

## **Grameen Technology Lab: An initiative in Japan to help social business solve more social problems**

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### **1. Introduction**

According to WHO, in 2009 diarrhea was estimated to have caused 1.5 million deaths in children under the age of 5 i.e. over 4000 children died per day. Only in India itself, more than 1050 children die of diarrhea per day [1]. The mothers of these children were asked, "What did you do when your kid had diarrhea? Did you stop feeding liquids or provide more liquids?" Thirty five percent answered, "stopped feeding liquids". In contrast, a total of 14,286 deaths in the same year, were reported, according to European Centre for Disease Prevention and Control reported [2]. Information of H1N1 flew faster than the virus. The world took necessary steps to fight against H1N1. Lives of 1059 kids in India a day do not get attention of the world because diarrhea is not a disease of the rich. Technology to combat diarrhea is not an issue. The medicine is affordable. No policy is stopping them to take proper treatment for diarrhea. These unnecessary deaths occur just because the information is not reached to them.

Kyushu University opened a new research project to rethink the present social information infrastructure. The purpose of the project is to establish a new social infrastructure to serve social services e.g. health, education, business, Governmental services to the masses. Part of our research focused the developing countries and made an agreement with Grameen Communications in Bangladesh in 2007. We have conducted a series of surveys [4] to understand how villagers use Information Communication Technology. Six hundred villagers in three rural areas were asked which media among newspaper, radio, television, mobile phone and Internet they use to access social information such as health, education, business and entertainment. The key finding is that people choose media according to the content. Our results show that 93% watch TV, 90% have access to a mobile phone, 60.9% listen to radio, and 63.4% read a newspaper while only 6% use the Internet. Although the basic infrastructure e.g. water, gas or electricity in the villages was absent the availability of the mobile phone in rural areas were amazingly high. In order to charge the mobile phones, people bring advanced solar energy in the village. Using solar energy, people also operate computers to connect the outer world for confirming their jobs in the Middle East.

This is a common scenario in most of the developing countries. They want advanced technologies, do not wait for all the infrastructures to be settled first, do not want to wait for the policy to be set. This situation is in sharp contrast to that in the developed world where policy and infrastructure strongly influence what is possible. Thus, it takes a longer period of time to deploy a technology in the complex infrastructures of developed countries because the new technology needs to have backward compatibility with the existing system and policy needs to approve the new technology. This makes deployment costs expensive in terms of both time and money. On the other hand, a place with little or no infrastructure has an open option to accept new and advanced technology. There is no issue of backward compatibility. Deployment costs become relatively cheap. Therefore, the developing world offers a great opportunity for academic researchers, product designers and vendors to enjoy the immediate outcome of our efforts.

Technology can save the developing world from many of the problems that the people face. While some technologies are getting there, many with the most potential to improve lives are not. We are proposing a new technology development process so that masses are reached by the technologies.

## **2. Technology / Product Development Process**

While budget allocation may have different priorities, a careful technology/product development process can change the scenario. We have sufficient technologies in hand to design products regardless of the income level of the targeted user. Projects like WSIS by the UN, 1LPC by the Melinda-Gates Foundation and ITU-T are taking different ICT4D initiatives to give the unreached community access to social services. Traditionally,

- (a) The technologies developed in the university do not necessarily reach their final destination to be used by the society. Many of them stay on the shelves.
- (b) As the commercial industries have to prioritize profit, they select the premium customers. Moreover, in order to stay competitive, they make aesthetic changes to the product to attract the customers. This makes the product price even higher.
- (c) Consumers with high incomes in developing countries end up importing the higher priced products with the unnecessary aesthetic features. Then, these products need to be customized to suit cultural and regional requirements. The price becomes even higher and increasingly unaffordable for the people in low-income brackets. Therefore, a larger portion of the population remains unreached by technologies, products or services.

While fundamental research should continue in universities, space also needs to be created for research on social needs along with technology development. By social needs, we mean the requirements of the masses. The advantages of this approach are that the redundant features can be eliminated from the design phase resulting a cheaper product price. This will increase the accessibility of people in the lower income brackets.

## **3. Projects at Kyushu University**

Currently, there are six major projects running in Kyushu University. All the projects are based on the requirements raised from Grameen Communications, Bangladesh.

### **3.1 Social Information Platform**

Social services (health, education, business etc) information provided by the government, non-government, social development agencies, business agencies have hurdles to convey information to the villagers. The villagers on the other hand did not have the opportunity to have their voice heard. The GramWeb platform [5] ([www.gramweb.net](http://www.gramweb.net)) is capable of handling 8,5000 village websites, one for each village in Bangladesh. A Village Information Entrepreneur (VIE) (ideally a native villager) collects the village information and uploads it to the allocated space of the GramWeb platform. The villager-friendly interface (designed for both high and low-literate populations) allows villagers to share news, upload photos, trade goods, promote tourism and even interface with local matrimony and job-search portals, opening them up to new opportunities.

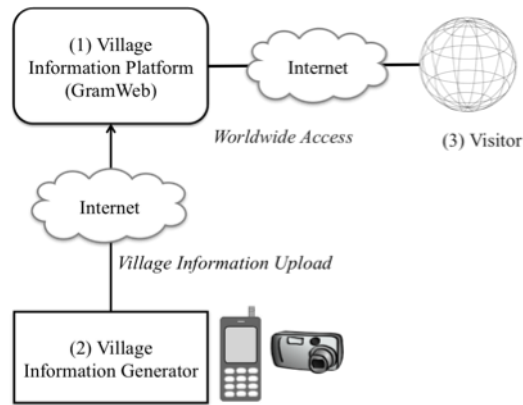


Fig 1: Social Information Platform (www.gramweb.net)

Enabling villagers to broadcast their information to the world brings invaluable benefits not just to the villagers themselves but also to society as a whole. If village information is collected, archived and maintained locally for publication through GramWeb, data can be aggregated with statistics from other villages. These aggregated reports can be sold to third-party organizations and act as a source of income for the villages. Aggregated statistics can help local and national government officials for making policy decisions and provide local and country information to the global organizations such as the UN. The statistics have the advantage of being immediate and up-to-date. For example, conducting a population census in a developing country can take between five to ten years but with the GramWeb framework it can be done in a few seconds.

### 3.2 ePassbook: an electronic gadget for the poor

ePassbook [6] is a multi-functional electronic card originally developed for microfinance borrowers to maintain their financial records. Grameen Bank uses manual passbook and had the requirement of digitizing it. The bankcards that we use in developed countries do not satisfy their requirements. Grameen Bank users have more functional requirements that need more technical innovations. For an example, the manual passbook has their loan information which can be viewed at any time. A digital bankcard does not show the loan information. The dimensions of a wallet determine the size of a bankcard. However, Grameen Bank borrowers do not use wallets. Most of the borrowers are women who wear sarees without pockets. The requirements led us to design and manufacture a new card from the scratch. We named it "ePassbook".

We added a display in our ePassbook (Fig. 2) in order the view the records. A solar panel has been as source of energy for the display. The additional features make a product more expensive, and we are constrained to keep the price affordable.

The core module of a digital card is an IC chip. We have selected Kyushu University's IC chip with the capacity to support multiple services. By allowing multiple services on the same card, the service provider can share the cost of the device. Out of many potential services that are required by the poor community, we decided to start with three: health records at the patient end, ecommerce, and money transfer. These services can subsidize the cost. For an example, if an archive of millions of people's health record can bring be an invaluable information source for researchers to see disease trend, the statistics can benefit the government, WHO and social development organizations. The statistics (removing the private information) can be a source of income for the ePassbook card issuers. This way, the device cost can be subsidized.



Fig. 2: ePassbook: an electronic gadget for the poor



Fig. 3: Microfinance borrowers and managers test the usability of ePassbook

### 3.3 Affordable (\$300) portable clinic

In section 2.3, we discussed the health record to be maintained at the patient side in their passbook. There are standard electronic health record (EHR) scheme in different areas in the world. One interesting thing we observed that microfinance borrowers become a member of a microfinance institute as a family unit [7]. Therefore, an ePassbook will be offered to a family not an individual. The proposed EHR will also will be a family based not a personal one. A new set of challenges appeared: how to design a family health record (FHR) system and how to insert FHR into the ePassbook. We have designed a health check up booth equipped with nine most common diagnostic tools. The booth can be set up in a village clinic or in a community place where the villagers can come and take their measurements. A medical health assistant will be required to assist the villagers and maintain the health booth.



Fig. 5: Electronic diagnostic tools producing on-site test results.

Fig. 4: Health check up booth. Various diagnostic tools are equipped to collect health data and store them in ePassbook.



Fig. 6: \$300 portable clinic. All the functions in a booth (in Fig. 4) can be designed and mounted in a suitcase. A grameen nurse can visit patients' home.

Traditionally, there were village doctors who used to visit homes. In other words, there is a culture where doctors visit patient, rather than the other way around.

If we want to keep this tradition in tact, constraints lead us to introduce advanced technology to satisfy all concerned parties- the patient, the doctors and the government. We are proposing a \$300 portable clinic (Fig. 6). The proposed \$300 portable clinic is a box consisting different diagnostic tools, a display and a communication interface. A health assistant in the rural areas (preferably a Grameen nurse) can carry the clinic box the patients' homes. Tools in the box are to collect diagnostic data, and send them to a doctor in an urban area. The doctor can provide necessary instructions to the nurse. This box will create opportunities for medical equipment vendors to design and develop diagnostic tools, and for software vendors to structure these diagnostic tools in such a way that a nurse with minimum training can operate.

This portable clinic can address the health issues of billions. Unreached people will have opportunities to consult with a remote doctor with instant pathological test results. This will create job opportunities in remote areas. Education on healthcare can gradually improve in villages. A doctor does not have to travel all the way to the village. We anticipate millions of such boxes will be required resulting creation of business for advanced medical equipment vendors, software vendors and healthcare service providers.

The health checkup box is already developed (Fig. 4) and being used for experimental purpose in Bangladesh. We are currently carrying out feasibility study for the \$300 portable clinic.

### 3. Social Business in Japan: Background and present status

Japanese people are highly inspired by the concept of social business coined by Professor Yunus [8]. The seven principles of social business overlap with the Japanese traditional business practices. The current profit-maximization business process is creating bigger gaps between poor and the rich. In a typical company in the US, the salary of a company president is 1,000 times bigger than a new employee in the same company, while it is only 10 times in Japan. Japan meets the requirement of "social business" in a sense that employer does not make excess profits for themselves. They offer their resources more for their customers. We are also aware of the limitations of NGOs and NPOs which are suffering from the sustainability issue. In our understanding, if NGOs, NPOs with the social objectives in mind can add the sustainability function in

the process, they can turn into a social business. In Japan, there are more than 3,000 companies operating their business for more than 200 years, and 7 companies for more than 1,000 years. This sustainability proves how carefully they served the society. We believe we have some sort of social business DNA in our body.

We have already created three social business entities in Japan: Grameen YukiGuni Maitake Ltd, Grameen Uniqlo and Grameen Technology Lab. Two Grameen Creative Labs are established in Japan in two universities- Rikkyo University in Tokyo and Kyushu University in Fukuoka.

### **3.1 Grameen Yukiguni Maitake Co. Ltd**

The objective of this social business joint venture is to enhance income of the farmers, particularly for the village women who will be engaged in the processing of mung beans for export market. The company will also offer healthcare services and scholarships to children of farmers, as well as bringing new technologies to the farmers.

This joint venture company has three partners: YukiGuni Maitake Co. Ltd of Japan to provide technical know-how, Kyushu University will carry out joint academic research to build case studies of social business between Grameen and other Japanese industries. Grameen Krishi Foundation will assist organizing the local farmers.

Bangladeshi farmers in general, produce mung beans and eat them as beans in the form of lentil-soup. On the other hand, sprout produced from the beans will have 1.5 times more nutrient. Beans with 4mm or long are appropriate for sprout. Other beans can be utilized as soup. It is expected that 70% of the beans will qualify for export.

Bangladeshi farmers will be benefited in three ways- generating more income by growing the beans and exporting them to Japan, new job opportunity will be created to sort the beans (>4mm beans need to be sorted manually), and will be engaged in business to sell the beans in local market too.

### **3.2 Grameen UniQlo**

The objective of this company is to produce affordable women's underwear, school uniforms and blankets. Women in developing countries do not use proper sanitary napkins. Affordable sanitary napkins and underwear can protect many female specific diseases. People in northern area in Bangladesh suffer from sudden cold in winter. Grameen UniQlo is established to address these issues.

The company plans to hire up to 2,000 local people within three years, drawn mainly from the eight million borrowers of Grameen Bank, and train them to become financially independent by selling clothes.

### **3.3 Grameen Creative Lab in Kyushu University**

Grameen Creative Lab in Kyushu University (GCL@KU) was established in March 2010, based on the MOU between Kyushu University and Grameen Family in 2009. Kyushu University, in general, actively promotes not only a worldwide contribution through the dissemination of customized University resources based on the needs of developing countries, but also fostering excellent human resources to play an important role to think about and to create a future society. GCL@KU consists of researchers from different departments (engineering, medicine, agriculture, economics etc) proactively carry out education, research, incubation and concept-spread of social business as the central core, in collaboration with the Grameen family, companies, NPOs/NGOs, Universities and governments.

In the following, we are outlining the key activities of GCL@KU.

*Research:* Gather the interdisciplinary researchers within and outside the university to solve a particular social issue; Interface and create global joint research opportunities utilizing the worldwide GCL networks; assist and cooperate Grameen Technology Lab.

*Education:* Build curriculum for designing and implementing social business; Promote global joint education program with GCL@University; Foster social business ideas from the students, etc.

*Incubation:* Support and consult of social business ideas from students, companies and individuals to go into a practical phase; Arrange competition of social business ideas, etc.

*Promotion:* Arrange social business workshops, symposium; Deliver lectures to companies, governments and other external organizations, etc.

#### **4. Grameen Technology Lab**

Grameen Technology Lab is a proposed social business entity to examine how a technology development organization could run as a social business. The above mentioned ePassbook project was financially supported by JETRO, designed by university researchers, and manufactured by Japanese vendors. Grameen provided the experimental support. The university took the lead in the project by identifying the social needs, designing the product and managing the development and experiment. In the end, government, academia, industry and society were all engaged in the creation of the product. The project resulted in a win-win situation for all concerned. Through this experiment, we designed a product considering the social needs, confirmed the market of million customers. A further salient point is that the same technology has been reversely imported and is being used in an experiment in Itoshima city in Japan.

NGO/NPOs have expertise on social problems and needs. On the other hand, research organizations have the most advanced technologies, as well as the human resources to solve social issues. In order to make a bridge between society and the research institutes Fig. 7 proposes the framework of GTL (Grameen Technology Lab). Depending on the social needs that are identified by the local partners, GTL gathers appropriate technologies or proposals from research organizations.

Technologies developed in the research institutes will find a way to become useful in society. Industries partnering with the local counterpart for developing and distributing the product will help deliver the product to the consumers' doors. A developing country like Bangladesh receives financial support as donations; however, for the long term, we hope to see the donations turning into technical knowledge transfer in a sustainable business scheme to solve social issues of 4 billion largely unreached people in the world.

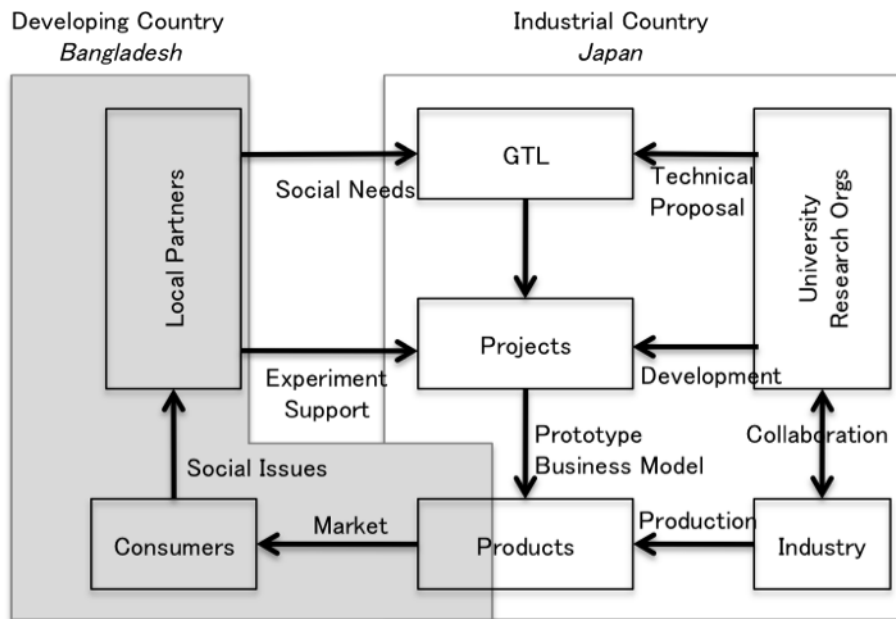


Fig. 6: Social needs based research: product development diagram

## 5. Conclusion

This article introduces a new approach to the development of affordable and income generating technologies considering the requirements of the hitherto unreachable. We introduced three of our major ICT related innovations: ePassbook to record financial and health related information; a social information platform where villagers can gather information on their own and share it with the world as a business; and a portable clinic. We have established Grameen Technology Lab to engage with the community to identify social needs, with industries to put their technical know-how to best use, with academia for long-term research, and with other social business entities to disseminate the products to the targeted people. Japanese people are highly inspired by the concept of social business coined by Professor Yunus. The seven principles of social business overlap with what Japanese industries have been practicing for hundreds of years. Profit-maximization industries that have forgotten or are unaware of these principles can reset some of their policies to step into the world of social business. Through GCL and GTL activities, we will continue promoting the social business concept to students, researchers and our collaborative research partners.

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