# Smart Hubs for Rapid and Massive Implementation of SDGs – Key Results Through Video Clips

## Overall Objective and Vision

Our objective is rapid implementation of UN SDGs (Sustainable Development Goals) at a massive scale by deploying inexpensive smart hubs that provide *low cost but high impact* SDG services to underserved populations. *By definition, a smart hub is a center of activity, supported by a set of powerful portals, that provide location specific services of high value to its users.* A smart hub may be totally virtual (i.e., located in the cloud) or a physical building with access to the hub portals. The following four distinguishing features of our work make it an effective response to the SDG/2030 and the Urban Agendas:

**I: SMART HUBS TO ADDRESS THE BASIC CHALLENGES**: Each smart hub addresses many SDG challenges by providing highly specialized region and population specific low cost and high impact services in health, education, public safety, public welfare and other vital sectors. Specifically, each Smart Hub supports the following powerful portals so that no one is left behind (see video clip [1]):

- Administration Portal that has prefabricated plug-ins for collaboration, business intelligence, observatories, decision support, security and project management.
- End-User Portal that directly supports SDG specific activities of the end-users (e.g., patients to get healthcare help, farmers to launch e-agriculture initiatives, and children in remote areas to get basic education)
- A Capacity Building Portal to educate the Hub-Masters to become successful entrepreneurs

**II: SMART GLOBAL VILLAGE (SGV) FOR REGIONAL GROWTH THROUGH COLLABORATIVE HUBS:** These smart hubs are designed to collaborate with each other to form a *Smart Global Village (SGV) for the Underserved Populations.* An SGV consists of smart collaborating hubs located in small islands, small towns and isolated communities. Members of an SGV can (see video clip at [2]):

- Collaborate with each other and also with a Global Center for HelpDesk capabilities
- Operate eco systems with entrepreneurs from different countries on different topics
- Support SDGs plus the UN Urban Agenda by gradually transforming regions

**III: COMPUTER AIDED PLANNING METHODOLOGY FOR RAPID & MASSIVE IMPLEMENTATION:** This methodology is based on free pilot projects so that the poorest populations and young entrepreneurs can participate. The most innovative aspect of our methodology is that it uses a "Hub Factory" to produce a complete smart hub in about an hour, create a community center in about a day, a village in two days, and a regional SGV in about a week (Smart Solomon was created in a week!). This acceleration changes the dynamics of our projects (see video clip at [3]).

**IV: RESEARCH TO DEVELOP AN ADVANCED "HUB FACTORY" TO QUICKLY PRODUCE HIGHLY SPECIALIZED AND SOPHISTICATED SMART HUBS:** We have developed a Hub Factory that supports the aforementioned computer aided planning methodology. This factory, called SPACE (Strategic Planning, Architecture, Controls and Education) uses an extensive array of latest developments in "additive" manufacturing, AI, Big Data, gamification, business patterns, technology patterns, and management patterns. SPACE is a research prototype that is being extended and enriched because of its use in deploying and managing the growing SGV (60 hubs in 15 countries at present). Several research papers have been written about SPACE (see video clip [4, 5]).

Specifically, we have developed the architectural vision, displayed in Figure 1, that shows:
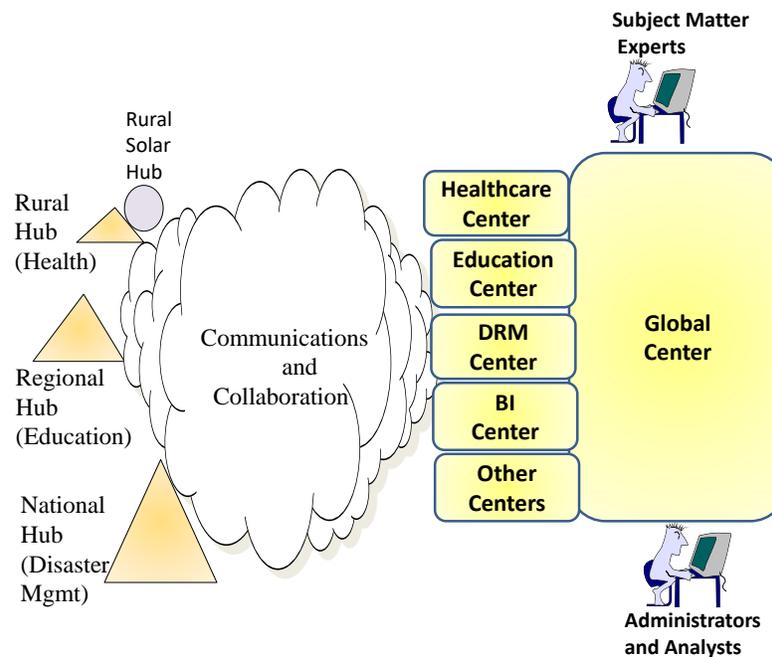


*Figure 1: Overall architectural vision for smart hubs and the Global Decision Support Center*

- All Smart Hubs fully support the UN initiatives such as the UN SDGs (Sustainable Development Goals) that address poverty reduction, hunger, health, education, gender equality, disaster recovery, economic development and other vital issues.
- The collaborating Smart Hubs are specialized to support different SDGs at different locations for local, regional and national needs and are managed by a Global Center, as shown in Figure1.
- The Global Decision Support Center is located at Harrisburg University and resides on an IBM donated machine. The Decision Support Center, as shown in Figure 1, houses large databases and coordination centers. It also includes planning, administrative, analytics, and training tools that provide central support for the smart hubs at rural, regional and national levels. These capabilities, explained later, serve as the central decision support dashboard.

## Smart Global Village at a Glance and Highlights of the Results

We are implementing our vision of a Smart Global Village through pilot projects that have deployed several smart hubs for underserved populations in Small Islands, Africa, South East Asia, South America, Russia, and the United States. A partial snapshot of our projects at the time of this writing is displayed in Table 1. This sample table displays how different hubs (columns) are being implemented in different countries (rows). The cells of the table show the specific topics being addressed and illustrate the diversity of our approach. Here are the highlights of the main results so far (more are provided in the next section):

- The POCs of each hub are *required* to communicate and collaborate with at least 3 other hubs as part of the training program. They initially exchange educational materials and lessons learned but later start exchanging other vital information such as evacuation procedures in case of a disaster and digital marketing approaches and experiences for cottage industries.
- Even in its formative stages, the collaboration matrix in Table 1 is an extremely interesting playground for horizontal collaborations between different hubs in the same country (e.g., all hubs of the Solomons), vertical collaborations between different countries but on the same topic (e.g., telemedicine hub in Haiti collaborating with the one in Peru), and diagonally (e.g., micro-entrepreneurship and micro financing in Rwanda and Sri Lanka serving as connector hubs for each other).

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- The collaboration matrix in Table 1 is a realization of the Smart Global Village for underserved populations. The Global Center of the Village, located on an IBM donated machine at Harrisburg University (USA), is playing a key role in the overall administration, data analytics, help desk, and coordinated collaboration among the smart hubs. An interesting example is the remote monitoring of disaster resilience capabilities of smart hubs located anywhere in the world.
- Diversity of applications of smart hubs is enormous globally ranging from solar energy to domestic violence. In addition, the capability of horizontal collaboration between smart hubs on different topics in the same region can be used for regional growth such as South to South and Carricom (Carribean Community) initiatives. The vertical collaborations between different global sites but same topic can be used for global ecosystems in healthcare, education, public safety, public welfare and entrepreneurship.

*Table 1: Snapshot of implementation plan of the Smart Hubs and the Evolving Smart Global Village*

| | *Health (Telemed Hubs)* | *Education & Capacity Building Hubs* | *Entrepreneur-ship & eCommerce* | *Food and Agriculture Services Hubs* | *Business Intelligence (BI) Hubs* | *Disaster & Energy Hubs* | *Community Centers & Smart Towns* |
|---|---|---|---|---|---|---|---|
| *Haiti* | General | | | | | | |
| *Jamaica* | Hyper-tension | | Tech-Preneurship | | Data Mining | | Health and Agriculture |
| *Solomon Island* | | Business Management | Digital Marketing | | Data Mining | Storms | Health and Education |
| *Tanzania* | | ICT4Teachers | Tech-Preneurship | | | | |
| *Nigeria* | General | ICT4Teachers | eConsulting | | BI & Data Mining | Solar Energy eMarket | Smart Town |
| *Togo* | General | | | e-Agriculture | | | |
| *Maldives* | Hyper-tension | | | Food Distribution | | | |
| *Sri Lanka* | General Telemed | | Digital Marketing | Smart Farming & Fisheries | BI4Small Firms | Storms | Plastic Waste |
| *Pakistan* | General | | eConsulting | | BI4Health | Solar Energy eMarket | Education |
| *USA* | Hyper-tension | Entrepreneur-ship Education | Tech-Preneurship | | BI and Analytics | Remote Monitoring | Smart Towns & Cities |

## A Closer Look at the Results So Far

Our methodology and the SPACE Factory have been used for rapid generation of more than 60 smart hubs in 15 countries that span Asia, Africa, North America and Small Islands.  The Sample Smart Hubs shown in Figure 2 display only a few interesting results of our work at present. Examples include:

- Healthcare and Education Centers in Pakistan, Nigeria, Tanzania, and Bangladesh
- A Fisheries Center in Sri Lanka, a Solar Energy eMarketplace for Nigeria, and an e-Agriculture Center for Togo
- A sustainable tourism network in Maldives, Disaster Management Centers in Timore Leste and  the Solomons
- A Domestic Violence Center in the Republic of Georgia, smart towns in Pakistan (Lahore) and the Solomon Island (Honiara)
- A large scale Smart SIDS initiative with initial focus on the Solomons
- Examination of hypertension data from Haiti, Peru and El Salvador

In addition to the actual Smart Hubs, the few Pilot Invitations shown on this page can serve as testimonials that these are real projects. This sample site shows the diversity of topics (almost all SDGs) and the locations (almost all continents) covered by these hubs.
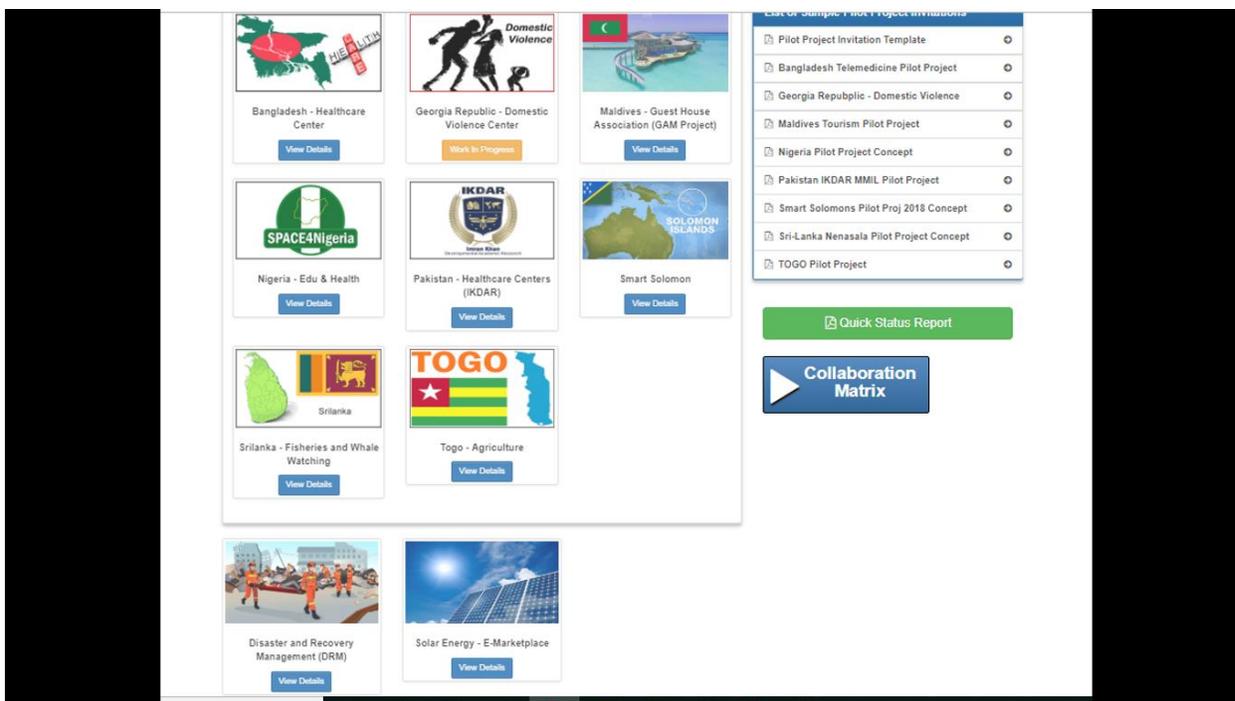


Figure 2: Samples of Smart Hubs

**Smart Solomons**: For further insights, let us take a closer look at the Smart Solomons Project (see videoclip [6]) and smart Solomon site (URL: http://ict4sids.com/Solomon.html) that is attempting to transform the Solomons into a smart island by 2020. The Smart Solomons Home Page, shown in Figure 3, supports eight Hubs at the national level (health, education, disaster management, energy management, e-agriculture, e-commerce, entrepreneurship, and tourism), a Smart Honiara Hub to support the city of Honiara as a smart town, and a community center for AreAre rural area for health, education, and tourism. Collaboration scenarios include a tourism hub in AreAre collaborating with micro-entrepreneurship and micro financing hubs in Pakistan, Maldives and Harrisburg. Also, blood pressure readings at the AreAre

Center can be  sent to the National Healthcare Center in Solomons and the Global Healthcare Center located at Harrisburg University.
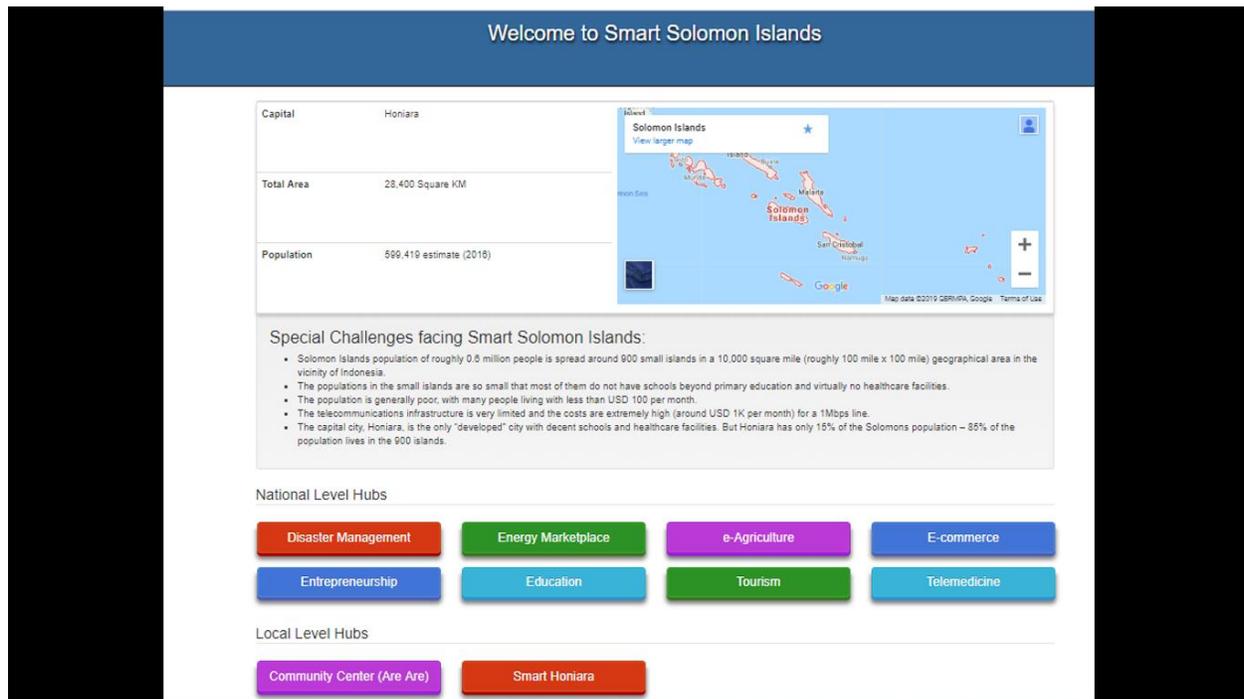


Figure 3: Smart Solomons Home Page

## Key Outputs and Conclusions

- The approach of highly focused pilot projects (about 3 months) works very well -- we quickly learn what really works and also provide educational and entrepreneurship opportunities for the POCs.

- The POCs of each hub are *required* to communicate and collaborate with at least 3 other hubs as part of the training program. They initially exchange educational materials and lessons learned but later start exchanging other vital information such as evacuation procedures in case of a disaster and digital marketing approaches and experiences for cottage industries. The Smart Global Village (SGV) of underserved populations collaborating with each other is giving us unprecedented opportunities to collect, combine, and analyze highly valuable data from very diverse populations from different sectors living in different parts of the world.

- The Global Center of the Village, located in USA, can remotely monitor the disaster resilience capabilities of smart hubs located anywhere in the world.

## Video Clips and Links

[1] What is a Smart Hub: 3 Minute Video Clip (http://ict4sids.com/ved14.html)
[2] How Does Collaboration Help a Smart Global Village: 4 Minute Video Clip  (http://ict4sids.com/ved4.html)
[3] What is Our Computer Aided Methodology: 5 Minute Video Clip (http://ict4sids.com/ved6.html)
[4] What is the SPACE Factory:  2 Minute Video Clip (http://ict4sids.com/ved9.html)
[5] SDG Advisor: Video Clip (http://ict4sids.com/ved7.html), Link to the Tool (http://space4ict.com/pages/sdgsadv.aspx)
[6] Smart Solomons Project: 4 Minute videoclip (http://ict4sids.com/ved13.html)
[7] ICT4SIDS Partnership: Sample Pilot Projects, URL:  http://ict4sids.com/proj.html
[8] Global Entrepreneurship Zone for All (GEZA):  URL: http://ngegeza.com/