ICT 4 SIDS
Small Islands and Developing States

Invitation to Launch Smart Collaborating Hubs for Rapid Implementations of SDGs – Towards a Smart Global Village

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Executive Summary

This is an invitation to launch a Free Pilot Project for acceleration of SDG Implementations in health, education, public safety, public welfare, fisheries, food and agriculture and other vital sectors. Briefly:

- The objective of our Partnership is to accelerate the implementation of UN SDGs (Sustainable Development Goals) through digital innovations.
- The Pilot Projects generate *Smart Hubs* that provide highly specialized region and population specific SDG services and also collaborate with each other to form a *Smart Global Village*.
- We have implemented more than 50 smart hubs in 15 countries which span SIDS, LDCs, and other underserved populations.
- The launched smart hubs accelerate adoption of SDGs and provide educational and entrepreneurship opportunities for the youth, We have started offering Hands-on Workshops based on our SDG Advisor.
- The smart hubs also are collaborating with each other horizontally (e.g., in the same country), vertically (e.g., on same topic) and diagonally (e.g., different topics in different countries) for economic and social growth at regional and global level.
- A computer aided methodology is being used to implement this plan by employing local youth as Point of Contacts (POCs).
- Our approach has been acknowledged by academic communities as well as UN organizations such as UNESCAP and UN University (see papers published).

Additional Information

- Review this document to get a better understanding
- Visit the ICT4SIDS Partnership Site at www.ict4sids.com, especially the Learning Corner for tutorials, reports and videoclips
- For detailed questions and//or to join a Free Pilot Project, please send an email to A. Umar at umar@amjadumar.com (indicate "ICT4SIDS Partnership" in the email header).

Recent Research Papers Published

- Umar, A., "Smart Collaborating Hubs and a Smart Global Village – An Alternative Perspective on Smart Cities", IEEE Conference on Technology and Engineering Management, June 2018. Link: (http://www.ict4sids.com/newdoc/IEEE-TEMS%20SmartHubs-Final.pdf)
- Umar, A., "Computer Aided Strategic Planning for the United Nations Sustainable Development Goals (SDGs)", International Journal of Engineering and Applied Sciences, Dec 2017, Link: http://www.ict4sids.com/newdoc/IJEAS-SPACE4SDGs-Published-Final.pdf

What is the Main Idea and What are the Key Results

We are implementing Smart Collaborating Hubs through pilot projects for underserved populations in Small Islands, Africa, Asia, South America and the United States. A 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). Community Centers provide multiple services to a small population (e.g., community centers in SIDS provide adult education, telemedicine services and fisheries support). The cells of the table show the specific topics being addressed and illustrate the diversity of our approach. The computer aided methodology, explained later, is being used to implement this plan by employing local youth and other individuals as Point of Contacts (POCs) who are given tangible entrepreneurship opportunities in different rural and urban areas. For example, young nursing school graduates in some developing countries are running Hypertension Telemedicine Centers as "Hub Masters". We have learned the following key lessons so far:

- The approach of highly focused pilot projects (about one month) works very well -- we quickly learn what really works and also provide educational and entrepreneurship opportunities for the youth. For example, young entrepreneurs in Maldives, Rwanda and Pakistan have developed business opportunities in health informatics by working on telemedicine hubs.
- In Tanzania, we launched an educational hub for educating high school teachers in ICT (a highly valued skill in extremely short supply). This hub exceeded our expectations by becoming financially independent in just 2 months because of much higher than expected enrollments (we were expecting 20 students, we enrolled 120 students). This hub has now started collaborating with nursing education that is supporting telemedicine hubs.
- 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 Pakistan and Sri Lanka serving as connector hubs for each other).
- The collaboration matrix in Table 1 is a realization of the Smart Global Village for underserved populations vision. This 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. For example, we have combined hypertension data from Seat Pleasant, a small town in Maryland (USA), with data from Haiti, Peru, and Jamaica. According to the World Hypertension League such data has *never* been collected before.
- The Global Center of the Village, located in USA, can remotely monitor the disaster resilience capabilities of smart hubs located anywhere in the world.

Table1: 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 Resilience Hubs***	***Community Centers***
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	eCommerce				
Nigeria	General	ICT4Teachers					
Rwanda	General		eConsulting				
Maldives	Hyper-tension			Food Distribution			
Sri Lanka	General Telemed		Digital Marketing	Farming & Fisheries	BI4Small Firms	Storms	Plastic Waste
Pakistan	General		eConsulting		BI4Health	Floods	Education
Peru	General						
USA	Hyper-tension	Entrepreneur-ship Education	Tech-Preneurship		BI and Analytics	Remote Monitoring	Smart Towns

What are Smart Hubs and How Do They Support a Smart Global Village

Our vision is a *Smart Global Village for the Underserved Populations* that consists of smart collaborating hubs located in small islands, small towns and isolated communities, as shown in Figure1.We are focusing on *Smart Hubs* for rapid implementation of SDGs at rural, regional and national levels that must:

- Provide highly specialized region and population specific SDG-driven services in health, education, public safety, public welfare and other vital sectors.
- Collaborate with each other, as specified by the Samoa Pathway, for a region wide impact through information exchange and cooperation between various smart hubs.
- Be aware of the local information technology and energy constraints and be customized accordingly (for example, do not offer cloud-based services to small islands that do not have access to the cloud)
- Be supported by a powerful portal that has prefabricated plug-ins for collaboration, business intelligence, decision support, and security so that a smart hub located in the remotest possible locations can equally participate in the government decision making and citizen engagement processes.
- Provide a pathway to add cognitive services as local capacities of populations improve accordingly.

Figure1 displays our architectural vision that illustrates how all the pieces fit together. Specifically:

- 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.
- A large number of 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 (HU) 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.
- Our distributed approach of using different smart hubs that focus on different SDGs in different regions appears to be more economically effective than the centralized large smart city approach. The Harrisburg University (HU) graduate program in information systems (1500 students from 72 countries) is a very strong population of well-educated potential POCs (Points of Contacts) who could serve as catalysts for change in their originating countries and also support the Global Center. In fact, three POCs of pilot projects mentioned above are graduates of HU.

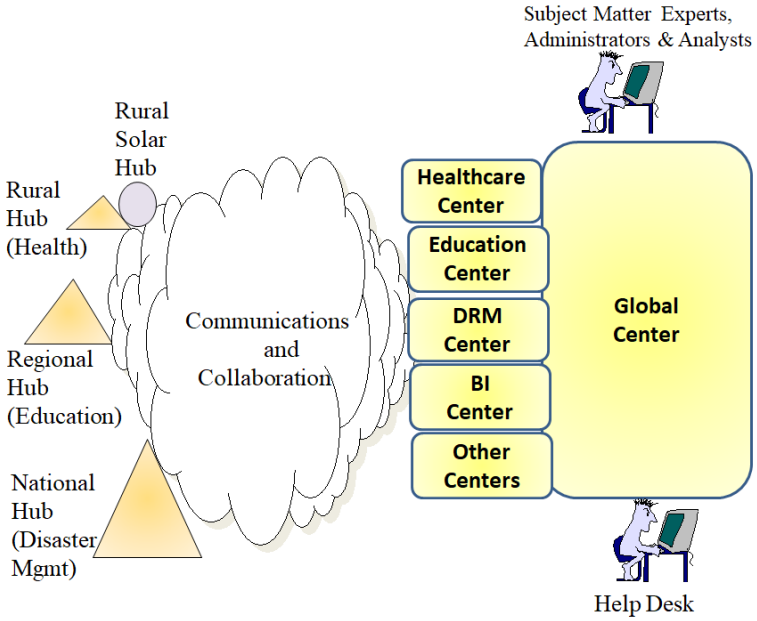

Figure 1: Overall Architectural Vision for Smart Hubs and the Smart Global Village

How is the Vision being Implemented

Figure 2 shows the Global Decision Support Center at HU that supports the vision presented in Figure 1 and the implementation plan shown in Table 1. This site, developed by the ICT4SIDS Partnership, serves as a Center for Collaboration and Control between all hubs, and provides the following capabilities:

- *Collaboration Matrix* that supports various collaboration scenarios between different hubs and global centers. For example, telemedicine centers in Samoa and Solomon Islands can exchange information with each other and also with a nursing education center located in Aruba.
- *World Hypertension Center* located in Harrisburg can be used to store hypertension data from Haiti, Jamaica, Tanzania, and other countries for across-country analysis and advice to populations in these islands. This center is currently operated by the World Hypertension League, part of the World Health Organization (WHO), and a partner healthcare NGO (Colleagues in Care) addressing non communicable diseases world-wide.
- *Education Center* is available as the central repository of education and training for capacity building of different regions. We are currently working with Tanzania to educate local teachers for effective use of computers in classrooms.
- *Business Intelligence Center* is a new capability that will be used by any of the hubs for analytics so that even the remotest villages can also participate and benefit from simple analytics to promote local economic activities in the global marketplace
- *Smart SIDS* is a new initiative that is using the SDG Advisor and Computer Aided Planning to develop smarter SIDS. We are currently working with Solomon Islands on a Smart Samoa Pilot Project. This concept is also being expanded to smart towns and isolated communities.
- *Entrepreneurship Portal* is a new initiative that is primarily focusing on micro-entrepreneurship through microfinancing. This portal is providing resources for education, social networking, digital marketing and e-commerce as the basic tools for young entrepreneurs.
- *Smart Agriculture Portal* is a new initiative that is extensively based on using IoTs and embedded systems for monitoring the growth of crops and food security as the key areas of focus at present.
- *Disaster Recovery Center* is currently not operational but is in design to reduce risk from disaster situations such as climate change and earthquakes, and to accelerate recoveries of economic activities thereby reducing risks to public and private sector investors
- Additional centers on food safety, micro-grids, AI (Artificial Intelligence) applications, and Internet of Things (IoT) solutions are also under investigation for SIDS and Least Developed Countries (LDCs).

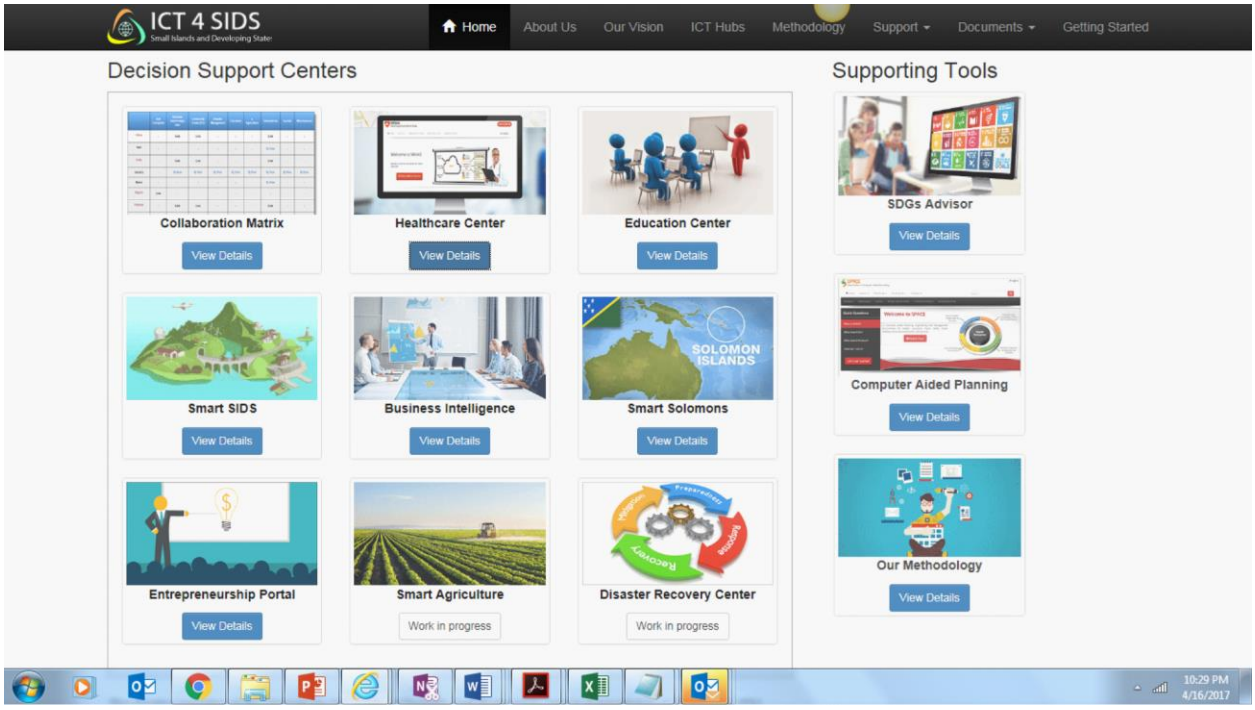

Figure 2: Screenshot of the Global Decision Support Center for SDGs

What is our Methodology for Rapid Implementation of SDGs

Figure 3 shows our systematic computer aided planning methodology for launching and supporting the pilot projects and the needed smart hubs. The first two phases of this methodology rely heavily on two powerful tools (an *SDG Advisor* that quickly checks the SDG indicators for different regions/countries and a *Computer Aided Planner* that conducts detailed feasibility studies and produces a strategic plan, plus a highly customized working portal for a proposed hub within hours). This methodology is based on the insights gained by implementing the pilot projects shown in Table 1 and will be further refined and used in the future. The methodology consists of the following phases.

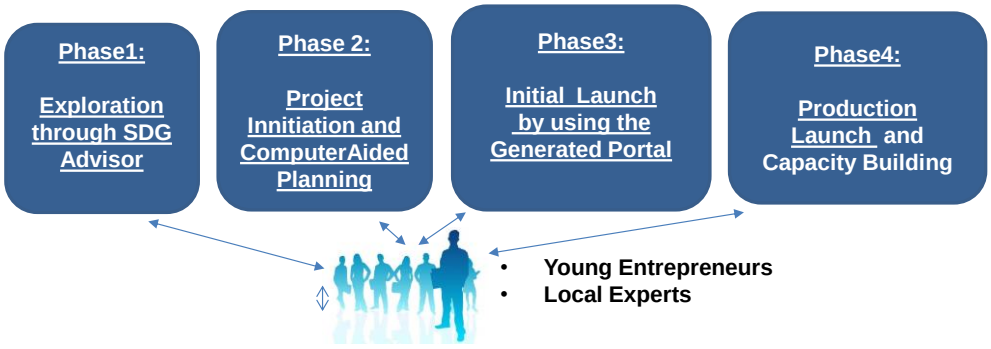

Figure 3: Computer Aided Implementation Methodology for Launching Pilot Projects

- Phase 1: We invite potential users to join a smart pilot project and ask them to use the SDG Advisor tool to help them assess their needs and determine which SDGs should be addressed in the pilot project.
- Phase 2: A hub vision is proposed and a pilot project is initiated by a user and a *Point of Contact (POC)* is appointed by the target community. The POC is trained to use the computer aided planning tool to conduct an extensive feasibility study and produce a strategic plan, a funding proposal and a working prototype of the selected smart hub(s) – all within a day.
- Phase 3: The results of the feasibility study are analyzed/revised and a final smart hub is created in collaboration with the POC and local experts. The final hub is "registered" in the Collaboration Matrix.
- Phase 4: The produced portal is used extensively for capacity building at the local sites and is refined for a production version. The production version of the hub portal is launched at the end of this phase.

Results So Far and Future Directions

Under the umbrella of UN ICT4SIDS Partnership, a small team of 5 people in a startup, with help from advisors from IBM and the UN, has launched more than 50 pilot projects that involve 15 countries. We have learned that our methodology can save $50K to $70K per pilot project and significantly reduce retries, errors and failures. Our approach improves decision-making, harnesses innovation to improve outcomes, and engages young entrepreneurs to meet evolving needs. Based on the insights gained through the pilot projects, we feel that significant improvements in rural / urban transformations can be achieved through a set of collaborative smart hubs which facilitate specific local goals such as financial inclusion and youth economic opportunities, reduction in hypertension, and expanded educational opportunities, while improving citizen engagement capabilities of local governments.

Next Steps

- For tutorials, reports and videoclips on this topic, please visit the ICT4SIDS Partnership Site at www.ict4sids.com, especially the Learning Corner and the Video Gallery (Red Button on Top Bar).
- To join a Free Pilot Project, please send an email to Dr A. Umar at umar@amjadumar.com (indicate "ICT4SIDS Partnership" in the email header).