Case Study of ICT Solutions Contributing to Improving Life in Rural Areas

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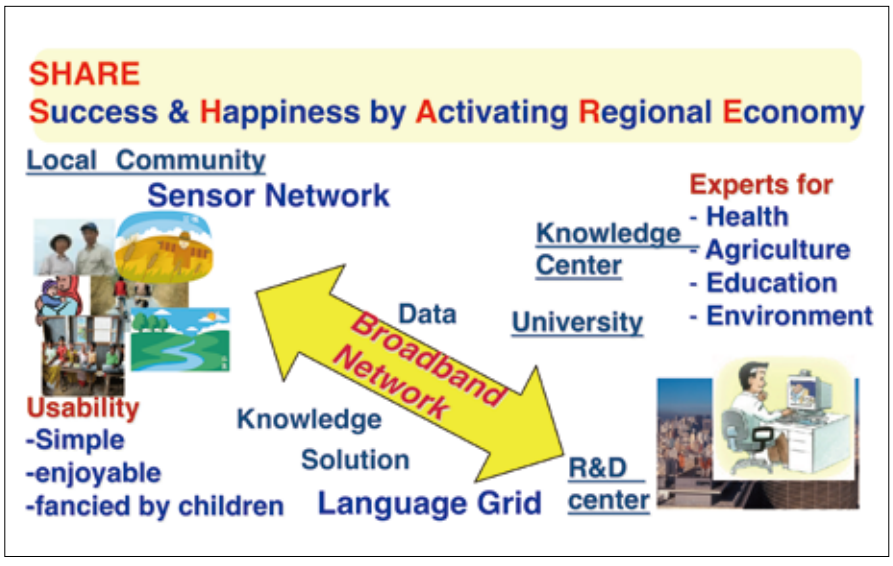
1. Introduction

The TTC Promotion Committee began its activities in April, 2007, based on the slogan "Let's SHARE (Success & Happiness by Activating Regional Economy) together." Through cooperation among five countries in Asia (Indonesia, Malaysia, Philippines, Thailand, and Vietnam), and with the support of the Asia-Pacific Telecommunity (APT), it has been conducting ICT pilot projects in rural areas, with solutions for social issues in agriculture, aquaculture, environment, health, education, and constructing telecommunications infrastructure. Also, the Case Study Team (CST) was established in 2008, under the Bridging the Standardization GAP Working Group (BSG-WG) of the Asia-Pacific Telecommunity Standardization Program (ASTAP), to do standardization activities, taking case studies on APT projects implemented in each country and extending them into neighboring Asian countries. Activities of the TTC Promotion Committee were concluded in March, 2013, and in April, 2013, the Bridging the Standardization GAP Committee was established to take over its standardization and promotional activities.

2. Overview of the SHARE pilot model

Figure 1 shows the model for pilot projects demonstrated in rural areas of South-East Asia, for solutions in agriculture, aquaculture, environment, health and education. For the areas of agriculture and aquaculture, the model was to build sensor networks, gather data measured with various sensors on a field server, and send it to specialists in urban areas through the network. Specialists then analyzed the data, and promptly sent feedback through the network, such as urgent information or useful ways to resolve issues.

Figure 1: SHARE solution model through broadband network



3. Overview of projects

3.1 eHealth solution

An ehealth solution was implemented in the Tanah Datar Regency of the West Sumatra province of Indonesia. Adequate health and medical services are not always provided to residents of rural areas of Indonesia. In this project, a basic health data-base and a wireless network connecting hospitals, clinics, regional government offices was built using Wi-Fi, to centralize and share data such as measured height, weight, and blood pressure from various health-related facilities. Web pages and CD players with large-screen TVs in hospital and clinic waiting rooms were also used to distribute government information about handling diseases such as dengue fever, influenza, and rabies.

3.2 eAquaculture solution

An agriculture and aquaculture solution pilot project was implemented at Palapakin Lake, one of the San Pablo seven lakes on the outskirts of Manila, in cooperation with the Ateneo de Manila University in the Philippines. As shown in Figure 2, a network was built with sensors measuring water temperature, pH, dissolved oxygen (DO), turbidity, and conductivity around the lakeshore. Field servers from the three cooperating research groups (from the Philippines, Thailand, and Japan) gathered the sensor data. In particular, the Philippine field server was self-propelled; consisting of a bamboo boat with field server powered by solar panel and battery, GPS, and sensors; so it was able to take measurements over the whole of the lake. Information was distributed to fisherperson through a portal site created and operated by Ateneo de Manila University.

3.3 eEducational solution

An educational solution was implemented with the Universiti Malaysia Sarawak (UNIMAS). In this project, an optical network connecting elementary and middle schools with a telecenter was constructed

and educational solutions were provided to improve the Quality of Life (QoL) of residents. Solutions were provided by Wi-Fi from the Optical Network Unit (ONU) to students at the elementary and middle schools using tablet PCs. Students accessed servers in the telecenter, which provided educational applications for topics such as arithmetic and English, and cloud services for storing photographs, video and other data on the server.

3.4 eEnvironmental solution

An environmental solution was implemented in the city of Palangkaraya, in the province of Central Kalimantan in Indonesia. For this project, a Machine to Machine network (M2M) for gathering fire control information was built in a peat land area, in cooperation with Palangkaraya University. In particular, it measured water levels in the canal and peat land, which is closely correlated to the outbreak of peat fire. Figure 3 shows an overview of the sensor network. Measurements were taken at the canal and at three points in the peat land. In addition to water levels, instruments for measuring carbon dioxide, methane, precipitation, temperature, humidity, and wind speed were installed. The measurement data was collected by field servers and gathered on a data server by Wi-Fi. The data server and the university were also connected by wireless network, so the daily data sequence for individual measurement points could be checked from the university, enabling quick response when there was a fire.

Figure 2: APT 2009-J3 pilot project in Philippines

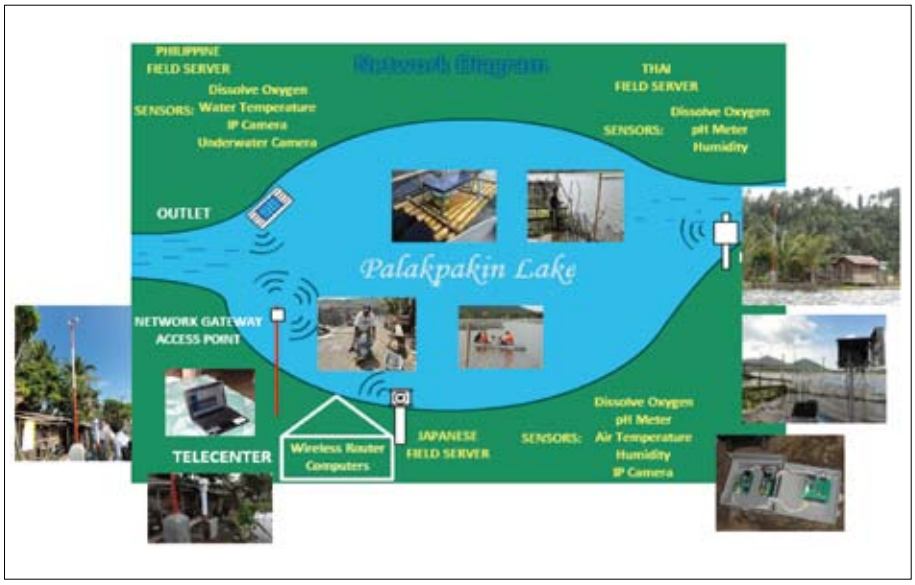


Figure 3: Schematic view of network in Palangkaraya

4. Building solution models for governments in developing regions

We plan to build a showcase in the Tanah Datar Regency of West Sumatra, Indonesia, where the ehealth solution was provided, by gathering the solutions that can be provided to regional governments in areas of agriculture, aquaculture, environment, health and education. However, regional governments have a serious lack of ICT expertise, so even if these services are implemented, it will be difficult to maintain the environments. Because of this, we plan to build a T3 center in Tanah Datar with three functions: to cultivate ICT personnel (Training), to implement solutions (Technology Transfer & Testing), and to provide solutions (Telecenter & Data center).

5. Standardization of ICT solutions for rural areas in developing countries

In 2008, the CST was established under the BSG-WG of ASTAP, with Indonesia, Thailand, Malaysia, Philippines, Vietnam, Japan, and Korea as members, as a function to discuss application of the APT-supported solutions performed in each of the countries in neighboring Asian countries. In the BSG Committee, which took over the activities of the TTC Promotion Committee in 2013, it is also doing upstream activity for ASTAP, making a handbook for implementing ICT solutions in rural areas of developing countries, which summarizes the case studies.

6. Conclusion

We have implemented pilot projects for various solutions, using ICT to solve social issues in rural areas of developing countries. Solutions that match local needs could be provided by collaborating with local universities. Who will continue the project after it is completed is an issue with this type of project, and if the efforts of the T3 center are successful, we can expect to create local industry as indicated in the SHARE slogan, and also to develop them as sustainable models for other neighboring countries.