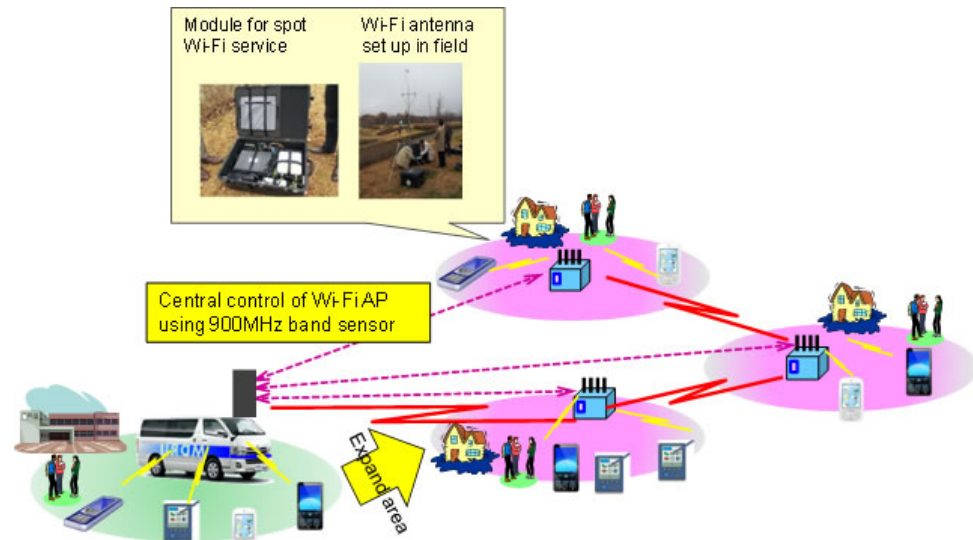

Figure: Our ICT Car establishes Wi-Fi service in afflicted area.

(2)   System for collecting afflicted people's data

Our ICT Car has a system for collecting and managing victim data. People in evacuation centers can be promptly registered into the system's database with their information (name, address, sex, age, etc.) after uploading their face photos and document photos taken by a tablet PC with a camera. This data base becomes instantly available to management services, providing reassurance of personal safety.

Using this system, we can support people by providing them with inexpensive IC cards with proper ID (Also, their own IC cards or mobile phones and their IDs can be used as substitutes.) and linking the IC cards (ID) to their photos and information when they are registered in the system. For example, by using personal data and ID, we can easily grasp peoples' movement between evacuation centers, their health state, and so on.

In addition, the registered information can be linked to J-anpi (http://anpi.jp/top?lang=en) and thus is accessible through the Internet.

(3)   Data center function

Our ICT Car has a data entry function. By loading individual application programs used by local governments, hospitals and etc. into the virtual servers provided by our ICT Car, they can be independently operated by the staff of each organization.

2.   Brief overview of "attaché case size ICT BOX"

Focused on the capability of instant communication recovery, we have successfully developed the "attaché case size ICT BOX"; it is more portable than the ICT Car since its performance is restricted. As the ICT BOX has a PC as basic switching equipment, batteries and Wi-Fi access points, we can use it to promptly provide local telephone call service in an afflicted area.

Figure: Attaché case type of ICT BOX

3.   Technical points in this development

We have researched & developed the technologies to realize our concept of MDRU (Movable and Deployable ICT Resource Unit). MDRU is a container that holds communication functions, information processing functions, and data storage. We transport a MDRU to a severely afflicted area and activate it to restore the communication environment. The following technology points enable us to promptly restore communication.

(1) Prompt construction of a Wi-Fi access NW by using a sensor NW and intensively controlling the surrounding access point group.

(2) Telephone service that is instantly available for use by easily registering your own smart phone.

(3) Combination of plural MDRUs by forming a network based on them, which extends the service area and expands functionality.

(4) Self-reliant operation of the ICT Car by introducing self-sustaining power supply system including a power generator and highly efficient air conditioner based on heat storage medium.

(5) Special storage data transmission technique enables images and videos to be sent without stress even during network instability.

We have developed a lot of core technologies including virtual server, optical interconnection, remote monitor & control and so on through the developments of various kinds of MDRUs and applied the best of them to the ICT Car.
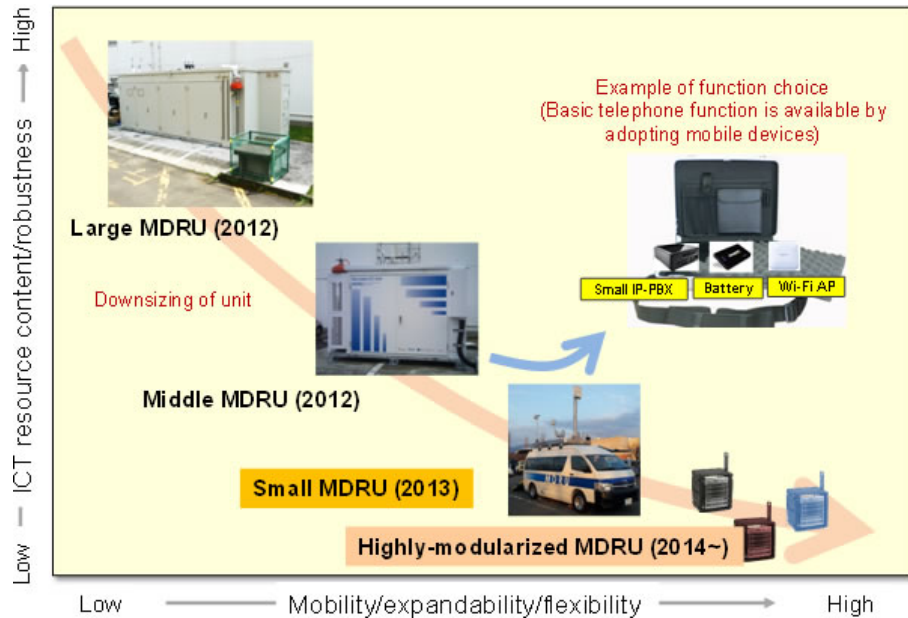

Figure: R&D history of MDRU and ICT Car's position

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Innovative R&D by NTT

NTT Has Instituted a Logo to Represent R&D Activities.

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