

Computer Aided Planning, Architecture and Management Examples & Case Studies

SPACE (Strategic Planning, Architecture, Controls & Education) is a computer aided environment that supports the Learn-Plan-Do-Check cycle for ICT Services. The following examples illustrate the use of SPACE in real life situations.

Case Study: Launching a Mobile Health Clinic

Mobile Health Clinics (MHCs), 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).



Figure 1: Overview of a Mobile Health Clinic Support System

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.

- **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.

Short Case Studies and Examples

SPACE is currently 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, Cameroon, 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 Cameroon.
- 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. Most of these projects have been inspired by our work with the Cyber Cities of Nepal Initiative. Similarly, the Mobile Health Clinic described above 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).

The most interesting example, perhaps, is our recent work with Southern Sudan – a newly formed country. We are working with Southern Sudan Network (an NGO) that wants to rapidly build Southern Sudan by using ICT. In other words, SPACE is evolving from planning of eGovernment services to planning of cities and even countries such as Southern Sudan.

Hands-On Project: Planning of City & Intercity Services

This project, inspired by our work with the Cyber Cities of Nepal Project, is being used for management training and graduate courses in Strategic ICT Planning, Architectures and Management. The class is divided into several teams, 3 to 4 persons per team, and each team was asked to choose one city (population from 10,000 to 30,000 people) from any part of the world. Their first assignment is to do the following by hand:

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

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. The students gain tremendous insights by using SPACE as a Self Assessment Tool.

More Information: www.space4ictd.com