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Asia-Pacific

Tech Monitor

Jan-Feb 2011

Technologies for Social Protection

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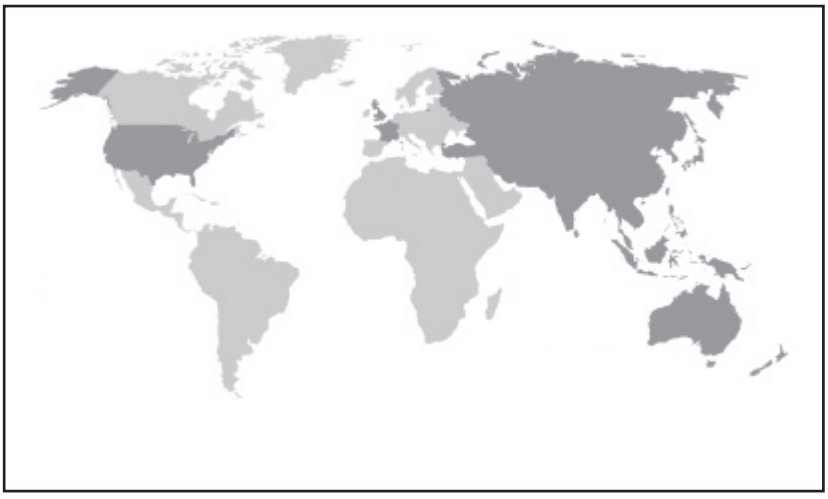
ESCAP
Economic and Social Commission for Asia and the Pacific

ASIAN AND PACIFIC CENTRE FOR TRANSFER OF TECHNOLOGY

The **Asian and Pacific Centre for Transfer of Technology** (APCTT), a subsidiary body of ESCAP, was established on 16 July 1977 with the objectives: to assist the members and associate members of ESCAP through strengthening their capabilities to develop and manage national innovation systems; develop, transfer, adapt and apply technology; improve the terms of transfer of technology; and identify and promote the development and transfer of technologies relevant to the region.

The Centre will achieve the above objectives by undertaking such functions as:

- Research and analysis of trends, conditions and opportunities;
- Advisory services;
- Dissemination of information and good practices;
- Networking and partnership with international organizations and key stakeholders; and
- Training of national personnel, particularly national scientists and policy analysts.



The shaded areas of the map indicate ESCAP members and associate members

The **Asia-Pacific Tech Monitor** is a bimonthly journal of the Asian and Pacific Centre for Transfer of Technology (APCTT) that brings you up-to-date information on trends in technology transfer and development, technology policies, and new products and processes. The Yellow Pages feature Business Coach for innovative firms, as well as technology offers and requests.

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Introductory note

In spite of rapid economic growth in the Asia-Pacific region, it remains home to two-thirds of the world's poor with 1.8 billion people surviving on less than $2 a day, and 903 million struggling on less than $1.25 a day. Given the emphasis on inclusive and balanced development, protection of the poor and vulnerable in the region, which has more than 60 per cent of the global population, has assumed great importance. Dr. Noeleen Heyzer, United Nations Under-Secretary-General and Executive Secretary of ESCAP, in her keynote address on 21 April 2010 at a regional conference on "Enhancing Social Protection Strategies in Asia and the Pacific", called for a renewed focus on social protection policies and programmes which are aimed at getting people out of exclusion and poverty and building resilience to risks and vulnerabilities thereby helping to ensure achievement of the UN Millennium Development Goals (MDG) in Asia and the Pacific. She further stated that the social protection agenda should incorporate poverty and risk reduction, social inclusion for inclusive growth and political stability, human security as a basic right, and contribution to the achievement of MDGs.

Governments of the Asia-Pacific countries have introduced programmes and schemes from time to time for social protection of the poor and vulnerable. However, the success of such interventions largely appears to depend on how effectively and efficiently they are accessed by and delivered to the target beneficiaries. In this context, there is considerable interest in examining how technologies could be deployed in empowering and delivering prompt and high-quality services to the target population. Evidence exists to show that technologies in fields such as information and communication, renewable energy, water harvesting, sanitation, health and hygiene, disaster preparedness and mitigation, housing and rural construction, and assistive technology for the disabled have been deployed in many areas of social protection. Technologies in these fields could also be utilized in designing and delivering economically feasible and optimally-tailored solutions for promoting economic empowerment and social protection of the poor and vulnerable people.

Information and communication technologies (ICT) have, over the years, demonstrated their pivotal role in the delivery and management of several social protection programmes and services. They are also popular since they provide opportunities to develop locally relevant innovative and efficient solutions in delivering social protection assistance to target beneficiaries. Examples include, among others, mobile phones for improved personal and business communication, rural ATMs, farmer credit cards, smart cards with PINs, telemedicine for healthcare, mobile transfer of cash and kind, e-governance, and payment of social security pensions. Successful examples of innovative application of ICTs in social protection can be found in the Asia-Pacific region especially from China, India, and the Republic of Korea. However, a necessary prerequisite for implementing such ICT-based interventions, for the effective delivery and management of social protection, is the availability of a robust ICT infrastructure. It is therefore imperative for developing countries in the Asia-Pacific region that wish to adopt ICT-based social protection interventions to upgrade their ICT infrastructure. While technology is at best an enabler, its deployment for social protection initiatives must be congruent with well designed and effective delivery mechanisms. In this context, South-South cooperation for sharing of best practices and experience in designing and implementing ICT-enabled social protection mechanisms can play a significant role in promoting the introduction of and strengthening social protection mechanisms across the region.

This issue of *Asia-Pacific Tech Monitor* discusses the role of technology in social protection and highlights various strategies, issues, challenges and opportunities that are of relevance to countries in the Asia-Pacific region. Case studies are also presented to demonstrate how ICT has assisted in the delivery of social protection programmes and schemes in selected countries.

K. Ramanathan
Head, APCTT-ESCAP

Technology Market Scan

ASIA-PACIFIC

CHINA

Dual-purpose technology development

China will formulate detailed rules to guide and support the flow of private capital into the development and industrialization of dual-purpose high technology, according to the *Shanghai Securities Journal*. The newspaper quoted an unidentified source with China's Ministry of Industry and Information Technology that the new guidelines will be based on the State Council's private investment support plan released in May 2010, which opened a new range of government-run industries to the private sector. According to the report, the ministry has conducted thorough research in several provinces and a survey involving thousands of participants.

China's dual-purpose high-tech development has long been the task of government-backed labs, universities and large enterprises, so the commercialization of research achievements has been difficult. Small and mid-sized enterprises (SMEs), limited by their low research and development capability, can hardly take part in dual-purpose high-tech research and lost chances for rapid development.

Industrial insiders believe China should learn from the U.S. government's Small Business Innovation Research (SBIR) and Small Business Technology Transfer Research (STTR) programs, which allocate a portion of research funds to support small high-tech firms' research and innovation in dual-purpose high-tech sectors while boosting innovation with universities and large companies.

http://english.peopledaily.com.cn

Large-scale auction of patents

Eight companies won bids for 28 invention and utility patents worth a combined total of nearly 3 million Yuan ($450,000) at an auction on Dec. 16. Ninety high-tech patents offered at the auction included those in information technology, wireless communication, data security, networking of everyday appliances and high-performance computing.

All the patents were developed by the Chinese Academy of Science's Institute of Computing Technology. It was the first time that a single professional scientific research institution held such a large-scale patent auction.

http://english.peopledaily.com.cn

Policies to import technology

China will sharpen policies to promote imports of advanced equipment and technology in the first half of the year, as part of Beijing's efforts to reduce the Chinese trade surplus, according to a media report. Efforts will focus on reducing import tariffs and subsidizing companies that import advanced technologies, as well as reforms to streamline the import process for high-end goods, according to a report in the 21st Business Herald newspaper. In addition, a catalog that specifies which high-tech imports are encouraged by Beijing, is being updated, the report said.

Other measures under consideration include relaxing foreign-exchange controls, the report said. It said lowered import tariffs are a key to boosting trade, though it stopped short of calling for an all-round reduction, noting that import tariffs on high-tech goods stand at 9.8%.

China is due to publish trade data for December 2010. Figures are expected to show its trade surplus narrowed, but not at a rate that likely would be sufficient to soothe trade tensions between China and the U.S. Figures due to be released by the General Administration of Customs are expected to show China's trade surplus in December narrowed to $21.7 billion from $22.9 billion in November, according to the median forecast of 11 economists compiled by Dow Jones Newswires.

http://www.marketwatch.com

Tax reduction procedures for technology transfer income

Based on the State Administration of Taxation's Circular No.825 and Circular No. 212, which clarify the related procedures and qualifications required for an enterprise or individual to receive tax reductions or exemptions from its technology transfer income, the Jiangsu provincial tax authorities announced new procedures for regional entities applying for tax preferential treatment regarding technology transfer in a circular issued on November 26, 2010.

The "Circular on Administration of Tax Preferential Treatment in Relation to Technology Transfer" circular gives the following guidelines to obtain the preferential taxation treatment:

"An enterprise or individual that is eligible for business tax exemption and corporate income tax reduction on income from its technology transfer, development, and related technology consultation as well as services shall present the technology contract registration certificate given by a provincial-level science and technology authority when going through record-filing procedures with the in-charge taxation authority."

Circular No.9 took effect from January 1, 2011.

http://www.china-briefing.com

INDIA

R&D in defence production

The defence ministry has approved a new Defence Production Policy

(DPrP), which seeks to boost indigenous R&D and private sector participation, as well as a revised Defence Procurement Policy (DPP). The new DPrP is targeted at gradually reducing India's overwhelming and strategically-vulnerable dependence on foreign military hardware and software by building a strong domestic defence-industrial base (DIB).

The revised DPP, in turn, seeks to speed up the cumbersome procurement process. The two new documents were cleared at a meeting of the Defence Acquisitions Council, chaired by defence minister A K Antony, sources said.

The DPrP lays down that only those weapon systems will be procured from abroad which cannot be made within the country in specified timeframes to meet operational requirements. All the projects from abroad will necessarily include transfer of technology, unless exceptions are required for specific reasons, to ensure that subsequent generations of the weapon systems are developed indigenously.

http://timesofindia.indiatimes.com

JAPAN

Clean tech exports investment

A Japanese government fund will invest as much as 130 billion Yen (£1bn) in overseas clean tech projects involving Japanese companies, the Nikkei newspaper reported. The fund, which is run by the Innovation Network Corporation of Japan, aims to help Japanese companies win overseas contracts to supply infrastructure equipment and facilities. It is hoped that these projects can be used to earn carbon credits that will count towards reducing Japan's carbon emissions in line with its goal of cutting emissions 25 per cent by 2020.

According to the paper, the fund plans to invest 10 billion Yen in a smart-city project in Gujarat, India, to be built by firms including Mitsubishi Heavy Industries, Mitsubishi and Electric Power Development. It was also reported that Japan's Ministry of Economy, Trade and Industry will provide 40 billion Yen for the fund in 2011, with a view to financing studies on 15 emission-reduction projects around the world. Ten other Japanese companies are involved in developing the projects, including efficient coal power and nuclear plants in Indonesia and Vietnam, and a carbon capture and storage project also in Indonesia.

Reforestation, geothermal and energy-efficiency schemes in Mexico, Malaysia, Thailand, the Maldives, Laos and China are also being evaluated by the fund and studies on 180 other potential projects will begin next year.

Some of these schemes will earn Japan credits through the UN-backed Clean Development Mechanism (CDM) carbon offset scheme. But because nuclear power and CCS projects do not qualify under the UN scheme, the Japanese government has proposed the use of a bilateral carbon credit system to be used in addition to the CDM.

Japan hopes its system will be adopted when the current Kyoto arrangements run out in 2012, and has commenced talks with a number of countries about the possibility of bilateral carbon credit agreements. However, any move to reform the CDM and make more projects eligible for the scheme would ultimately require UN approval.

http://www.businessgreen.com

PAKISTAN

Transfer of solar power technology

A project to generate 2,300MW of electricity through wind turbines and solar panels has turned out to be the most important agreement reached with China during the recent visit of Premier Wen Jiabao, says Board of Investment (BoI) chairman Saleem H. Mandviwala. Briefing the media on the outcome of the Pakistan-China Business Cooperation Summit, he said the project would involve an investment of $6.5 billion and wind power projects of 1,000MW each would be set up in Punjab and Sindh. A 200MW solar power project would be set up in Punjab and another of 100MW in Sindh.

Mr Mandviwala said the agreement signed between the China International Water and Electric Corporation and the Alternate Energy Development Board would also involve transfer of technology and China would assist Pakistan in manufacturing solar panels and turbines. He said the summit had worked out 22 memorandums of understanding (MoUs) in different sectors, including wind power generation, solar energy, mining, trade, textile, engineering goods, automobile, electronics and chemicals, but 18 MoUs were signed and the remaining four would be taken up in the near future when the BoI would hold another 'business-to-business' meeting with Chinese investors to formalise the agreements. He said the 18 MoUs negotiated through the forum of BoI involved $15 billion, including investment, equity sharing and borrowing. The two sides would jointly look into feasibility of the projects, decide locations in consultation with the provinces and arrange financing, he said.

The BoI chairman described the $3.55 billion MoU on National Transmission Distribution Company as yet another landmark in the energy sector, saying that power generation required new transmission and distribution lines which would be financed by the China Development Bank.

A list of 13 inter-governmental projects for which MoUs have been signed includes reciprocal establishment of cultural centres; strengthening technical cooperation and Pak-China road transport activities between the Chinese ministry of transport and Pakistan's ministry of communication; grant of $200 million for flood reconstruction projects; grant of $200 million for agricultural projects; concessionary loan to Pakistan for non-intrusive vehicle X-ray inspection system projects; launching of Urdu programme of China Radio International in Radio Pakistan; cooperation between the Securities and Exchange Commission of Pakistan and the Securities Regulatory Commission of China; Safe City Islamabad project; and establishment of National Electronics Complex of Pakistan.

http://www.dawn.com

REPUBLIC OF KOREA

Transfer of green technologies

The United Nations Industrial Development Organization (UNIDO) and the Korea International Cooperation Agency (KOICA), will work together to facilitate the transfer of environmentally sound technologies to Cambodia. An agreement on this was signed in Vienna by the Director of UNIDO's Resource Mobilization and Quality Assurance Branch, Adrie De Groot, and the Minister Counsellor of the Permanent Mission of the Republic of Korea to UNIDO, Dae-jong Yoo.

KOICA will provide UNIDO with USD 900,000 to establish a trust fund which will be used for the identification, assessment and prioritization of pollution "hot spots" and transfer of environmentally sound technologies (TEST) in the Cambodian section of the Mekong River. This is the first agreement between UNIDO and KOICA.

The TEST project in Cambodia will be implemented by UNIDO in cooperation with the Ministry of Industry, Mines and Energy, and the Ministry of Environment of Cambodia. It is funded by the East Asia Climate Partnership established by the Government of the Republic of Korea in 2008 to enable developing countries in East Asia coping with both economic growth and climate change simultaneously. KOICA is the implementation agency for this partnership.

The two-year project will help improve the water quality of the Mekong River and reduce the negative impacts from industrial activities through the introduction of UNIDO's integrated approach for the transfer of environmentally sound technologies. This methodology increases the environmental performance of polluting enterprises. The TEST approach integrates and combines traditional tools such as the Cleaner Production Assessment, the Environmental Management System, Environmental Management Accounting, Technology Transfer, and Corporate Social Responsibility, applied on the basis of a comprehensive diagnosis of enterprise needs.

In the course of the project, UNIDO will also recommend mitigation measures, including policy mechanisms and technical solutions. Low cost technical solutions will be implemented and the financial feasibility of more expensive technical solutions will be assessed. Lessons learned will be disseminated and the replication of the project in neighboring countries will be assessed.

The project will help enhance the knowledge and the capacity of the counterparts in Cambodia to allow them to take decisions on mitigation measures to reduce man-made pressure on the Mekong River. In addition to selected industries, entrepreneurs' associations, labour unions and the media will be invited to participate in the training workshops.

For more information, contact:

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Funding new, renewable energy sources

The Republic of Korea plans to inject 1 trillion Won ($900 million) into developing new and renewable energy sources this year with a plan to achieve $40 billion in exports in the sector by 2015, the Ministry of Knowledge Economy said. The budget allocation for research and development of new renewable energy in 2011 was increased to 267 billion Won, up 15 billion Won from last year, according to the ministry.

The money will be used to develop original technologies for solar batteries, bio fuels and wind power generation as well as fostering appropriate human resources, officials said. For commercializing the use of new renewable energy sources, the government said it will spend 311 billion Won this year. The amount was raised by 20 billion Won compared to 2010. The government will assist firms and households to adopt the use of such technologies including photovoltaic, solar heat and geothermal heat, and support the establishment of infrastructure and test beds.

The ministry said it is seeking to spend 17 billion Won for the organization of a new renewable energy complex in Buan, North Jeolla Province, and to spend 4 billion Won to establish a wind power generation test bed in the Saemangeum region. The government revealed an ambitious plan in October to invest 40 trillion Won in new renewable energy sources over the next four years to join the world's top five countries in the industry.

The plan is also in line with the "low carbon, green growth" agenda which the Lee administration has been pushing strongly. The President has voluntarily vowed to reduce the country's greenhouse gas emissions by 30 percent by 2020.

http://www.koreaherald.com

SINGAPORE

Researchers top in region for quality inventions

Singapore researchers created some of the best-quality inventions in the region - and there are more of them coming out every year. According to the second *Asia Pacific Intellectual Property Scorecard* which will be released later at the Global IP Forum at the Raffles City Convention Centre, Singapore's researchers have successfully fended off competitors to hang onto the top spot.

They had also come in first place for the previous study by the National University of Singapore's Entrepreneurship Centre published in 2004.

To come up with the results, the research team analysed patents filed with the United States Patents and Trademark Office (USPTO) annually, across 13 regional markets including China, Japan, Republic of Korea and Singapore, said the Centre's director, Professor Wong Poh Kam. Prof Wong said: 'USPTO data was used, because the United States is the biggest market in the world, so any invention you think has commercial value...you will protect it there.' He added that the team had also looked at data from the European patent office and found largely similar trends.

In the latest study, the Centre found 622 Singapore patents filed in 2009, putting it in 7th place within the region and accounting for just 0.32 per cent of all patents filed worldwide. By comparison, United States patents accounted for half of all patents filed, and Japanese patents, one-fifth.

http://www.straitstimes.com

THE PHILIPPINES

Biotech a multi-billion industry in 2011

The Congressional Commission on Science Technology and Engineering (COMSTE) prioritized the development of Biotechnology for Health and food security as one of its flagship projects for 2011, recognizing its vast potential for investment. Senator Edgardo J. Angara, Chair of COMSTE, pointed out that he also filed a senate bill no. 2055, or the Biotechnology Industry Development Act of 2010, to support the initiative of the commission.

Angara pointed out that the world biotechnology industry is a multi-billion industry. Investment in medical biotechnology alone is estimated at USD 200 billion whereas investment in agricultural biotechnology was worth USD 67 billion in 2003. The start of the 21st century indicates the coming convergence of agriculture and medicine with pharmaceuticals being produced by genetically engineered plants and the greater acceptance of herbal medicine.

The proposed bill, "intends to address the weaknesses of our system to enable the country to develop a biotechnology-based industry. The private sector is given incentives to invest in biotechnology R&D by allowing the total R&D cost and prices of shares of stocks in biotech companies as tax deductible. Majority of the government's investments in biotechnology R&D is awarded through a government corporation so as to lessen the burden of an unwieldy accounting and auditing system."

Other priority projects of COMSTE for 2011 are Telehealth for remote areas and Digital Medical Records, Remote-Sensing for Agriculture, Electronic Vehicles and Green Transport and Disaster Science, and Renewable Energy Systems.

http://www.pia.gov.ph

Fund to jumpstart technology businesses

A P12-million capital fund has been infused by the government into the Enterprise Center for Technopreneurship-Technology Business Incubator (ECP-TBI) that will jumpstart technology businesses of an initial eight locators. Nurturing different startup businesses including those in agricultural processing (coconut juice), accounting software development, and remote sensing technology, the ECT-TBI is seen to contribute to near-term financial viability of the locator firms.

The Department of Science and Technology (DoST) has committed a two-year funding for the ECT-TBI located within the National Engineering Center (NEC)-University of the Philippines (UP) in Quezon City. The ECT-TBI aims to achieve the goals of enhancing private sector participation in research and development, address problems in technology transfer, and raise investment in technology development.

The locators of the ECT include the Cloudsoft which provides inventory and stock control software for micro, small, and medium enterprises (MSME); Itemhound Inc. which provides radio frequency identification (RFID) technology for running or sports events and asset tracking for companies; and GS Metrix which has a remote sensing technology useful for agricultural companies' crop forecasting and aquaculture companies' automatic fish pond monitoring system.

http://www.mb.com.ph

ASIA-PACIFIC

FIJI

Westpac for social welfare recipients

Recipients of the Social Welfare family, care and protection assistance would be issued their Westpac handy cards to allow them to access funds. Permanent Secretary Social Welfare, Govind Sami said that Westpac Banking Corporation won the tender to distribute cash grants to family assistance and care and protection recipients last month. Mr Sami also said that the electronic banking system would be introduced for 17,000 recipients around the country.

"Under the new progressive electronic mode of transfer the family assistance and care and protection funds will now be deposited into the recipients' accounts at Westpac. From January 2011, the recipients will withdraw their cash allowance using their Westpac handy cards through electronic channels around Fiji," said Mr Sami. He said the recipients would not be charged any account fees by the bank.

The electronic banking system is expected to ensure timely delivery of social welfare assistance to the recipients. Mr Sami said recipients would be able to collect their Westpac handy cards from locations which would be advertised in the local media. Westpac Head of Micro Finance Olive Whippy said that about 5000 clients in the rural and remote areas would continue to be served by Post Fiji until Westpac identified agents to service the remote areas.

http://www.fijitimes.com

CHINA

Natural disasters monitoring, emergency relief technologies

Chinese researchers have made significant progress in developing key technologies for natural disaster early warning systems and emergency relief, according to the Ministry of Science and Technology (MOST). The four-year project, "Research on Key Technologies for Geological Disasters Monitoring, Early Warning and Emergency Relief," was initiated in 2006 with support from China's top-level government scientific research funding program.

Scientists involved in the project had made remarkable technological progress in four fields, namely, natural disaster recognition in early stage, monitoring and early warning, risk assessment and emergency relief, the MOST said in a statement on its website. As part of the project, rain-triggered landslide monitoring and early warning systems have been established around Mount Ailao in southwest China's Yunnan Province and in the southeastern area of east China's Fujian Province.

A natural disaster monitoring system has been developed by Chinese scientific workers using optical fiber technologies. This system with Chinese intellectual property has been put into use in areas, including the reservoir region of the Three Gorges Project on the middle reaches of the Yangtze River. According to the MOST, the research project also provided substantial technological support in assessment of disasters and relevant relief during China's responses to the Wenchuan earthquake in May 2008 and the massive mudslide in Zhouqu of Gansu last August.

http://news.xinhuanet.com

Quake early warning system

Taiwanese scientists unveiled an "On-Site Earthquake Early Warning System" that they say could help mitigate quake damage and casualties. The system was developed by the National Science and Technology Center for Disaster Reduction, the National Center for Research on Earthquake Engineering (NCREE), the National Center for High-Performance Computing and the Central Weather Bureau, which began working on the project in 2008.

NCREE researcher Lin Pei-yang said the system mainly focused on two types of seismic waves, known as P-waves and S-waves. "P-waves travel between 6 km and 7 km and arrive first, generally causing less damage [than other wave types]," Lin said. "S-waves travel only 3 km or 4 km and hit after P-waves, potentially causing greater damage." Lin said that the opportunity to prevent disasters comes during the short interval between the arrival of P-waves and S-waves.

To test the system, Lin said researchers used data collected during the 921 Earthquake in 1999, which was centered in Jiji, Nantou County. Researchers found that residents in Dali, 43 km away in what is now Greater Taichung, would have had about 7 seconds to react to the quake. People in Hsinchu, which is located about 105 km from the epicenter, would have had 17 seconds. People 152 km from Jiji, such as those in Taipei, would have 27 seconds to take appropriate measures. The magnitude 7.6 earthquake killed 2,415 people and injured 11,305, and caused about NT$300 million (US$10 billion) in infrastructure damage.

http://www.taipeitimes.com

INDIA

Solar-powered X-ray machines

Siemens Healthcare will launch solar powered X-ray machines in three months after the ongoing clinical trials. The solar power technology, which could be extended to other medical imaging products as well, will help Siemens penetrate further into the semi urban and rural markets, which are dogged by power problems. The first

of its kind medical technology product to use solar power was developed at Siemens' manufacturing facility in Goa and the clinical trials are being conducted at Bhiwandi near Mumbai. "Outside cities, power is a major issue in running medical equipments. Power failure keeps patients waiting for long hours for diagnosis. Though the initial cost of the solar powered x-ray machine will be around Rs five to seven lakh higher than electric ones, the higher cost could be recovered in around four years as the running cost will be substantially lower," said D Ragavan, country head, Siemens Healthcare.

Siemens also plans to extend the technology to other imaging products such as ultrasound machines and CT-scanners. The India-specific innovation is part of Siemens' strategy to penetrate further into the semi urban and rural markets. The company that claims a 35 per cent market share in the $400 million imaging market in India, has made its machines available in 400 districts in the country. This year it plans to add 50 more districts to the list.

The firm is also trying to make its X-ray technologies available in India at one-third of their German cost by indigenising the production. Siemens' marketing strategy is focused to reach out to the medical fraternity through its publications and sales force.

http://www.mydigitalfc.com

Telemedicine moves on to version 2.0

A telemedicine software has been developed by a Bangalore based start-up i2i Telesolutions. The software links ophthalmologists at urban centres with patients in remote areas. "This is telemedicine 2.0, moving ahead from the earlier system of video-conferencing to live streaming of data and images onto the mobile phone of the doctor," says Sham Banerji, CEO of i2iTeleSolutions. The company is partnering with Narayana Nethralaya, a Bangalore-based ophthalmology centre, to pilot a series of initiatives to detect and treat retinopathy of prematurity (RoP) — a condition that affects nearly a tenth of the 27 million children born in India every year.

In the 18 months since it was set up, i2i has focused on developing technology that allows data transfer of medical images from ophthalmology to sonography. Using this, specialists at partner hospitals such as MediScan Systems in Chennai can diagnose potential birth defects in foetuses by screening pregnant women within the first 13 weeks.

The Worldwide Telemedicine software and services market, which does not include healthcare devices, is expected to grow to $2 billion in the next two years. "Our focus is to lead in the fastest growing segments of this market — from tele-ophthalmology, to tele-cardiology, tele-sonography and mobile health," says Banerji, who leads a lean team of ten people in his start-up.

http://timesofindia.indiatimes.com

JAPAN

Models for people with disabilities

Tamio Tanikawa (Senior Research Scientist) and others of RT-Synthesis Research Group (Leader: Tetsuo Kotoku), the Intelligent Systems Research Institute of the National Institute of Advanced Industrial Science and Technology (AIST) in collaboration with the Information Technology Research Institute (Director: Satoshi Sekiguchi) of AIST, Collaborative Research Team for Communication and Control of Smart Grid (Leader: Tetsuya Higuchi) of AIST, Research Institute (Director: Seishi Kato) of the National Rehabilitation Center for Persons with Disabilities (NRCPD), and Misawa Homes Institute of Research and Development Co., Ltd. (MHIRD), have developed a system design technology that allows people with disabilities to combine various disability aids and use them in an integrated manner. Home environment models to address the needs of individuals with disabilities have also been proposed and demonstrated.

In the demonstrated system, input and output devices that use different control methods are networked by using a common network platform technology for robot modules, "RT (Robot Technology) Middleware." This allows devices to be easily added to or removed from the network and enables cooperation of the devices on the network; thereby, it allows the user to combine devices according to his/her needs.

The system is equipped with high-performance interfaces for equipment control, namely a stereovision-based, fast-response gesture interface that can be customized according to the level of mobility of a person with disabilities and a speech-recognition interface that is robust to noise in the home environment and can recognize unclear speech. In addition, active casters for easy movement of home equipment are installed in the home environment to provide physical assistance.

http://www.aist.go.jp

Technology which could benefit seniors

There are a variety of technologies currently being developed that are focused on helping the elderly, as a massive amount of baby boomers are starting to reach their retirement years and there will need for more efficient ways to help support them. One such technology that could benefit seniors comes from Nippon Telegraph and Telephone Corporation, which is Japan's top telecom company. The

technology being developed looks like a basic wristwatch, but upon closer inspection it is actually a very powerful monitoring device which could ultimately be used to improve the care of the elderly across the globe.

This wristwatch-like device has a variety of neat features including an accelerometer, similar to those found in the Nintendo Wii or Apple iPhone, which helps to measure the direction and speed of the person's hand movements. Using this data, the device can determine if the person is making coffee or brushing their teeth. In addition to an accelerometer, the device has a microphone and built-in camera to monitor what the person is doing throughout the day. Using the data, researchers could graph the person's activity and better understand what they do each day.

The exact plans for commercial usage of this device are unknown at this point. That said, it is obvious that this type of data could be quite useful, as it could be collected over time and then analyzed to better help seniors live more independent lifestyles. As the elderly population continues to grow, technology will play a key role in helping to accommodate this change, and we should see more interesting devices coming out over the next decade.

http://www.allassistedlivinghomes.com

Robotic arm for persons with upper-limb disabilities

We have developed a small and light robotic arm, Robotic Arm for Persons with Upper-limb DisAbilities (RAPUDA). It is a robotic arm having seven degrees of freedom in arm and hand parts; it weighs approximately 6 kg and has a payload of 0.5 kg. In RAPUDA, an original mechanism of a linear expansion and contraction is adopted in order to enlarge the field of vision of the user during operation and to reduce the number of pinching parts (joints) of the arm. Since RAPUDA has been designed considering future safety certification standards, double sensors for measuring joint movements, a high-reliability communication system and so on are adopted. Further, cost reduction of the robotic arm is considered and the arm should be available at easily affordable prices.

RAPUDA attached to an electric wheelchair

It is expected that this small and light robotic arm can be operated independently by persons with upper-limb disabilities, who would otherwise require assistance. To realize this, evaluations are carried out by users suffering from muscular dystrophy or cervical spine damage.

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EUROPE

AUSTRIA

Telemedical remote monitoring system

The i-Residence telemedical and telehealth system from Spantec eliminates the need for costly human-based healthcare monitoring with automatic fall detection, remotely monitored disease management, and medically prescribed exercise monitoring using ANT+ compatible wireless health or fitness sensors. Ultra low power (ULP) RF specialist Nordic Semiconductor ASA recently announced that Austrian company Spantec has developed the world's first fully comprehensive ANT+ telemedical remote monitoring system using Nordic nRF24AP2 8-channel 2.4GHz ANT transceivers.

The i-Residence uses an ANT+ ULP wireless network to detect medical emergencies in nursing homes, hospitals, and private households (particularly for the elderly). The network employs ANT+ compatible devices and a series of wireless relay bridges (typically one per room or ward) that connect to an ANT+ hub located in a GSM-based (cell phone network) modem.

Emergencies are detected and classified in rising levels of escalation with various application-dependent measurement options. These include automatic fall detection using a wireless hip worn device developed by Spantec (currently undergoing full clinical trials in one of Austria's largest hospitals) that measures move-

ment and motion (and is able to store data for scientific research as well); automatic alert to rescue center control desks, relatives or neighbors by phone, Short Message Service (SMS or 'text message'), or visual interface; and full compatibility with any third party ANT+ medical, health or fitness device (such as monitors for blood pressure, blood glucose, mobile electrocardiogram (ECG), weight, or heart rate).

In operation, a Nordic nRF24AP2 2.4GHz 8-channel Single-Chip-Connectivity solution running ANT RF protocol software is built into a Spantec-provided GSM modem ANT+ hub that can communicate with up to 64 Nordic nRF24AP2 8-channel-based Spantec relays per sub net. The ULP performance characteristics of the Nordic ANT chips mean that in the event of a mains power failure, the relays can run from back-up battery power alone for up to 24 hours. In addition, Nordic ANT chips are highly immune to interference from other 2.4GHz wireless sources (such at Bluetooth wireless technology and Wi-Fi) that may be operating in the vicinity.

For more information, visit www.spantec.at.

http://www.rfglobalnet.com

UK

Safer drinking water

Pioneering technology by scientists at Queen's University Belfast, which is transforming the lives of millions of people in Asia, is now being used to create safer drinking water in the United States.

The award-winning system – Subterranean Arsenic Removal (SAR) – removes arsenic from groundwater without using chemicals. It was developed by a team of European and Indian engineers led by Dr Bhaskar Sen Gupta in Queen's University School of Planning, Architecture and Civil

Engineering. The technology, based on the principle of oxidation and filtration processes, is already in use in six plants in West Bengal. And the technology has now been successfully tested in the United States, in a rural community outside Bellingham, in Northwest Washington State, where high levels of arsenic in the water had previously caused challenges for local residents.

Jeremy Robinson, a member of the Washington State installation team, said: "We first read about the SAR technology on Wikipedia. Initially, it seemed too good to be true. Arsenic is a significant problem for many of the wells in our area. None of the conventional approaches for arsenic treatment have worked well for us. But, once we recognised the advantages and elegance of the SAR approach, we started preparing to test it here.

The technology has already attracted interest from other parts of the United States, and plans are now advanced for SAR plants to be set up in Cambodia, Vietnam and Mexico in the next six months.

The work of Dr Sen Gupta's team has won accolades from around the world. In November Queen's University was awarded the prestigious Times Higher Education Outstanding Engineering Research Team of the Year title. Dr Sen Gupta was also awarded the St Andrews Prize for the Environment and the World Bank Innovation Fair Championship in Cape Town in 2010.

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http://www.eurekalert.org

Robot could help earthquake victims

A Kinect-powered robot could soon be helping locate earthquake victims, thanks to the engineering ingenuity of a group of U.K. students. The rescue-robot, developed at the University of Warwick by the geeky Warwick Mobile Robotics (WMR) team, could help significantly reduce the costs involved in earthquake rescue attempts.

Current technology is pricey and sees robots making use of lasers in order to scan rooms. WMR's solution could be a cost-effective (and safer) way of searching unstable buildings and, thanks to the Kinect, looking around for any potential survivors. Searching for survivors isn't this robots' only trick: It could also create an accurate digital model of the room it's in, making for a far more detailed output, and hopefully resulting in more successful rescues.

For more information, contact:

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NORTH AMERICA

USA

Electric wheelchairs

Researchers at the Florida A&M University-Florida State University College of Engineering are working on technology able to detect hazardous terrain and automatically adjust control

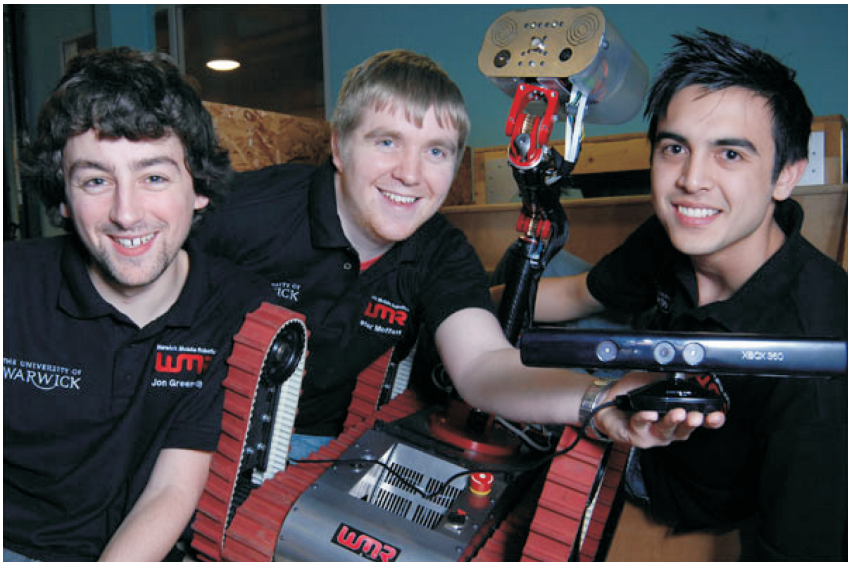
settings of an electric-powered wheelchair to allow a safer transit without the need for assistance. Inspiration for the research began when Professor Emmanuel Collins, director of Florida State University's Center for Intelligent Systems, Control and Robotics, heard a presentation by Professor Rory Cooper, director of the Human Engineering Research Laboratories and chairman of Pitt's rehabilitation science and technology department. Cooper has used a wheelchair since receiving a spinal cord injury in 1980 during his service in the Army. In his presentation, Cooper noted the need for terrain sensing electric-powered wheelchair assistance. The two began developing the idea and along with collaborators at the National Science Foundation-sponsored Quality of Life Technology Center, the concept started taking shape.

Automatic terrain-sensing controls for military robotic vehicles, and four-wheel-drive automobiles have now been in the market for nearly a decade. Collins adapted a device known as a laser line striper, originally developed for military use. The end result is a system that enables electric-powered wheelchairs to detect hazardous terrain and implement safe driving strategies avoiding wheel slip, sinkage or vehicle tipping.

http://www.gizmag.com

Telemicroscopy solution for remote areas

Imagine using a miniaturized light field microscope attached to a mobile phone to support healthcare in remote and developing areas. One pioneering effort in this area won a 2010 Nokia Health Award and demonstrates to pathologists and clinical laboratory managers how innovative new technologies can be used to transform the way medical laboratory testing is performed.



A development team from the University of California at Berkeley (UCB) and the University of California at San Francisco (UCSF) decided to tackle the challenge of diagnosing disease in the rural areas of developing countries. The challenge is to provide advanced medical services to indigenous populations in remote regions where there is a lack of common medical services and equipment. The UCB/UCSF team recognized how remote microscopy or telemicroscopy—which involves attaching a special microscopic lens apparatus to a common cell or Smartphone—might be an effective solution. The combo-device enables caregivers to photograph or video record minute details, such as moles, skin abrasions, and even blood cells, which then can be transmitted to the cell phone of a consulting physician or pathologist for interpretation.

In 2009, the research group at UCB/UCSF developed a portable method for performing light microscopy from remote locations using cell phones. What sets their invention apart from existing light microscopy products is that their solution is small, cheap, robust, and portable.

In 2010, Professor Daniel A. Fletcher, Professor, Department of Bioengineering Faculty Scientist, Lawrence Berkeley National Laboratory Deputy Division Director, Physical Biosciences Division, LBL, and a member of the original research team that developed the telemicroscopy technology, won the prestigious 2010 Nokia Health Award for development of the CellScope, a small lens that "turns the camera of a standard cell phone into a diagnostic-quality microscope with a magnification of 5x-50x," according to the Berkeley-based CellScope website.

CellScope combines a cell phone and a microscope and provides mobile microscopy for disease diagnosis and monitoring, thereby linking patients with high quality physicians no matter where they are in the world.

http://www.darkdaily.com

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Mainstreaming information & communication technology (ICT) for social protection
Challenges and opportunities in Asia and the Pacific

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Abstract

Social protection to the vulnerable people plays a vital role for inclusive and balanced growth in developing and least developed countries. This issue has become even more pertinent in the recent years because of increasing globalization and free market economy. This increases the danger of more and more economic and social exclusion of vulnerable people thus posing a great challenge for national economies in the Asia-Pacific region. Though social protection has been largely recognized as an effective instrument to bridge the socio-economic and developmental gaps between people and communities, meaningful and concerted efforts are still lacking in most countries of the Asia-Pacific region. Towards this objective, the Information & Communication Technology (ICT) can play a significant role in providing innovative solutions in the delivery of social protection assistance to the targeted beneficiaries. This article discusses the challenges, opportunities and scope of various applications of ICT-based tools and techniques in the social protection sector for countries in the Asia-Pacific region.

Introduction

Social protection is considered vital for inclusive and balanced development of the poor and vulnerable sections of society, especially in developing and least developed countries. Providing social security to the vulnerable people has been always a major issue to be addressed by national governments and their various administrative authorities in the Asia-Pacific region which has vast population reeling under extreme poverty and misery. The population is vulnerable to too many risks emanating from diverse sources such as national, health, life-cycle, social, economic, political and environmental. Unless these risks are properly dealt with and vulnerability is effectively addressed by the national governments, the developmental gaps between communities and countries would widen further with far-reaching socio-economic consequences.

In the age of globalization and knowledge economy, the developmental gaps existing in countries and the region can be narrowed down with the help of advanced technology. Technological advances in various fields are known to provide innovative tools and solutions for developmental and commercial activities. Globalization and free market economic regimes also provide a favorable environment for wide-spread and cross-country diffusion of technological advances. It is now being recognized that advanced technologies have tremendous potential for delivering prompt, efficient and high-quality services to the vulnerable and needy population of the society. Hence, there is a need to exploit the potential of technology by applying it in the social protection sector. The technology can help provide an optimal tailoring of social protection instruments and benefits thereof in a financially feasible way. The UN Millennium Development Goals (MDGs) with regard to poverty alleviation and social protection can thus be achieved faster by using the vast array of technological tools and solutions that are available now.

There are ample evidences to show how different technologies are being used in the social development sector. The fields of technology which can play major roles in delivering social welfare, security and protection include: Information & communication technology (ICT), renewable energy, water harvesting, sanitation, health & hygiene, disaster preparedness, mitigation and management, housing & rural construction, assistive tech-

nology for the disabled etc. When applied judiciously, these technologies can provide social and economic empowerment to the poor and vulnerable sections of the society. Towards this objective, the ICTs clearly have a significant and more direct role to play especially in the social protection sector. In this sector, ICT tools and techniques are gaining immense popularity as they provide innovative solutions in delivering social protection assistance to the targeted beneficiaries. This paper intends to assess the scope of various applications of ICTs in the social protection sector to target recipients of social protection programs and schemes in the Asia-Pacific region. The paper also deals with the challenges and opportunities of ICTs in the social protection sector for countries of the region.

Setting the agenda

As envisaged by the MDGs, global efforts are currently being directed towards addressing the many dimensions of extreme poverty including penury, hunger, disease and inadequate housing. A definition of social protection as put forward by UNDP International Poverty Centre (IPC) presents a meaningful and comprehensive understanding which captures most of the critical dimensions of poverty alleviation (UNDP IPC, 2006). As per this definition, "Social protection aims to enhance the capacity of poor and vulnerable persons to manage economic and social risks, such as unemployment, exclusion, sickness, disability and old age." In realistic terms, social protection is aimed at: providing support to the vulnerable and the poorest; acknowledging and addressing the hazards, risks and stresses affecting individuals, households and communities; seeking to support and develop the capacity of the poor to deal with the above risks; and designing and evaluating suitable institutional interventions to mitigate and/or reduce the risks and hazards.

The importance and urgent need to bring social protection high on the agenda for social policies and programs in countries of Asia and the Pacific, has been recently emphasized by Dr. Noeleen Heyzer, United Nations Under-Secretary-General and Executive Secretary of the Economic and Social Commission for Asia and the Pacific (ESCAP). In her keynote address on 21 April 2010 to a regional conference in Manila on "Enhancing Social Protection Strategies in Asia and the Pacific", Dr. Heyzer called for a renewed focus on social protection policies and programs in areas such as employment schemes and pensions for older people, which are aimed at getting people out of exclusion and poverty and building resilience to risks and vulnerabilities, ……., thereby helping to ensure the achievement of the UN Millennium Development Goals in Asia and the Pacific (ESCAP Press Release, 28 April 2010). Dr. Heyzer further emphasized, "Stronger social protection has the potential to be a powerful tool for achieving not only the MDGs, but also for bridging the development divide in the Asia-Pacific region and ensuring sustainable and inclusive development." According to Dr. Heyzer, the social protection agenda in the Asia-Pacific region should include: poverty and risk reduction, social inclusion for inclusive growth, human security, and contribution to the achievement of the MDGs on poverty, hunger, health and education, etc.

Addressing social risks and vulnerability

Understanding and managing the multiple risks surrounding and affecting the poor and vulnerable is considered crucial in designing and implementing any social protection strategy. Prior to developing a social protection strategy, there is a need to assess and evaluate the variety and magnitude of the potential risks that are likely to affect the vulnerable population in a society. Better and appropriate risk management always gets the top priority by social protection policy makers, planners and administrators. The multitude of sources and different forms of potential risks affecting the vulnerable sections of society can be identified as (Emmanuel, 2008):

- **National** – Rainfall, Landslide, Volcanic eruption, Earthquakes, Floods, Storms, Drought;
- **Health** – Illness, Injury, Disability, Epidemic;
- **Life-cycle** – Birth, Old age, Death;
- **Social** – Crime, Domestic violence, Terrorism, Civil strife, War;
- **Economic** – Unemployment, Harvest failure, Business failure, Resettlement, Financial crisis;
- **Political** – Ethnic discrimination, Riots; and
- **Environmental** – Pollution, Deforestation, Nuclear disaster.

In view of the wide-spread nature and impact of these risks, the poor and vulnerable are generally subjected to a higher exposure than the rest of the society. The risks and associated problems can get even more compounded when there are fewer and less effective social protection instruments available with the responsible authorities to address the problems. Conventional modes of social protection delivery mechanisms lacking the requisite technological impetus can defeat the goals of any good social protection program. Therefore quick, effective and efficient delivery of social protection measures to the needy remains the basic issue to be addressed by the administration. In this context, ICTs can come in to play a critical role in enhancing the quality of social protection delivery mechanisms, tools and instruments. The ICTs would assist the authorities to effectively and efficiently manage those risks which can appear in a variety of forms and emerge from a variety of sources.

Social protection mechanism

Social protection mechanism consists of a wide range of schemes and programs for delivering tailor-made services at the doorstep of the needy and vulnerable people of the society. These schemes are designed with an objective to deliver assistance in the form of either cash, kind or as different kinds of services such as cash transfer, coupons/stamps for basic goods and services (i.e., food, clothing) and basic health services (www.adb.org). Different countries have developed and implemented different mechanisms to meet the social protection needs of their vulnerable population. Designing and developing suitable tools for social protection requires critical consideration of the severity and potential impact of the associated risks. Though these mechanisms are being designed for different socio-economic settings, they all have more or less the same basic structure and similar modes of implementation.

The common social protection instruments adopted by different countries across the world include (www.adb.org): Micro-insurance; Agricultural insurance; Community-based social funds; Unemployment insurance; Work injury insurance; Disability and invalidity insurance; Sickness and health insurance; Maternity insurance; Old-age insurance; Life and survivor insurance; Social assistance – Welfare and social services, Cash or in-kind transfers (such as food and family allowances), Temporary subsidies (such as life-line tariffs, housing subsidies, or support of lower prices of staple food in times of crisis); and Disaster preparedness and management.

The schemes of social protection as outlined above need to be delivered to the needy and vulnerable population with an objective to protect them against the potential risks. The success of any social protection scheme or program would largely depend upon how effectively and efficiently these schemes are delivered at the doorstep of the beneficiary.

ICTs not only increase the performance of social protection agencies but also improve the quality of social protection tools and also the delivery mechanism of social protection programs and services.

Smooth and efficient delivery of these social protection measures often encounters many challenges and constraints. If these constraints are not addressed in the most effective ways, they are likely to defeat the very purpose of any social protection policy. Many limitations which pose as obstacles on the way of implementing social protection programs have been identified (Rory, 2007; Shaikh, 2005):

- Traditional paper-based methods, being mostly physical in nature, are not only slow but also at times ineffective when directed at reaching out to large population.
- The targeted beneficiaries are mostly illiterate and do not understand the paper-based documents like postal money orders and vouchers.
- Traditional methods are not tamper-proof and could be easily subjected to abuse and malpractice while dealing with personal data and other sensitive information.
- Poor telecommunications infrastructure could act as a significant constraint in delivering social protection services.
- Often, there are no reliable national ID systems to verify identities of insured workers and claimants.

ICT-strategy for social protection

It is now widely recognized that the development-divide in the Asia-Pacific region can be technologically addressed by national efforts directed at reducing the digital divide existing between countries in the region. In this context, the role of ICTs is well-known across the world. Rapid proliferation of ICT innovations in recent years has contributed enormously in opening new opportunities for service delivery and income generation in today's world of globalization and knowledge economy (John and Dennis, 2010).

ICTs not only increase the performance of social protection agencies but also improve the quality of social protection tools and also the delivery mechanism of social protection programs and services. The design and implementation of social protection programs present many operational challenges related to the determination of eligibility, the maintenance of a data base of beneficiaries, the documentation of compliance, the distribution of benefits, and the verification of program efficacy (Mike, 2005). These challenges can be effectively addressed by applying innovative ICT solutions.

The World Bank has raised the awareness of the importance of using ICT for development and some 80% of Bank-financed projects include ICT components throughout all regions and sectors including the social protection sector (Knut, 2002). Advanced ICTs have been employed in the social protection sector by many developed and developing countries across the world; however, there is a need to accelerate the process of ICT deployment and adoption in order to achieve the desired MDGs faster.

ICT tools offer a lot of potential in the context of designing and implementing social protection systems to meet the needs of countries in a changing

world. The benefits of ICT application in the social protection sector have been enormous. The ICTs offer many opportunities and challenges for the implementing authorities and agencies in their efforts to deliver social protection measures and services (Knut, 2001; Knut, 2002; www.adbi.org; Rory, 2007) which may include the following:

Cost minimization and maximization of benefits; Contributes to more transparency, thus avoiding fraud and corruption; Meet expectations of the customers; Services at any place and any time; Participation and decision-making; Integrated delivery of social services; Vertical (placement, counseling); Horizontal (e-Government); Diversification of end-devices; Sharing of resources; Single point contact (one-stop-shop); Self-service information and transactions; Reliable collection of contributions and payment of benefits; Maintaining an effective communication network; Simplification or elimination of routine and repetitive tasks; Active availability of services independent of place and time; Deliver sustainable and accessible services; Improve the quality of positioning of social security services (speed, actuality, contents); Self-learning by self-service devices; Enable new social security developments and increase social security coverage; Developing new forms of partnership in the delivery of social security; Achieve greater administrative and operational efficiency; Address the demographic evolution; Offers the potential of moving from traditional automation to transformation, i.e., aligning processes, organizational structures, and new technologies along the goals of social policies; and Improved image of social protection institutions.

In order to achieve the most out of all the above benefits, the ICT-based systems for the delivery of social protection measures need to be suitably designed according to the objectives of the scheme and needs of the targeted beneficiaries. The implementation of these ICT-based tools and systems would depend on a number of crucial management issues before being actually put into practice. The key success factors which require critical consideration in the design and implementation of ICT-based tools for social protection delivery are identified as (Knut, 2001): Design & Implementation; Management commitment; User involvement; Capacity building; Flexibility in change; Professional project management; Design; Early consideration of ICT potential for transformation; Professional planning; Implementation; Professional procurement; and Sustainability.

At the national level, the ICT infrastructure for supporting social protection administration is based on the principles of e-Governance or e-Administration.

ICT infrastructure for social protection

e-Government is regarded as one of the key drivers of national social and economic development. At the national level, the ICT infrastructure for supporting social protection administration is based on the principles of e-Governance or e-Administration. It is an ICT-based strategic tool which is used to support government administration and public services. The main goal of e-Governance is significant improvement of effectiveness and efficiency of the public governance through optimization of data flow, application of advanced ICTs, reduction of operational costs, fighting hidden corruption, and so on (ISSA, 2005). The benefits of e-Governance include: transparency and openness, reliability and predictability, accountability, efficiency and effectiveness. With the help of ICTs, vast amount of information can be collected, stored, processed and disseminated. All these benefits are vital requirements of a good social protection scheme to become successful.

As ICTs present a wide range of technological options, the governments need to develop a framework to assess how these technologies may be used to improve the efficiency of the delivery of social safety net programs (Mike, 2005). Innovative approaches may include the use of integrated ICT systems across government agencies and the customer-centered delivery of social services through electronic channels (Knut, 2002). For the implementation of any social protection delivery system, the basic ICT infrastructure includes a variety of ICT equipment (e.g., hardware, software, networks) and applications (e.g., back-office systems, operational systems and management information systems). The automated systems consisting of computers, networks and databases are supported by automated office systems, electronic mailing systems and many more modern electronic gadgets.

Countries have adopted different approaches for developing relevant e-Government infrastructure for administering social protection schemes and programs. Important approaches are briefly presented in Table 1.

Innovative ICTs for delivering social protection

ICT innovations are becoming more powerful and complex with satellite-based and fiber-optic cable networks thus opening up numerous technological possibilities for suitable incorporation into various developmental strategies across the world. ICTs also present enormous scope of application due to convergence of different technologies such as personal com-

Countries	e-Government approach
Bangladesh	Bank computerization; Biometric system
China	Networking
India	Unique Identification Number Project
Thailand	Web-portals; ICT-based system for nationwide poverty registration system; Networking; General Financial Management Information System (GFMIS)
Italy	Networking all back offices of the public administration functions; Linkage with intermediates; Web portals
Germany	PC- or Internet-assisted exchanges for care and support services
Poland	Local Information Centres with computerized data bases; Internet; Software for account maintenance and payment; System for Bilateral Information Exchange (SDWI); Web services
United Kingdom	Web-based delivery
Sweden	Web-based delivery; Unique Personal Identification; Electronic signature

Table 1. Important e-Government approaches in selected countries
Sources: Chinese Academy of Labor and Social Security, 2004; Shaikh, 2005; Wichian, 2005; http://uidai.gov.in; Helmut, et al., 2005

puters, telephones, telecommunication networks, digital cameras, digital video cameras and players, personal digital assistants (PDAs), slide projectors, mobile telephones, radio (digital, satellite) and television (cable, digital satellite) (Robert and Tom, 2002). These devices can be linked to others for faster and efficient sharing and exchange of information.

Some advanced ICT-based tools that find innovative applications in the social protection sector are briefly outlined below:

- Mobile computing
- Satellite communications
- Global positioning systems
- Radio frequency identification tags
- Kiosk systems – Applications for distance learning and job matching; information delivery; social assistance claim filing
- Internet kiosks – For services of insurance companies; community-based information and services
- Modern call centres – Automated call distributors (ACD) and advanced interactive voice response (IVR) are used for UI claim filing
- Interactive television, scree phones and Internet
- IVR data collection script for collecting information over a telephone-touch keypad
- Automated databases for on-line claimant verification
- Customized Graphical User Interface (GUI) software
- Electronic payment systems
- Pension Reform Options Simulation Toolkit (PROST) software of the World Bank
- Social Security Pensions Software
- Smart cards with PINs, fingerprint and other biometric systems
- Management Information Systems (MIS)
- Creation of personal medical file directly linked to the ICT development for improving the quality of health services
- Electronic health card equipped with a microprocessor which allows for authentication (electronic identity check), codification, and electronic signature
- Electronic patient files, telemedicine solutions
- Patient referral management systems for conducting of diagnoses via mobile phones and other telemedicine applications
- Rural clinics with IT infrastructure including wireless LAN and GPRS connectivity
- Electronic medical record system (EMR) or Electronic Health Record (EHR) system – A database that contains a comprehensive record of patients' medical histories

Potential applications of important ICTs in the social protection sector are presented in Table 2. Many innovative ICT equipment and systems have been suitably employed by various national and provincial governments and their agencies in the social protection sector across the world (Table 3).

Successful ICT applications in social protection

There are many success stories showing how ICTs have been effectively applied and adopted in the social protection sector in both developed and developing countries. While the developed countries have shown successful ICT applications in the social protection sector, many Asia-Pacific countries have initiated innovative ICT-based projects for faster delivery of social protection assistance to the beneficiaries (Table 1). The following sections elaborate selected success stories which could be replicated in many Asia-Pacific countries with similar socio-economic situation.

Social Security Pensions Software in Andhra Pradesh, India
(http://event.stockholmchallenge.se)

In India, the Government of Andhra Pradesh implements a Social Security Pension (SSP) scheme targeted at the most vulnerable sections of society like the elderly, widows, disabled, and elderly weavers to provide them

succor and ensure their economic development. The SSP software was developed for delivering the social security pension benefits in a financially feasible way with special attention for prompt, efficient and high-quality services to the beneficiaries. It facilitates regular payment and monitoring of the disbursement so as to maintain transparency. The objectives of the SSP software are: Facilitating successful implementation of Pension Schemes; Transparency and visibility; Maximize accountability; Minimize leakage of funds; Reduce administrative cost and effort; and Accurate and fast disbursement; and Tackle corruption by close monitoring through web reports that are transaction-based.

In the program, standalone software is placed in the Districts. The software deals with generating the financial approvals, sanction orders for new pensions and release orders. The information is uploaded into the state server and is available in the website. The SSP software has enabled the clumsiness of the delivery system and reduced misrepresentation and fraud by building a comprehensive client database. The ICT solution has also brought in checks and balances to ensure proper working of the processes. All the key processes are captured in the software work-flows.

The Unique Identification Number Project, Government of India
(http://uidai.gov.in)

The Government of India has initiated the Unique Identification project being implemented by the Unique Identification Authority of India (UIDAI) for the issuance of unique identification numbers *(Aadhaar)* linked to a person's demographic and biometric information. The Aadhaar will only guarantee identity, not rights, benefits or entitlements.The UIDAI envisions full enrolment of the residents, with a focus on enrolling India's poor and underprivileged communities.

Major ICTs	Potential applications
Mobile computing – Personal Digital Assistants (PDA)	Determination of eligibility; Documentation of compliance; Distribution of benefits; Verification of program effectiveness
Biometrics	Documentation of compliance; Distribution of benefits
Satellite communications	Determination of eligibility; Documentation of compliance; Distribution of benefits
Global Positioning Systems (GPS)	Determination of eligibility; Distribution of benefits; Verification of effectiveness
Simple and Smart Cards, Magnetic Strip Card, Smart Cards – Integrated Circuit Memory Cards, Integrated Circuit Microprocessor Cards, Optical Memory Cards	Documentation of compliance; Distribution of benefits
Radio Frequency Identification (RFID) Tags	Documentation of compliance; Distribution of benefits
Automated Teller Machines	Distribution of benefits

Table 2. Potential application of major ICTs in the social protection sector
Source: Mike, 2005

The Registrars that the Authority plans to partner with in its first phase such as – the Mahatma Gandhi National Rural Employment Guarantee Scheme (NREGA), Rashtriya Swasthya Bima Yojna (RSBY), and Public Distribution System (PDS) – will help bring large number of the poor and underprivileged into the UID system. The UID method of authentication will also improve service delivery for the poor.

Technology systems will have a major role across the UIDAI infrastructure. The *Aadhaar* database will be stored on a central server. Enrolment of the residents will be computerised, and information exchange will take place over a network. Authentication of the residents will be online. The Authority will also put systems in place for the security and safety of information.

The Pensions Reform Options Simulation Toolkit (PROST), The World Bank
(Knut, 2002; World Bank, 2000)

The World Bank's pension reform options simulation toolkit models pension contributions, entitlements, system revenues and system expenditures over a long time frame. The model is designed to promote informed policy-making, bridging the gap between quantitative and qualitative analysis of pension regimes. It is a flexible toolkit, easily adapted to a wide range of countries' circumstances. Modeling pensions can also assess different reforms, informing both policy-makers and the public about the impact of different reform options.

Opportunities for Asia-Pacific

The Asian and Pacific countries have been actively implementing many innovative social protection schemes for their vulnerable population. These schemes are of various kinds and are targeted at different vulnerable groups of population in the respective countries (Giang and Wade, 2009; UNICEF, 2009; Edi, 2007; http://www.ipc-undp.org; ADB, 2008; Shaikh, 2005; World Bank, 2006; Dao, 2002). Some of these are enlisted below:

ICT tools	Social protection schemes/programs	Country/Region
Automated Teller Machines, Mobile Pay Stations, Mobile Computer, Satellite Modems/Phones, GPS Devices, Smart Cards and Biometrics	Cash transfer programs to the poor	Bangladesh
Social Security Pensions Software	Social Security Pension Scheme	Andhra Pradesh, India
Mobile phones and web-based technologies	Disease monitoring	Andhra Pradesh, India
Networking	Golden Insurance Project	China
Web portals, Information networks	Poverty eradication e-Governance	Thailand
Management Information System (MIS), e-governance Electronic submission of application and declaration forms	Social insurance	Azerbaijan
Mobile telephone nets, patient referral management systems, telemedicine applications	Health services delivery	Africa
m-Health (free 'please call me' SMS messages) IT infrastructure (computers, wireless LAN, GPRS connectivity) for rural clinics	Primary healthcare	
Electronic national cards	Health insurance, Social security	Rwanda
PDAs for remote data collection	Health information	Uganda
Web-enabled pensions system	Social security	Tanzania
Integrated ICT platform with modular software application system eDeclaration	Employment Social insurance	Turkey
Magnetic card named 'carte Vitale' Website named AMeli (www.ameli.fr) Simulator named CEDRE (Calculateur Expert de DroitsREtraite) Website 'ANPE.fr'	Social security, Health insurance Health insurance Pension scheme Employment	France
PIN (Personal identification numbers) Phone service through an automatic system or operators (inbound & outbound), fax, mail Computerized system named 'SILES'	Social welfare Social assistance Registration of foreign workers	Italy
PC- or Internet-assisted exchanges Electronic job exchanges Electronic health card	Care and support services Employment Health insurance	Germany
Multi-channel service environment	Social security	Finland
Local Information Centres using computer technologies, computerized data base; Internet site e-Government, electronic signatures 'Platnik' (Payer') software, Web information centre Automation of unemployment insurance (UI) claim filing ZUS electronic information channel	Employment Social welfare governance Social insurance Unemployment insurance	Poland
Electronic Service Delivery (ESD)	Social welfare	United Kingdom
Smart cards, web portals and CRM (Customer Relationship Management) systems; web-based 'Directgov' 'Halton Direct Link'	e-governance Communication claimants	
Electronic communications and services, electronic signatures, online information about public services, web-service	Social security, health services, e-governance, employment	Sweden
Modern call centre technology, such as automated call distributors (ACD), advanced interactive voice response (IVR) and customized Graphical User Interface (GUI) software applications for UI claim filing and processing	Unemployment insurance	United States

Table 3. ICT-based tools for delivery of social protection
Sources: Shaikh, 2005; http://event.stockholmchallenge.se; Chinese Academy of Labor and Social Security, 2004; ISSA, 2005; ISSA, 2007; GTZ, 2009; Helmut, et al., 2005; Knut, 2002; Wichian, 2005

Table 3: ICT-based tools for delivery of social protection

Bangladesh – Bangladesh National Social Protection Project, Old Age Allowances Program, Program Widowed, Deserted and Destitute Women, Fund for Natural Disaster, Cash for Education

China – Minimum Living Standards Guarantee Scheme

India – National Old Age Pension Scheme (NOAPS) for destitute elderly people, The Mahatma Gandhi National Rural Employment Guarantee Scheme

Indonesia – Household and Community Cash Transfer Schemes; Work injury insurance

Malaysia – Old Age Social Pension; Disability and invalidity insurance

Mongolia – Child Money Program

Nepal – Old Age Allowance Program (OPA), Helpless Widows Allowance (HPA), Disabled Pension (DP)

Pakistan – Child Support Program, Individual Financial Assistance

Sri Lanka – Samrudhi; Cash transfer for disabled soldiers and families of service personnel; Widows and Orphans Pension Scheme

Thailand – Welfare Fund for Older People; Disability and invalidity insurance

The Philippines – Cash or in-kind transfers such as food stamps and family allowances; Unemployment insurance; Disability and invalidity insurance

Viet Nam – Disability and invalidity insurance; Social Guarantee Fund for Veterans and War Invalids; Social Guarantee Fund for Regular Relief (SGFRR); Regular monthly benefits for elderly alone, orphans, and disabled civilians; Contingency Fund for Pre-harvest Starvation and Disaster Relief (emergency)

In view of the wide variation in the nature and coverage of social protection schemes in the Asia-Pacific region, the countries are required to adopt faster and efficient modes for quick delivery of social protection assistance measures and services to the targeted population. The countries can make use of the advanced ICTs which present wide range of options for the delivery of social protection assistance. Developed countries in Europe and elsewhere have successfully adopted many of these ICT applications in their social security sector. The Asia-Pacific countries need to better understand the current trend in the application of ICTs in the social protection sector, costs and benefits, and design and implementation of ICT-enabled systems for delivery of social protection measures.

The Asia-Pacific countries need to better understand the current trend in the application of ICTs in the social protection sector, costs and benefits, and design and implementation of ICT-enabled systems for delivery of social protection measures.

Availability and access to advanced ICTs can become a major issue for some countries in the Asia-Pacific region. However, there are examples of success stories available in countries like China, India, Bangladesh and Thailand which show that ICT-enabled social protection can be a feasible option for other countries of the region as well. Currently, China has been taking measures to reform its social protection system through extensive use of ICTs. In China, the so-called 'Golden Insurance Project' makes all the computers in the social insurance administration agencies throughout the country connected by means of ICT thus enabling sharing of social security information of each participant via network (Chinese Academy of Labor and Social Security, 2004). The Unique Identification project initiated by the Government of India makes extensive use of ICT tools including biometric identification systems, multimodal software, etc (http://uidai.gov.in). The Government of Bangladesh has also been taking steps to modernize its social protection sector by adopting advanced ICTs such as Mobile ATM, Mobile Computer, Satellite Modems/Phones, GPS Devices, Smart Cards, and Biometrics (Shaikh, 2005). These success stories indicate that technological capabilities for application of ICTs in the social protection sector do exist in some countries of the Asia-Pacific region. Therefore the issue of accessibility and availability of necessary technology can be effectively addressed by establishing relevant regional cooperation mechanisms.

Conclusion

Considering the wide choice of ICT options available and their successful adaptation to the local conditions, the opportunities are enormous for the Asia-Pacific countries. Extensive application of advanced ICTs in the social protection delivery system seems a feasible proposition in the region as indicated by many success stories. The countries need to upgrade their ICT infrastructure so that appropriate and relevant ICT solutions can be integrated into the system at all level of operation. South-South cooperation could play a significant role in these efforts for sharing of experiences and best practices among countries in Asia and the Pacific. In some cases, availability of innovative technologies may become an issue to deal with; however, this issue can be suitably addressed considering the superior ICT strength and capability of some Asian countries like China, India, Republic of Korea and Japan. Asia-Pacific being one of the most populated and vulnerable regions of the world, application of advanced and innovative ICT-based solutions in the social protection delivery system could

contribute immensely towards achieving the Millennium Development Goals in the social development sector.

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Effective role of ICTs in social protection
Case studies from South Asia

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Abstract

Social Protection has come to the forefront of international policy agenda in the face of multiple crises of recent years. Information and communication technologies (ICT) are increasingly viewed as one of the tools for extending outreach to the poor as strategies across the globe are increasingly becoming technology based. Using case studies from South Asia, the article brings out the fact that information-oriented society is opening to us a new global world that we have never experienced before. Nations are at different paces of adoption of technology for reaching out to the poor. Adoption of the appropriate technology by the government and NGOs would help in empowerment of the poor.

Introduction

Multiple crises of recent years have increased the vulnerability of millions of people living close to poverty. Although various nations are taking concerted actions to deal with the increased vulnerability, the share of social protection (SP) expenditure as percentage of GDP is very low in the Asia-Pacific region. As per the Social Protection Index in Asia (2008), the figure is as low as 1.6 for Pakistan, 1.9 for Indonesia, 4.04 for India, 4.5 for China as compared to 5.3 for Asia (Baulch et al 2008). The coverage of key target groups, percentage of poor receiving any social protection, and its impact on overall poverty are yet to be addressed at a macro level.

In the present century, technological innovations are taking place across the globe at a very fast pace. Information and communication technologies (ICT) helps to introduce a wide range of ways in which government could use the Internet and computer networks for improving accountability, transparency, efficiency and effectiveness in its social protection policies. ICT has become a driving force for the transformation process towards the knowledge-based information society, which is likely to have an immense impact on political, economic, and social development of countries. Although this technology-driven trend may increase the 'digital divide' within and between countries, the role of technology in SP is increasingly recognized by both national and international agencies, across the world including the Asia-Pacific region. The present paper attempts to identify the importance of ICT in SP policies, reasons for its slow progress in the developing countries, and finally documents some successful practices from South Asia on the effective role played by ICT in SP.

Challenges of ICT in poverty reduction

Statistics relating to the diffusion of ICTs is widely available. Various national and international organisations collect data concerning the number of radios, televisions, telephone lines, personal computers, Internet users, etc. As with indicators relating to human development, these ICT diffusion figures are national averages, which do not allow us to estimate exactly how much access the poor have to each of these technologies. However, it is a known fact that access to ICTs by the poor is significantly less than the national average, especially in the developing world. Given that Internet users are less likely to be counted among the poor, one could conclude that the poorest people in the developing countries presently have no

meaningful access to the Internet. Therefore, using the Internet to target directly the information and communication needs of the poorest people is unlikely to be a successful strategy for poverty reduction in the present. Lack of ICT infrastructure, restrictive government policy and regulation, high cost, low IT literacy, etc. act as deterrent to equitable Internet access. The task of overcoming these barriers is huge. It will require the wholesale rollout of ICT infrastructure, enabling policies and legislation to ensure the availability and affordability of services, broad-based IT literacy programs, and efforts to ensure that content is relevant and appropriate for the end-users. In countries where there are millions of undernourished children and population below poverty line, it is unlikely that limited public resources would be diverted from basic health and education programmes to the task of bridging the digital divide. It will require massive investment from both the public and private sectors to create a suitable ICT environment. Even in developed countries, the private sector has been reluctant to invest in rural and remote areas due to the perception that potential for financial return is limited.

Overcoming the digital divide is a long-term objective that will, in all likelihood, take a generation or more to achieve for the poorest countries in Asia. Alternative strategies are needed if the ICT for Poverty Reduction movement is to make a significant and immediate difference for the people living in poverty in Asia today. Long before 'ICT for Social Protection' became official and fashionable, 'old' technologies like radio and television had been used to disseminate information among the poor. As a medium for delivering information directly to the poor, radio has potential to achieve far wider outreach than the Internet. Even in those countries which have high incidence of poverty, radio receivers are relatively common. Furthermore, whereas an Internet user represents just one person, many people can listen to a single radio receiver. Generally, there are about half as many televisions as there are radio receivers in each of the developing countries in Asia, although in both China and Thailand, the count for each is about equal. Like radio, television far outstrips the Internet in terms of potential outreach.

ICT supports the administrative and operational processes of SP agencies and also drives institutional development towards business process re-engineering.

ICT supports the administrative and operational processes of SP agencies and also drives institutional development towards business process re-engineering. ICT has always been used to support processes in SP agencies. Huge amounts of information can be collected, stored, processed and disseminated with the help of automated systems consisting of computers, networks and databases. Personal data of job seekers, contributors to and/or beneficiaries of unemployment benefits or old-age insurance can be put into a database via PC. Computer-based matching of job offers and demands, automated retrieving and archiving of individual work histories and contribution records, and modern multimedia systems for job counseling and vocational training are other examples of automatic information handling.

Also, internal institutional business processes, such as human resources, asset management, accounting, and procurement may be supported by automated office systems. Electronic mailing systems are much more effective than writing documents manually and sending them to other staff by in-house mail. The automation of processes usually results in better operational performance of SP agencies and improved quality of their program delivery. The potential of ICT to integrate different applications, such as vocational counseling, job placement etc. may result in a reorganization of the labor agency from separate divisions for these services to a customer friendly single point of contact. In addition, ICT may have some major implications for the evaluation and redesign of SP programs. Information about different programs, such as social assistance, active labor programs, or alternative pension schemes, and their impact can be better collected, processed and distributed with the help of automated databases.

Finally, the use of innovative ICT may have an impact on policies beyond Social Protection. Particularly in the context of Social Insurance schemes, which are characterized by a lot of financial transactions in terms of contribution collection and benefit administration or payment, reliable and safe information systems including intelligent agents for checking compliance or eligibility may contribute to more transparency, thus avoiding fraud and corruption. As a result, increased revenues may be used to adjust the Social Insurance or tax policy and lower contribution rates and income tax respectively.

Documentation of good practices in Asia

The following section documents a few of the good practices in the use of technology in SP. These are Kothmale Community Radio Internet Project, Sri Lanka, Role of Technology in Agricultural Development in Malaysia, and GyanDoot and Tara-Haat in India.

Kothmale Community Radio Internet Project, Sri Lanka

Kothmale FM Community Radio Station is one of four community radio stations operating under the Sri Lanka Broadcasting Corporation. It is located in the central region of Sri Lanka in Mawathura, which is about 25 kilometres south-west of Kandy. Mawathura is primarily a rural region with tea and rice being the dominant plantation crops. Kothmale FM began broadcasting in February 1989. Around this time, the regional government authority relocated around 3000 families for a large dam project. Many people lost crops and farming land. While they had specialised in various crops such as pepper, cardamom and rice, the land they were given was established with tea crops. Therefore, these people had to learn new cultivation methods and adapt to different conditions. Kothmale FM was established with the objective of providing relevant information to these people about self-employment and health, and to create a link between people who were now geographically distanced from one another. The station is dedicated to being community focused. Workshops and events for the community are held on a regular basis to encourage local participation. Kothmale FM plays an important role in disseminating information regarding health, agriculture and local news. It also works with local schools and broadcasts cultural, sporting and social events. Given the lack of access to telephones, the station also plays a vital role in keeping the community informed in emergency situations.

When the station was opened it was fully sponsored by the Sri Lanka Broadcasting Corporation and was permitted one hour of transmission per week. In February 1991 this was extended to three days per week and three hours of transmission per day. The station employed a station manager and operated with the assistance of volunteers. In 1999 the station moved to its larger, current location in Mawathura.

The Kothmale Community Radio Internet Project was established as a pilot project to assess the prospects for converging community radio and the Internet to serve rural information needs and to assess its possible impact in rural communities. The concept of extending 'Internet radio' to rural regions in developing countries was devised in 1996 during discussions between UNESCO and Community Radio broadcasters. The idea was that the two mediums – radio and the Internet - could be integrated to lower user connectivity costs and to make the Internet accessible to a wider audience.

The Community Radio Internet project began in April 1999. UNESCO provided a USD 30,000 grant for the project and the Sri Lanka government provided support through Sri Lanka Broadcasting Corporation, Mahaweli Authority and Sri Lanka Telecom. Three computer access points have been established at different community centres in the local area. Kothmale FM has a server and three computers whilst Gampola library and Nawalapitya Town Hall each has one computer. The project works in a number of ways. Listeners send questions or topics by telephone or by post to the radio station, and program hosts and volunteers use the Internet to research responses. This information is then translated (from English) and presented on the radio. The Internet is also utilised by the radio announcers who will often incorporate information, news, weather reports and music into their broadcasts. The Internet centres also provide the local community with direct computer and Internet access. Due to lack of Internet service providers in the country there were previously no Internet access points in the area. The Internet is also a luxury that the majority of Sri Lankans cannot afford. Many people in the community now contribute to the Internet broadcasts by researching and translating and by directly participating in radio programmes.

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The three access centres keep in touch via email and share information, which is then posted on boards for all of the community. In November 2000, an Internet club was formed in the community and this group of volunteers takes the responsibility of coordinating computer workshops for the community and maintaining this website.

The project was initially targeted at people that had been disadvantaged through relocation due to the dam development project. It also targets 'information-disadvantaged' people (lacking both IT and English-language skills, and access to the Internet) in the area by providing a mechanism through which they can submit queries and receive contextualised responses in their own language. This process is limited only by the IT and English-language skills of the radio personnel. Whereas stand-alone Internet cafes would have concentrated benefits to the small number of people with the necessary skills, this project makes relevant information available to many more people through the combination of Internet access and FM radio. The potential audience is that which can be reached

by the FM radio transmission, the bulk of the population of Mawathura. The program cannot be expanded as it is restricted by the range of the FM radio transmitter. However, it can be easily replicated in other communities. The morning broadcast has been commercialised and the station collects approximately 75 per cent of its operational costs from this commercial revenue.

Technology for agricultural development in Malaysia

The Asian economic crisis of 1998 and the associated fall in value of the Malaysian Ringgit caused a dramatic increase in the cost of agricultural commodities imported into Malaysia. In part response to this, the Malaysian Ministry of Agriculture developed the Third National Agricultural Policy 1998-2010, the goal of which is to guide and enable the development of the local agricultural sector. The policy encourages the use of ICT to increase the competitiveness of the sector.

There are numerous agricultural websites available on the Internet, published by national, regional and international organisations. However, most of these sites are tailored for countries with different economies, ecologies and levels of development. Furthermore, the language used is usually English, while the majority of Malaysian farmers read Bahasa Melayu.

TaniNet was created to enable the Malaysian agricultural community to use the Internet as a tool for communication and as a place to share information on agriculture and biotechnology. The project started in September 1999. TaniNet provided on-line information and services on agriculture and biotechnology, a forum for discussion among farming communities through a managed bulletin board and chat room, access to expert advice and troubleshooting related to agricultural problems via the Internet, to increase local understanding of agricultural biotechnology and of local applications of new technology and educate the farming community with respect to the application of the Internet to access useful information and services.

Farmers received information from a variety of sources: government agencies, mass media, the private sector, Local Farmer Associations (LFAs) and individuals. Thirty per cent of respondents felt they did not receive adequate information. Farmers are generally interested in accessing information from computers. About 15 per cent owned a computer and 20 per cent were computer literate.

TaniNet provides each Local Farmer Association with one personal computer with a dial-up connection to the Internet. This enables access to the TaniNet system for the majority of farmers that do not have a computer. TaniNet hopes that as the system becomes more accepted and its benefits realised, more farmers will purchase their own computers. Most of the target groups are not IT literate. Consequently, an important component of TaniNet is IT training. Members of the farming community are given introductory training on the use of personal computers. Internet use and skills to access the information and services are offered by TaniNet. Training is not just offered to farmers themselves but also to family members and to officials and office workers of Local Farmer Associations. TaniNet reaches farmers, who are a relatively disadvantaged group in the Malaysian society.

TaniNet is currently being implemented in conjunction with 50 Local Farmer Associations throughout west Malaysia. TaniNet is expandable throughout Malaysia because of the existing network of Local Farmer Organisations, the relatively good ICT infrastructure, and the government's commitment to developing the use of ICT in all sectors of Malaysian society. The project is located clearly within the policy framework of the Ministry of Agriculture.

The initial pilot phase of TaniNet did not generate substantial income. Phase two has a greater focus on e-commerce whereby buyers will be able to purchase agricultural commodities directly through LFAs. The system will also place more emphasis on business-to-consumer sales. This includes not only advertising, but also on-line purchasing of farm inputs. For example, farmers will be able to purchase farm inputs through the system rather than traveling to a regional centre to make their purchase. It is hoped that this emphasis on e-commerce will increase income earned through the system so that TaniNet will be on a more secure financial footing.

The project managers do not envisage TaniNet to be a financially viable operation in the immediate future, primarily because they believe that it will take years for the required technology cultural transformation to occur. They, therefore, suggest that public financing is necessary for the immediate future. However, they do believe that TaniNet will become financially viable in the future and they are working towards that goal.

GyanDoot in India

Project GyanDoot is a unique government to citizen Intranet project implemented in a tribal district (Dhar) in central India, with numerous benefits to the region, including a people-based self-reliant sustainable strategy. Gyandoot is recognised as a breakthrough in e-government, demonstrating a paradigm shift which gives marginalised tribal citizens their first ever chance to access knowledge, with minimum investment. It is a community-owned,

self-sustainable and low cost rural intranet project in Madhya Pradesh.

On January 1, 2000, Dhar district began the new millennium with installation of low cost, self-sustainable and community owned rural Intranet project. Dhar district is located on the south western corner of the central India and has a population of 1.7 million, with 54% population being tribal (Bhils, Bhilalas, Patleiyas) and 60 per cent population living below poverty line. Computers in 20 village centres in ten blocks of the district were wired through an Intranet network (presently there are 34 such wired village centres). Local rural youth act as entrepreneurs for running cyber-cafe-cum-cyberoffice on commercial lines without salary or stipend. The computers in the network have been established in Gram Panchayats (Village Committee). They have been called Soochanalayas (Information Kiosks). The Soochanalayas provide user-charge-based services to the rural people. This Intranet system has been named Gyandoot.

The person operating the Soochanalaya is a local matriculate operator and is called Soochak. A Soochak is not an employee but an entrepreneur. Soochak only needs maintenance and numeric data entry skills. He needs very limited typing skills since most of the Intranet software is menu-driven. The Soochaks for original 21 centres were selected interactively by village committees and the local community. Three member panels were selected by the community who received training at their own cost at the District Council. At the end of the training, the best trainees were selected out of a panel of three as Soochaks. He/She runs the Soochanalaya on commercial lines. He has an initial one year agreement with the village committee. He does not receive any salary. He bears the cost of stationery, maintenance and electric and telephone bills. He pays 10% of income as commission to the Zila Panchayat (district council) for maintaining the net.

The 13 centres having started as private enterprises, the Soochak is the owner of the establishment who pays Rs. 5,000 as a license fee for one year to the district council. Each Soochak is expected to earn a net income of at least Rs. 36,000 per annum at conservative projections.

Services and facilities: During the formation of the project proposal a detailed RRA/PRA exercise was taken up involving the villagers and the community. The selection of the services was a result of this interactive exercise and was based on the advice and the felt needs of the villagers. In these meetings, it was learnt that due to lack of information regarding the current and prevailing mandi (agriculture produce auction centres) rates, the farmers were unable to get the best price for their agricultural produce. Villagers also informed that copies of land records were difficult to obtain. The villager who requires a copy of the land record had to go out in search of the patwari (village functionary who maintains all land records) who may or may not be available on that particular day at his headquarters. For small complaints or for giving applications, people had to go to district headquarter which resulted in waste of time, money and potential livelihood earnings. The services offered on the Gyandoot network are:

Agriculture produce auction centres rates: The variety-wise current and prevailing rates of prominent cereal crops of the district like wheat, gram, soybean, etc. at local and other prominent auction centres of the country are available on-line. Other statistics of the auction centres e.g., the volume of incoming agricultural produce, previous rates etc. are also provided on demand. The facility is available at a nominal charge of Rs.5. Horticulture crops like tomato, potato, peas, green chillies, guava etc. are also produced in substantial quantity in the district. The rates of these commodities are also available.

On-line registration of applications: So far, the villagers had to go to the local revenue court to file applications for obtaining income/caste/domicile certificates or for getting demarcation done or for obtaining landholder's loan passbook (rin pustika) etc. For this, they would again have to make repeated visits to the court to enquire about the progress of the application as well as to finally collect the prepared document. Now, through Soochanalayas they may send the application at a cost of only Rs.10 and thereafter, in a maximum period of 10 days, preferably less, an intimation of the readiness of the certificate is sent back to them through e-mail at the concerned Soochanalaya. Thereafter, they may go to the concerned court to collect the certificate.

On-line public grievance redressal: Wherever there is some problem in the delivery of services, the villagers travel at the cost of time, money and livelihood to block, tahsil or district headquarters without any certainty that they would even be able to meet the officer concerned. Now through the Soochanalaya, a villager may send his/her complaint with assurance of reply within a maximum period of seven days, preferably lesser, at a charge of Rs.10. The reply to his complaint after redressal is sent back at the Soochanalaya through e-mail. Complaints available on the intranet include complaints regarding drinking water, scholarship sanction/disbursement, quality of seed/fertiliser, employee establishment matters (like leave or provident fund sanction) queries, functioning of school, public distribution system, beneficiary ori-

ented schemes, functioning of village committee etc.

Rural e-mail facility, e-education, village auction site, online matrimonial site, information dissemination on government programmes, free e-mail facility on social issues, and e-village newspaper are other facilities offered by the programme.

- *Additional facilities at Soochanalayas:* To make Soochanalayas economically viable Soochaks are given licenses to vendor government judicial stamps and powers of petition writer are also delegated to them. Due to the delegation of above mentioned powers additional incomes are possible and the Soochanalayas are becoming virtual cyber offices.
- *On-line linking of all departments with GyanDoot server:* A local area network (LAN) linking all the major district offices has been installed. As a result, the district heads of various government departments like health, education, tribal development, revenue, food, agriculture, public health engineering, district council and district magistrate etc. are connected directly to GyanDoot network. This provides backup support and logistics to GyanDoot network.
- *E-education initiatives:* The GyanDoot Samiti, with the help from Member of Parliament, has established 32 kiosks at the high schools and higher secondary schools. We are providing them local educational contents through the server. They are also accessing internet for other educational contents. Each school has a computer club to promote activities related to IT among rural students.

Tara-haat in India

The project is a private sector initiative to provide online services to large number of rural communities in north India. One of the most innovative aspects of the project is its highly interactive and graphics–interface system, which allows semi-literate and neo-literate users enhanced access to products and services.

The Development Alternatives (DA) group comprises Development Alternatives and its associate organizations in India: Technology and Action for Rural Advancement (TARA), TARA-haat Information and Marketing Services Ltd., TARA Nirman Kendra and Decentralized Energy Systems India Ltd. The DA group, a pioneer sustainable development enterprise was established in 1983 as a not-for-profit research, development and action organization. With two decades of experience and over 400 professionals, the DA group has had a profound impact on the creation of sustainable livelihoods, specifically in the innovation and application of appropriate technologies and their distribution through micro enterprises in rural India. It is recognized by the Ministry of Science and Technology as a scientific research institution.

Over the years, the DA group has built up several initiatives and networks at the field level in different parts of the country. The partnerships established with over 500 NGOs and rural entrepreneurs across Madhya Pradesh, Uttar Pradesh, Chhattisgarh, Jharkhand, Bihar and Maharashtra will be of particular interest to the Village Resource Centre (VRC) Programme.

TARA-haat was established as a social enterprise dedicated to bridging the digital divide between rural communities and the mainstream economy. It provides village communities, particularly the youth, access to information and livelihood opportunities comparable to those available in urban India. A broad portfolio of services is offered through TARA-kendras – the community knowledge-cum-business centre. Initial focus has been on vocational training, community development, information and e-governance through a host of programs customized for local communities (e.g. TARA-chetna, TARA-meljol). The next generation of services focuses on the promotion of micro and small enterprises through a unique Enterprise Development Programme.

In keeping with its mandate to empower rural and marginalized communities through ICT with the purpose of enabling them to integrate with the mainstream economy, TARA-haat's latest venture - ICT enabled Enterprise Development and Support Services - is an exciting step forward. It focuses on providing entrepreneurship opportunities to youth, women and self-help groups through the rapidly expanding network of TARA-kendras, and TARA-haat's rural business-cum-community centers. When ready, the Enterprise Development Support and Service (EDSS) will add a critical dimension to the scope of services provided by TARA-haat, or indeed any experiment in information and communication technology (ICT) enabled services for rural India.

To meet the most important and widespread need in rural India - jobs, the next generation of services under development focuses on the promotion of micro and small enterprises through a unique, comprehensive Enterprise Development and Support Program.

The EDSS is an innovative experiment in addressing a critical need in rural India employment. Micro and mini enterprises can be a driving force for the rural economy, seen, as key to addressing new jobs needed every year in India. Small and local enterprises together account for the largest number of jobs in the country and have shown the positive impact that they can have on individuals and communities. The service is also in

line with the Government of India focus on rural enterprise and addresses the broader objective of the Eighth Millennium Development Goal that calls for cooperation with the private sector to address youth unemployment and make available to all the benefits of new technologies. The proposed service will be a comprehensive package comprising an Enterprise Package for technical training and financial linkages, an Entrepreneurship Development Programme for understanding business set-up, planning and management and a web-based Business Support System for on-going support. A network of local consultants is also being developed as an integral part of the venture.

A farmer with the help of a volunteer calls up a phone number and puts up a query that is recorded and stored in a computer and gets a reference number for his/her query. Knowledge workers from agri-business organizations analyse these calls and collate appropriate answers which are stored in the computer against the reference number for retrieval by the farmer when he/she calls back again for the answer. The answers are to be given within 24 hours. The information can also be retrieved in text format from the Information Centre near to the village. The farmers can send pictures along with their questions, and also voice clips to clarify on the issue.

The service has been pilot launched in villages of Bundelkand region of Uttar Pradesh (UP)/Madhya Pradesh (MP) and Himachal Pradesh (HP) in partnership with India Society for Agribusiness Professionals and TARAhaat. Local volunteers will facilitate the use of the service by the farmers. The farmers can also visit the nearest information centre to access the offline database in local language, listen to the audio clips and also to send pictures of affected crops.

The application has the potential to address a large variety of knowledge and information problems at the local level. Lifelines India would also serve the grassroots communities with information and knowledge from other sectors like education, health, livelihoods, grievances, RTI, etc.

Conclusion

SP strategies across the globe are increasingly becoming technology based. ICT helps to introduce a wide range of ways in which government could use the Internet and computer networks for improving accountability, transparency, efficiency and effectiveness in its social protection policies. However, it is a known fact that access to ICTs by the poor is significantly less than the national average, especially in the developing world. Different national and international agencies working for the upliftment of the poor are using technology as a means for dissemination of information as well as a means to reach SP to the masses. The case studies illustrated in the article bring out the fact that information-oriented society is opening to us a new global world that we have never experienced before. Kothmale FM in Sri Lanka plays an important role in disemminating information regarding health, agriculture and local news. It also works with local schools and broadcasts cultural, sporting and social events. Given the lack of access to telephones, the station also plays a vital role in keeping the community informed in emergency situations. The program cannot be expanded as it is restricted by the range of the FM radio transmitter. However, it can be easily replicated in other small communities.

TaniNet in Malaysia, provides on-line information and services on agriculture and biotechnology, a forum for discussion among farming communities through a managed bulletin board and chat room, access to expert advice and troubleshooting related to agricultural problems via the Internet, to increase local understanding of agricultural biotechnology and of local applications of new technology and educate the farming community with respect to the application of the Internet to access useful information and services.

Rural e-mail facility, e-education, village auction site, on line matrimonial site, information dissemination on government programmes, free e-mail facility on social issues, e-village newspaper are other facilities offered by the GyanDoot programme in India. Tara-Haat in India is a private sector initiative to provide online services to large number of rural communities in north India. One of the most innovative aspects of the project is its highly interactive and graphics–interface system, which allows semi-literate and neo-literate users enhanced access to products and services. Nations are at different paces of adoption of technology for reaching out to the poor. Adoption of the appropriate technology by the government and NGOs would help in empowerment of the poor.

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Information and Communication Technologies for Protection of Older Adults in India

Abstract

Information Communication Technologies (ICTs) driven economic growth in India is not only creating jobs, but also has been credited for improvement of economic well-being. This paper explores theoretically the potential areas where ICTs could be instrumental in providing social protection to the toiling older people in India. Furthermore, this paper will cite few case studies being currently implemented that promisingly use ICTs for creating social protection for older people. Moreover, the paper identifies the threats to social protection for older adults in India and connects this phenomenon with globalization. It also theoretically elaborates how ICTs could be implemented to create social protection for older adults in India. The paper further narrates few current case studies to supplement the above theoretical assumptions. The final section discusses the implication of ICT usage for social protection of older adults and charts out recommendations for future studies and policy making.

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Introduction

India will witness a significant rise in its elderly population. A World Health Organization (2004) report suggested that currently India has around 90 million people who are 60 years and older (Patterson 2006). A recent HelpAge India report has indicated that the growth rate among the older population in India is three times higher than the general population (2010), which further suggests that by 2025 India will add another 100 million older people to its population roster. Between 1950's and 2010 life expectancy of Indians has grown on an average by 20 years, which has led to a numerical increase in the rank of the "oldest old" (people above 80 years). Moreover, almost two-thirds of India's older people live in rural areas and rely on agriculture for sustenance (Jamuna 2003). Rapid growth in urban areas has already resulted in higher incidence of rural to urban migration of younger people, who often leave their older relatives behind. Furthermore, globalization and urbanization have obliterated the multi-generational households that traditionally provided a social and economic safety net for older people.

These above referred political and economic developments, together, have attenuated the social and economic status of older people in India, especially in rural areas, and has exposed them to potential vulnerabilities emanating from the free market economic forces. Unlike the United States, India does not have entitlement programs such as the Social Security and Medicare, ensuring economic and physical well-being in late life. Access to existing healthcare systems is further limited for older people who live in rural areas, where majority of Indians live, which further enhances economic and social uncertainties for older people. The rural enterprises in India employs a large number of unorganized laborers who still do not receive any job, health or retirement security, which leaves out many retired older workers without any economic protection such as pension. Existing state sponsored pension plans in India cater to government employees only and that too are insufficient with rising inflation. Thus, many older farmers and small landholders in rural India are finding it increasingly difficult to afford even the basic amenities for a life with dignity (Jamuna 2003, HelpAge 2010).

The plight of the older people in developing countries in the wake of fast pace globalization and urbanization driven changes has been well-documented (Mukherjee, 2008). Creation of a new set of social protection for older people is the biggest challenge that Indian and other governments in the developing world are facing. This is a major policy making challenge since the independence of India, and no one seems to have the right answer.

This paper argues that an optimum employment of ICTs could be a useful tool in addressing this emerging social problem.

The unprecedented growth of ICTs in India is much celebrated internationally and has been touted as the panacea for all ills affecting the nation. The ICT driven economic growth in India is not only creating jobs in urban areas, but also has been credited to have trickled down to improve economic well-being in rural areas. Though many such overtly optimistic accounts are factually unfounded, this paper would rather explore theoretically the potential areas where ICTs could be instrumental in providing social protection to the toiling older people of India. Furthermore, this paper will cite a few case examples being currently implemented that promisingly use ICTs for creating social protection for older people. The author hopes that the case examples will complement the theoretical assumptions about ICT use for the protection of elderly people.

The first section of this paper identifies the threats to social protection for older adults in India and connects this phenomenon with the broader context of globalization. The second section theoretically elaborates the areas where ICTs could be implemented to create a web of social protection for older adults in India. The third section narrates a few current case examples to supplement the above theoretical assumptions, and the final section discusses the implication of ICT usage for social protection of older adults and charts out recommendations for future studies and policy making.

Globalization and social protection of older adults in India

Globalization refers to "integration of national economies into the international economies, through trade" (Bhagwati, 2004). It is primarily an economic force that has social, cultural and policy implications for nation states. The Indian economy opened itself to foreign investment in all the core sectors in early 1990s. Investments from primarily the United States and the European Union have had a profound impact on the employment landscape of India (Bhagwati, 2004). Recent studies have shown that urban job growth in India has overtaken rural job creation rates by more than 300 percent and as a result there has been a great deal of movement of human resources in the form of skilled young workers from rural to urban areas. Investment in non-agricultural industrial infrastructure in India has quadrupled compared to what has been done for agro-based rural infrastructure development. Even the exploits of the green revolution were not channelized to invest and improve the rural infrastructure (Das, 2002; Bardhan, 2010).

The shifting tide of cultural norms over the last two decades has put the growing number of older people at risk of poverty, exploitation, abuse and neglect.

As stated earlier, globalization is not just an economic phenomenon, it transfers cultural values and norms from one culture to another, which can profoundly influence the attitudes of societies towards population groups like older people. The key motivation for economic integration of global markets through loosening of trade and tariff barriers is to create a new market for global goods. Globalization, however, is more than this economically defined process described above; it requires certain culturally constructed attitudes to appreciate and participate in the market as consumers. Developing countries like India were not on economically strong footing to dictate the terms of cultural influence from interactions with economically powerful western countries. As a result, they passively experienced an incipient transfer and hybridization of cultural norms, belief systems, linguistic usage, household structure and core societal values from the western countries (Barrs et al., 2006).

This shifting tide of cultural norms over the last two decades has put the growing number of older people at risk of poverty, exploitation, abuse and neglect. As stated earlier, traditionally, a majority of the elderly people in India have depended on their immediate and often inter-generational extended family systems for economic and social support. The general attitudes towards older people in India have been characterized by respect and responsibility that had reduced the degree of ageism against this population. Ageism refers to labeling of older people using stereotypes and prejudices associated with old age (Nelson, 2002). Ageism could lead to withdrawal of instrumental and emotional support to older people, and in extreme cases could result in exploitation and abuse of older adults (Nelson 2002, Jamuna 2003).

In the absence of a western-style social security and Medicare system in India, older people consistently experience steep reduction in their income soon after their retirement from work (HelpAge, 2010). A handful of state and federal government employees are guaranteed a pension, but even that is inadequate for independent living. Moreover, the social stigma associated with institutional living of older people also deters them from seeking assistance outside the family networks (Jamuna, 2003). As a result, older adults become more dependent on their children and other family members for basic sustenance (HelpAge, 2010). Literature suggests that under such circumstances social isolation, depression, abuse and exploitation thrive.

Social isolation increases post-retirement for older adults. Along with reduction in income, they often find their friendship network to have shrunk. According to recent estimations, almost 22 percent of older adults in India live alone. Social isolation has been identified as a key predictor for depression, anxiety and other bio-physical chronic illnesses such as arthritis, heart ailments and dementia among elderly population. Emotional attachment to family ties and aging in communities reduce old age stress and depression (Dong, Simon, Odwazny, & Gorbien, 2008; Nay & Garratt, 2009; Schonfeld, et al., 2010). Recent trends in India, however, suggest that incidence of institutionalization of older adults by their children and relatives is on the rise. The construction of old age homes to provide assisted living and nursing home facilities to older persons has risen 200 percent over last ten years. An increasing number of employed children are refusing to live in co-residential families in presence of their older relatives. Moreover, reductions in disposable time among the younger generation and the breaking up of the co-residential family structure have further increased the social isolation for older adults (Jamuna, 2003).

Ageism has been increasing in India along with the spread of globalization and individualization of popular culture. Literature suggests that with the increase in cost of living and consumer-driven values, older adults are more likely to be viewed as "useless" and "burdensome" (Nelson, 2002). A recent pan-Indian survey commissioned by the HelpAge International suggests that almost 30 percent of older people in India are subjected to physical abuse, and of that around 48.7 percent are abused by their family care givers (2010). However, there is no data to suggest how many of these cases get reported to law enforcement and other authorities. This is indicative of the internal tensions within care givers who find it difficult to balance the stress of dependent older relatives and social stigma associated with institutionalizing them. In India, there is no law mandated mechanism at place to anonymously report elder abuse, which further hides this matter from the public eye (Gupta & Chaudhuri, 2008; Pandya, 2008). Presence of social isolation and chronic illnesses further complicates circumstances of elder abuse (Bendix, 2009; Cavanaugh, 2010; Thurston & Modugno, 2010).

Older people with their conventional fear of new technologies have found themselves on the wrong side of the digital divide.

Proponents of globalization like Thomas Friedman (2006) in his now famous book on the growth of ICTs in India have extolled the potential of the Internet and the Telecommunication adaptation in Indian economy. However, he forgets to mention that the vast majority of Indian population, that includes almost 92 percent of older adults, has remained outside the purview of the Internet age. The great "digital divide" has created another layer of hierarchy between the ICT haves and the ICT have-nots (Singh 2010). Older people with their conventional fear of new technologies have found themselves on the wrong side of the digital divide. The sense of uselessness among older adults has further increased as they observe the younger generation communicate, work and gather information from the Internet with relative ease. Thus, the ubiquitousness of ICTs has drawn a line between the digital information literate with access and proficiency with computers and other electronic devices, and the digital information illiterate with no access and proficiency in these matters. Older adults in India largely fall in the second category (Singh 2010).

The growth of ICT is commensurate with that of globalization; however, the usage of ICT is not determined by the globalization process alone (Mukherjee, 2008; Yusuf, 2001). ICT is a tool that could cause either social exclusion or social protection for older adults. If the right policies are in place, ICTs can be harnessed for the benefit of the large number of older people in India (Rajan, 2007). The following section describes a few conceptual areas where ICT can play an important role to provide social protection to older adults.

ICTs, gerontology and social protection: Challenges and possibilities

ICT usage in India is an urban phenomenon. Almost 12 percent of users of ICT hail from urban areas whereas only 1.2 percent from the rural areas (Singh, 2010). The users of ICTs in India are mostly well educated, socio-economically upwardly mobile and younger. India's Internet and telecommunication infrastructure is still in its infancy compared to her Asia-Pacific neighbors. Despite significant progress in Internet and software development, India still falls behind in creating the basic Internet infrastructure. Outdated and costly service regulations in some key areas and elongated bureaucratic processes limit India's Internet accessibility from percolating down to the general population. The gap in the sophistication of Internet connectivity and usage are widening with a few sections of the population using state of the art technologies while a vast majority of others are left behind. Rural infrastructure faces these challenges in greater proportion.

Now the question is, under these extenuating circumstances and abysmal infrastructure, how is it possible to transfer the benefits of ICTs for

social and economic protection of older people living in both urban and rural areas? To many, this question may sound preposterous; some may find it ludicrous considering that India is still waiting for its roads, electricity and water pipes to reach all her people. In such a hierarchy of needs, Internet accessibility seems unimportant. The answer to such reactions lies in the history of ICT growth in India. The infrastructural deficiencies towards basic needs like electricity and water have been problems since India's independence in 1947. These same questions of prioritization between technological needs were relevant even in early 1990s when the Internet was first introduced in India. Had India waited for the water and electricity to reach all its regions, she would still be waiting today sans the Internet. Currently the ICT enabled services contribute 2.5 percent of the Indian GDP, which would not have been possible without policy makers deciding to move on with the new technology as soon as it was available (Bardhan, 2007).

The "moving on" approach is imperative for better facilitation of ICT enabled services for older people in India. Theoretically, the usage of ICTs could take place either through primary user or secondary user interfaces. A primary user interface is when someone accesses the Internet first-hand and draws useful information and communicates with others through email or social networking sites. A secondary interface is when the end user is not accessing or using the Internet first-hand, but using the services through a third party intervention. This is a more secondary trickled-down approach where the third party could be a grandson, a younger relative, or a volunteer from an organization working for older peoples' welfare. The secondary interface mechanism is gaining popularity in many developing and underdeveloped countries where Internet accessibility is low (Hawkins, Pearce, Skeith, Dimitruk, & Roche, 2009; Humphrey, 2007).

According to Castells (2009), communication potential for both the primary and secondary interfaces with ICTs are similar, but the secondary process might turn out to be a little time consuming for users at the beginning. Empirical literature from the western countries finds many successful domains where ICTs could play a constructive role in the social protection of older adults. One such domain is healthcare information. As India is gradually adopting a privately-insured healthcare model similar to the US, the information related to health insurance and government entitlement programs becomes important. Public health and social service organizations can create health information kiosks or information centers specifically addressing the needs of older adults. An increasing number of the older population from the middle class urban background are computer literate who can directly access such information from the websites. Health information and technology literacy and accessibility from either primary or secondary interfaces are crucial to protect healthcare for older people.

Similarly, ICTs can be used for elder abuse and exploitation prevention as well. As there is no nationwide or statewide official agency in India responsible for receiving reports of elder exploitation, the responsibility naturally falls on the civil society. Non-governmental organizations like the Dignity Foundation and HelpAge India run their private toll free helplines to receive reports of elder abuse. The penetration of 50 million mobile phones across the socio-economic divide can play an important role in enhancing reporting of elder abuse. The United Nations recently created an international task force to combat the menace of domestic violence of older adults internationally. Thus, such initiatives could bring international civil society collaboration to fund such projects.

The penetration of 50 million mobile phones across the socio-economic divide can play an important role in enhancing reporting of elder abuse.

A recent article in the magazine *Outlook India* narrated a new trend among educated retired individuals, from urban India, who use the Internet to connect with each other, meeting new friends and sharing interests such as book clubs (Bhatt, 2010). Internet connectivity can bring the world to one's doorstep and thus could facilitate social engagement from the confines of one's home. There are many debates among social researchers on effectiveness of new media to replicate face to face interactions, but there is no denying that social interaction over the Internet or telephone could bring down the sense of isolation by a few notches and could help older persons cope with the onset of chronic diseases by facilitating support groups of people with similar conditions (Asgarali Patel, 2006; Rajan, 2007).

Finally ICTs could create avenues for older adults to generate income for themselves through mentoring, conducting coaching classes online, or informing farmers about competitive markets for their crops (Narula, 2009; United Nations, 2002). There are many organizations, mostly non-profit, who have been engaged in bringing the ICT connectivity to people without a state mandated infrastructure. All of these prospective projects stated above could empower older people in years to come. The following section describes some of the cases involving ICTs in the lives of older adults in some details.

Social networking online is getting popular among older adults living in urban India.

Case examples

Case # 1: The National Institute of Social Defense (NISD), an autonomous body of the Ministry of Social Justice and Empowerment, Govt. of India has initiated a computer training program for older people. The training program concentrated on basic computer and Internet literacy and how to do some basic activities of daily living using the Internet. The training involved modules on e-ticketing, e-banking and e-Insurance and electronic photo sharing for older persons. The evaluation of the program showed that older persons can overcome the technophobia or initial inhibitions towards technology and surf the Internet fairly quickly on their own after being introduced. Evaluation data also indicated that Internet surfing comes more easily to older adults than learning Microsoft Word, for example. The program also held groups sessions to create a digital mindset among older persons so that the attitudinal barriers to computer usage is reduced (Prakash, 2008).

Case # 2: The Hindustan Lever Limited (HLL), a subsidiary of the Lever group in India has funded a computer based adaptive dialogue system through which people in the rural India could get product information and even buy a product using a simple computer interface. i-Shakti is a multi-platform, multi-tiered, decoupled software kiosk system (Patel, 2006). The computer is placed in the rural areas with very limited electronic infrastructure; it requires only an electric connection. Evaluation data from this project indicated that older people especially preferred the interface of this project and spent on an average 7.2 hours/week in front of the machine. They received prescription medication at 40% discount, information about local doctors, and information about crops (especially brinjal, in this particular example) from adjacent markets (Patel, 2006; Toyama 2005).

Case # 3: Social networking online is getting popular among older adults living in urban India. As the Internet in India has already existed more than 15 years, many older people who are not retiring have used it during their employed years. Now they are utilizing the medium for connecting with family, friends, and information. Many older adults have reported that they learned the computer and the Internet from a younger relative like a son or a grandson. A new social networking forum called Verdurez.com has been created to cater to the social networking needs of older adults of exclusively Indian origin. This particular online forum was designed with an understanding that popular generic online forums like Facebook or Orkut will give access to online discussions of older people to other generations, increasing the chances of ageism. Moreover, older adults from Indian origin share a distinct cultural trope that needs an exclusive forum to ensure secure participation. Verdurez and similar web platforms have generated large membership, leading to social inclusion of older adults who might have experienced social isolation after retirement (Bonder & Dal Bello-Haas, 2009).

Case # 4: The Agewell foundation and Dignity Foundation have begun to offer a toll free helpline to domestic violence or other kind of emotional and financial exploitation of older people (HelpAge India, 2005). These organizations are using ICTs to share their helpline data to better coordinate elder abuse reporting in India, which, unlike the United States, does not have any organization with legislative mandate to receive reports and investigate cases.

Discussion and recommendations

Many ICT projects directed towards older customers fail in India because they do not, at times, understand the need of the end-users and they often design the technology to human interface in a way that older people may find unfriendly (Patel, 2006). The above referred cases show a combination of primary and secondary interfaces of ICT use for the protection of older adults. All of the four cases have had encouraging outcome evaluation data and have been funded for continuation. The cases show how, in a myriad ways, different business and social entrepreneurs are trying to outreach the benefits of ICTs for the well-being of older adults. This is done in spite of the apparent disadvantage in Internet infrastructure and lack of computer literacy among older people.

The first case focused on computer skill development and Internet literacy training to ensure the older participants could perform certain tasks like buying tickets for the subway or checking their bank account information online (Prakash, 2008). Internet and computer literacy is the key to protect older persons from getting victimized by telemarketing and online hacking activities. This is an example of training for primary user interface. The second case had adopted a kiosk approach to engage the digitally divided rural elders with the computer and the Internet knowledge to help them locate health related services and other information at a discounted rate. This is a valiant attempt to reduce the urban-rural digital divide. The third case focused on social networking among urban older adults that could address the prob-

lem of post-retirement social isolation (Toyama, 2005; Putman, 2001). And the final case example showcased a secondary user interface where ICT had been used to improve the services to prevent and treat elder abuse for community dwelling older persons (HelpAge, 2005).

These cases show forward looking experiments are being made in India to connect older adult social protection issues with the broader ICT development. Considering that in the next thirty years older people in India are going to increase by more than 100 percent, and there is not much protection and social security available to them at large scale, such experiments with ICTs assume much significance (HelpAge, 2010).

Many encouraging efforts are being made to address the social protection issues of older adults. The usage of ICTs for this purpose is still very small compared to the scope of the problem. Thus more participation of India's private sectors, especially the software giant corporations, to invest in the computer and Internet literacy projects at a macro level is of paramount importance (Bennet, 2002). Older persons experience technological change without education and may face social alienation and a plethora of health and economic issues that are associated with it. ICT technologies can serve as a tool of inclusion in this regard. The Indian government needs to invest in rural Internet infrastructure and should create private-public partnerships to facilitate such projects. The non-governmental organizations already working in this area could provide valuable resources. Similar to the National Center for Elder Abuse in the US, Indian older persons also require the support of such an exclusive legally mandated organization to enhance protection from elder abuse. In a nutshell, the core argument of this paper is not to assert that ICT will bring a cure-all solution for the fragile social protection issue of older adults in India, but it can definitely provide a useful tool towards a possible solution.

ICT based social participation lead to positive health and mental health condition and lower negative influence from social isolation.

Conclusion

It has proven over the years that technology can act as generational leveler between the young and the old. In the United States where Internet access and use have crossed over the class and education barriers, we are witnessing encouraging signs of inter-generational mentoring programs being designed where older adults sign up for voluntary mentorship of younger school children from disadvantaged families. Experimental research studies also indicate that ICT based social participation lead to positive health and mental health condition and lower negative influence from social isolation. A large majority of older people in India, however, do not have the social and economic resources to participate in ICT based social activities similar to their western counterparts.

Hence, social organizations need to be motivated financially and socially to design and implement community based programs for older adults to get trained in computer application and access the Internet. Early signs from India show that in the next three decades, as the younger folks assume old age, incidence of Internet use among older adults are going to increase exponentially. Thus, as we discuss and meditate over the impact and design of next level of ICTs on society, we should not leave the older folks out of the equations, because if not today, tomorrow they are going to be popular users and a market for the ICT based products and services, which should be an incentive for private for-profit investment in this area. Moreover, with the proliferation of state of the art retirement homes and nursing homes to house the well-to-do older people, in the future we may see a migration of people from the developed countries to India as a popular destination to meet their long-term care needs. These homes can begin, on experimental basis, basic training of older people and their eventual induction to ICT based social environment. The opportunity cost of such investment will justify as the percentage of older people increases in our society.

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Role of Hazard Communication of Chemicals in Social Protection

Abstract

There are many accidents and diseases by chemicals, especially at worksites. Hazard information of chemicals is a basis for sound chemical management. The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) is United Nations Recommendations issued in 2003, which aims to enhance the protection of human health and the environment by providing an internationally comprehensible system for hazard communication. The GHS is the wisdom from experience, knowledge and technology in order to control chemicals. In 2009 EU implemented the GHS as CLP (Classification, Labeling and Packaging) regulations. It gave a big impact to other regions or countries, especially to those trading with EU. Now many countries are preparing to implement the GHS in their regulatory system. To share the experience, a case study of the GHS implementation in Japan is introduced in this paper.

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Introduction

There are many accidents and diseases by chemicals, especially at worksites. In 1999, at the opening of the 15th World Congress on Occupational Safety and Health (São Paulo), the Chief of the ILO's (International Labour Organization) Health and Safety programme told delegates assembled as follows (http://www.ilo.org):

"In a speech to the introductory session of the Congress, Dr. Jukka Takala, Chief of the ILO's Health and Safety Programme, pointed out that the workplace hecatomb of 1.1 million deaths exceeds the average annual deaths from road accidents (999,000), war (502,000), violence (563,000) and HIV/AIDS (312,000). Approximately one-quarter of those deaths result from exposure to hazardous substances which cause such disabling illnesses as cancer and cardiovascular, respiratory and nervous-system disorders. He warned that work-related diseases are expected to double by the year 2020 and that if improvements are not implemented now, exposures today will kill people by the year 2020. In addition, he said that by conservative estimates workers suffer approximately 250 million occupational accidents and 160 million occupational diseases each year. Deaths and injuries, he said, continue to take a particularly heavy toll in developing countries where large number of workers are concentrated in primary and extraction activities such as agriculture, logging, fishing and mining - some of the world's most hazardous industries."

One of the most important reasons for chemical accidents or diseases is a lack of hazard information of chemicals amongst workers or consumers.

Hazard communication of chemicals (GHS)

Hazard information of chemicals is a basis for sound chemical management. Without the information, nobody can take measures against hazards. On the contrary, with information, anybody can handle chemicals safely.

The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) is United Nations Recommendations issued in 2003, which aims to enhance the protection of human health and the environment by providing an internationally comprehensible system for hazard communication (http://www.unece.org).

The purposes as described in the GHS document include:

- The use of chemical products to enhance and improve life is a widespread practice worldwide. But alongside the benefits of these products, there is also the potential for adverse effects to people or the environment. As a result, a number of countries or organizations have developed laws

Category	Criteria
1	Flash point < 23°C and initial boiling point ≤ 35°C
2	Flash point < 23°C and initial boiling point > 35°C
3	Flash point ≥ 23°C and ≤ 60°C
4	Flash point > 60°C and ≤ 93°C

Table 1. Criteria for flammable liquids

	Category 1	Category 2	Category 3	Category 4
Pictogram				No pictogram
Signal word	Danger	Danger	Warning	Warning
Hazard statement	Extremely flammable liquid and vapour	Extremely flammable liquid and vapour	Flammable liquid and vapour	Combustible liquid

Table 2. Label elements for flammable liquids

or regulations over the years that require information to be prepared and transmitted to those using chemicals, through labels or safety data sheets (SDS). Given the large number of chemical products available, individual regulation for all of them is simply not possible. Provision of information gives those using chemicals the identities and hazards of these chemicals, and allows the appropriate protective measures to be implemented in the local settings.

- While these existing laws or regulations are similar in many respects, their differences are significant enough to result in different labels or SDS for the same product in different countries. Through variations in definitions of hazards, a chemical may be considered flammable in one country, but not another. Or it may be considered to cause cancer in one country, but not another. Decisions on when or how to communicate hazards on a label or SDS thus vary around the world, and companies wishing to be involved in international trade must have large staff of experts who can follow the changes in these laws and regulations and prepare different labels and SDS. In addition, given the complexity of developing and maintaining a comprehensive system for classifying and labeling chemicals, many countries have no system at all.

- Given the reality of the extensive global trade in chemicals, and the need to develop national programs to ensure their safe use, transport, and disposal, it was recognized that an internationally harmonized approach to classification and labeling would provide the foundation for such programs. Once countries have consistent and appropriate information on the chemicals they import or produce in their own countries, the infrastructure to control chemical exposures and protect people and the environment can be established in a comprehensive manner.

- Thus the reasons for setting the objective of harmonization were many. It is anticipated that, when implemented, the GHS will:

a. enhance the protection of human health and the environment by providing an internationally comprehensible system for hazard communication;

b. provide a recognized framework for countries without an existing system;

c. reduce the need for testing and evaluation of chemicals; and

d. facilitate international trade in chemicals whose hazards have been properly assessed and identified on an international basis.

The GHS includes the following elements: (a) harmonized criteria for classifying substances and mixtures according to their health, environmental and physical hazards; and (b) harmonized hazard communication elements, including requirements for labeling and safety data sheets (MSDS). The GHS applies to chemicals, which include pure substances and their dilutions and mixtures.

In the GHS, health hazards include acute toxicity, skin corrosion/irritation, serious eye damage/eye irritation, respiratory or skin sensitization, germ cell mutagenicity, carcinogenicity, reproductive toxicity, specific target organ toxicity-single exposure, specific target organ toxicity-repeated exposure and aspiration hazard; environmental hazards include hazards to the aquatic environment and hazards to the ozone layer; physical hazards include explosives, flammable gases, flammable aerosols, oxidizing gases, gases under pressure, flammable liquids, flammable solids, self-reactive substances and mixtures, pyrophoric liquids, pyrophoric solids, self-heating substances and mixtures, substances and mixtures which, in contact with water, emit flammable gases, oxidizing liquids, oxidizing solids, organic peroxides and corrosives to metals.

Classification criteria are defined for every hazard. An example of classification criteria for flammable liquid is shown in Table 1.

In the GHS, once classification is done for a chemical on hazards, label elements for the chemical are decided

automatically according to the classification results. Label elements for flammable liquids are in Table 2.

Competent authorities concerned with chemical control in each county are recommended to implement the GHS in the regulatory system.

Classification of chemicals and making labels and MSDS should be done by suppliers (manufacturers or importers) according to the domestic regulations.

The GHS is the wisdom from experience, knowledge and technology in order to control chemicals. The concept of the GHS is explained according to label elements. A typical label made according to the GHS is shown in Figure 1.

Information required on a GHS label consists of the following elements: product identifier, supplier identification, pictograms, signal word, hazard statements and precautionary statements.

Product identifier

- The name of this product or substance is “Pseudo Chemical” and consists of 99% of it. The contents are 2kg.

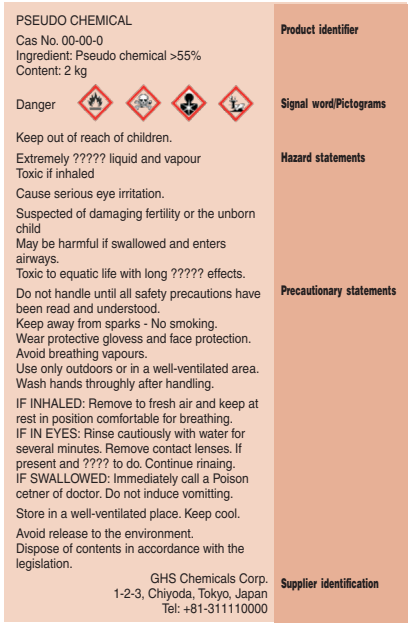

Figure 1. Example of a GHS label

- The CAS number is given as well as UN number for transport. These numbers are useful when you search for the data on this chemical.
- The chemical name would be very important information when fire is to be put out or medical treatment has to be given.

Supplier identification

- The name, address and telphone number are provided on the label.

Pictogram

There are nine pictograms for different types of hazards. These display a kind of hazard and play an important role on a label as an eye-catcher.

Four pictograms out of nine are applied to the example label.

Signal word

- A signal word indicates the relative level of severity of hazard.
- The signal words are “Danger” and “Warning”.

Pictogram	Hazard
	Explosive
	Flammable
	Causing or contributing the combustion of other materials by providinoxygen
	Being contained in a receptacle at a higher pressure
	Corrosive to the metals or to the skin, or gives serious damage to the eye
	Lethal acute toxicity
	Lower acute toxicity, Skin sensitization, Skin irritation, Eye irritation, Narcotic effect, Respiratory irritation, Hazardous to the ozone layer
	Serious target organ toxicity (including Respiratory sensitization, Genetic defects, Cancer, Damage of fertility or the unborn child etc.)
	Aquatic toxicity

Table 3. Pictograms and hazards

The World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002 encouraged countries to implement the GHS as soon as possible with a view to having the system fully operational by 2008.

- "Danger" or "Warning" is used in a label.
- "Danger" is used for the more severe hazard categories, while "Warning" is used for the less severe.
- For example, Flammable liquid Category 1 and 2 "Danger", Category 3 and 4 "Warning".
- For Acute Toxicity Category 1, 2 and 3, "Danger", Category 4 "Warning" and Category 5 none.

Hazard statements

- A hazard statement means a phrase assigned to a hazard class and category.
- For example, Flammable liquid Category 1 "Extremely flammable liquid and vapour", Category 2 "Highly flammable liquid and vapour", Category 3 "Flammable liquid and vapour" and Category 4 "Combustible liquid".
- For Acute toxicity (gas) Category 1 "Fatal if inhaled", Category 4 "Harmful if inhaled".
- Every hazard and category concerned is reflected in "Hazard Statements".

The product of the example has 6 kinds of hazards: Extremely flammable liquid and vapour; Toxic if inhaled; Causes serious eye irritation; Suspected of damaging fertility to the unborn child ; May be harmful if swallowed and enters airways; and Toxic to aquatic life with long lasting effects.

Precautionary statements

- Precautionary statements describe the measures that should be taken to minimize or prevent accidents or adverse effects.
- There are five types of precautionary statements: general, prevention, response, storage and disposal.

In the example label, precautionary statements are:

[General] Keep out of reach of children.

[Prevention] Do not handle until all safety precautions have been read and understood. Keep away from sparks – No smoking. Wear protective gloves and face protection. Avoid breathing vapours. Wash hands thoroughly after handling. Use only outdoors or in a well-ventilated area.

[Response] IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF SWALLOWED: Immediately call a POISON CETNER or doctor.

[Storage] Store in a well-ventilated place. Keep cool.

[Disposal] Avoid release to the environment. Dispose off contents in accordance with the legislation.

Concerning material safety data sheets (MSDS), minimum information is required as in Table 4.

A new GHS-based SDS can be seen by the information in the second heading "Hazard identification" from an old type MSDS. The GHS-MSDS must include "(b) GHS label elements" in Hazard identification (Table 3). Without GHS label elements in an MSDS given by a supplier, the new GHS-MSDS could be requested from the supplier.

Status of the GHS implementation

The World Summit on Sustainable Development (WSSD) held in Johannesburg 2002 encouraged countries to implement the GHS as soon as possible with a view to having the system fully operational by 2008. Some countries or regions have implemented or considered to implement the GHS.

In 2009 EU implemented the GHS as CLP (Classification, Labelling and Packaging) regulations (http://echa.europa.eu/home_en.asp). It gave a big impact to other regions or countries, especially to those trading with EU.

Now many countries are preparing to implement the GHS in their regulatory system. Relevant information on GHS implementation in 67 countries is included in the website of the United Nations Economic Commission for Europe (UNECE) (http://www.unece.org. The 67 countries and one region are: Argentina, Australia, Austria, Belgium, Bolivia, Brazil, Brunei Darussalam, Bulgaria, Cambodia, Canada, Chile, China, Colombia, Cyprus, Czech Republic, Denmark, Ecuador, Estonia, Finland, France, Gambia, Germany, Greece, Hungary, Iceland, Indonesia, Ireland, Italy, Japan, Lao People's Democratic Republic, Latvia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Malta, Mauritius, Mexico, Myanmar, Netherlands, New Zealand, Nigeria, Norway, Paraguay, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, United Kingdom, United States of America, Uruguay, Viet Nam, Zambia, European Union and European Economic Area.

Case study of GHS implementation: Japan

Existing laws and regulations related to chemicals in workplace and consumer products in Japan have been developed for risk control and regulatory systems for hazard information dissemination. The biggest issue in the implementation of the GHS is that the system for classification and labeling of hazardous chemicals apply only to

	Minimum information required	Description
1.	**Identification of the substance or mixture and of the supplier**	(a) GHS Product identifier; (b) Other means of identification; (c) Recommended use of the chemical and restrictions on use; (d) Supplier's details (including name, address, phone number etc.); (e) Emergency phone number.
2.	**Hazards identification**	(a) GHS classification of the substance/mixture and any national or regional information;
		(b) GHS label elements, including precautionary statements. (Hazard symbols may be provided as a graphical reproduction of the symbols in black and white or the name of the symbol e.g. flame, skull and crossbones); (c) Other hazards which do not result in classification (e.g. dust explosion hazard) or are not covered by the GHS.
3.	**Composition/information on ingredients**	Substance (a) Chemical identity; (b) Common name, synonyms, etc.; (c) CAS number and other unique identifiers; (d) Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance. Mixture The chemical identity and concentration or concentration ranges of all ingredients which are hazardous within the meaning of the GHS and are present above their cut-off levels. *Note: For information on ingredients, the competent authority rules for CBI take priority over the rules for product identification.*
4.	**First-aid measures**	(a) Description of necessary measures, subdivided according to the different routes of exposure, i.e. inhalation, skin and eye contact and ingestion; (b) Most important symptoms/effects, acute and delayed; (c) Indication of immediate medical attention.
5.	**Fire-fighting measures**	(a) Suitable (and unsuitable) extinguishing media; (b) Specific hazards arising from the chemical (e.g. nature of any hazardous combustion products); (c) Special protective equipment and precautions for fire-fighters.
6.	**Accidental release measures**	(a) Personal precautions, protective equipment and emergency procedures; (b) Environmental precautions; (c) Methods and materials for containment and cleaning up.
7.	**Handling and storage**	(a) Precautions for safe handling; (b) Conditions for safe storage, including any incompatibilities.
8.	**Exposure controls/personal protection**	(a) Control parameters e.g. occupational exposure limit values or biological limit values; (b) Appropriate engineering controls; (c) Individual protection measures, such as personal protective equipment.

Table 4. Minimum information for an MSDS

Table 4 (Contd...)

9.	**Physical and chemical properties**	(a) Appearance (physical state, colour etc); (b) Odour; (c) Odour threshold; (d) pH;
		(e) Melting point/freezing point; (f) Initial boiling point and boiling range; (g) Flash point; (h) Evaporation rate; (i) Flammability (solid, gas); (j) Upper/lower flammability or explosive limits; (k) Vapour pressure; (l) Vapour density; (m) Relative density; (n) Solubility(ies); (o) Partition coefficient: n-octanol/water; (p) Auto-ignition temperature; (q) Decomposition temperature; (r) Viscosity.
10.	**Stability and reactivity**	(a) Reactivity; (b) Chemical stability; (c) Possibility of hazardous reactions; (d) Conditions to avoid (e.g. static discharge, shock or vibration); (e) Incompatible materials; (f) Hazardous decomposition products.
11.	**Toxicological information**	Concise but complete and comprehensible description of the various toxicological (health) effects and the available data used to identify those effects, including: (a) information on the likely routes of exposure (inhalation, ingestion, skin and eye contact); (b) Symptoms related to the physical, chemical and toxicological characteristics; (c) Delayed and immediate effects and also chronic effects from short and long term exposure; (d) Numerical measures of toxicity (such as acute toxicity estimates).
12.	**Ecological information**	(a) Ecotoxicity (aquatic and terrestrial, where available); (b) Persistence and degradability; (c) Bioaccumulative potential; (d) Mobility in soil; (e) Other adverse effects.
13.	**Disposal considerations**	Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.
14.	**Transport information**	(a) UN number; (b) UN proper shipping name; (c) Transport hazard class(es); (d) Packing group, if applicable; (e) Environmental hazards (e.g. Marine pollutant (Yes/No)); (f) Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code); (g) Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport
15.	**Regulatory information**	Safety, health and environmental regulations specific for the product in question.
16.	**Other information**	Including information on preparation and revision of the MSDS

regulated and controlled chemicals under certain laws. The GHS has implemented partly in Industrial Safety and Health Law (ISHL) in 2005. Unlike the GHS that applies to all hazardous chemicals, ISHL requires labels based on GHS requirements for 100 regulated substances, and MSDS for 640 substances. MSDS is required by not only ISHL but also Toxic and Deleterious Substances Law and PRTR (Pollutant Release and Transfer Register) Law, approximately for 1,400 substances in total.

Among laws and regulations concerning chemical control, only ISHL requires comprehensive (physical and health) hazard information on a label for 100 substances. Article 119 of ISHL describes: "The person who violates the provisions regarding labeling shall be punished with a penal servitude not exceeding six months or with a fine not exceeding 500,000 Yen (about US$4,000)." It then becomes difficult for the government to increase the number of chemicals that has to be classified and labeled if the purpose for such will mainly be for risk control. Furthermore, the stiff penalties may dissuade policy makers in adding to this list. In the event that the law prescribes that more chemicals follow the GHS requirements, industries concerned may be hard-pressed to immediately comply because they do not have enough data and human resources to complete the classification and labeling process. This Catch-22 situation puts the Japanese society in a bind where the very law that seeks to protect human health also hinders the implementation of the GHS regarded to be even more vital in attaining protection of human health and the environment.

This selective application of the GHS becomes confusing and, at times, dangerous. For instance in the case of mixtures, content of hazard information will need to refer to those that correspond to the regulated chemical with leaving out potentially important information about the chemical that is not regulated. The end result of this classification system may be deficient at the very least or as a worse case, totally erroneous.

The concept of the "Building Block Approach" introduced in the GHS was not intended to delimit the chemicals to be classified but was aimed at providing flexibility in the implementation of GHS. The fundamental essence is to accept classification of hazards done under regulations set by different sectors for as long as these are in accordance with the GHS. In Japan, however, it can be said that the chemicals themselves are the core of the "Building Block Approach".

With consideration to the above issues, Japan needs to step up its initiatives in framing laws that will require classification and labeling of all chemicals and will confer to users of chemicals their right-to-know about hazardous substances they are exposed to.

In any case, many projects on capacity building for the GHS implementation have been done in Japan as follows:

Establishment of the inter-ministerial committee

Around the same time as UNSCEGHS was established, an inter-ministerial committee which consisted of policy makers, GHS experts and industrial representatives was organized in 2001. Its original objectives and tasks were to exchange and share information on GHS among ministries and to play a pivotal role in UNSCEGHS. Seven government offices[1] and experts from national laboratories and industries have participated in the inter-ministerial committee.

Among the significant actions taken by the inter-ministerial committee included the following:

- Japanese translation of the GHS documents;
- Information sharing among ministries with respect to the relevant domestic laws; and
- Classification of chemicals under each relevant domestic law.

Japanese translation of the GHS documents

Translating the GHS documents into Japanese was started at the very beginning of the national projects (February 2002) because the Japanese version was considered as an indispensable material for the implementation of the GHS. The inter-ministerial committee acted as an organizer for the translation of documents. The committee, recognizing at that time that the GHS would become an essential element in future chemical management systems, paid particular attention to and ensured that technical terms were harmonized in the Japanese version of the GHS documents to resolve the inconsistencies of terms used in the different laws governing chemical use in Japan. The translation was a joint effort of the multi-sectoral stakeholders that included the government agencies, chemical industry representatives, experts from academia and national/public laboratories.

The work on the Japanese translation brought an unexpected benefit. Government officers engaged in the work became more familiar with the concept of the GHS. In the mean time, they identified similarities and differences between the current Japanese law and the GHS. Through this work, gap analysis was also accomplished.

The Japanese translation of the first GHS documents except the Annexes was completed in March 2004. It took two years because of the arduous task of harmonization of technical terms

[1]Ministry of Health, Labour and Welfare (MHLW)
Ministry of Economy, Trade and Industry (METI)
Ministry of the Environment (MoE)
Ministry of Internal Affairs and Communications (MIC)
Ministry of Agriculture, Forestry and Fisheries (MAFF)
Ministries of Land Infrastructure and Transport (MLIT)
Ministry of Foreign Affairs (MOFA)

and some ambiguities included in the GHS documents. In coming up with the Japanese translation of the GHS documents, the inter-ministerial committee exerted much effort in choosing the most relevant Japanese terms and tried to be as faithful as possible to the original English text. Now the Japanese version of the 3rd revised edition of the GHS is published as a book and also available for downloading from the MHLW and MOE homepages.

Gap analysis between the GHS and current Japanese laws

Differences between the GHS and current Japanese laws were analyzed to identify gaps and issues that will impede the full implementation of GHS in Japan. Chemicals which are regulated under the current single or overlapping Japanese laws were also identified.

The gap analysis underscored the absence of laws that aim to transmit hazard information to users and handlers of chemicals. Majority of the laws and regulations concerned with chemicals were made primarily for risk management and have been limited to specific safety measures to the exclusion of hazard communication. A handful of these laws included the system for labeling but only for the listed chemicals. Furthermore, the information concerned with a hazard on the label consists of full precautionary statements, few hazard statements and no pictogram. Some signal words are required but different from GHS's.

Introduction and implementation of the GHS (Chemicals regulation law)

There are more than thirty laws or regulations concerned with classification or labeling of chemicals in Japan. ISHL was amended to introduce the GHS in 2005 and became effective from the 1st of December 2006. For the time being, other laws and regulations have not aligned its provisions to the GHS and have not signified their intent to do so.

Classification of 1,400 regulated substances

In Japan, the MSDS is required for approximately 1,400 substances. MHLW has regulated and, METI and MOE have recommended the GHS criteria for these chemicals as a joint project, aiming to help industries making labels and issuing MSDSs. The classification work was performed by experts from laboratories and the industries. The output of the project was validated by members of the inter-ministerial committee. In 2007, the inter-ministerial committee published the classification results of these substances. The public was encouraged to give its comments that could be conveniently submitted via the website. The final classification results partly amended by the comments can be seen from the website of the National Institute of Technology and Evaluation (NITE) in English (http://www.safe.nite.go.jp/english/ghs_index.html) as well as in Japanese.

The results of the projects are not compulsory, thus, allowing industries to use their own data and classify chemicals on the basis of their own judgments.

GHS classification manual and technical guidance

The development of a GHS classification manual and a technical guidance was another collaborative project of the inter-ministerial committee. These are not regulatory but reference oriented materials. The main objective is to facilitate the classification of the 1,400 chemicals within the limited time schedule, and to eliminate any discrepancies in classification among experts.

One of the unique points of the manual is that it allows the users to refer to data sources that are reliable for the classification of hazards, such as those peer-reviewed by international authorities. Furthermore, original scientific papers that principally target highly technical readers are not generally used. This feature of the manual enables industries to have ready access to references that have been rated for their quality and relevance.

The GHS classification manual and the technical guidance in English (http://www.safe.nite.go.jp/english/ghs_index.html) as well as in Japanese are also published via NITE's homepage.

GHS under the Japanese Industrial Standards (JIS)

The GHS has a big volume consisting of classification criteria, label elements and MSDS format, and furthermore is revised every two years. It is not so easy to implement the GHS as it is in laws. Given the difficulties concerning revisions of laws, reference to the Japanese Industrial Standards (JIS) will avoid the possibility of obsolescence. The JIS is a set of national standards and the responsible body in its formulation is the Japanese Industrial Standards Committee. Flexible revisions, therefore, are possible in the event of any changes made in the GHS.

JIS systems for classification criteria (JIS Z 7252 2009), label elements (JIS Z 7251 2010) MSDS format (JIS Z 7250 2010) in accordance to the GHS have been developed.

Software to classify mixtures

Most of the chemicals are mixtures and the classification of them is not so easy. The software to classify mixtures was developed in Japanese by METI. This is freely available to interested parties after signing up in the METI website *(http://www.meti.go.jp/policy/*

chemical_management/int/ghs_auto_classification_tool_ver3_download.html).

Guidance for risk-based labelling of consumer products

METI developed the draft guidance for risk-based labeling of consumer products in collaboration with stakeholders coming from the consumer groups, manufacturing sector, academia and other partners. The guidance in English *(http://www.safe.nite.go.jp/english/ghs_index.html)* as well as in Japanese is now available in the NITE website.

Miscellaneous activities for the dissemination of GHS

In order to embark on a nationwide public campaign to increase awareness on the GHS, several ministries and organizations developed a package of information, education and communication materials comprising of brochures, audiovisual presentations, and government advisories, among others.

Many training courses on chemical management are being held in Japan. Seminars on GHS and workshops focusing on chemical classification have also been conducted. Participants in these seminars and workshops, numbering more than three thousand, were safety hygienists, chemical risk managers, those in charge of labeling of consumer products, policy makers, staff in labour standards inspection offices and scientists.

In addition, several research and development projects, parallel with global GHS activities, have been completed. The following are some examples; assessment of public awareness of the GHS, research to improve information communication for the blind people, training needs assessment to obtain skills and knowledge necessary to classify chemical hazards.

Educational materials to better understand the classification criteria and labeling system of the GHS have been developed and available free on the following web-site. *(http://jonai.medwel.cst.nihon-u.ac.jp/?cid=8&lang=second)*

Strategies to implement GHS for Asia-Pacific

It is deplorable that many accidents and diseases caused by chemicals still occur every year. The GHS has a great potential as a preventative strategy in advanced chemical management like Control Banding *(http://www.ilo.org)* as well as a good tool for hazard information dissemination. “Right-To-Know” or “Obligation to inform” concept has not been developed for chemical control in Japan in part because of the age-old rule–based control laws. The same thing seems to be applicable to other Asian countries. This point should be recognized when the GHS is implemented in the regulatory system.

Chemical control will be more complicated due to the increasing number of chemicals and the diversity of their use. Chemical control must be done and this responsibility must be shared by every user. Unless people are informed, it is difficult for them to make the proper decisions. Informing the public needs to become part of our government and social fabric. Law makers should establish a legal framework aimed at informing workers and consumers about chemical hazards.

Concerning the GHS elements, especially pictograms and hazard statements seem to be unfamiliar to workers and consumers in Asia. Education must be very important to make the GHS effective in chemical control.

The GHS in the future

The GHS is the basis of chemical control, since hazard classification and/or information dissemination of it is directly related to countermeasures in regulations as well as handling.

Other international programmes on chemicals are in the process of synchronizing with the GHS, for example:

- UNRTDG *(http://www.unece.org/trans/danger/danger.htm),*
- WHO pesticides classification *(http://www.who.int/ipcs/publications/pesticides_hazard_2009.pdf),*
- Montreal protocol (GHS Chapter 4.2 Hazardous to the ozone layer),
- ILO control banding *(http://www.ilo.org/legacy/english/protection/safework/ctrl_banding/index.htm).*

References

Globally harmonized system of classification and labeling of chemicals (GHS), third revised edition

http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html (GHS document, Third revised edition)

http://www.oecd.org/ehs/Class/ (OECD classification)

http://echa.europa.eu/home_en.asp (European Chemicals Agency)

http://www.ilo.org/global/About_the_ILO/Media_and_public_information/Press_releases/lang-en/index.htm

http://www.unitar.org/cwm/ghs (UNITAR (Unite Nations Institute for Training and Research) GHS)

http://www.osha.gov/SLTC/hazardcommunications/global.html (USA OSHA)

http://www.ilo.org/legacy/english/protection/safework/ctrl_banding/index.htm

http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html

http://www.unece.org/trans/danger/public/ghs/implementation_e.html

Jonai H. (2008) Implementation of the GHS in Japan. Ind Health, 46, 443-447 ❑

Current status on information technology at NHIC, Republic of Korea

Abstract

The objective of informatization at the National Health Insurance Corporation (NHIC) is to exercise leadership in information technology among public institutions by strengthening the capability of our IT organization, to operate the most efficient institution based on convergence with the latest information technology, to fulfill customer satisfaction by building an information system providing convenience in civil affairs, and to provide scientific data on the Corporations policies, thereby becoming the very best among IT organizations. Also, we seek to fulfill the ideal of an e-Corporation by means of revamping our IT organization, applying the latest information technologies, preparing a scientific foundation for our policies and strengthening activities to protect informational assets.

Since the integration of the Corporation in October 1998, the information system faced many challenges including civil complaints and dissatisfaction among the organization's employees in the process of implementing the first and second integrations and the construction of a next-generation system. Benefiting from the lessons gained through these past experiences, we now face the demand to continually acquire new knowledge and conduct research to respond to the needs of operating the Corporation's large-scale information system and the rapidly changing information environment.

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168-9, Yeomni-dong, Mapo-gu
Post-code: 121-479
Seoul, Republic of Korea

Directions for the Implementation of Informatization

- Exercising IT leadership among public institutions by strengthening the capacity of the IT organization – Revamping reforms implemented through a small but powerful IT organization
- Operating institutions with maximal efficiency by converging with the latest IT technology – Applying the newest information technology in all processes including inherent work responsibilities as well as institutional operations
- Building a convenient information system for channeling civil complaints to fulfill customer satisfaction – Operating a speedy and accurate channel for client communications
- Using IT to provide scientific data regarding NHIC policies – Preparing the scientific basis for policy decisions by means of the systematic management and maintenance of wide-ranging IT information

Progress of informatization at NHIC

Past achievements in informatization at NHIC

The Information Management Office, which is responsible for the informatization of the Corporation, was installed in October 1998, when the Korea Medical Insurance Corporation was launched through the integration of the Medical Insurance Corporation for Civil Servants and Private School Faculty and 227 Regional Medical Insurance Organizations. In July 2000, 140 workplace medical insurance organizations and the Korea Medical Insurance Corporation were merged to form a single insurance system, resulting in the expansion of the scale of the organization.

Main work responsibilities

The Information Management Office operates the information communication office of the Corporation and performs work for the development and operation of specific information systems. The main work responsibilities of the Office includes a variety of projects related to the informatization of the Corporation, including informatization planning, the implementation of new systems and technologies, standardization of information and office work automation, the management of systems and communication networks, management of infrastructural software and databases, support for informational operations, the protection of personal information and information pertaining to the information and technology infrastructure, the development of internet and intranet systems, the generation of DW data and computerization development for DW, computerization development, maintenance

and repair for each work sector, etc. (Tables 1 & 2). To facilitate work processing in the operative departments, the Office fosters specialists through continual education for computer specialization, cultivates talent of a global caliber through overseas training, and rears talented future IT leaders through forms for communication and acquisition of a variety of knowledge and through research presentations.

Major project outcomes and achievements

1st integration of the information system (1998-1999)

For 18 months following the announcement of the tentative plan for the integration of medical insurance, the Office pursued the objective of "minimizing investment costs" by means of maximally utilizing the small-scale computing equipment of regional organizations. The transfer of data from the computing data of regional a sociations dispersed all across the country using a standardization mode and the implementation of changes in the development language (COBOL→ Power Builder) and the development environment (2tier→3tier), etc. were completed by September, 1998 and thus the 1st integrated information system was launched into operation in October, 1998.

Personnel input	Category
P/G Development & Operation (79%)	Information Planning
Information Planning (10%)	System & D/B Management
Network Management (5%)	Network Management
System & D/B Management (6%)	P/G Development & Operation

Table 1. Current status of personnel input in specific sectors

Category		Main contents	Required knowledge
Information planning		• Reinforcement of the information system and the computational environment • Establishing strategies and plans for informatization • Analysis of trends in informatization and implementation of new technologies • Standardization of information and quality management • Establishing and managing policies for information communication security	• Management information strategy • Cost management studies • Statistics • Laws and regulations pertaining to information protection
System management		• D/B operation, back-up, server tuning; managing current status, addressing malfunctions, managing accounts, etc. • Operating communication networks and processing malfunctions • Operating the system and on-line systems	• System & D/B management • System & internet management • Wired and wireless communication studies
Development & Operation	Groupware management	Operation and development of groupware	• Management of personnel payroll information • Knowledge for development and operation
	Statistics development	D/W development, maintenance, repair and operation	• Specific work systems • Knowledge pertaining to D/W development
	Other areas of information development and operation	Development and operation for specific work sections	• C/S development and operational knowledge • Web development and operational knowledge • Systems for specific work sectors

Table 2. Essential work requirements for specific sectors

Plans were made for a next-generation information system which will raise the level of informatization utilizing the newest information and communications technologies and strengthen internal capabilities.

The information system was stabilized after overcoming the confusion arising from instability in the initial stages of the integration, and thereafter the Corporation resolved problems such as overlapping listing of qualifications or omissions of clients arising from deficiencies in the system of interlinkage and the sharing of computerized data. This resulted in integration benefits across all areas of service which had been unimaginable under corporatism, such as comprehensive linkage of data with external institutions and the strengthening of the post-management system for billing the care benefit costs of care institutions.

However, due to the continued use of the small servers for the information system, with the database also being operated by 227 individual servers, the number of servers requiring management and the frequent transfer of data to individual servers resulted in a rapid increase in the quantity of work demanded from the information system. Moreover, large-scale computing tasks such as the calculation of insurance premiums lead to delays in the processing of certain services by the Corporation and the impossibility of processing data in linkage with regional organizations inevitably resulted in lowered quality of service for our clients.

In response, the construction of an integrated information system through which health insurance services may be provided at any branch office in the country without distinction between regional or employer sponsored insurance beneficiaries emerged as a key project, and beginning in February, 1999 the National Health Insurance Task Force Team came to propose a system for processing civil complaints regardless of the affiliation (region, employment, civil services and schools).

2nd integration of the information system (2000-2001)

Based on the results of commissioned research submitted by the consulting specialization firm Ernst & Young reviewing the method for building an integrated computing network for integrating work processing, the master plan for the construction of the integrated computing network was established. Following procedures including two sessions of advisory meetings on informatization and computer audits and the governmental approval of the project, the project was confirmed and the contractor was selected in July 1999, thus initiating the project. Due to the shortage of time for the development of the information system, the construction was to take place in stages. The first stage was implemented with a triadic structure (region, workplace, civil services and schools) and in July 2000, the second stage constructed the newly unified integrated information with plans to launch the system into full operation in March 2001. Based upon the experiences during the 1st integration in 1998, test operations were conducted for three months and problems were reviewed and addressed through a meticulous preparatory process, and thus the truly integrated information system was successfully put into full operation in March 2001, bringing revolutionary developments in equipment, system composition, services, and processing of civil requests.

Construction of next-generation information system (2006-present)

Seeking to improve efficiency and boost competitiveness through enhancements in the organization of the information system, the method of dispersed processing via regional headquarters was converted to a centralized processing method centered in the headquarters, enabling us to eliminate inefficiencies in the work process and provide optimized services. Moreover, plans were made for a next-generation information system which will raise the level of informatization utilizing the newest information and communications technologies and strengthen internal capabilities to enable the provision of a variety of information and to prepare the foundation for knowledge-based management such as Enterprise Information System (EIS) and Knowledge Management System (KMS). The scope of the project was set to include internal work, development of services addressing civil requests and providing information support, installation and rearrangement of computing equipment, construction of facilities, transfer of data, and training for users and operators. The construction of the next-generation information system was conducted over 15 months from September 1, 2005 to November 20, 2006. For this project, a contract was signed in August 2005 with the LG CNS- Samsung SDS consortium (29.93 billion Won). The analysis and system design took place from September 2005 to January 2006, and the introduction and installation of computing equipment for the infrastructure was completed between March and April of 2006. Program development and testing was conducted from February to June 2006 (5,729 templates for applications, 2,449 templates for DW, 90 units of EIS, KMS 104 types of KMS), and conversion for each stage of the

testing was implemented across five sessions. Also, training in the utilization of the system for users and computer operators was completed between September and December of 2006. The system was opened on October 30, 2006, and to ensure stabilization in each stage the Information Management Office and the contractor (121 persons) conducted first work jointly (1st stage) followed by the contractor (88 persons) providing support for stabilization in the early stages (2nd stage) and then providing concentrated support in key services (3rd stage).

The elements of the project implemented in specific areas were as follows: for the application system, the project included the simplification and automation of the procedures for processing interlinked data on charges for regional insurance premiums, the construction of an integrated database on health examinations and redevelopment reflecting the increased flexibility in the database structure, the change of the method of billing examination fees from the billing using diskettes to billing via internet, etc. The project also encompassed the development of programs reflecting centralization and improvements to inefficiencies in services, the enhancement of the D/W system for strengthening analysis and forecasting functions, the construction of the KMS and EIS systems for sharing knowledge and information and for reinforcing the function of providing management information, and the introduction of SSO and DRM to strengthen the information protection system and authorization management.

Improvements in infrastructural equipment included the introduction or expansion of a total of 35 units including 9 superdomes, the introduction of 12 new types including the disk array DMX 3000, etc., 2 new models of back-up devices, the new application of the SAN switch and the memory disk, etc., 19 types of new purchases such as Oracle, etc., extensions of switches and modules, the building of a mobile communication base, the construction of facilities for the information communication office in the central headquarters and 6 regional headquarters, etc.

As regards the transfer of data, the 17.2 billion entries of computer data (D/B) in 6 regional headquarters were integrated into the central headquarters where we were able to conduct analysis of erroneous data and implement maintenance on 5.9 billion data entries. 26 individuals in the Corporation's project implementation task force and 705.4 M/M personnel from the contractor were input for the construction of the next-generation information system.

Through the construction of the next-generation information system, NHIC achieved a variety of effects and service improvements. These included the enhancement of efficiency and heightening of competitiveness by means of improving the organization of the information system and improvements in efficiency obtained through the elimination of unnecessary processing procedures. We also secured system flexibility and increased its utilization by operating a unified database and were enabled to provide a variety of information through the internet and operate a one-stop service achieved through the integrated management of the records on civil requests.

Outcome of project implementation

Improvement of work efficiency

Reflecting consideration for the characteristics of the work involved, the integrated information system constructed and implemented measures for the headquarters focusing on the service of payments for care benefit

Through the construction of the next-generation information system, NHIC achieved a variety of effects and service improvements.

costs and pertaining to organizational operations, the reimbursement of health examination fees, statistical services and detailed statements of individual benefits. Meanwhile for the six regional headquarters, the system was distributed to focus on qualification services and on the billing and collection of insurance premiums to promote stability in services. By operating medium and large computing devices with distributed construction, we prepared the foundation for processing and managing large-scale computing data efficiently and on-time, from the basis of which we were able to begin implementing the computerization of all services in earnest.

The first priority was to simplify the services in processing civil complaints and requests, and for this purpose we constructed a system for computerized linkage of data pertaining to changes among residents with the Ministry of Government Administration and Home Affairs as well as linkage to information from other relevant institutions, such as the consolidated income data from the National Tax Service, the taxation data of the local government authorities, data on the payment of care benefit costs from the Review Agency, the data on departures and entries of citizens from the Immigration Office, etc. This provided the infrastructure for radically reducing the time consumed for processing civil complaints and requests by branch offices in the field. This information system environment enabled us to prevent omissions of qualifications and to track the records of insurance premium payments. A wide variety of methods for payment

was developed, including electronic billing and payment via the internet giro site, payment through CD/ATM (automated cash withdrawal and deposit machines) at financial institutions, automated payment by applying for automated transfers from accounts, payment through a virtual account, etc. Moreover, the automated response system (ARS) operated in linkage with the computerized database was launched, further improving convenience for civil services.

Also, we constructed a data warehouse capable of analyzing large quantities of data and forecasting which enabled us to generate a variety of information required for decision making, and the intra-mural communication network was revamped by means of the electronic payment system using intranet within the Corporation and the installation of communities, etc.

Constructing a cyber work system

The information linkage system has been constructed to enable users to conveniently process tasks through the internet portal service for the four major social insurances (http://www.4insure.or.kr). Through this information linkage center, established among the four major social insurances, it was made possible to easily process the majority of civil affairs services related to social insurance such as registration, modification, withdrawal, viewing of insurance information, etc., at this site.

Within the Corporation, we currently operate a groupware system including e-payment, management of e-documents, e-mail, e-bulletin boards, linkage of personal information within the organization, and decision making information, etc. Externally, the Corporation has constructed a cyber information system for civil affairs using the internet, developing and converting the health insurance EDI system, which had previously been exclusively for VAN usage, into a web-based internet EDI. The Corporation's homepage allows users to view and zoom-in on the basic information of insured members, verify insurance premium payments, and review at a glance the details of treatments received at hospitals and the results of health examinations as well as applying for a variety of civil affairs requests, etc. Thus the homepage performs the majority of civil affairs services and provides required information, and the scope of the services provided has been steadily expanded to provide customer satisfaction in information services.

> To secure the information security for an information system of such a large scale, the Corporation operates a highly developed security system addressing four areas.

Operation of a stabilized information system

The Corporation's information system operates in linkage with the control system monitoring the operational status of the system and extending even to subsidiary devices such as the uninterruptible power units and immediately reports malfunction situations to the personnel in charge. When malfunctioning situations are notified on the large-scale electric sign board in the control room, workers in the machinery room, specialized engineers, or maintenance and repair companies are contacted to speedily implement restorations. In particular, information regarding the amount of loads in specific communication lines, the quantity of work processed by the servers of regional headquarters, and status reports on whether the process is consuming excessive amounts of the system resources (memory, etc.), is monitored round the clock in linkage with the control system, enabling us to manage and administer the nationwide on-line network to provide support for public services with ease.

To secure the information security for an information system of such a

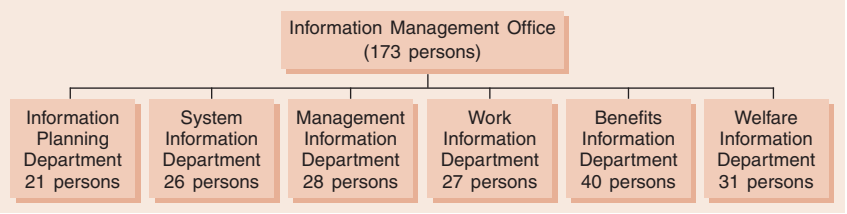

Fig. 1. Information Organization System (Number of personnel)

(Unit: Equipment Unit)

Category	Computerization equipment		Subsidiary equipment		
			UPS	Thermo-hygrostats	Halon packages
Total		383	22	38	7
Headquarters	Subtotal	322	15	26	1
	Large Servers	81			
	Small and Medium Servers	241			
Regional Headquarters	Subtotal	61	7	12	6
	Large Servers	9			
	Small and Medium Servers	52			

Table 3. Current status of the information system
Note: Large Server: SUN - E10k or above, HP - RP8400 or above, IBM - P590 or above

large scale, the Corporation operates a highly developed security system addressing four areas. This rigorous security system is composed of the firewall and encoding, the certification program, the buffer zone, etc. and protects the information system from external infiltration. However, to ensure the stability of the information system in the face of various internal and external security threats, using the rapidly developing current hacking techniques and to safely guard the personal information of our citizens, in 2003 we have introduced ESM which integrates the management of all information protection systems and have thereby equipped ourselves to operate an even more effective and systematic information security system.

The current status of informatization at the NHIC is presented in Figure 1 and Tables 3-6.

Category	Units	Notes
Headquarters	45	Qualifications, insurance premiums, etc.

Table 4. Management database

Category		Quantity
Objects	Tables	102,059 types
	Indices	162,163types
Data Entries	435.589 billion entries	
DB Storage Capacity (Amount of usage)	101,438GB	

Table 5. Objects and data entries

Name of task	Number of templates	Notes
Total	53,035	
C/S	28,600	Qualifications, insurance premiums, benefits, health examination and improvement, integrated civil complaints, etc.
Web	23,087	Internet civil complaints, customer service center, groupware, care for the elderly, etc.
D/W	1348	Statistics including D/W, etc.

Table 6. Current status of available programs (As of April 20, 2010)

Operative departments and communication

Fostering a culture of communication among new and old employees

Mentoring dedicated to new employees: Staff members within the Office with a position of Level 2 or higher and executive members of other offices are designated as mentors and actively take part in sponsoring activities. Conference sessions are held one or more times a week providing a forum for presenting visions for the workplace and achannel of communication with the principal staff, as well as the opportunity for identifying problems and issues regarding the Corporation's IT and brainstorming for solutions.

Strengthening the foundation for future-oriented creative activities: We provide opportunities for participating in seminars and IT exhibitions within Republic of Korea and also actively participate in externally commissioned projects. Also, we are actively engaged in pioneering new frontiers for Corporation IT, such as IP TV, the field of medical informatization, data mining, etc. and conduct field experiences in the branch offices and regional headquarters for the purpose of identifying user demands through on-site experience and applying these findings to IT.

Programs for cultivating specialized human resources

We conduct advanced training in IT development (CS, web development) in accordance with the work characteristics of new employees, and also operate classes for IT license qualifications such as the Professional Engineer of Information Management, Data Architecture Professionals, CISA Certified Information Systems Auditor), SIS (Specialist for Information Security), etc. to cultivate IT professionals.

Opportunities for partnership and communication

We hold "open discussion" sessions in which we discuss major issues with the operative departments to strengthen communication and to seek measures for improving the work process to root out cash accidents as well as to reinforce partnership.

We also conduct presentation sessions for case studies in work improvement, in which outstanding instances of improvements, case studies in system development and construction, as well as new technologies acquired during the implementation of IT services are presented.

To collect suggestions for the informatization from executive employees

who have had circulating work experience in both IT and operative services, an Informatization Development Council consisting of 20 executive employees of level 2 or higher who are engaged in operative work and who have had employment experience within the Information Management Office, conducts discussions regarding measures for strengthening the informatization capability of the Information Management Office, deliberating a variety of informatization project plans and issues regarding implementation, and other current issues related to informatization.

Strengthening the infrastructure for enhancing IT capability

The implementation objectives include:

- Dynamic organizational management based on the virtual cycle among personnel and capability enhancement; and
- Securing motivation by providing various incentives and creating a supportive environment.

Research activities for strengthening capacity: We have organized an IT Leaders' Forum which operates to acquire IT professional licenses and strengthen information capability through the study of new IT technologies and thereby find areas for applying this knowledge in the work of the Corporation.

To assist the comprehension of employees regarding new IT technologies and products, we administer public competitions and presentations for new technology companies on our Corporation homepage. For the purpose of identifying the newest trends in technology both internally and externally, we participate in IT seminars and offer presentations of outstanding IT cases from the Corporations outside the organization to improve the Corporation's image as well as conducting educational sessions with invited guest IT specialists.

Henceforth the Corporation will pursue a green growth policy in accordance with the Climate Convention and develop eco-friendly technology including green IT to achieve informatization in an environmentally conscious manner.

Motivating development through external IT experiences: We seek to identify employees who have contributed to the development of informatization and boost morale, thereby fostering a workplace environment in which employees are recognized for their work accomplishments. We also select outstanding information personnel and conduct advanced IT tours to revitalize the organization and enhance capability. Opportunities for overseas training in the fields of basic science such as IT technology and statistics, etc. and dispatch training at outstanding specialized companies are also provided to promote research in the basic science fields of IT technology and statistics, etc. and to acquire information on the on-site practices of specialized companies and to acquire superior technology.

- General Research Program (1 year): Advanced countries in the English-speaking regions
- Dispatch Training: H/W (IBM Korea, HP Korea), DBMS (Oracle Korea, Sybase Korea) etc.

To acquire specialized informatization technology for medical systems and hospitals and clinics, and to cultivate specialists to support data analysis for post-management of benefits, we also conduct work exchange with the Ilsan Hospital.

Educational support for enhancing IT capacity: Education in office automation teaching skills such Excel, PowerPoint, Photoshop, etc. is offered to desiring employees in order to enhance basic work capability and training in PC operation for personnel in charge of computing in branch offices. To become the public institution noted for the best utilization of DW, the Office also conducts education for enhancing skills in DW utilization.

NHIC informatization plan

Since the integration of the Corporation in October 1998, the information system also faced many challenges and vicissitudes such as civil complaints and dissatisfaction among the organization's employees in the process of implementing the first and second integrati ons and the construction of a next-generation system. Benefiting from the lessons gained through these past experiences, we now face the demand to continually acquire new knowledge and conduct research to respond to the needs of operating the Corporation's large-scale information system and the rapidly changing information environment.

Henceforth the Corporation will pursue a green growth policy in accordance with the Climate Convention and develop eco-friendly technology including green IT to achieve informatization in an environmentally conscious manner. The Corporation will continue to develop into a public institution recognized for the best IT utilization exercising advanced leadership, by means of expanding mobile services for smart phones, etc. and realizing a mobile Corporation by constructing a mobile base and applying this technology to the conduct of our business, creating a smart system serving as the base of an advanced IT model for public institutions, and strengthening client-oriented services by fulfilling client-centered services within and without the organization and achieving informatization for enhancing communication. ❑

TECH EVENTS

May 7-9
Bangkok
Thailand

International Conference on Food Engineering and Biotechnology (ICFEB 2011)
Contact: APCBEES Editor
Asia-Pacific Chemical, Biological & Environmental Engineering Society (APCBEES)
E-mail: icfeb@cbees.org; Web: http://www.icfeb.org

May 10-14
Manila
The Philippines

6th Asia Pacific Biotechnology Congress
Contact: Philippine Society for Microbiology, Inc (PSM)
Room C-11, EC Arcade, Demarses Compound
College, Laguna 4031
Tel: (+6349) 536-5794; E-mail: philsocmicro@yahoo.com
Web: http://www.psm.org.ph

May 11-12
Beijing
China

ChinaBio® Partnering Forum 2011
Contact: Monica Cheng ChinaBio® LLC
Tel: +86 21 5137 0751 ext 27
E-mail: mcheng@chinabiollc.com

Jun 4-5
Kuala Lumpur
Malaysia

International Conference on Environment and Industrial Innovation (ICEII 2011)
Contact: APCBEES Editor, Conferences Secretary
Asia-Pacific Chemical, Biological & Environmental Engineering Society (APCBEES)
E-mail: iceii@cbees.org; Web: http://www.iceii.org

Jun 6-9
Kota Kinabalu
Malaysia

International Conference on Nanotechnology-Research and Commercialisation (ICONT 2011)
Contact: Dr Saharudin Hamzah
E-mail: fauziahg@sirim.my;
Web: http://icont2011.sirim.my

Jun 7-9
Shanghai
China

China International Nano Exhibition & New Technology and Industrialization Forum 2011
Contact: Dr. Jim Wang
Room 304, Hall 9, No.1623, Yunchuan road, Baoshan District, Shanghai, China
Tel: +86-21-56436721; Fax: +86-21-56436721
E-mail: jim.wang@nanotechchina.org
Web: http://www.nanotechchina.org

Jun 15-17
Jakarta
Indonesia

Indorenergy 2011
Contact: PT. Napindo Media Ashatama
Jl. Kelapa Sawit XIV Blok M1 No.10
Kompleks Billy & Moon, Pondok Kelapa
Jakarta 13450, Indonesia
Tel: +62 21 865 0962; Fax: +62 21 865 0963
E-mail: info@napindo.com

Jun 16-18
Colombo
Sri Lanka

RE Power Sri Lanka 2011
Contact: CEMS Bangladesh
House # 119, Unit- A3
Road-1, Banani Block-F, Dhaka-1213, Bangladesh
Tel: +880 2 8812713; Fax: +880 2 9894573
E-mail: cems@cemsonline.com

Jun 24-26
Kuala Lumpur
Malaysia

International Renewable Energy & Environment Conference 2011
Contact: World Academy of Research and Publication
3, Jalan Pulai Perdana 2/6, Taman Sri Pulai Perdana
81110, Johor Baharu, Johor, Malaysia
Tel: 0060 127 887 169; Fax: 0060 755 998 10
E-mail: contact@warponline.org
Web: http://warponline.org

Jun 27-29
Kuala Lumpur
Malaysia

Clean Energy Technology 2011
Contact: Dr. JeyrajSelvaraj
E-mail: umpedacac@gmail.com
Web: http://www.seeforum.net

Jun 28-30
Bangkok
Thailand

Clean Power Asia Conference and Expo 2011
Contact: Synergy Conferences and Exhibitions
Asia-Pacific Pte. Ltd.
78 Shenton Way #20-03, Singapore 079120
Tel: +65 6590 3970; Fax: +65 6223 9198
E-mail: info@synergy-events.asia
Web: http://www.cleanpower-asia.com

Jul 24-30
Shanghai
China

The Nineteenth Annual International Conference on composites/Nano engineering (ICCE-19)
Contact: Professor David Hui (Conference Chair)
Department of Mechanical Engineering
University of New Orleans, New Orleans, LA 70148
Tel: (504) 280 6652; Fax: (504) 280 6192
E-mail: dhui@uno.edu
Web: http://www.icce-nano.org

Jul 28-30
Kandy
Sri Lanka

Solar Asia 2011
Contact: Prof. M.A.K.L. Dissanayake
Organizing Committee Solar Asia 2011
Institute of Fundamental Studies (IFS)
Hantana Road, Kandy, Sri Lanka
Tel: +94 81 2232002; Fax: +94 81 2232131
E-mail: solarasia2011@ifs.ac.lk
Web: http://www.solarasia2011.ifs.ac.lk

Sep 12-14
Kuala Lumpur
Malaysia

International Conference on Creativity and Innovation for Sustainable Development 2011
Contact: Department of General Studies,
Kulliyyah of Islamic Revealed Knowledge and Human Sciences, International Islamic University Malaysia,
P.O. Box 10, 50728 Kuala Lumpur, Malaysia
Tel: +60-3-61965576; Fax: +60-3-61965504
E-mails: rkgs2011@gmail.com; azrulshah@iium.edu.my
Web: http://www3.iium.edu.my

Sep 21-24
Jakarta
Indonesia

Renewable Energy Indonesia 2011
Contact: P.T. Pamerindo Buana Abadi
Deutsche Bank Building, 13th Floor Jl. Imam Bonjol No. 80, Jakarta 10310, Indonesia
Tel: +62 (021) 316 2001;
Fax: +62 (021) 316 1981
E-mail: info@pamerindo.com

Oct 15-18
Pune
India

2nd International Conference on Stem Cells and Cancer (ICSCC-2011)
Contact: Prof. Dr. Sheo Mohan Singh
School of Biotechnology
International Institute of Information Technology
P-14 Rajiv Gandhi Infotech Park,
Hinjewadi Phase I,
Pune 411 057, India.
Tel: +91 20 22933441
Telefax: +91 20 22934592
E-mail: icscc2011@gmail.com

Oct 28-30
Shanghai
China

The International Conference on Sustainable Development (CSD) 2011
Contact: The Secretary of CET 2011
Tel: +86-186 2773 7240
E-mail: cet@engii.org, csd@engii.org
Web: http://www.engii.org/cet2011/

Dec 1-3
Kochi
India

Nanotech India 2011
Contact: AG Nanotech Impex India Pvt.Ltd
65/2852, Kurian Tower, Banerji Road
Cochin-682 018, Kerala, India.
Tel: +91 484 2395553; Fax: +91 484 2398553
Mob: +91 94471 39855, +91 9447139555
E-mail: info@nanotechindia.in
Web: http://www.nanotechindia.in

Dec 6-8
Kuala Lumpur
Malaysia

The 3rd International Congress on Green process Engineering (GPE 2011 Malaysia)
Contact: Conference Secretariat
INPT-SAIC "GPE 2011"
6 allée Emile Monso BP 34038
31029 Toulouse Cedex 4, France
Tel: +33 (0)5 34 32 31 12
Fax: +33 (0)5 34 32 31 13
E-mail: gpe2011@inp-toulouse.fr
Web: http://www.gpe2011.com

TECH VENTURES & OPPORTUNITIES

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Web-based Technology Resources of A P C T T

Technology Opportunities
www.technology4.sme.net

Business Information
www.businesss-asia.net

Innovation Systems
www.nis.apctt.org

Biotechnology Network
www.binasia.net

Traditional Medicine Network
www.apctt-tm.net

Latest Innovations & News
www.apctt.org

Grow your business

Get the right accounting system

http://www.businesssense.com.ph

Henry Ong, Business Sense Inc., The Philippines

An accounting system is vital to running your business, so having a working knowledge is crucial.

An accounting system consists of the methods and records that identify your transactions and provides a basis for accounting for your assets. It is vital to managing your business.

In designing an accounting system, it's important that you consider starting a chart of accounts—a classified listing of all accounts in use and a guide on what account to use for certain transactions—and a manual of accounting policies, which dictates how your transactions are to be treated and recorded.

Basic components

Your accounting system should also include a general ledger, a book summarizing all transactions made for each account and whose data come from the general journal or book of original entry. The general journal follows the double-entry system where, to ensure accountability, a corresponding entry is made in another account for every transaction recorded in one account.

If, for instance, you have sold some merchandise to a customer on account, you record such transaction as a debit in your accounts receivable and a credit in your sales account to indicate a sales transaction. Though you have yet to receive payment, the records establish a claim from the customer, and once you receive payment, you record it as a debit to cash in the bank and a credit to your accounts receivable.

The basis for recording transactions in the general journal is the source documents, and they include invoices, payment vouchers, bank checks, official receipts, purchase orders, billings, and other documents that you use to transact business with suppliers and customers.

The other components of your accounting system are your accounts receivable and accounts payable—the major accounts in the general ledger that let you track your receivables and payables and are normally supported by sub-ledgers—books that summarize your transactions from each supplier or customer and allow you to manage your cash flows.

Two accounting systems

There are only two types of accounting systems: the manual, where you do your book-keeping manually, and which is adequate for you if you're running a small business—and the computerized, which is ideal if you handle large sales volumes and complex financial transactions.

The computerized accounting system comes in three types: semi-manual, where you do accounting using spreadsheets instead of journals and ledgers; online, where the application is delivered to you over the Internet; and accounting using off-the-shelf software with templates to ease your workload.

You may buy locally customized and unbranded accounting software for P25,000 or less and branded software—such as Quickbooks—for up to P117,000. But when deciding to shift from manual to computerized accounting using off-the-shelf software, consider its cost and benefits and the time and training you require so you may use the software properly.

The advantages and disadvantages of using accounting software:

PROS

- You get few mathematical errors. With machines doing the computation, you virtually eliminate all errors unless you key in the wrong data.
- You get better record-keeping. Good accounting software ensures a clear audit trail for all your recorded transactions.
- You get efficiency. With your software automatically generating reports, you get to know quickly how your business is doing.
- You get value for money. Buying accounting software represents a one-time cost for you, but you save money by preventing unnecessary audits and reporting backlogs.

CONS

- You may not need it. This is true particularly if you're operating a small business with few complex transactions.
- It may be costly to maintain. The software's price aside, you may have to update it every year and paying your book-keeper to train to use it.
- It may not be possible to customize it. In fact, many off-the-shelf accounting software don't allow customization, and this limits your options particularly on design.

Source: http://www.entrepreneur.com.ph

Setting up a business in Thailand

What you need to know?

http://www.boi.go.th

Board of Investment, Thailand

The following is an overview of establishing a business in Thailand.

As in most countries, there are three kinds of business organizations in Thailand: Sole proprietorships, partnerships, and limited companies. The most popular form of business organization among foreign investors is the private limited company.

Private limited companies require a minimum of three promoters and must file a memorandum of association, convene a statutory meeting, register the company, and obtain a company income tax identity card. They must also follow accounting procedures specified in the Civil and Commercial code, the Revenue Code and the Accounts Act. A balance sheet must be prepared once a year and filed with the Department of Revenue and Commercial Registration. In addition, companies are required to withhold income tax from the salary of all regular employees.

The Ministry of Industry administers The Factory Act, which governs factory construction and operation, as well as safety and pollution-control requirements. In some cases, factories do not require licenses, in other instances the requirement is simply to notify officials in advance of start-up, and in some cases licenses are required prior to commencing operations. Licenses are valid for five years, and are renewable.

Thailand recognizes three kinds of intellectual property rights: patents, trademarks, and copyrights.

The Patent Act protects both inventions and product designs and pharmaceuticals. The Copyright Act protects literary, artistic works, and performance rights, by making it unlawful to reproduce or publish such works without the owner's permission. The Trademark Act governs registration of, and provides protection for, trademarks.

The Alien Occupation Law requires all foreigners working in Thailand to obtain a Work Permit prior to starting work in the Kingdom, except when they are applying under the Investment Promotion Law, in which case they have 30 days to apply.

Non-Immigrant visas provide the holder with eligibility to apply for a work permit, and allow the holder to work while the work permit application is being considered.

Through the links to the BOI website you can learn more about topics such as industrial licensing, taxation, patents and trademarks, and the cost of doing business in Thailand. You can also find out about the status of Thai infrastructure, including facilities such as airports, deep sea ports, and highways, and the availability of power, water and telecommunications.

In addition, there is a link to the BOI website to a page of statistics, which displays tables of utility, communications and labor costs, tax rates, information about air, sea, rail and road freight pricing, and information about availability and cost of land within industrial estates. Other charts and tables provide costs of establishing and running an office in Bangkok, and the results of a survey of expatriate living costs in Bangkok.

The web-page also contains information about industrial production of selected products in Thailand, tables breaking down Thai imports and exports by product and a table displaying interest rate movements for the past 5 years.

By the time you have finished visiting all these pages, you will have a complete picture about the business climate in Thailand.

Global Trade-Related Technical Assistance Database

The "Global Trade-Related Technical Assistance Database (GTAD)" is a portal for exchange and sharing of information between partner agencies on the future execution of trade-related technical assistance (TRTA) and capacity-building (CB) which are core elements in the multilateral trading system (MTS). The GTAD is an interactive tool, which takes into account national and regional projects, as well as training courses of a global nature. The GTAD is forward looking and the period of coverage starts in January 2010. Currently it is foreseen that data be reported by multilateral and regional agencies. The database includes a search engine, which enables the extraction of information through different parameters, such as beneficiary country or by one of the 20 trade categories, etc.

For more information, contact:

World Trade Organization, rue de Lausanne 154, CH-1211 Geneva 21, Switzerland
E-mail: trta.admin@wto.org • Web: http://gtad.wto.org

Protecting pharmaceutical intellectual property rights in China

http://www.kingandwood.com

Mia Qu and Bessie Ye, King & Wood, China

To many foreign companies, China remains attractive as the world's largest potential market for pharmaceutical products. As such products rely heavily on the protection of intellectual property rights, it is essential for foreign companies in this field to adopt a combination of IP protection methods to formulate a strategy for their products in China. To this end, China has established a relatively comprehensive legal system in relation to IPR protection where intellectual assets are protected by way of patents, trademarks, copyrights, and trade secrets.

Patenting drug product inventions

In China, patents can be granted to inventions, utility models, and industrial designs. Invention patents are available to both product and method inventions. The term for invention patents is 20 years and the term for utility model and design patents is 10 years, from the filing date of patent application. The primary criteria for granting a patent are novelty, inventiveness, and industrial applicability. A finished drug or biological product (such as a vaccine and an antibiotic), typically consisting of active ingredients is generally eligible for product invention patents. However, active ingredients in a drug are also eligible for separate product patents. The invention patent for a finished drug must be defined in terms of usage. In other words, the applicant must clearly state in the application the diagnostic or therapeutic application of the drug.

The examiner will usually examine the ingredients of a finished product and their contents when determining the novelty of the product. In general, a finished product is considered novel if its active ingredients are novel. The standards for the inventiveness and industrial applicability of a finished product are not high. In general, a new drug will satisfy the inventiveness requirement as long as a new drug delivers beneficial effects which are not commonly seen in the existing treatments.

Advantages and disadvantages

A product patent for a drug entitles the patentee the exclusive right to manufacture, market, and sell the drug. Any other party manufacturing or marketing the same product, regardless of an identical method being used for production or not, will be regarded infringing upon the patent holder's rights.

As a new drug is subject to a long clearance process before it can be marketed, the European Union, the United States and Japan have extended the patent term for drugs. However, China has yet to establish an extended term for pharmaceutical patents which shortens the time of protection compared to other jurisdictions. In addition, the 2008 Amendments to the PRC Patent Law ("2008 Patent Law"), which came into force on October 1, 2009, also specifically provides an infringement exemption for generic drug manufacturers similar to the "Bolar exception" in the United States, namely, "manufacturing, using or importing patented drugs or medical devices solely for the purpose of acquiring information necessary for obtaining administrative approval, and manufacturing or importing patented drugs or medical devices for an enterprise for the purpose of seeking administrative approval, shall not constitute patent infringement." This enables a generic drug manufacturer to embark upon the preparation for manufacturing of a patented drug well before the patent expires and to be ready to compete with the patent holder immediately after the patent expires.

Administrative protection

In addition to patent protection commonly accepted around the world, China also offers a special administrative protection system for drugs. The Chinese pharmaceutical administrative authorities (SFDA and its local branches) provide administrative protection to pharmaceutical companies by granting licenses and permits, which gives these companies certain exclusive rights.

China promulgated the PRC Patent Law ("Patent Law") in 1984. However, the Patent Law did not provide patent protection for drugs until it was amended for the first time in 1993. Before 1993, drugs were primarily protected by administrative measures. After patent protection was established upon the revision of the Patent Law in 1993, some administrative protection measures remained in force in addition to patent protection for pharmaceuticals. Until then, administrative protection for drugs covered new drugs, traditional Chinese medicines, foreign-related drugs, and protection during the trial period.

Source: http://www.chinalawinsight.com

Thailand's trade competition act

Application and pitfalls

http://www.tillekeandgibbins.com

David Duncan, Tilleke & Gibbins, Thailand

The Trade Competition Act (TCA), enacted in 1999, applies to all enterprises and business activities in Thailand, with certain enumerated exceptions, such as state enterprises, agricultural and cooperative groups, and government agencies. If you are a business operator in Thailand the TCA is relevant to how you do business.

The TCA regulates abuse of dominance, anticompetitive agreements, unfair trade practices, and interference with consumer purchases from foreign suppliers. Upon the eventual passage of a Ministerial Notification setting review thresholds, the TCA would also allow for the review of mergers by the Trade Competition Commission (TCC). This article will focus primarily on three areas of concern for commercial entities: abuse of dominance, anticompetitive agreements, and unfair trade practices.

Market dominance

It is often complex to determine market dominance under the TCA, largely because it is necessary to define the particular market at issue. A market can be defined broadly or narrowly, with differing results in terms of apparent market dominance. By a 2007 Notification, the TCC defined market dominance as having greater than 50% market share in the previous year or being one of the top three producers with a combined market share of over 75% in the previous year and, in either case, having at least one billion baht in turnover. However, the Notification provides relief for those with market shares of less than 10%, and turnover of less than one billion baht.

Business operators should consider whether they have market dominance in any particular market. If a merger is contemplated, it is also important to consider this question with respect to the potential merger partner as well as the merged entity. Note that the law does not make market dominance illegal, rather it imposes additional obligations on those business operators who have market dominance.

Abuse of dominance

Among other actions, a market-dominant business operator is prohibited from: (1) unreasonably setting or maintaining purchasing or selling prices; (2) unreasonably imposing certain restrictions on other business operators with whom it does business; (3) suspending, reducing or restricting services, production, purchases, distribution, deliveries, or importation without justifiable reasons; (4) destroying or causing damage to goods in order to reduce the quantity below market demand; and (5) interfering in the business operations of others without justifiable reasons. Although these are significant and broad restrictions, it is important to note that most are phrased in terms of taking actions either unreasonably or without justifiable reasons.

Anticompetitive agreements

It is not only those with market dominance who need to concern themselves with the TCA. Regardless of market dominance, all businesses governed by the TCA are prohibited from contracting with another business operator to form a monopoly or to otherwise reduce or restrict competition.

The TCA describes a number of examples of agreements that would be considered to form a monopoly or otherwise reduce or restrict competition. These include agreements that would: (1) set sale prices or restrict sale volumes; (2) set buying prices or restrict purchase volume; (3) provide for market dominance or control; or (4) provide for rigging bids. Other examples include agreements that would (5) restrict distribution by geographic area or by customer lists; (6) restrict customer purchases by geographic area or vendor lists; (7) restrict manufacturing, purchasing, or distribution, such that quantity would fall below market demand; (8) reduce quality in certain ways; (9) appoint exclusive distributors; or (10) set conditions or procedures in connection with purchase or distribution to provide for uniform or agreed practices.

In considering whether a particular agreement is against the law and depending upon the particular offence, the TCC may apply a Rule of Reason analysis, where the TCC will consider the agreement and its effect on the market, or the Per Se concept, where the TCC will only consider the agreement itself. In certain circumstances, a business may apply for and be granted advance permission from the TCC to enter into certain categories of otherwise restricted agreements.

Unfair trade practices

The TCA also contains a sort of catch-all provision. Specifically, it provides that business operators are forbidden from

carrying out any acts that are not free and fair competition and have the effect of destroying, impairing, obstructing, impeding, or restricting other business operators, preventing others from entering business, or causing them to go out of business. The TCC has also provided some compliance guidelines for wholesale and retail businesses. However, it is important to realize that this section applies to other types of businesses, as well.

Risk

Businesses should heed all applicable provisions of the TCA, as violations may result in civil litigation. Those who allege injury, including business competitors, may bring suit against an alleged transgressor. The TCA also provides some capacity for the Consumer Protection Commission to take action on behalf of consumers as well as for consumer groups to take actions on behalf of their members.

In addition, a primary function of the TCC is to receive complaints about potential violations of the TCA. Since the TCA was enacted in 1999, there have been approximately 76 complaints, with the number of complaints varying from year to year. Of the complaints that have arisen so far, approximately half arose from unfair trade practices, while the remainder split approximately evenly between abuse of dominance and anticompetitive agreements. If a complaint is filed, the TCC may investigate and order the errant company to undertake remedial action. If a violator does not follow the TCC's order, the case may be referred to a Public Prosecutor.

From time to time, public discourse turns to revamping the TCA. This has again arisen in the context of building the ASEAN Economic Community, as moves are made to harmonize and develop each member state's competition law. Even if such reforms do not come to pass for some time, the current act contains a number of compliance requirements, to which business operators should give their careful attention.

On-line tools from World Intellectual Property Organization

The World Intellectual Property Organization (WIPO) has launched two on-line tools to assist and facilitate in filing international trademark applications and brand searches:

On-line tool to assist in filing international trademark applications

The on-line tool - the Madrid System Goods & Services Manager (G&S Manager) - will help trademark applicants in compiling the list of goods and services that must be submitted when filing an international application under the Madrid System for the International Registration of Marks. The G&S Manager, which can be accessed through the WIPO GOLD portal, gives access to thousands of standard terms classified in accordance with the 9th edition of the International Classification of Goods and Services for the Purposes of the Registration of Marks (Nice Classification). Applicants using the G&S Manager can select the terms that best describe the goods and services relating to the mark.

Users of the Madrid system must ensure that they provide the correct description and classification of the goods and services for which the mark will be used. By selecting terms from the G&S Manager, applicants can be confident that no irregularity notice will be issued with respect to the classification or indication of those goods and services.

The G&S Manager is available in the three working languages of the Madrid system, namely English, French and Spanish, and gives access to some 30,000 terms in English and their equivalents in French and Spanish. A Russian interface of the G&S Manager is also available on the WIPO website. This Russian interface gives access to some 16,000 terms that have been translated into Russian by the Federal Institute of Industrial Property (FIPS) of the Federal Service for Intellectual Property, Patents and Trademarks of the Russian Federation (ROSPATENT). Using this interface, a Russian-speaking applicant can compose a list of goods and services in Russian and then have the list translated automatically into any of the Madrid system working languages (English, French or Spanish), before finalizing and submitting an international application to WIPO. Other language versions of the G&S Manager are currently under preparation in cooperation with the trademark offices of other Madrid Union members.

On-line tool to facilitate brand searches

A new on-line tool launched by WIPO on March 8, 2011, will make it easier to search over 640,000 records relating to internationally protected trademarks, appellations of origin and armorial bearings, flags and other state emblems as well as the names, abbreviations and emblems of intergovernmental organizations. The Global Brand Database allows free of charge, simultaneous brand-related searches across multiple collections. At present, the Global Brand Database search interface allows users to access three WIPO databases – international trademarks registered under the Madrid system for the international registration of marks; appellations of origin registered under the Lisbon system for the international registration of appellations of origin; and armorial bearings, flags and other state emblems as well as the names, abbreviations and emblems of intergovernmental organizations protected under Article 6ter of the Paris Convention for the Protection of Industrial Property – by means of one simple, user-friendly screen.

The Global Brand Database builds on existing search resources related to brands by providing a one-stop shop for searching multiple sources. A novelty is the addition of an advanced function that allows searching for fuzzy and phonetic terms. The service will be integrated into WIPO GOLD, which provides quick and easy on-line access to a broad collection of searchable IP data and tools relating to, for example, technology, brands, designs, statistics, WIPO standards, and international classification systems.

For further information, contact:

Media Relations Section, World Intellectual Property Organization
Tel: (+41 22) - 338 81 61 or 338 95 47 • Fax: (+41 22) - 338 82 80 • Web: http://www.wipo.int

Venture capital fund raising process in india

http://www.metalogosindia.com

Neeraj Jain, Metalogos, India

Once your company has decided to explore the venture capital funding route, it is very important for your company to follow the appropriate process to raise funds. In India, the typical venture capital fund raising process involves the following steps:

1. Identifying the right investment banker – The company should decide to work with an Investment Banking firm (IB) who offers the following skill set:
   a. Very good understanding of venture capital business
   b. Good understanding of company's industry and business
   c. Ability to tell a good and true story about the company
   d. Experience of dealing with the VCs
   e. Good network in the VC community
2. Preparation of Investment Memorandum and Financial Model: Once the company has finalized the investment banking firm, then the company and the investment bank work together to prepare the Investment Memorandum (IM) and a Financial Model (FM). A good IM captures the company's business in such a manner that it addresses most of the investor's key questions and helps the investor make his mind about the company. A Financial Model captures various business variables like revenue drivers, cost drivers, capital expenditure etc. in a Microsoft Excel file and projects the company revenues, profitability, cash flows and fund requirements for next 5 to 7 years.
3. Short listing and approaching the venture capital funds: The next step is to short list the investors whom the investment banker will approach on company's behalf. While short-listing the investors, it should be kept in mind that the short listed investors should be comfortable with the company's industry, stage of business (seed stage, early stage, growth stage, pre-IPO etc.) and the company's fund requirements.
4. Meeting the Venture Capital Funds: The investment banker approaches the venture capital funds and starts making presentation to them. The purpose of these presentations to get the first meeting between the promoters of the company and the investors. In the follow-up meetings, the company tries to convince the investors about the investment. Once the investors are convinced then they issue a Term Sheet.
5. Signing the Term Sheet: A Term Sheet (TS), as the name implies, covers the key terms of the investment. Two of the most important terms in the TS are the valuation of the company (price) and the transaction structure. There are a number of other important terms related to investor's exit, board memberships etc, which are also covered in the Term Sheet. Once there is an agreement on all the terms, a non-binding Term Sheet is signed between the company and the investors.
6. Due Diligence by the Investors: After the Term Sheet, investors conduct a due diligence process on the company. Generally investor's due diligence process focuses on the following aspects of the company and its expansion plans:
   a. Financial
   b. Business
   c. Technological
7. Signing the shareholder's agreements and funds transfer – Once the investors are satisfied with the outcome of the due diligence process, they issue a Shareholder's Agreement (SHA). SHA covers all the terms of the Term Sheet and, in addition, it has a number of other important terms and conditions regarding dispute resolution, non-compete, lock-in, share transfer process etc. Generally lawyers from the company's side and the investor's side also get involved in this process. Once there is an agreement, all the shareholders of the company and the investors sign the SHA and investor transfers funds to the company.

Source: http://wowfinance.wordpress.com

What due diligence is carried out by high profile investors?

http://www.indiape.com

Sanjeev Bhalla, India PE, India

Private equity firms and foreign institutional investors attract a lot of admiration. Of late, several big boys from the institutional world have suffered heavy losses in their multi-million dollar investments.

A relatively obscure firm, Money Matters Financial Services, is now a household name in India, for all the wrong reasons. Reports of its involvement in bribing senior officials of public sector banks and institutions, for facilitating big-ticket loans to property developers, has raised many eyebrows. But what still remains a mystery in this saga is how this firm, with questionable pedigree, managed to attract a stupendous Rs. 445 crore from renowned institutional investors, just one month before its chairman, Rajesh Sharma, was under CBI investigation for brokering deals through political connections. Four FIIs – Morgan Stanley, Wellington, Fidelity and GMO – put in as much as 60% of the funds into the firm through a qualified institutional placement (QIP) in late October.

After recent developments surrounding the firm, these renowned institutions have seen massive erosion in their investment, with the stock price of Money Matters Financial Services plunging 46% from Rs. 787 in late October to Rs. 425 today. It leaves one wondering what due diligence was carried out by these high profile investors. But this is not a one-off hiccup; several leading private equity players have been finding themselves at the wrong end of the bargain recently. The aura of infallibility surrounding these firms has taken quite a knock as a result.

Several leading PE firms have recently cashed out of their investments, booking substantial losses in the process. Two years ago, New Silk's investment in high-profile 9X media group crashed and burned. The most recent instances are the exits of Warburg Pincus and ChrysCapital from auto components manufacturer Amtek India. Warburg Pincus recently sold over half of its 7.45% stake in the company taking an estimated 63% hit on its portfolio. This was followed closely by the exit of ChrysCapital from its entire 8.17% stake in the company, which is estimated to have put it in the red by up to 20%. Another PE firm, Citigroup Venture Capital International (CVCI), carved out an 11% loss when it cashed almost 7% of its 10.44% stake in Jindal Drilling recently.

It is unusual for PE firms to report such heavy losses, when they are known to make multi-fold gains from their investments in small, growing companies. They are usually known to march in with oodles of cash, pick up gigantic stakes in growing businesses, often work with the management to improve performance and almost always, exit at a massive profit. The multi-billion dollar deals inked by these high-profile firms make the headlines for the whopping amounts invested, as also for the fabulous returns generated on those investments.

This has even led to an assumption that PE investments can rarely go wrong, that their ideas always work out in the end. For, PE firms are supposed to be ideally equipped for stock-picking as they are armed to the teeth with expert knowledge of companies, sectors and markets. They are supposed to be highly selective and undertake detailed research, before plonking big amounts of money into companies that have great potential. They make bigger, more concentrated and longer-term bets on companies than any other kind of investor.

History is filled with glorious tales of big-ticket profits made by PE firms. ChrysCapital's entry and exit from Suzlon and Shriram Finance at huge profits were the envy of the PE community some years ago. Recently ChrysCapital reportedly made a blockbuster exit from software giant Infosys at a phenomenal profit of almost 130%.

So what went wrong with the recent exits by some of the leading players in this field? Warburg Pincus is to be blamed for making the purchase at an inappropriate time–it bought the bulk of its stake in the fourth quarter of 2007, which was near the market peak. ChrysCapital's investment in around mid-2008 also was not exactly a perfect time to enter the stock. CVCI suffered a similar fate. However, Warburg Pincus also made a terrible bet on Moser Baer. This was one stock about which the market was always sceptical. Its accounting was seen as unreliable, especially since CDs (compact discs) were hardly a high-margin business. Very few FIIs seriously bought this stock. Warburg Pincus was alone in keeping the faith for a very long time, which turned out to be misplaced.

This only proves that even the most seasoned experts are just as prone to making wrong judgements as anybody else. Things don't always work out as desired for professionals too.

How to raise your company's innovation quotient (IQ)

http://www.mindbloom.net, http://www.copycat-innovation.com

Yew Kam Keong, Copycat Innovation, Australia

Many people confuse creativity with innovation. Creativity is the ability to bring forth new ideas. Innovation is the transformation of selected ideas into improved processes, marketable goods and services. It is the conversion of ideas into profits that is the essence of innovation. Creativity or the power of idea creation is simply the starting point. This brings us to the key point – it is innovation, not creativity that ultimately matters.

What is Innovation Quotient?

There are many creative companies with high C.Q. (Creativity Quotients), the measurement of average number of ideas generated per employee. The problem is that many of these high C.Q. companies suffer from low I.Q. (Innovation Quotient). I.Q. is the measurement of the percentage of ideas that can evolve into tangible applications that bring about improved performance and better profits.

Any company can raise its I.Q.

Any company can raise its I.Q. What then is standing in the way of companies that fail to innovate?

In many cases, it is the tried-and-trusted formula that brought them past successes could become the greatest enemy of innovation. This is because businesses with a winning formula are understandably hesitant to change. Over time, every business model and every strategy goes stale. Indeed, the lifespan of successful business strategies has been rapidly declining in this era of fast technological changes and intensive competition. Recognizing and acknowledging this fact is the first step towards raising your corporate I.Q.

Principles of innovation

According to Margaret J. Wheatley, a creativity consultant and a professor of management innovation means relying on everyone's creativity based on her belief that organizations are living systems rather than machines. She outlines six principles of the human dimension for innovation.

1. Meaningful engagement

If we want people to be innovative, we must discover what is important to them, and we must engage them in meaningful issues. The simplest way to discover what's meaningful is to notice what people talk about and where they spend their energy. Put ideas, proposals, and issues on the table as experiments to see what's meaningful to people rather than as recommendations for what should be meaningful to them. No two people see the world exactly the same way.

2. Encourage diversity

By encouraging diversity in an organization, innovative solutions are being created all the time since different people do things differently. There is a high probability that the innovation that the company needs is already being practiced somewhere in that system. Failure to encourage unique and diverse ways of doing things will destroy your company's capacity to adapt.

3. Involve anyone who is interested

Involve anyone who is going to be affected by change to contribute ideas to bring about a better organization. Those who are not invited may rebel, or worse still, sabotage the entire process.

4. People will always surprise us

Listening to colleagues -- their diverse interpretations, their stories, what they find meaningful in their work -- always transforms relationships. The act of listening to each other always brings people closer together.

6. Rely on human goodness

People want to help. People want to contribute. Everyone wants to feel creative and hopeful again. As leaders, as neighbors, as colleagues, it is time to turn to one another, to engage in the intentional search for human goodness.

Conclusion

Innovation comes more from the heart than the head. Companies must involve all its people and tap into their creative energies that takes into account the human dimension of encouraging diversity, sharing a sense of purpose and recognizing that each person is talented uniquelyl. When people are part of a cause and not just a cog in the wheel, your corporate I.Q. (Innovation Quotient) will zoom.

For more information, contact: E-mail: mindunzipper@gmail.com

Source:http://cdp.mscmalaysia.my

When ideas are capital in creative businesses

http://www.creativethailand.org

Apisit Laistrooglai, Thailand Creative & Design Center (TCDC), Thailand

For over a decade, the term SMEs (Small and Medium Entrepreneurs) had become a significant phenomenon driving Thai business. Many organisations, governmental and private ones alike, came up with several strategies to equip these SMEs for the business battles. Now, ten years later, SMEs need not only to differentiate themselves from those warriors in the traditional price war, but also to strive to survive in the current of Creative Economy. Such economic system stimulates interaction between business and creativity, and results in various outstanding products and services which are both highly competitive and can bring about significant amount of profit.

What is the competitive advantage of creative economy?

Key production capital of the creative economy is idea, which is different from that of the traditional one. This also reduces conditions or limitations of traditional manufacturing process and creates new business opportunities in the following ways:

1. **Idea is significant production capital of products and services:** How you think brings about difference. So, idea competition has no limitation. The cost is the ability to think rationally and is based on knowledge. So, creative entrepreneurs don't have to do a big industrial business.
2. **Production process doesn't have time limitation:** In the production lines of traditional industry, production labour hours are 8-10/day. But in the production where creativity is a major factor, time isn't a limitation anymore. Modern technology helps boost up productivity for manufacturers. For instance, online product selling, or working for online communities, allows manufacturers to work and follow-up progresses all the time.
3. **Production process reduces limitations in terms of resources and capital:** creative industry doesn't need a large area for factories, massive labour, or even high capacity production machines. It needs only technology which is appropriate for ensuring standard and quality of the products and services.
4. **Production process reduces limitations in terms of knowledge:** Production process of creative business is to build and enhance the knowledge network, not to imitate. So, it's the combination of a wide variety of knowledge in order to create new products and services.

"Creativity" – endless capital reserve of SMEs

The term SMEs reflects obvious competitive advantage. Small businesses are highly flexible. Their thinking and manufacturing processes can be changed fast to respond to the situation. This advantage helps you start over in time. And with the reserve of "creativity", you can start over in an outstanding and different way.

But creativity in the economy perspective needs to have originality, social value – to be needed or to have demand for it, and process and solution – to have rationale as well as thinking and manufacturing process.

Exploring new lifestyles and understanding original culture

What you may need to realise is that the terms 'new market' or 'modern consumers' don't only capture those in new rich countries or new generations of people. The terms also mean those markets or people whose concept or value shift from those traditional lifestyles has come about. That exactly is what you need to carefully analyse and observe.

So, in the world of SME entrepreneurs, new markets are not anything far and modern consumers are not that hard to understand. The world of SMEs has perfect overlapping area with the world of creative economy where history and culture is significant capital for enhancement and development of products and services. The two worlds co-exist in a strong and supportive way. This is sufficient for you to grow and strive to live in the future with competitive advantage.

And based upon the strong foundation, we also need to add up the missing spaces by linking knowledge, cultural basis, skills, or technology in order to make them a perfect combination for the future. Also, we must not be tired with researching, and experimenting or testing new knowledge from sources both near and far, in order to make our products and services outstanding and have higher quality than others'.

Criteria for a sustainable business model

http://sustainabilityadvantage.com

Bob Willard, Sustainabilityadvantage.com, Canada

It is one thing to critically assess how today's dominant business model is not sustainable; it is another thing to design one that is. As sustainability champions, we need to have a positive vision of the pot of gold at end of the sustainability rainbow. We need to be able to respond to a "put up or shut up" challenge with a description of a sustainable business model that is better for the environment, society, and the company.

When guiding companies on their 5-stage sustainability journeys, we need to know where we are going—what a sustainable company in Stage 4 or 5 looks like. It behooves us to have a blueprint for a sustainable business, one that is simple enough that it is a handy guide to knowing when we've arrived at our destination. Here are five characteristics of a sustainable, cyclical, borrow-use-return business paradigm, overlaid on the 3-nested-dependencies model of a sustainable society.

1. Radical resource productivity

Companies stretch natural resources by increasing productivity for a given amount of a resource by factors of 5, 10, or even 100. They work to eliminate dependencies on materials and energy from resources dug from the earth's crust. This commitment addresses issues of overharvesting and depletion of natural capital.

2. Investment in natural capital

Companies restore, maintain, and expand ecosystems to sustain society and business needs.

3. Ecological redesign

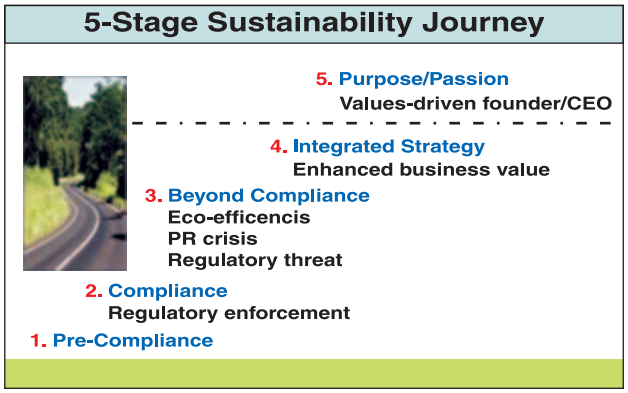
Companies use closed-loop production systems in which waste from production and end-of-life disposal is treated as a resource and reused, rather than sent to a landfill.

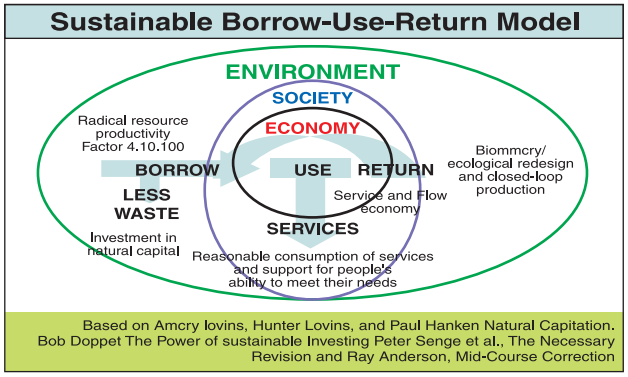
4. Service and flow economy

Companies replace their goods with services. They lease products and their solutions instead of selling them. When the product becomes obsolete or is unable to produce its service, the company takes it back and recycles or remanufactures the returned product.

5. Responsible consumption

The company promotes responsible consumption by educating consumers so they can make more informed decisions about their purchases based on products' location of origin, the labor conditions under which they were made, their ingredients, their packaging, their life-cycle ecological footprints, and other sustainability-related criteria.





The sustainable borrow-use-return model enables companies to perform as described by William Donough and Michael Braungart in Cradle to Cradle.

- "Buildings that, like trees, produce more energy than they consume and purify their own waste water.
- "Factories that produce effluents that are drinking water.
- "Products that, when their useful life is over, do not become useless waste but can be tossed onto the ground to decompose and become food for plants and animals and nutrients for the soil; or, alternately, they can return to industrial cycles to supply high-quality raw materials for new products.
- "Billions, even trillions, of dollars' worth of materials accrued for human and natural purposes each year.
- "Transportation that improve the quality of life while delivering goods and services.
- "A world of abundance, not one of limits, pollution, and waste."

Green factory

SME exit strategy in green growth era

http://www.apec-smeic.org

APEC SME Innovation Center, Republic of Korea

The The Republic of Korean government is strongly promoting a low-carbon, green growth policy that minimizes use of resources and environmental pollution while utilizing it as an engine for economic growth.

Green growth is a new paradigm that was suggested to maximize environmental and economic synergy effects by responding to energy and environmental problems, the increasing mandatory climate change burden, high oil prices, exploitation of environmental markets, etc., with economic policies. The green paradigm transition era requires SME manufacturing process innovation that coincides with low-carbon green growth, i.e., 'Green Factory' management.

'Green Factory' means a low-carbon economic era facility equipped with eco-friendly design and manufacturing processes that efficiently improve greenhouse gas emission, environmental pollution and energy consumption. In other words, 'Green Factory' is green-izing process, green-izing workplace and green-izing product.

First, green-ization improves the manufacturing process efficiently and reduces consumption of energy and resources. Second, it also pursues high efficiency in all areas of the manufacturing workplace, installing solar cells on the factory roof, replacing motors with 3-phase induction motors and fluorescent lamps with LED lamps, etc. Third, it improves product design in a way that uses less energy when producing and using the products, develops products with a longer life span, and facilitates recycling of after-use waste materials.

SMEs, viewed from a green growth perspective, despite being small in scale, are equipped with a centralized power in the organizational structure. So, manager influence is greater and employee participation in low-carbon, green growth is stronger compared with large enterprises, assuming that communication is smooth.

As for the SMEs that have organic relationships with large enterprises, their active utilization of SCM would facilitate their acquisition of new technologies as well as introduction and establishment of a green management system. Furthermore, as several such companies are located in a particular area (industrial complex, etc.), cooperaton and strategic alliances between enterprises becomes easier.

Also from an environmental perspective, if their small corporate scale and comparatively simple production facilities are taken into account and the wastes minimization programs practiced as in the United States, U.K. and Netherlands, SMEs can more easily pursue technological alternatives and secure profit-creating opportunities. Furthermore, in the green growth era, SMEs should actively respond to changes in competition conditions.

Due to the characteristics of the green industry, first, dynamic SMEs should pursue a rapid market advance. Second, SMEs should exert utmost effort for development of core technologies, narrow the technological gap with advanced countries and accelerate localization of parts. Third, SMEs must secure overseas source technologies and patents and resolve technical barriers.

Fourth, SMEs should secure and nurture excellent manpower through industry-academia-research institute cooperation in line with the green growth era when development of excellent manpower is more important than ever before. Fifth, SMEs have to advance into the world, which has already grown into a large, single market, to secure new outlets for their products and services.

Unlike other growth paradigms, low-carbon, green growth will not develop by itself in response to the market. Therefore, the government should support diverse policies, including designation and cultivation of green-specialized research institutes, cultivation of green technology design centers, supply and technology development of green facilities and equipment, support for global green partnerships, support for green technology information development and exchanges and cultivation of green production and environmental manpower.

To grow green SMEs equipped with global competitiveness, the government should also establish long-term goals and, in parallel, continuously implement complementary revisions to processes to achieve the goals.

In order for SMEs to develop the necessary competitiveness in the paradigm transition, they must be made aware of the potential and benefits of low-carbon, green growth and management in a low-carbon economy, i.e., 'Green Factory' management.

Technology Offers

HUNGARY

Polarization Mode Dispersion (PMD) Emulator

Our partner, a South-African University has developed a novel technology to emulate first and second order polarization mode dispersion (PMD) in optical fiber networks and other applications. They would like to discuss this novel technology with potential partners who already sell emulators and other related equipment and who may be interested in adding value to their existing portfolio of products using this technology.

Area of Application
Optical network systems. Typical customers: Fiber optic telecommunications industry, specifically suppliers of line testing equipment.

Advantages
Main advantages: i. Performs PMD emulation under controlled environments; ii. Second order PMD of differential group delay behavior can be set as either stochastic or otherwise, depending on the emulator configuration; and iii. Designed from a combination of optical delay line, a polarization controller and a fixed number of concatenated PMF segments.

Development Status
Commercial prototype

Legal Protection
Patent

Transfer Terms
Subcontracting, Technology licensing, investment

Contact
Laser Consult Ltd.
H-6701 PO Box 1191, Szeged, Hungary
Tel: +36-62/562-782; Fax: +36-62/562-783
E-mail: laserconsult@t-online.hu

INDIA

Device for Tracking and Cleaning Solar Energy Plants

An innovative method in sun tracking and cleaning developed by Gayatri Energy may pave the way for reducing the tracking cost of solar energy plants employing single axis and dual axis trackers and also the maintenance cost related to cleaning. The economies of scale are proportional to the size of the plant. Solar panels and reflectors requiring sun tracking are being tracked with huge number of electrical equipments and complex gearboxes.

Area of Application
Renewable energy generation

Advantages
1. Low cost; 2. Innovative Technology; 3. Enhanced Solar Energy Harnessing; 4. Reduces pay-back period; 5. Self-Cleaning system; 6. Can clean 100 MW plant in 20 mins; and 7. Suitable for domestic as well as industrial scale consumers

Environmental Aspects
Cleaner production, Energy efficiency

Development Status
Design

Legal Protection
Patent

Transfer Terms
Technology licensing

Contact
Gayatri Energy, BD-95, Janakpuri
New Delhi-110058, India
Tel: +91-9899329476
E-mail: gayatrirenewables@gmail.com

INDIA

MYRSOFT III Bread Improver

This is a unique blend of Polyglycerol Ester of vegetable fatty acids, PGMR (Polyglycerol Mono Recinoleate) and Recinolic acid

Areas of Application
Bakery products (biscuit, bread, cookies, pattis, rusks, etc.); Confectionery products (ice cream, cakes, pastries, etc.); Sweet meat products (barfi, khaja, peda, etc.); Fried products bhujia, gathis, samosa, etc.). It is used in the Fast Food Industry.

Advantages
Specially formulated improver which gives dual effects of emulsifier and enzyme action. MYRSOFT III is a liquid bread improver which can easily control gluten network and starch complexion and can improve the uniformity in dough helping to make soft, white crumb with a strong structure and with a lot of attractive visual appeal and decoid of any mechanical shock on the outer shape.

Development Status
Commercial prototype

Transfer Terms
Technology licensing

Contact
Management and Systems Research
700 B, Block-P, New Alipore-700053, Kolkata, India
Tel: 24007369 • Fax: 24005333
E-mail: sujitray@hotmail.com

SWEDEN

Vibratory Roller

Vibratory rollers, based on a unique innovation, make it possible to infinitely vary the vibration amplitude. Amplitude, frequency and speed can be adjusted automatically by means of a compacting meter and a computer, in order to obtain optimal compaction with a minimum number of passages, and to avoid bouncing and over-rolling. The same roller can be used for asphalt layers and for deep penetration when compacting soil.

Areas of Application
For compaction of soil and asphalt at road construction etc.

Advantages
Capacity Infinitely variable amplitude and frequency; Amplitude, frequency and speed automatically adjustable by compacting meter; Lower fuel consumption; High capacity – in most cases > 30% higher compaction capacity than standard roller from competitor; No bouncing – less vibrations and stress on the roller; Documentation system for compaction result is standard; Download and analyse compaction result in a PC Amplitude adjustable by asphalt temp. when compacting asphalt; Crab steering – increased width Lower manufacturing cost; Modular design - less spare parts in stock; Start and stop of eccentric shaft without amplitude but with frequency – no resonance frequency; Change of travel direction without amplitude but with frequency; Electronic steering – depending on travel speed; Compact - short tuning radius – cheap freight; Adjustable max speed 3 – 4 "gears" - travel speed; Visibility – a cube of 300-1000 mm in front of and behind roller visible from driving seat; Swivel and sideways moveable seat.

Environmental Aspects
Energy efficiency

Development Status
Design, Laboratory model, Commercial prototype

Legal Protection
Patent

Technical Specifications
Operating weight from 3 to 27 ton. Most Popular 3 to 9 ton. The design of the single-drum roller and a confidential Power Point presentation can be displayed after the signing of confidentiality agreement

Transfer Terms
Consultancy, Technical services, Technology licensing, Equipment supply

Contact
Golfbanevagen 31, Halmstad, Sweden 30273
Tel: +46 352999110 • Fax: +46 3530967
E-mail: supac@telia.com

THAILAND

Honey Evaporator

We offer evaporator for moisture lowering in raw honey product. The evporator is scrap surface type, operate at low temperature and pressure. The machine consisted of feed tank, boiler, evoporator, cooler, vaccum chamber and auxillary pumps.

Areas of Application
Honey process, food processing, Agro-industry, fruit juice.

Advantages
Lower cost with quick pay back period. Lean process.

Environmental Aspects
Energy efficiency, Systems integration

Development Status
Pilot plant

Transfer Terms
Consultancy, Equipment supply, Turnkey

Contact
Sarapee, Chiangmai, Thailand
Tel: 053-420468 • Fax: 053-420468
E-mail: tcsn005@gmail.com

THAILAND

Formulation and Development of Herbal Cosmetics

We could offer technology to make value addition to cosmetics using herbal extraction techniques.

Areas of Application
Chemical industry, Cosmetics industry

Advantages
1. Value addition; 2. Generate employment and support livelihoods

Transfer Terms
Technical services

Contact
MOST Thailand
MS. Chitradee Luprasong, Faculty of Pharmaceutical Sciences, Ubon Rajathanee University Warin Chamrap, Ubon Ratchathani
Thailand, Zip/Pin Code 662
Tel: 042-205-159,08-9968-4490
Fax: 045-353-626
E-mail: chitradee.l@phar.ubu.ac.th

Technology Requests

BANGLADESH

Storage Battery Plant

We are willing to buy a complete battery plant and wish to invite offers for the same.

Area of Application
Power sector

Transfer Terms
Consultancy, Turnkey plant, Technical services, Equipment supply, Technology licensing.

Studies Available
Consultancy, Turnkey plant, Technical services, Equipment supply, Technology licensing, Others, Feasibility report.

Project Type
Start-up

Contact
Dhaka Chamber of Commerce India (DCCI)
33/1 Sonargaon Road, 1st Floor
Dhaka, Bangladesh, Zip/Pin Code 1205
Tel: 88029674780 • E-mail: npro7@yahoo.com

BHUTAN

Waste Management

I am interested to know the details on the recycling and reutilisation of domestic and industrial waste as well as plastic waste and used tyres for production of high performance roofing materials, pavement tiles, automobile bumpers, shoe soles and other goods.

Areas of Application
The process to have applications such as (a) recycling of municipal and industrial wastes, (b) recycling of plastic wastes, (c) recycling of used tyres, (d) in building industry (high performance roofing and floor tiles, pavement stones and road barriers), (e) in canalisation (hanging sieves, drainage components), and (f) in automobile industry (bumpers, protection systems, mirrors etc.).

Project Type
Start-up

Contact
P.O. Box 1416, Lungtenphu, Thimphu, Bhutan
E-mail: tamang.s@gmail.com

BHUTAN

Roofing, Pavement, Automobile Bumpers from used Rubber Tires and Plastic Waste

Technology for manufacturing high performance roofing materials, pavement stones, automobile bumpers, shoe soles and other goods from used tires and plastic waste.

Areas of Application
Recycling of municipal and industrial waste, plastic waste, and used tyres to manufacture high performance roofing and floor tiles, pavement stones, road barriers, etc.

Project Type
Start-up

Contact
P.O. Box 1416, Lungtenphu, Thimphu, Bhutan
E-mail: tamang.s@gmail.com

EGYPT

Chemical Production

We need to establish a new production line for ammonium chloride in our exisiting set up. We invite technology offers under licensing mode.

Area of Application
Chemical industry

Studies Available
Feasibility report, Environmental Impact Studies (EIA/EIS)

Project Type
Start-up

Contact
Ministry of Trade Industry
29 Sherif st. Dowen Towen, Cairo, Egypt
Tel: 0020 20105018493 • Fax: 0020 223916154
E-mail: aboohaitham@yahoo.com

UNITED KINGDOM

Object Segmentation in Still Images

A European research group of a multinational company is looking for a consumer software tool that will extract an image of a person in 2 or 3 clicks on a PC or touch type device.

Areas of Application
Digital images, photography

Project Type
New idea

Contact
RTC North Ltd
1Hylton Park Wessington Way
Sunderland, United Kingdom, SR5 3HD
E-mail: yvonne.williams@rtcnorth.co.uk

PUBLICATIONS from APCTT

PERIODICALS

(Free access at www.techmonitor.net)

- Asia Pacific Tech Monitor (6 issues/year) — (e-version)
- VATIS Update (6 issues/year)
  - Biotechnology — (e-version)
  - Non-conventional Energy — (e-version)
  - Food Processing — (e-version)
  - Ozone Layer Protection[#] — (e-version)
  - Waste Management — (e-version)

BOOKS

	Indian Rupees* (India, Bhutan and Nepal)	US Dollars*
Managing Innovation for the New Economy: Training Manual, 2002 Volume 1: How to Guide & Quick reference materials Volume 2: Articles & Lectures	1,000.00	50.00
Regional Capacity-building for the Adoption of ISO-14000 and Transfer of Environmentally Sound Technology: Training Manual, 2000	600.00	30.00
Small Rural Industries in the Asia Pacific Region: Enhancement of Competitiveness of Small Rural Industries in a Liberalized Economic Environment and the Impact of Poverty Alleviation, 2000	600.00	30.00
Technology Transfer and Technological Capacity-building in Asia and the Pacific		
❍ Volume 1: Big Countries and Developed Economies, 1999	600.00	30.00
❍ Volume 2: ASEAN, NIEs, SAARC and the Islamic Republic of Iran, 1999	600.00	30.00
❍ Volume 3: Least Developed and Pacific Island Countries and Economies in Transition, 1999	600.00	30.00
❍ Volume 4: Emerging Issues in Regional Technological Capability-building and Technology Transfer, 1999	600.00	30.00
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Ozone Depletion Substances Phase-out Technologies: Problems & Issues on Technology Transfer, Absorption and Generation, 1998	300.00	15.00
Development and Utilization of S&T Indicators: Emerging Issues in Developing Countries of the ESCAP Region, 1998	300.00	15.00
ODS Phase-out: A Guide for Industry, 1998	500.00	25.00
Proceedings of the Consultative Meeting on Technology Management Education and Training for Developing Countries, 1997	800.00	40.00

Notes: *Amount less than Rs 500 should be sent through a demand draft only. Otherwise, payment should be made by cheque/demand draft/ UNESCO coupon in favour of the Asian & Pacific Centre for Transfer of Technology, payable at New Delhi.*

[#] Print version supported by the Ozone Cell, Ministry of Environment & Forests, Government of India, for distribution to a select target group.

** Amount to be sent to APCTT with the order for covering costs and handling charges.*