ICT4SIDS Partnership

Case Studies and Examples

Case Study1: Launching a Mobile Health Clinic

Mobile Health Clinics, combined with the mobile computing technologies, have been highly effective in combating HIV and malaria, improving maternal health, and reducing infant mortality in Peru, South Africa, Uganda, and the Philippines. In particular, location-based text messaging applications have been highly effective to attract young people to mobile clinics that provide informational, testing, and/or clinical services.

While there are many success stories about mobile clinics, numerous failures have occurred due to logistical issues (e.g., running out of supplies in the middle of nowhere), technology issues (no wireless signal in the area), procedural problems (healthcare professionals could not get visas on time), and social issues (some parents did not like their children to be invited to a clinic without parental consent).

A *Mobile Clinic Support System* is needed to address the people, process and technology issues and thus assure repeatable success of these clinics. Figure 1 shows a conceptual view of a support system that leverages the latest ICT developments to serve the physicians, the patients, the healthcare facilities, the suppliers of materials and the regulating authorities. Such a support system could profoundly impact the delivery of healthcare to different parts of the World and could be of value to central governments, municipalities, cities, or NGOs (non-governmental agencies) with interest in operating mobile health clinics around the globe. In addition, it can be offered with minimal technologies or sophisticated web and wireless support. How can the aforementioned Learn-Plan-Do-Check cycle be used to assure success? To gain some insights, let us go through the said capabilities of the SPACE Planner.

Figure 1: Overview of a Mobile Health Clinic Support System

Learn: A user (government agency or NGO) starts by first visiting the Directory and the Knowledge Repositories for case studies and information on different aspects of mobile health clinics. In particular, the

Portal of Portals (meta portal) provides "yellow pages" type capabilities to a wide range of existing valuable portals instead of a single portal with "selfish" content.

Plan: Go beyond case studies and actually use the Strategic Planner to generate a country and situation specific plan. The Planner, described previously, provides step-by-step guidance for mobile health clinics. Specifically, the Planner guides the users through the maze of decisions in cost-benefit analysis, business process modeling, technology selection, system integration, disaster recovery, and information security that is specific to the country in which the mobile clinic is supposed to operate.

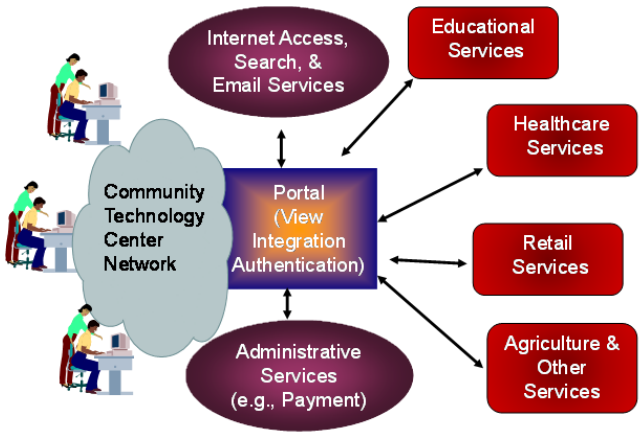
Do: The generated plan serves as a solid starting point for the implementers to refine and operate mobile health clinics for different situations in different regions of the world. A wide range of simulations and business games could be used to create and exercise some what-if scenarios such as running out of supplies, loss of key staff, and technology failures.

Check: The operation of the mobile health clinics, the problems encountered, and the solutions that work and the ones that did not, can be monitored through project management techniques such as "management dashboards". The lessons learned could then be used to reiterate, refine and improve the deployment of future mobile health clinics.

Case Study 2 : Launching Digital Services Centers (DSCs) in Rural Areas

A Digital Service Center (DSC) is typically a small building (2-3 rooms) with good internet connectivity in a rural area that provides services of value to the community. DSCs provide a single level entry portal for Government to Citizen and Government to Business services. Objective of these centers would be to provide high impact. citizen centric, ethical, efficient and effective services in health, education, public safety, public welfare and other vital sectors. The DSCs provide non-discriminatory delivery of all services to citizens and businesses located in rural areas. A good example of a DSC is eSeva in India and community centers in different parts of Asia. These DSCs can serve as the ICT hubs envisioned by the Samoa Pathway and can provide the following list of services in rural areas (see Figure 2 for a Conceptual View of DSC):

- Business Intelligence (BI) Service
- E-agriculture
- Eservices for Food Safety
- Fishery Distribution (Supply Chain)
- Tourism Services
- Distance Education
- E-learning for the physically-Handicapped
- Telemedicine
- Disaster Management Service
- Weather Alert and Travel Warning



Legend: Bubbles indicate individual services, boxes represent sectors (e.g., health) that may themselves be portals or portlets.

Figure 2: Conceptual View of a Digital Service Center

However, design and implementation of DSC raises several challenges such as location (what would be the optimal location that can provide maximum service), what kind of services to provide (e.g., offering aging population support if the community has a large aging population), what would be the role of ICT in the DSC and is the needed bandwidth available, and are technical staff available for DSC.

We have repeatedly found that while the basic concept of a DSC is very clear, most communities in rural areas do not have the technical and financial resources to plan, justify, develop and deploy DSCs. For example, in the Far East, the concept of DSC in a rural area was approved but the proposers were asked to develop a detailed plan and a business proposal. However, none of the proposers had developed a plan or a proposal. So they hired 3 consultants (it took them 3 months), and then the consultants disagreed with each other. After 6 months the local authority declined to fund this project because the proposers did not produce a plan. We used SPACE to produce the needed plan in 2 days and later this plan was approved by a commercial entity.

Case Study3: Capacity Building for Planning of Government and Inter-government Services

This project, inspired by our work with the Digital Service Centers, is being used for management training and graduate courses in Strategic ICT Planning, Architectures and Governance. This hands-on course so far has been taught to more than 1500 graduate students in ICT and IT managers from the public and private sectors – almost all from developing countries. The class is divided into several teams, 3 to 4 persons per team, and each team was asked to choose one region (a village or a small island, population from 10,000 to 100,000 people) from any part of the world. Their first assignment is to do the following by hand:

- Each team member develops an ICT plan for one service of the chosen city in the area of public health, education, welfare, and safety.
- Combine the chosen region services into a region-wide architecture that works smoothly
- Each region (team) is then asked to partner with another region (team) and to exchange information about their services for a set of scenarios (e.g., food shortage, disaster recovery, major accidents, etc)

The second assignment is to do Self Assessment of the results from Assignment 1 by using SPACE. This allows the students to redo their work by using the SPACE tool and then improve their results based on the hands-on experiments.

This project is currently being converted into an online tutorial because it required the students to understand the concepts of developing individual services, then integrating them for enterprise wide scenarios, and finally struggle through interagency communications for G2G and B2B integration. They gain tremendous insights by using SPACE as a Self Assessment Tool.

Short Case Studies and Examples

Although SPACE is currently not a production system, it is being used to help developing countries and small to medium businesses to plan and engineer their systems. In addition, SPACE is being used extensively to support graduate courses and professional education in strategic planning and enterprise architectures and integration. Specifically, we have worked with and are currently working with more than 10 countries (Bahrain, Cambodia, Camaroon, Nepal, Niger, Nigeria, Liberia, Macedonia, Myanmar (formerly Burma), and Southern Sudan) on projects that range from simple a eService to inter-agency and inter-country communications. In addition, we have and are working with almost 20 businesses in healthcare, telecommunications and defense services and more than 20 universities in the United States, Russia, UAE, and New Zealand. We have also formed partnerships with Enterprise and Solutions Architecture Institute (ESAI) and Government Technologies Institute (GTI) to offer online training to government officials and practitioners in industry. Specific examples of the practical use of SPACE are given below.

Individual Services: The participating countries, businesses and students have developed a series of individual services such as the following:

- Mobile health clinics (MHCs) for remotely located populations that need urgent help. MHCs are the *primary* healthcare method for countries like Southern Sudan where no established hospitals exist. Special considerations are also needed for mobile clinics in the Far East where remote populations can be reached only by boats.
- Helping design of ICT-based women shelters against domestic violence. These shelters are being supported by the Gender Equality initiatives in countries such as Cambodia.
- Online education for primary school teachers to address the urgent need of improving primary school education and also online education of the government officials in Cambodia, Myanmar and Niger to properly plan and manage ICT projects.
- Support social welfare projects such as ICT-based assisted living facilities in Central Europe. These facilities are being developed to support aging populations that choose to move to developing countries for economic reasons.
- Mobile computing apps, especially location based services, to support large numbers of users that need wireless access to existing eGovernment and eBusiness systems such as online purchasing, customer relationship management and portals.

Enterprise Wide Services and Initiatives: A number of initiatives at present involve multiple services within the same public or private sector. Examples are:

- Economic development, especially entrepreneurship networks between startups and financiers. This includes entrepreneurship centers with focus on micro finance in countries such as Nepal and Camaroon.
- Working with Nepal to develop a detailed plan for a digital city in Hetauda County. The plan was generated to obtain public acceptance and funding.
- Working with Liberia to help them develop their five year plan by using the SPACE capabilities.

- Support of mobile services in the public safety sector for emergency response units and law enforcement for an island in the Pacific.

Interagency and B2B Integrations: A few projects between agencies are already operational. Examples are:

- Information exchange networks between different government/business agencies for industrial growth in countries such as Macedonia.
- Supply chains for food distribution and eAgriculture for food safety in developing countries such as Niger. We are using SPACE in collaboration with AidMatrix (a large food distribution company) to improve supply chains for food distribution.
- NIEM (National Information Exchange Model)-based interagency communications that interconnect the individual government agencies. This project is in its early stage but has very high interest from three different countries.

Combinations: Most of our projects involve a combination of individual, enterprise-wide and inter-enterprise services that combine different aspects of the afore mentioned case studies. For example, Case Sty3 describes an ICT planning project that has been inspired by our work with the Digital Service Centers described in Case Study2. Similarly, the Mobile Health Clinic described in Case Study1 can be easily expanded to a Health Information Network, depending on the type of situation (e.g., a single service run from a small provider, an enterprise wide service from a large hospital, a B2B health service between multiple agencies, or even an N2N service between health providers in neighboring countries).

One of the most interesting example, perhaps, is our work with Southern Sudan – a newly formed country. We worked with Southern Sudan Network (an NGO) that wanted to rapidly build Southern Sudan by using ICT. We quickly developed a complete plan by using SPACE but could not proceed due to political issues in Southern Sudan. However, SPACE has evolved from planning of eGovernment services to planning of cities and even countries such as Southern Sudan.

Examples of Our Current and Future Projects (early stages)

- Partnerships between SIDS colleges and US universities for human capacity development
- Big Data applications in sanitation, food safety, fisheries & disaster management.
- Business Intelligence and Analytics for SIDS to support Fisheries, Tourism and Disaster Management.
- Use of Computer Aided Planning, Engineering, and Management Platform (SPACE) that uses Big Data to support capacity building in health, education, public safety (including disasters), public welfare (including economic development), etc.
- Telemedicine services that integrate e-learning, e-health and e-administration to offer inexpensive healthcare to remote populations.
- Smart Services and Smart SIDS
- Artificial intelligence (AI) Applications to help the disabled and disadvantaged populations.
- Gamification for training of nurses and govt officials on needed areas
- Integration frameworks and architectures for inter-agency collaboration for SIDS.
- Mobile computing and Social Media especially for the small islands and underserved segments.

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Basically, we want launch pilot projects in the afore mentioned areas to:

- Offer diverse array of digital innovations primarily to address the challenges faced by SIDS (Small Islands and Developing States).
- Utilize ICT to address SIDS specific problems through capacity building (human as well as technical).
- Focus on the ICT Services that cut across all sectors instead of one sector.
- Offer Computer Aided Advisory services, that can be quickly customized for different regions and can serve any underserved population around the globe.