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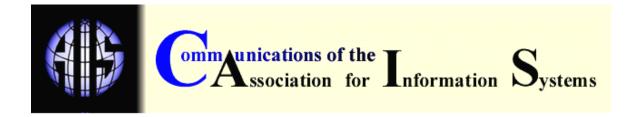Follow this and additional works at: https://aisel.aisnet.org/cais

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ABSTRACT

This article introduces ways to create proper IT services which can help organizations serve the emerging rural markets. The research is based on a two-year action research project which derives a framework for building IT services for the low-income consumers in the rural area of China. The framework is proposed to understand the characteristics that the consumers in the rural area use the IT services, especially in China. The framework helps IT companies and governmental agencies design and improve the IT services they provided to the emerging market.

Keywords: Services, Internet, China, design

I. INTRODUCTION

There are 4 billion people whose annual per capita incomes fall below the minimum considered necessary to sustain a decent life. These people represent what is being described as the emerging bottom of the pyramid (BOP) market [Prahalad and Stuart 2002], which is a great opportunity for business, government, and the civil society to join together in a common cause. Companies require approaches fundamentally different from those in the upper tiers of the global markets, in order to serve these consumers. Changes in technology, credit, costs, and distribution logistics are critical prerequisites. Within this fast-changing process, information is regarded as one of the most indispensable resources for exploring the BOP market. Corporations and private start-ups are designing new information and communication technology (ICT) infrastructure and services which can facilitate their participation in the BOP markets. More and more managers and local entrepreneurs are beginning to think of poor communities as big potential markets. Researchers and engineers are shifting their focus to design low-cost products and provide affordable services. But the products and services currently offered to the higher echelons are not appropriate for these BOP consumers. At the start of this century, digital networks have not yet penetrated rural areas, very low-cost devices are still not being produced in large quantities and applications holding apparent promise have either not yet reached the requisite scale or have not been widely replicated [Prahalad and Hammond 2002]. Governmental authorities, nongovernmental organizations (NGOs), financial institutions, and other companies still face the big challenge of adjusting their corporate attitudes, strategies, and cost structures. To address these issues, we explore the contribution that IT services can make toward bringing together

businesses and consumers in developing countries, specifically in the countryside of China. Based on important findings from our action research, we identify ways to create proper IT services which can help organizations communicate with this vast emerging market and offer a beacon of hope in an otherwise grim situation.

II. PIONEERS ENTERING THE RURAL MARKET

In the last few years, some IT companies have started rushing into the rural markets of developing countries, such as China, India, Brazil, and South Africa. They have initiated a series of plans to promote applications of their IT products and services which are designed for low-income consumers in remote areas. In a strategic shift to tap the lower-end market, Lenovo unveiled a national program to boost its personal computer sales in townships and rural areas in 2004. Optimistic about the huge potential of this undeveloped and hindered China market, Lenovo aimed to enhance sales in the rural areas to between 2-3 million PCs a year, or a quarter of the country's total PC market, according to its president Yang Yuanqing. The cheapest product of the rural promotion program sells from $363. To cut costs, the computers were equipped with inexpensive AMD processors, instead of the popular Intel chips. MIT Media Lab has started the one laptop per child project (OLPC) [OLPC 2007]. The education project has designed a hand-cranked laptop that will cost roughly $100. It was expected to be in the hands of school children in poorer countries by late 2006 [Declan 2006]. The nonprofit organization is in detailed discussions for launching the program in Brazil, Argentina, Libya, Nigeria, and Thailand. In late 2006, a series of actions taken by big IT corporations focusing on the rural market were reported by Chinatechnews.com. Intel plans to invest over $1 billion in the BOP program, which involves promoting informationization in rural areas in China. Intel will help the Guangdong province government to set up 300 rural community computer centers and 105 digital clinics by the end of 2006. After achieving success in this area, it will gradually popularize the pattern in other regions across China. This program is part of the company's plans to implement a rural program in developing countries and regions all over the world. In April of 2006, Tsinghua Unisplendour Corporation, a major state-owned PC vendor and IT services provider in China, put forward a "Thousand City Program" that aims to introduce sales, training, and value-added services in 1000 rural counties across the country. The CEO mentioned that the rural market has a great demand for family education. Because the service system in the rural areas is very weak, the company sees an opportunity to open the market.

III. FINDINGS FROM ACTION RESEARCH

Providing IT services to the BOP market in China can bring one of the biggest markets in the world to the biggest evolution agents. However, challenges and pitfalls accompany this tremendous opportunity. Many IT companies and governmental authorities are realizing that their experiences and knowledge in the urban markets can not be easily adopted in rural areas. Besides, there is no effective methodology to assess the viability of these new business initiatives. Doing business with the world's poorest people will require radical innovations in technology and business models. It will require companies and governmental authorities to carefully examine the key elements and mechanisms for building successful products and services before spending resources. Valid IT services for the BOP market depend on synergy between many intertwined issues, such as the society, the economy, the culture, education, and income status. Designers must understand the users and put efforts into solving unanticipated problems. To understand these issues and develop an applicable methodology, our research focuses on problem solving through inquiry into the problems in a real context. The essential of such research is a collaborative approach to investigation that provides the community with the means to take systematic action to resolve the problems.

The research team from Peking University has conducted a two-year research project to investigate how the Internet and the PC can go into the Chinese BOP market. Researchers first observed the situation carefully, working with governmental authorities, IT service providers and

the rural users to define and describe the problems. The objective was to investigate effective ways to provide feasible IT services to villagers in remote parts of China. When we started to design our research in 2004, few companies and local governmental authorities in China had taken steps to provide IT services to families in rural counties. After investigating similar cases from India and Southern America, we figured out that possible straight ways to promote IT services in rural areas in China would include providing low cost PCs to the people by the IT companies, donations of computers and cell phones by philanthropists, and setting up information booths and service stations in the countryside by the government. Each of these solutions might provide IT products and services with different characteristics. It was not clear as to which of these ways could take the lead role in China. We had chosen the action research approach to investigate this problem, because it offered an effective way of bringing about process and cultural changes and, at the same time, of generating transferable knowledge [Baskerville and Wood-Harper 1996; Stringer 1999]. We planned an action that was expected to lead to resolution of the problem in a concrete and systematic way. What had been proposed was a new solution called "Extra to First," which is to use the extra computing resources in the cities (e.g., hardware, software and accessories) to serve the rural consumers and improve their lives. In October 2004, a professor and his master student from Peking University brought a PC to the remote countryside in Hunan province and conducted a three-day field study. The secondhand PC, which was bought on the Beijing campus for $150, became the first computer of that remote village. We trained a 16-year-old farmer, who was selected to host that PC at his home, to create a Yahoo email account and send his first email through a dial-up Internet connection. It took three days to interview the families in the nearby three villages and visit the local IT stores and Internet bars in the town of the county. After six months, we interviewed the participants again and were informed that the computer was still being used for learning and information-access purposes. In the experiment of using the "Extra to First" way, the total cost for an organization to help a family to own its first PC and to be online was less than $350, including shipment and training. More importantly, we were able to reflect on the process of designing the service model, refine the processes, and achieve a deeper understanding of the phenomenon.

We found that companies and organizations face huge challenges of promoting IT services because of the intricate characteristics of the BOP market in China (Table 1). Although some local governments had initialized some rural computer training programs, they actually had not achieved the anticipated effect. An experimental program in Hunan province had given 1,055 villages computers to train the basic unit cadres. However, many young adults in the rural areas egressed to work in the big cities. The remaining senior trainees were not very capable of learning how to operate the computers. Moreover, they did not have the enthusiasm. They showed little interest in trying the new technology and found it hard to realize the value of information. Some township authorities even invented a new method: each trainee could get 6 Yuan (78 cents) per day for them to show up in the class. However, in the daytime many computers were still locked in the village office because of the low attendance rate of the class.

Curious kids were not allowed to play with those computers. On the contrary, we saw a private primary school in another village. Inside the simple and crude classroom, children gathered around several worn-out computers from dawn to dusk. They were eager to learn typing and searching on the Web. Some local government official possibly thought, "The computer is a symbol which indicates that the farmers are getting rich." But those farmers felt that the use of the computer was a burden. The real situation proved that if the promotion of computer and the Internet is defined as the "achievements project," their real function is extremely limited.

The disappointing misuses of computers and other unanticipated uses created another problem. The younger generations were easily addicted to darker sides of the Internet, while the older generations lacked interest in using IT products. For example, to our surprise, other home-owned computers in the nearby relatively rich counties were mostly used for online gaming and chatting. In an Internet bar in the nearby local township, we found all users were kids, and they spent their lunch money playing Shanda games. We discovered that villagers used telephones and online chatting tools to gamble with the small amounts of cash they possessed. Some of them enjoyed

Table 1. Challenges of Providing IT Services to BOP Market

Factors	Challenges
Society	Lack of education: Many people in rural areas can not read and write.
	Lack of collaboration: Companies and governmental authorities want to take the lead role and resist collaborating with others.
	Lack of shared values: Since many stakeholders are involved, applications of IT services always face various conflicts when satisfying various purposes.
	Fuzzy objectives: Companies, governmental authorities, and non-profit organizations are not sure about the ultimate goals of their work.
Culture	Misunderstanding of IT: Book reading is still treated as the main way of accessing real knowledge. Computer is viewed as a play machine and its real value is ignored.
	Fear to be the first: Villagers with the old traditional thinking feel concerned about becoming the first one in the village to test the new fancy stuff.
	Resistance to changing lifestyle: A surprise. Some villagers were satisfied with their simple but happy life. They do not want to work and live as the busy people in the cities.
Economics	Lack of income: The poorest families cannot afford even the cost of electricity for operating the computer. Their low income prohibits wide usage of the digital equipment.
	High price: The product and the services designed for the urban population is expensive in rural areas.
	Lack of capital: Rural families have little savings and few assets. Most of their money goes into building houses and paying tuitions for kids.
Industry	Lack of incentive: Small and midsize companies hesitate to seriously invest money and human resources in exploring potential markets.
	Lack of differentiation: There are more than 6000 rural related websites (in 2006). Their business models and contents are similar to each other and need to be updated periodically. Most websites designed for rural users have similar appearance and functions.
	Lack of expertise: Companies are short of experts who really understand what the BOP market needs. Most of the products and services designers do not interact with the final customers.
Consumer	Lack of users: Most of the labors leave the countryside to find part time jobs in the cities. In many rural counties, children and seniors are the main population. They do not have bank accounts and credit cards.
	Lack of interest: Old generations (40 years and older) lack interest in using computers and IT equipment. They show little interest in trying the new technology.
	Hard to serve: For people living far away from railways and roads, complete customer services are impossible.
Technology	Lack of right technology: The low-cost computer which can work in the tough environment is hard to build.
	Weak connection: The dial-up connection is relatively expensive and easy to break.
	Recondite interface: E-commerce websites and electronic payment systems are too complicated to use for the villagers.

discussing the tricks to predict underground lottery by online chatting. They then placed the lottery orders by instant messages or phone and exchanged the prize using cash. The rife underground gambling is a big headache for the local governmental authorities. They lack laws and techniques to control it. The perceived value of IT services and user habits in the BOP market are dramatically different in patterns from those in the developed markets. On the east coast of China, we saw many cases where the rich farmers used Internet to search for business information and made deals to sell their agriculture products. But in the west, most of the time we heard that the low-income farmers viewed the computers as a luxury play machine. In the end of 2005, the research report from PKU was noticed by the Ministry of Commerce of China. Within one month, the head of the ministry of commerce set up a committee to further study the topics and carefully design the solutions to take up the challenges. Part of the suggestions of our research was accepted and integrated into the program plan. The result was that the national "Infortune" (means information brings fortune) program was launched in March 2006, which takes initiatives to set up 100,000 free e-commerce computer service stations in the countryside of China. The Infortune program aligned governmental authorities, IT companies, and universities together to pursue the following shared goals:

- To utilize the current infrastructure to create business information service stations at the village level;
- To support college students to donate their unused PCs and help installing service stations in nearby villages;
- To support the universities to assist training and promotion of IT services in rural areas;
- To set up special databases of agricultural information and build national agricultural e-business Web sites;
- To facilitate sales of farmers' products in the market by providing them relevant information;
- To guide and facilitate farmers to buy high-quality products and improve their consumption habits.

In 2006, 29 provinces have worked on this program. More than 13,000 villages from 425 counties have applied to set up information services stations. The program arranged to train 23,000 peasant brokers to be able to search and use business information from the Internet. It has been estimated that Infortune project services have covered the rural areas with population of more than 106 million. Although the real effects of the Infortune project will take more than a decade to be felt, our action research identified some transferable insights from real experiences. When working on this research project, we used many concepts and methodologies from information systems, strategies and economic development domains to define IT services design processes. The solution embraced models integrating different perspectives within the society. The outcomes are a collaboration model linking the companies, government and non-profit organizations and a procedure for design of feasible IT services for BOP markets in China.

IV. A DESIGN PARADIGM FOR BOP IT SERVICES

Designing IT services for BOP market is a complex endeavor requiring good ideas, a systemic approach, and a solid understanding of business, technology, and social issues. For companies who plan to use emerging technologies to enter the attractive BOP market ahead of others, the first step is to understand the global picture and systematically lay out an action plan. Based on our research findings, along with our experience in providing strategy consulting to Chinese industry and government, we have developed a framework aimed to help firms address these challenges. The critical part is to understand the proper requirements and create real customer value. Treating the BOP market as the place for dumping low-cost products would only result in the customers leaving. Then the potential business vanishes. All efforts to improve standards of living, boost productivity, and create jobs should focus mainly on the services sector [Chesbrough and Spohrer 2006]. As a matter of fact, services are indeed innovative and, in some areas, more innovative than manufacturing [Sheehan 2006]. Hence, real business value creation and profits depend on the ability to provide the right and innovative services. Providing IT services to the

BOP market is actually a socio-technical co-construction process [Lu and Cai 2001]. Practitioners and researchers need a service design framework that would lead to more direct links between different business layers and the IT infrastructure, leading to a more efficient alignment of IT services with the business goals of the enterprise. The underpinnings of the framework are four key steps—identifying customer value and testing it; leveraging resources to attract support and adoption; providing scalable and sustainable solutions; and improving customer access and service quality (Figure 1).

Figure 1. An IT Service Design Process Framework for BOP

This framework gives the companies structured reference guidelines to design and implement their IT services. Designers should first have a paradigm shift in their thinking— the right to access information from the Internet is not a privilege of a few but one of the basic human rights for everyone. To make the traditional and new solutions relevant to the rural market, the designers should step into the rural areas and talk directly to the customers to examine their characteristics and to understand their minds. Customer value proposition is much easier to be derived from the users' voices than from the strategic talk in the boardroom. For instance, it may sound implausible to equip the poorest children with connected laptops when rich children may not have them, but it is not. If a designer has ever watched rural kids touch the keyboard for the first time in their lives, he/she will agree that laptops can be affordable, and children are more capable than they are given credit for.

When designing the service model and the strategy, considerations are always on building synergies between social factors and the technologies. The challenge for service providers is to create services by optimally leveraging all their resources, often in a global environment. It

requires that service providers are cognizant of not just their software capabilities but also of their global work force, current business trends, and demands of their consumers. In the long term, the critical criteria for the right IT services is whether it can help resolve the conflicts between proponents of free trade and global capitalism on one hand and environmental and social sustainability on the other. Hence, cultural and political trends are the vane for identifying possible strategies of servicing the BOP markets. For example, after the announcement of the "Rural Construction" policy in January 2006, the Chinese government put a lot of effort in facilitating development of IT infrastructure and services in the countryside. The Ministry of Information Industry (MII) is working on detailed measures to solve the problem of high costs associated with the informationization process in rural areas. MII will soon require telecom service providers, including China Mobile, China Unicom, and China Telecom, to try their best to further lower their prices in rural areas so that all rural residents can benefit. In addition, in the future, MII will give priority to the needs of the rural areas in allocating number and frequency resources. This creates many opportunity for businesses to design and enhance their new IT services.

Conducting a test for proving a concept can reduce the risks and help communities comprehend that information can indeed build customer trust and create business value. In this stage, alternative methods and approaches can be tried and tested. It is critical to identify approaches which can actually remove the obstacles customers encounter when they access the beneficial information services. Then, feasible models and possible service strategies can carry forward. For example, the argument for OLPC is simple: "While the existing slow school building programs and teacher education must not stop, another and parallel method is to leverage the children themselves by engaging them more directly in their own learning." Only if the prototype tests succeed in some of the villages in the remote countries, a large volume of IT products can be manufactured. Then, the laptops will be sold to governments and issued to children by schools on a basis of "one laptop per child."

Leveraging resources and attracting support are indispensable before implementing the services. Our research case demonstrated that integration of resources and collaboration among different players can create a multiple winning situation. The Infortune program is sponsoring collaboration between universities and local governmental authorities. Students from hundreds of universities donated their used computers and contributed their expertise to assist the villagers to access the services. At the same time, for college students to undertake a meaningful volunteer job also means a profound influence on their personality and life. Collaboration and partnerships with local leaders and other business sectors will improve the products' technical features and distribution channels of international companies. For example, in June 2006, Intel signed a cooperation agreement with Gome, China's largest electronics retailer, to push digital home equipment to consumers including those in the city and rural areas. Under their agreement, Gome will choose its best-positioned stores to display Intel's digital home products and Intel will launch a special product package for Gome in cooperation with related digital home terminal products' manufacturers.

Designing IT services for the BOP market is a continuous process. Service providers build a bridge between low-income customers and the fast developing technology. Improving customer access and service quality is an endless task. The workable services model is co-constructed with and communicated to individuals, groups. and organizations. Oftentimes, the hotbeds of innovation in technology take shape where you have the largest number of young users and the largest number of engineers. As we found from our study, more innovative service models and products were designed by local entrepreneurs from the villages. Joint participation and group learning create and spread different ideas and knowledge. Communication creates the conditions for various stakeholders to influence each other and solve the public problems.

V. CONCLUSION

There is no doubt that information has become an indispensable resource for development of the BOP market. The mission of designing the right IT services for rural consumers is in fact to

facilitate a social revolution. For the IT service provider to become the change enabler and to create vigorous markets which the environment and the society can have sustainable development, the strategy should be close to the true requirements of the consumers. Companies need to rebuild their business processes to fit into the facts of the BOP market. While the "design for customer" process will be replaced by "design with customer" and "design by customer," a collaborative design paradigm will emerge. Successful implementation of the methodology and the process developed through this research is dependent on the existence of a shared value among all stakeholders. This project has shown that even where some positive elements do exist, such as economic incentives, advanced technologies, collaborations, and group learning, much still needs to be done to pave the way for sustainable growth and development. This research project, and the output generated, seeks to stimulate others to carry out more research into developing more effective extensions of the design framework, while obtaining their own organization's success.

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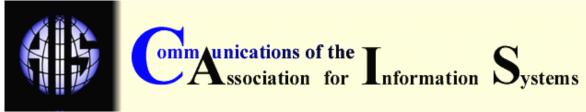
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