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ICTs, new services and transformation of the Post

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UPU UNIVERSAL POSTAL UNION

ITU

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Foreword

With more than 660,000 post offices throughout the world, the postal network is the biggest physical network in the world. Post offices are everywhere, from the capitals of bigger industrialized countries to small rural towns of least-developed countries. In outlying areas, they are often the only public service available and in many cases, they constitute a vital channel to communicate and exchange goods between communities. Billions of people visit post offices every year for a reason or another. They send and receive mail, parcels or money orders. They can also get access to more sophisticated services such as account-based financial services or new IT-based services.

New technologies are changing the postal world. They are not threats, but should be seen as catalysts that will help the postal enterprises reinvent themselves. When one buys a product from an e-commerce site, the order is placed on the internet. But in the end, the goods are not delivered electronically. A logistical partner, very often the Post, is the physical link between the seller and the buyer. Postal operators are adapting themselves to take advantage of the new possibilities. New technologies are re-shaping and transforming the postal sector. ICTs are an opportunity for Posts to improve their existing services or to evolve a whole new range of services. New technologies change the governance and the work culture of the organisations and promote innovation. The objective of this book is to put forward some best practices in that regard.

This publication has its origins in a project on which the International Telecommunication Union (ITU) and the Universal Postal Union (UPU) collaborated for a number of years. In 2003, the ITU, the UPU, the Governments of Bhutan and India, Bhutan Post and Bhutan Telecom launched a project in Bhutan, the objective of which was to bring the benefits of ICTs to the populations of rural and remote areas of Bhutan. In the framework of this project, 38 post offices became ICT centres, six of them based on satellite connectivity provided by India. This project helped change the life of thousands of people by bringing them access to services such as email, internet access, fax or e-government services. The project also enabled Bhutan Post to transform itself, delivering better quality to the citizens and developing new services.

This book presents case studies from seven postal enterprises and their experience in adopting ICTs. Case studies featured in this publication have been selected after extensive consultation. The countries in which these projects were implemented are at various stages of economic development and include an industrialized country, five developing countries and a least developed country. The projects which were implemented also vary considerably in terms of the level of technology used and services offered.

We wish to extend special thanks to the postal operators that cooperated with us whole heartedly and provided the material. The studies themselves were prepared by independent experts, thus ensuring a degree of detachment.

We have a great pleasure in making this publication widely available and trust that it will prove useful to policy makers, regulatory agencies, postal operators and the ICT industry in general. We do hope that the successful experiences of the Posts of Bhutan, Botswana, Brazil, Italy, Korea (Rep.), Russia and Saudi Arabia will prove useful to decision-makers of other countries wishing to embrace new technologies.

Sami Al-Basheer Al-Morshid

Director
Telecommunication Development Bureau
International Telecommunication Union
GENEVA

Edouard Dayan

Director General
Universal Postal Union
International Bureau
BERNE

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About the authors

Vinod Dhamija is a former UPU Regional Adviser for the Asia Pacific region. In that position, he was involved from 2002 to 2008 in formulating and implementing many projects aimed at improving the postal services in the region. Before joining the UPU, he worked in India Post for 32 years and held various positions at the middle and senior management levels in the areas of international relations, postal operations, postal planning and development as well as postal financial services.

Graeme Lee is a Senior Partner in Sunflower Associates, providing consultancy in the ICT and postal sectors. Graeme has worked in the international postal arena for 20 years with Royal Mail, Correo Argentino, DHL, the World Bank and set up Sunflower Associates in 2006. Through Sunflower Associates he provides policy, strategy and operational advice to Governments and postal operators throughout the world.

Juan Ianni has spent over 37 years in the postal industry working on postal projects in more than 60 countries. He spent most of is career with the U.S. Postal Service, where he was in charge of international postal development projects. He also spent two years with the World Bank as Senior Postal Policy Expert and since 2004 has worked as a private consultant developing postal sector policies and regulatory regimes for government and private clients. Juan has co-authored a number of postal sector studies including the "Postal Industry in an Internet Age" and the "Handbook of Postal Service Reform".

Kristian J. Sund is a Senior Lecturer in Strategic Management at Middlesex University Business School, in London, where he also leads the Shipping & Logistics MBA. His research on areas such as strategy, cognition and innovation has been applied to the hospitality and leisure industries as well as the postal sector. His forthcoming book discusses strategic options in the postal industry. Kristian holds a Ph.D. in Management and M.Sc. in Economics from the University of Lausanne and a M.A. in Society, Science and Technology from the Swiss Federal Institute of Technology (EPFL), where he also completed his post-doc.

Hoon Jung received a Ph.D. in Industrial and Manufacturing Systems Engineering from the University of Missouri, U.S.A., in 2001. He joined the Electronics and Telecommunications Research Institute (ETRI) in Korea in 2002. He has worked for the u-Post research team as a researcher and became a team leader in 2006. His research focuses on the postal logistics chain management, customer interface technology, internet-based postal service technology or intelligent mail service strategy.

Hans Boon is one of the leading experts in ICT-based financial services through the postal network, and the associated issues of postal reform and financing. In this field, Hans has 20 years of experience leading cross-cultural teams in more than 60 developing countries worldwide under assignments of the World Bank, the UPU and others. He started in 1977 at the Netherlands Post, and Post Office Savings Bank, helping to establish Postbank in 1986. In ING, he led the international Postbank operations till 2007. Hans is based in Amsterdam, as Managing Director of PostFinance International Development.

Farah Abdallah is a doctoral student and a research associate at the Management of Network Industries Chair, at the Ecole Polytechnique Fédérale in Lausanne (EPFL), Switzerland. She worked on consultancy projects for Swiss Post and SAP. Prior to preparing her thesis, Farah worked as an IT consultant trainee at the Lebanese Central Bank and at Unilog. Farah obtained her engineering diploma in Telecommunication and Networks at the Ecole Nationale Supérieure ENSEEIHT, France (2006).

Matthias Finger is currently a Professor of Management of Network Industries at Ecole Polytechnique Fédérale in Lausanne, Switzerland. He is specialized in the liberalization and regulation of infrastructures covering communications, transport and energy. He is also the Director of the Transport initiative of the Florence School of Regulation at the European University Institute in Florence. Pr. Finger is one of the leading academic experts on the postal sector.

Glossary of Abbreviations and Acronyms

API	Access Points to Internet
ATM	Automated Teller Machine
BOTEC	Botswana Technology Centre
BPR	Business Process Reengineering
B2B	Business-to-Business
B2C	Business-to-Consumer
BP	Banco Postal
CGAP	Consultative Group to Assist the Poor
CRM	Customer Relationship Management
DTTV	Digital Terrestrial Television
ECT	Empresa Brasileira de Correios e Telégrafos
EDI	Electronic Data Interchange
EMS	Express Mail Service
ERP	Enterprise Resource Planning
EUR	Euro
GDP	Gross Domestic Product
GICT	Global Information and Communication Technologies/ World Bank
GIS	Geographic Information System
GSM	Global System for Mobile Communications
HHT	Handheld Terminal
ICT	Information and Communication Technology
IFS	International Financial System
IPS	International Postal System
ITR	International Telecommunication Regulations
IT	Information Technology
ITU	International Telecommunications Union
IUE	International Union of Electro Telecommunication
LAN	Local Area Network
MDMS	Mail Delivery and Management System
NFC	Near Field Communication
NGO	Non-Governmental Organization
OECD	Organization for Economic Cooperation and Development
PABX	Private Automatic Branch Exchange
PI	Poste Italiane
PIAP	Public Internet Access Point
PIN	Personal Identification Number
POS	Post Office Shopping
RCC	Regional Commonwealth in the field of Communications
RF	Russian Federation
RFID	Radio Frequency Identification
RUR	Russian Ruble
SIM	Subscriber Identity Module
SME	Small- and Medium-sized Enterprises
SMS	Short Message Service
SP	Saudi Post
STEFI	Secured Transfer of Electronic Financial Information
UPU	Universal Postal Union
USD	United States Dollar
USO	Universal Service Obligation
VSAT	Very Small Aperture Terminal
WAN	Wide Area Network
WB	World Bank
WTO	World Trade Organization

Table of contents

ICTs, new services and transformation of the Post: Introduction

Information and communication technologies (ICTs, which encompass computers, software and telecommunications) are revolutionizing the way individuals, businesses and other parts of society communicate, work, bank and shop. The Internet has opened up the world. Users can send and receive e-mails or log on to a website from anywhere on the globe, enjoying instant communication at negligible cost. It offers virtually free access to huge amounts of information and expert advice on almost any subject. Communications both inside and outside the organization have also become comparatively easier, facilitating greater cooperation within an enterprise. Organizational efficiency has increased in all departments, especially in accounting and marketing. By raising productivity and linking buyers and sellers electronically along the supply chain, ICTs enable organizations to reduce costs and increase revenues. E-government is capable of delivering government services faster, more effectively and more economically. It also makes governance more transparent and responsive, giving citizens potentially a much bigger say in the way their country is run. It also has vast potential in reducing corruption in governance. The link between ICTs and social and economic development is widely accepted. The Geneva Declaration of Principles[1] (DoP) states that "Under favorable conditions, these technologies can be a powerful instrument, increasing productivity, generating economic growth, job creation and employability and improving the quality of life of all". The widely held belief that information technology is fundamental to an organization's survival and growth is therefore not surprising.

ICTs, the postal sector and their impact

The ICT revolution has had a considerable impact on the postal sector. Postal enterprises which are managed in the traditional government mould have generally been late adopters of ICTs, partly because they are subject to fewer competitive pressures, compared with those that are expected to function as profit-making businesses. However, today almost every postal enterprise, irrespective of whether it operates in a protected or open market, or whether it operates as a government corporation or as a private company, either uses or is keen to use ICTs in order to become more efficient, accessible and profitable.

This book presents case studies from seven postal enterprises and their experience in using ICTs. The countries in which these projects were implemented are at various stages of economic development and include one industrialized country, five developing countries and one least developed country. The projects carried out also vary considerably in the level of technology used and the services offered and include Italy's PosteMobile and its innovative mobile banking and commerce solutions, Brazil's Banco Postal and its basic banking services provided through its retail network, Saudi Arabia's delivery service, making use of an innovative address system, South Korea's Internet-based e-post office shopping, Russia's use of ICT-based postal services as part of a multi-sector plan to usher in information society and finally Bhutan's and Botswana's use of post offices to deliver integrated communication services in rural areas.

The UPU has always maintained that the convergence of the Post's physical, electronic and financial network would give the postal sector a competitive edge that was difficult to match. This claim is supported by the case studies featured in this collection. The postal enterprises that have integrated these three dimensions into their operations have achieved remarkable success in their projects and ventures. Others which have made significant progress in that integration are poised to reap rich rewards. These case studies also reveal that, while the success achieved has been rooted in the inherent strengths of the postal enterprises and their national retail, distribution and delivery network, and in the public confidence placed in them, the ICT-based projects implemented have, in turn, enriched these postal enterprises, enabling them to improve the quality of their services and to introduce new value-added services.

The use of ICTs in the postal sector has given a tremendous boost to the growth of the ICT industry and services. What is more, the impact of ICTs used by Posts has not been confined to the postal sector; their cascading effect has had an impact on governance and its societal and economic linkages. Besides contributing to more inclusive economic growth and more responsive governance, the projects have also encouraged the growth of e-commerce and mobile commerce.

The projects undertaken by these postal enterprises and the results achieved are described below.

Bhutan

As part of Bhutan Post's project, 38 telekiosks were set up in post offices to provide access to information and communication facilities in the country, particularly for the hitherto deprived communities in rural and remote areas. Six of the 38 telekiosk locations did not even have telecommunications connections or electricity before the project. Telecommunications connectivity was brought to these locations by the establishment of solar-powered VSAT stations linked to India's communications satellite, INSAT.

The case study of the Bhutan project shows how the residents of the villages near the six remote VSAT locations had been cut off even from other parts of the country. It took five to seven days for mail to reach them and the nearest telephone connection was two to seven days away on foot. The project has put an end to their isolation. The villages now have access to telephones, fax, Internet and e-post. Residents have seen their lives changed dramatically. In the other 32 locations,

[1] World Summit on the Information Society, 12 December 2003.

most of the people did not have computers or Internet access. The telekiosks gave them Internet access and services for the first time.

Users of these facilities include officials working in the basic health units (BHUs) and the Renewal Natural Resources Centres in these villages. They find the Internet a valuable source of information relating to their work. Other users include members of the general public who want to access e-government services. Builders engaged in construction work access the Internet to obtain copies of tender notifications, as well as application forms for building permits and their online submissions. Generally, however, students remain the primary users and beneficiaries of these telekiosk services. It is therefore reasonable to assume that the telekiosks have opened the door to a knowledge-based society in Bhutan. As people become more informed, they will expect more and, it is hoped, will receive more from a government made aware to their needs. The end result of all this will ideally be a more inclusive and prosperous society and a more responsive government.

Because the telekiosks were set up in post offices as part of their normal operation, one significant outcome has been the modernization of Bhutan Post and its integration into the global communication system. Before the project, counters were automated in only seven of the country's 42 regular post offices; now, a total of 33 post offices have computerized counter services. Before, only two post offices offered access to the Internet; that number has now risen to 32. These post offices are also connected to Bhutan Post headquarters in Thimphu. Online connectivity and the faster exchange of information have led to better management and control over the postal system and speedier resolution of customer complaints. A track and trace service for international EMS items and parcels is now available through the use of a software application known as IPS (International Postal System) Light. The online tracking of domestic express and registered items and parcels has been introduced in selected post offices.

Botswana

In the urban areas of Botswana, access to ICTs for people without computers or Internet access at home is now provided mainly by privately operated Internet cafes. For a number of years, rural and remote areas generally remained deprived of such access because of private operators' concerns about financial viability. In this situation, as in the case of Bhutan Post, BotswanaPost, because of its nationwide postal network, was chosen to provide the country's inhabitants, particularly those in rural areas, with access to information and communication facilities. BotswanaPost did this by establishing Kitsong (knowledge) centres in 49 of its 192 post offices and agencies. Five more are expected to become operational in 2010. Besides Internet access, Kitsong centres offer other services such as fax, photocopying, desktop publishing, printing and digital photography. They also provide local content in areas such as "agricultural and business development information, tourism, community bulletin board, localized directory of Government services and links to financial and educational institutions"[2] for the benefit of local communities. That a need for such services has always existed has been demonstrated by the number of similar centres set up by other groups in these areas.

The number of people using Kitsong centres has been steadily increasing. The income of post offices with Kitsong facilities has increased by an average of 25% "representing the use of the new services and increased use of traditional services". A Botswana study has rightly inferred that, "if the number of customers is growing, there must be a perceived benefit to each individual using the centre. This may be for business reasons in obtaining information about markets, it may be for educational reasons with e-learning programmes, or it may simply be for social reasons, such as chatting or gaming."

The project has also led to greater computer literacy because these centres also provide training in the use of computers. The government is particularly pleased with the results achieved so far, as it sees these centres helping to meet its national objectives and its commitment to the United Nations Millennium Development Goals.

BotswanaPost has also benefited from hosting these Kitsong centres. Besides contributing to increased revenue, Kitsong facilities have "revitalized BotswanaPost by providing an injection of new technology-based services".

Brazil

The Banco Postal project of Empresa Brasileira de Correios e Telégrafos (ECT) was intended to provide, through its retail network, basic banking services to people without access to any formal financial network. The case study on the Banco Postal project shows that "digital and physical networks such as ICTs and Posts can be successfully combined and provide both with 'win-win' scenarios, including improved efficiency, competitiveness and profitability for Posts, and increased utilization of and access to ICTs". Moreover, the provision of new non-postal products through the postal network "adds value to this network, lowers the costs of maintaining universal service and can help to ameliorate the impact of future declines in basic mail volumes".

The incorporation of ICTs into ECT's operations has enabled it to maintain an interactive website that offers information and allows transactions for the postal and financial services it provides. It has also enabled ECT to provide e-commerce and e-government services. The integration of the physical, electronic and financial networks "has significantly enhanced the numerous nationwide services that are distributed through the ECT network", many of which have "societal and eco-

[2] All unattributed quotes in this section and the following ones refer to the material in the case studies.

nomic value and it is unlikely that any network other than ECT's could make them as accessible to as many people in as many places".

When the Banco Postal project was launched in 2002, it was estimated that over 45 million adults in Brazil were "unbanked". These individuals, together with many small and medium-sized enterprises (SMEs), had limited access to credit, which is critical for business growth. By 2009, the situation had improved significantly, with 6,021 Banco Postal branches serving 8.8 million of these "unbanked" individuals. Over 1.2 million Banco Postal transactions are now made daily. Over 700,000 loans have been disbursed since 2002 and Banco Postal has become an important player in the microcredit market.

The incorporation of ICTs and the establishment of the Banco Postal have enabled ECT to maintain profitability and strengthen its universal service. Some post offices which were losing money and in danger of being closed now continue to operate because they have become profitable with income earned from Banco Postal services. In some post offices, Banco Postal revenues now exceed postal revenues.

With individuals, municipalities and businesses now keeping their money at the local Banco Postal branch, the bank is able to extend credit to local businessmen and farmers, helping them to expand their activities and increase employment. While there are still communities without financial services, the combination of ICTs and the Post's presence in the Banco Postal project has made people's lives easier and the economy's future more promising.

Italy

Poste Italiane (PI) launched PosteMobile to offer basic mobile services such as voice and messages, standard value-added services such as news, entertainment, music and games, and distinctive mobile banking, mobile commerce, mobile payment and mobile postal services.

PosteMobile is one of the early pioneers that contributed to the growth of mobile commerce in Italy. It was launched in November 2007 and by the end of 2009, the number of its customers reached 1.2 million. Over 8 million euros are transferred via PosteMobile on a monthly basis. The unique nature of the PosteMobile model lies in its "capability of providing distinctive value-added mobile services", such as bank transfers from one BancoPosta account to another or any other bank account or the purchase of products and services by BancoPosta account or the PostePay pre-paid card. PosteMobile customers simply connect their SIM card to their BancoPosta account or a PostePay pre-paid card.

PosteMobile plans to expand into the mass market, to enable customers to buy products and services using their phones (bus and train tickets or insurance policies) or to send remittances abroad. It will introduce these services using the latest commercial near-field-communication (NFC) technology, considered to be faster and more secure compared with other technologies, such as Bluetooth.

Large investments made by Poste Italiane in technological innovation have "allowed the company to guarantee its customers cutting-edge services, and have made it an important factor in Italy's general economic growth and modernization". Financial services promoted by Poste Italiane "played a leading role in the gradual integration of the new immigrant population". PosteMobile services are expected to further strengthen this integration by offering attractive pre-paid call packages.

Poste Italiane was one of the earlier operators to incorporate ICTs into their operations, and now its "entire postal system is governed by a technological infrastructure that is among the most advanced in the world", allowing it "to improve its products and services through the simplification and expansion of services which can be accessed via the Internet, telephone, self-service machines, and, soon, even through DTTV (digital terrestrial TV)".

PosteMobile is also helping Poste Italiane to constantly "innovate and improve performance" and directly contribute to its future development. It has "designed and developed a new system infrastructure with a Windows mobile client application, allowing postmen to transfer track and trace information about mail delivery by mobile phone". The aim of this particular application is to improve the delivery process. A total of 4,920 postmen currently use this service on a daily basis and it is expected that all 43,000 postmen will one day use it.

Korea (Rep.)

For Korea Post, the desire to transform its traditional home shopping service into an e-commerce venture (ePOST) was an important reason for the development of its information systems. Korea Post's e-commerce portal was launched in 1999 for the post office shopping mall. By the end of 2000, it had been expanded and transformed into the so-called Internet post office. Customers could now use the portal to access postal services in addition to the shopping option. It enabled producers throughout the country to sell online local specialties direct to consumers and gave customers the opportunity to purchase products in a secure environment.

Just as PosteMobile has helped to grow mobile banking and mobile commerce in Italy, Korea Post has played an important role in the growth of e-commerce in Korea. The operator has established a "platform where as many e-commerce businesses as possible could appear directly or be linked to the e-commerce system of the post office" and has served as "a shopping portal through linkages with several shopping malls and major retailers". It has also established "an independent system for payment and certification service". The government has used Korea Post's e-commerce venture as a test bed for developing sound e-commerce practices, such as quality guarantee, certification and refund systems.

Post office shopping was launched in 1986, primarily to sell the farming and fishing products of rural communities and to increase their income by eliminating the intermediary between the buyer and the seller. It has now become the country's premier specialty shopping mall for agricultural and marine produce. Beginning with only eight products in 1986, the shopping mall now offers more than 7,200 items and has an annual turnover of 135 million USD.

Korea Post has also computerized the entire mail handling process, from acceptance to delivery, and has set up a web-based postal logistics system designed for seamless connection for track and trace. As many as eight stages of information in real time are available with the track and trace system. Customers are notified by SMS on their mobile phone about the delivery status of their mail.

The adoption of ICTs by Korea Post for its operations has led to more efficient mail, banking and insurance services and has greatly contributed to the country's e-commerce growth and economic development, particularly in farming and fishing communities. One noteworthy example is how it has helped nine rural SMEs to increase their annual sales to more than 800,000 USD.

Russian Federation

The Russian Post has focused on introducing a series of new ICT-based services, generally known as "Cyber" services, such as Cyber Post, Cyber Press and Cyber Money, as well as on improving its internal management and control systems through the increased use of ICTs. The case study on the Russian Post shows how post offices in Russia have now become an important public access point to basic financial services (Cyber Money), to the digital world (Cyber Post), and to e-services such as e-government, e-commerce and e-learning.

Cyber Money provides a competitive solution for the rapid and secure transfer of money from one place to another. This service is particularly useful to those who do not have a bank account or easy access to a bank branch. It is now provided at more than 20,000 post offices. The service has also been extended to neighbouring countries under UPU agreements. The growth of this service has been phenomenal, with volumes and value in 2009 reaching nearly 200 million transactions, representing a value of some 15 billion USD.

The Cyber Post service involves providing Internet access at post offices. The service is now provided at nearly 24,000 post offices and has more than 3.5 million users. It meets the need of households, students and others to access the Internet at affordable prices especially in rural areas, "where Internet at home or work is often limited or non-existent". The Cyber Post project has contributed significantly to bridging the digital divide in Russia.

Cyber Press is another new service which has been developed by the Russian Post to assist in the timely delivery of newspapers across the large distances and time zones within the Russian Federation. This service involves acceptance of online newspapers, printing at post offices and delivery to subscribers. Now subscribers or readers do not have to wait for one or more days to receive the printed copy from the place where the newspaper was printed, as a copy can be printed at the post office itself

The Russian Post has also used ICTs to modernize its internal communications infrastructure and has created online real-time management information systems. This has led to a significant improvement in the Post's operations and facilitated its development and growth in a competitive environment. According to the case study on the Russian Post, "the application of ICTs has been a major contributor in the transformation of the organization, from paper-based and de facto decentralized into a much more corporate structure, with certain centralized real-time online management functions forming a basis for further growth".

Saudi Arabia

Saudi Post launched the Wasel service project in 2005 "to establish an automated mail processing system from reception to delivery". The overall aim of the project was to improve the quality of mail processing and the speed of delivery to residential addresses. The project proved to be the foundation of later e-commerce and e-government initiatives in Saudi Arabia. The Wasel project required each location to be assigned a proper address. The new addressing system is driven by satellite technology and has resulted in the "integration of the Post's electronic and physical platforms".

Wasel service is currently available in 25 cities, serving two million locations and 58% of the Saudi population. Saudi Post plans to gradually extend it throughout the country. Delivery service is now 99.99% accurate and, although 45% of the Kingdom's population moves every year, the new system makes it possible to directly forward mail items to their new address.

Saudi Post's innovative addressing system and associated initiatives have improved governance, have promoted e-commerce activities and inclusive economic development and have made people's lives more comfortable. The availability of a customer database, a key outcome of the addressing system, has enabled Saudi Post to develop many e-services, including the e-mall and a postal e-mail service. The e-mall, which is similar to amazon.com, has become the largest of its kind in the country, allowing customers to buy a large variety of products online and have them delivered to their homes the next day. People without Internet access can go to the nearest post office to place their orders. The prices offered by vendors in the e-mall are competitive. Saudi Post has also surveyed and catalogued the handmade goods of local craftsmen in remote areas, which can now be purchased through the e-mall. This initiative has not only helped to preserve the national heritage, it has also provided a huge market for local craftsmen and has contributed to inclusive economic growth.

The assignment of a secure e-mail address to every Wasel subscriber has led to the creation of a "targeted and cost-effective marketing platform". To fully utilize this platform, Saudi Post has launched its own direct-mail company. Private businesses can access these data by payment of a fee.

The availability of data on the location of residences and their owners has also contributed to better governance of the country. It has helped the government to provide many of its services online. The social security agency uses these data to "deliver welfare benefits to beneficiaries anywhere in the Kingdom" and to provide emergency services.

Residents have also benefited from the new addressing system for their day-to-day needs, allowing them to find the address of any individual, organization or facility, be it a private home, mosque or hospital.

The seven case studies included in this book show that while the sector of business in which ICTs are pressed into service are different in each country, overall, each of the initiatives in their own way transformed the entire postal enterprise radically with far-reaching effect within the organizations as well as on different aspects of the society they touch.

What can others learn from these distinctive experiences? Given the right circumstances, these initiatives can be replicated elsewhere, taking into account the specific characteristics of the local environment. In broad terms these case studies hold important pointers, particularly for developing countries where postal operators are in acute need of modernization in order to fulfill the potential offered by their physical presence in far-flung and remote areas. By transforming themselves, they could become vehicles of social and economic change in the societies they serve.

The last chapter in this book attempts to consolidate the lessons learned in different countries. The major determinants that shaped the initiatives through different stages of their evolution are discussed in depth. The challenges faced are also discussed in detail. These form the basis for the elaboration of a set of broad guidelines.

E-services for development: Initiatives through post offices in Bhutan

Vinod Dhamija

Introduction

Bhutan is a small landlocked Himalayan kingdom situated between the People's Republic of China and India with a land area of 38,394 square kilometres. It has a formidable mountainous terrain with elevations ranging from 160 metres to 7,000 metres above sea level. Its population is largely rural despite an increasing urban drift in recent years. Of the total population of 634,982, about 69% is rural. There are only two towns in Bhutan which have a sufficient commercial and demographic presence to qualify as truly urban. Thimphu, the capital, has a population of about 98,676. The next biggest town is Phuentsholing, with an estimated population of some 13,000.

The difficult terrain, coupled with inadequate transportation infrastructure, makes movement of people and goods within the country, particularly in rural areas, a daunting challenge. In the absence of a domestic air and rail travel network, roadways are the primary means of communication. And even the road network is not very well developed. According to the 2005 Population and Housing Census of Bhutan, 21.2% of the total rural households (87,804) were at a walking distance of between one and four hours, and another 20.9% at more than four hours, from the nearest motorable road. More than four hours could mean more than three or four days of walking in the case of remote areas.

As a result, mail to remote and rural areas took five to seven days to reach its destination. Bhutan Post saw new information and communication technologies (ICTs) as a potential means of improving this situation. Benchmarking analysis showed that one cost effective way of expediting mail delivery was to send it electronically. The electronic mail service or e-post service is meant for people without access to computers and/or the Internet. These customers can hand over a written communication at the post office for dispatch to the addressee as in the form of an e-mail. At the receiving post office, the message can be printed and delivered to the addressee, thereby substantially speeding up the delivery of mail.

Bhutan, as a least developed country, did not have the necessary financial and technical resources to implement such a project on its own. So, the then Managing Director of Bhutan Post, Mr Meghraj Gurung, sent a proposal to the International Telecommunication Union (ITU) and the Universal Postal Union (UPU) in 2001 to ask for assistance in setting up telekiosks in selected post offices which could offer e-post and other electronic services.

It was a very bold proposal for that time. In 2000, only 90 of the 201 *gewogs*[1] had telephone connections and, of the estimated 16,580 telephone subscribers, half were located in Thimpu.[2] The Internet was introduced only in 1999 and by May 2001, there were just 935 Internet accounts. Here again, the majority of the connections were in Thimphu, which had 597 or about 64% of the total connections, followed by 135 in Phuentsholing, with the remaining 203 spread all over the country. While since then, ICT penetration has spread rapidly from the two main cities to the rest of the country on the back of the digital microwave transmission system, it still remains low. According to the 2005 Population and Housing Census of Bhutan, density of telephones as a percentage of households was 12.20% for urban households and 4.90% for rural households. As regards the Internet, density was 1.10% for urban households and just 0.10% for rural households.

The ITU commissioned a feasibility study to assess the viability of the project. In the report entitled "Equitable Digital Access in Bhutan" submitted to the ITU in April 2002, it was concluded that "Overall, we feel that e-post could be a model that can bridge the digital divide in developing countries, even if it cannot eliminate it entirely."[3] The ITU accepted the report and took the lead in implementing the project, which was ultimately executed in cooperation with the UPU, the Royal Government of Bhutan, the Government of India, Bhutan Post and Bhutan Telecommunications.

This chapter discusses the policy environment in which the project was implemented; the implementing agencies; the implementation of the project and the difficulties and problems faced in the process and its operation; beneficiaries of the project; lessons learned; and the critical elements for success.

Policy environment

The Royal Government of Bhutan saw the great potential of developments in the field of information and communication technology as means of enabling the country to overcome the constraints arising from its isolation, the mountainous terrain and associated difficulties. The Ninth Five Year Plan of Bhutan noted that, to build a knowledge-based economy, it was necessary to "harness the opportunities arising from developments in the information and communications technology to: enhance communications, e-governance, and as a source of employment".[4] The key goals and objectives of the communication and ICT sector in the Ninth Plan (2002–2008) were identified as the expansion of telecommunication services to all the gewogs and promotion of e-governance.

The strategies adopted in the Ninth Plan to achieve these objectives were to establish at least 10 telephone connections in each of the 201 *gewogs,* resulting in 80% coverage of the rural population by telecommunication services. In areas where there was no electricity, repeaters and terminals were to be operated by solar panels. E-governance was to

[1] For administrative purposes, Bhutan is divided into four *dzongdey* (administrative zones), 20 *dzongkhag* (districts) and 201 *gewogs* (administrative units under the districts comprising a group of villages).
[2] Ninth Five Year Plan, Royal Government of Bhutan.
[3] Brij Kothari, Indian Institute of Management, Ahmedabad, "Equitable Digital Access in Bhutan", submitted to ITU, April 2002.
[4] Ninth Five Year Plan, Royal Government of Bhutan, page 96.

be "promoted through the establishment of networks (LAN and WAN) and web portals" to provide a wide array of online information services to the general public. The networks were expected to contribute to "an effective and efficient government information management system and enhance ease and speed of communication". Public telekiosks were to be set up to "enable people to obtain government information and forms online and send and receive letters and other correspondences electronically."[5]

Thus, the project to establish telekiosks in post offices to make available the benefits of ICTs, particularly to communities in rural and remote areas of Bhutan, was directly linked to the Government's wider development plan. This gave the project political legitimacy.

Objectives of the project

The aim of the project was to establish telekiosks in selected post offices in Bhutan to provide access to information and communications facilities in support of inclusive economic growth, grass-roots community development and improvement of public services to improve the quality of life of all citizens, particularly in disadvantaged communities in rural and remote areas of Bhutan which hitherto had limited or no access to them. In addition, these telekiosks were to provide e-post services[6] to facilitate faster written communication for people living in rural and remote areas.

Implementing agencies

The project document for the establishment of telekiosks at 38 post offices in Bhutan was signed by the Bhutan Post Corporation Ltd (BPCL); Bhutan Telecom Ltd (BTL); the ITU, and the UPU in 2002.

In that year, Bhutan Post had 110 outlets, of which 44 were regular post offices providing a full range of postal services and 66 were community mail offices offering selected services. The 38 post offices where telekiosks were to be set up were identified by Bhutan Post and Bhutan Telecom. Locations were determined on the basis of available infrastructure and revenue generation potential. Six of the 38 post offices were in remote areas which had neither telecommunication connectivity nor electricity owing to difficulty in access. The idea was to reach the "unreached". It took some three to seven days for the mail to reach these six locations:

i Laya: a three-day walk from the nearest motorable road;
ii Lunana: a seven-day walk from the nearest motorable road;
iii Merak: a two-day walk from the nearest motorable road;
iv Minjiwoong: a two-day walk from the nearest motorable road;
v Shingkhar Lauri: a four-day walk from the nearest motorable road; and
vi Sombeykha: a four-day walk from the nearest motorable road.

Providing telecom connectively to these remote locations in the conventional manner would have been time-consuming and expensive. Quicker and more economical methods were explored and it was concluded that connectivity to these locations could be provided cost effectively if VSAT links, powered by solar energy, were established at these locations. India, a neighbouring country, had the necessary expertise as well as its own communication satellite to provide the telecommunication connectivity. The Government of India was invited and agreed to join the project to provide a telecommunication link to these six remote locations.

A memorandum of understanding was signed in December 2003 between the Royal Government of Bhutan, the Government of India, the ITU and the UPU to establish connectivity to these particular locations.

Bhutan Post was designated as the nodal agency to implement the project. It was also made responsible for maintaining the telekiosks and for developing the software for e-post. It used its existing network to initiate the project and its employees to implement it.

Bhutan Telecom provided the Internet connectivity to the selected post offices, and basic computer training to the staff of Bhutan Post. It was also responsible for making the telekiosks at the six remote locations operational by establishing VSAT terminals there with the support of Telecommunications Consultants India Limited (TCIL) and Bhutan Post.

The Indian Government provided technical as well as financial support to the project. It supplied the equipment required for installation of a hub station in Thimphu and six VSAT terminals, including solar panels with the capacity to produce 600 watts and battery standby of eight days. More crucially, the Government of India also provided a space segment to Bhutan on INSAT, its communication satellite, free of cost for the first two years. In addition, it provided training to the staff of Bhutan Telecom for operation and maintenance of the installed systems.

India further tasked TCIL, a Government of India enterprise, with collaborating with Bhutan Telecom to install the hub station in Thimphu and VSAT terminals at the six remote locations. The technical staff of TCIL, Bhutan Telecom and Bhutan Post travelled together on foot to these remote locations to set up the VSAT terminals and establish the telekiosks.

The Bhutan Government ensured that the relevant authorities provided the necessary legal and regulatory clearances. It also obtained exemption from customs, excise and other duties and levies on the equipment imported into the Kingdom for the purposes of the project, and saw to it that the equip-

[5] Ibid, page 97.
[6] E-post is like hybrid mail in the sense that it is transmitted electronically. Hybrid mail generally refers to the sending of mail sent by one sender to many addressees. As the Bhutan project involved the exchange of single mail items, the term e-post was used.

ment and facilities installed were used exclusively to meet the objectives of the project.

The international partners, ITU and the UPU, were involved mainly in providing technical and financial support to the project. In the project document, financial support was envisaged for only the first phase of the project. However, ITU and the UPU went on to make additional financial contributions to provide for further requirements which arose from time to time, such as the need for more training, the media campaign to launch the e-post service, and provision for inter-post office connectivity. ITU was also able to mobilize funds from various donors for activities that had not been envisaged at the time of signing the project document. It also took the lead in arranging coordination meetings of the partners from time to time to monitor progress on the implementation of the project. These coordination meetings became a critical forum for resolving the problems faced in the implementation and operation of the project.

Implementation of the project

The project was implemented in three phases. The first phase saw the establishment of telekiosks in 17 post offices where the basic postal infrastructure and stable telecommunication services were already available. In the second phase, telekiosks were set up in 13 post offices, including the six which were provided with access for the first time to telephone and Internet services through satellite connectivity. In the third phase, telekiosks were established in the remaining eight post offices.

In the first phase, the setting up of telekiosks meant equipping the 17 post offices with the required hardware, software and Internet connectivity, along with training of the post office staff to operate the new equipment, which included a computer, a scanner and a printer. Once the telekiosks were operational and were starting to yield the desired results, some of the post offices received additional equipment such as photocopiers, digital cameras and fax machines from Bhutan Post or international donors.

Bhutan Telecom provided the initial basic computer training to the staff of Bhutan Post. However, as the implementation of the project progressed, the need for more extensive training was felt. Training of some staff members of Bhutan Post was arranged in India at India Post's dedicated training centre in Saharanpur, the idea being that they could train their colleagues upon their return. Later, Bhutan Post organized training programmes twice a year for its employees at Thimphu GPO. Training modules focused on both software and basic hardware maintenance. In addition, on-site and on-the-job training was provided to the staff of the post offices where telekiosks were installed.

By December 2003, the full package of hardware and software had been delivered and installed in the 17 post offices. Internet connectivity to these post offices was provided within a month by DrukNet, the Internet service provider arm of Bhutan Telecom. In addition to establishing telekiosks in the 17 post offices, six servers were installed at the General Post Office in Thimhpu for inter-post office connectivity.

In the second phase of the project, telekiosks were established in 13 additional post offices, including at the six post offices that lacked telecom connectivity. Bhutan Telecom and TCIL installed the hub station in Thimphu and the VSAT terminals at the six remote locations. The first installation took place at Merak. The equipment and material were transported using men and mules. It took more than a week to get everything to the project site. The installation and commissioning of the VSAT terminal was completed on 11 October 2005, and Merak became connected to the public telecommunication network for the first time.

The VSAT terminal at Laya was commissioned on 11 November 2005, followed by Sombeykha on 2 December 2005; Minjiwoong on 26 December 2005; Shingkhar Lauri on 3 January 2006; and Lunana on 15 July 2006. Successful voice and Internet connectivity tests were carried out at all locations by the installation team.

All VSAT terminals were equipped with one voice and one data channel. A three-line PABX was connected to the voice channel, which was distributed among the local users.

Operation and maintenance of VSAT terminals requires special training. Eight technical staff from Bhutan Telecom were trained in operation and maintenance of VSAT terminals at the Advanced Level Telecommunication Training Centre (ALTTC), Ghaziabad, India in December 2005.

The third phase, in which telekiosks were established in the remaining eight post offices, was completed in 2008.

Cost of the project

The implementation of the project began with the commitment of funds for the first phase to the tune of 105,800 USD by ITU, the UPU, Bhutan Post and Bhutan Telecom. By the time the project was completed, the four original partners had contributed 685,000 USD and the new partner, the Government of India, a further 500,000 USD.

Table 1: Contribution from partners (in USD)

Partner	*Contribution*	*Initial Commitment*	*Final Contribution*
ITU	Feasibility study, project document, computer equipment for post offices, LAN at GPO, wireless equipment, and training	35,000	160,000[7]
UPU	IT equipment and training	30,000	50,000
Bhutan Post	Equipment, personnel, buildings	30,600	275,000
Bhutan Telecom	Training of Bhutan Post staff; VSAT network	10,200	200,000
India	Six VSAT terminals for provision of voice and low/medium speed data services + hub in Thimphu): – power sources: solar energy, with about eight days' autonomy; – access/transponder capacity on INSAT system (free for the duration of the project, and later within equivalent INTELSAT DAMA tariffs); and – training and maintenance.	500,000	500,000

Difficulties experienced in implementing the project

Bhutan Post had not implemented a project of such magnitude and complexity before. Even for Bhutan Telecom, it was not an easy project to implement and maintain.

Providing telecommunication connectivity and installing telekiosks at the six remote locations proved to be the most challenging part of the project. There is no motorable road to these locations. The sites Laya and Shingkhar Lauri are at a distance of 110 km and 50 km respectively from the nearest road-head. In the case of the remaining four locations, the distance is between 20–25 km. In addition, three of the locations are situated at altitudes of between 3,800 and 4,500 metres. Equipment and material required for commissioning the VSAT link at Merak was transported using men and mules. It took two days for 112 people and 26 mules to carry the equipment over steep terrain from Phongmey, the nearest road point. Following this experience, a helicopter was hired to transport the equipment/material to the remaining five sites. Even so, the staff of Bhutan Telecom, Bhutan Post and TCIL had to trek through difficult mountainous terrain for two to seven days to reach these destinations to install and commission the equipment.

An e-mail from Thinley Dorji, Managing Director of Bhutan Telecom to Vishnu Calindi of ITU best sums up some of the problems confronted. "We just got back a few days ago. It was quite an expedition, walking for six days one way and then staying in Lunana for about seven days. We established communications for about a day and half but after that could not get a signal. As we had no equipment to measure many of the system parameters we returned to Thimphu to see what went wrong. After proper evaluation we will once again send a team to Lunana to establish communications."[8]

At most of the remaining 32 locations too it was not easy to transport the equipment and commission it. Though the post office staff at these locations had been provided with necessary training in the use of hardware and software, they still needed more guidance before they were able to use the systems independently. Consequently, the computers and other hardware had to be personally carried and installed at these locations by the two or three IT trained staff based at Bhutan Post headquarters in Thimphu. After installing the hardware and software, these employees stayed on for a few days at each location to provide on-site training.

[7] Includes 40,700 USD contributed by British Telecom, Deutsche Telecom, INTELSAT and Telstra.
[8] Satellite Connectivity to Remote Areas and E-Services for Development: Initiatives through Post Office Telekiosks in Bhutan, Pradosh Nath and Vishnu Mohan Calindi, ITU–UPU, 2009, page 17.

Problems faced with the operation of telekiosks

While it was not easy to install the telekiosks in many of the remote locations, their operation generated new difficulties. The initiative failed at Lunana, the remotest of the locations. The station ultimately had to be abandoned because of persistent technical problems and unfavourable weather conditions.

Of the five remaining stations, Minjiwoong and Shingkhar Lauri did not face any major problems and reported trouble-free functioning of the equipment. Laya reported occasional short breakdowns in connectivity and also faced technical problems which necessitated frequent assistance from Thimphu. Sombeykha station's connectivity was frequently affected by adverse weather conditions. Merak recorded breakdowns in connectivity only twice during the year under review, but one of the two breakdowns lasted for 50 days, mainly because of the unavailability of a critical spare part (data card) and the delay in reaching the station.

Solar panels are generally working well, but poor weather conditions occasionally reduce their effectiveness. Adverse weather also affects the recharging of batteries, thereby reducing their life. A common concern of all stations is that repair and maintenance could become a major problem in the future, owing to their hard-to-reach locations.

The VSAT stations are manned by locally recruited staff who have been provided with training in the basic operations and maintenance of the system. Serious technical glitches which arise cannot be resolved promptly because these have to be dealt with by the technical staff of Bhutan Telecom based in Thimphu. When the computer at Merak got infected by a virus, a team from Thimphu had to attend to the problem. Then there is the difficulty of procuring spare parts in real time. The majority of the spare parts need to be imported from India. With all these constraints, it is a remarkable achievement that the telekiosks at the five locations functioned adequately with only one location reporting 55 days of outage in a year.[9] It is expected that once the operations stabilize there will be fewer technical problems. Learning from experience, Bhutan Telecom has built up sufficient stock of frequently needed spare parts.

The telekiosks at the remaining 32 locations also faced operational problems which were not however, as severe as the ones faced by the telekiosks at the five remote locations. Most of the postmasters reported power breakdowns, shortage of trained manpower, slow Internet connectivity and equipment malfunctioning as the major problems impeding the smooth functioning of these kiosks. They felt that replacement, maintenance and repair of the equipment might emerge as major problems if steps were not taken to address these in the near future. Computers and other hardware needed to be brought to Thimphu for repairs since the necessary expertise was not available at the majority of locations. Bhutan Post addressed this problem by providing training to its staff in hardware maintenance. As the use of computers becomes more prevalent in these places, repair facilities should become more widely available.

Beneficiaries of the project

The study conducted in Bhutan during June 2008 to assess the impact of the project noted that the "benefits of this project are fundamental as well as transformative." The project also "revolutionized governance in Bhutan, changed the work culture of Bhutan Post as an organization, and encouraged innovation among the staff."[10]

The beneficiaries of the project can be broadly classified in three categories; communities living in the six remote locations which completely lacked telecommunication connectivity before the project; communities living in locations which had limited telecommunication and Internet connectivity; and Bhutan Post and its customers.

The authors of the study cited above had carried out a questionnaire-based survey to find out the profile of the users and usefulness of the telekiosks to the villagers in and around the post offices at the VSAT stations as well as non-VSAT stations.

Beneficiaries of the telekiosks at the six VSAT locations

The biggest achievement of the project was to bring the multiple benefits of digital technology to communities in the five remote locations. The villages in and around the remote VSAT locations are economically under-developed. The main economic activity of the villagers is subsistence farming or yak herding. The population of the villages varies from 700 to 3,000. Literacy levels are also low, ranging from 3% to 20%. Only one of the stations, Merak, has a primary school. All stations with the exception of Merak have a livestock extension centre looked after by a health assistant. Two of the stations also have a renewable natural resources centre.

The survey (which doesn't include the Lunana VSAT location) showed that the main users of telekiosks were local officials, visiting students and professionals, men as well as women. The main purpose of the use was for social interaction; education; and information related to career growth, health and personal hygiene and development programmes, and occasionally business.[11] The survey also showed that the users were not confined to the villages where the stations are located but also came from neighbouring villages, some as much as 15 km away. In the case of Merak, occasional users came from villages about two days' walk from the kiosk.[12]

[9] Ibid, page 18.
[10] Ibid, page iv.
[11] Ibid, page 60.
[12] Ibid, page 58.

The survey results further revealed that the telephone service was the most popular of the services provided. It was used at all five VSAT stations for periods ranging from 37 to 51 minutes a day. The use of the Internet was limited; it was only accessed at Minjiwoong for 120 hours and at Shingkhar Lauri for 180 hours in a year.[13] The survey also revealed that in addition to the use of telephone and Internet services, the telekiosks were also used for faxing, photocopying and scanning documents.[14] The demand for E-post was low. This was possibly due to the fact that access to voice communication had become available and literacy levels were low.[15]

The main findings of the survey regarding the profile of users and usage are given in Table 2 below:

Table 2: Telekiosks at VSAT stations: profile of users and usage[16]

Stations	*Voice traffic (minutes)*	*Internet usage (hours)*	*Profile of user villages*
Laya	18,720		Most of the users are from Laya, though there have been occasional users from some of the neighbouring villages. Neighbouring villages that accessed the services: four (two within 15 km; two more than 15 km away) – Population: 900 – Literacy rate: 6% to 10% – Main economic activity: agriculture and livestock rearing – Any other institution: basic health unit, livestock extension centre, renewable natural resources centre, national park branch office and two non-formal education institutions
Minjiwoong	16,140	120	Neighbouring villages that accessed the services: 10 (six within 15 km; four more than 15 km away) – Population: 3,000 – Literacy rate: 3% to 20% – Main economic activity: agriculture – Any other institution: basic health unit, renewable natural resources centre, livestock extension centre and a lower secondary school
Shingkhar Lauri	13,620	180	Neighbouring villages that accessed the services: eight (three within 10 km; five more than 10 km away) – Population: 3,000 – Literacy rate: 3% to 20% – Main economic activity: agriculture – Any other institution: renewable natural resources centre and livestock extension centre
Merak	542		Most of the users are from Merak, though there have been occasional users from some of the Neighbouring villages. Neighbouring villages that accessed the services: two (the actual distance of these villages from the kiosk has not been provided but they are reported to be about two days' walk from the kiosk) – Population: 2,000 – Literacy rate: 6%. – Main economic activity: livestock rearing – Any other institution: basic health unit, livestock extension centre, primary school
Sombeykha	13,657		– Population: 1,000 – Literacy rate: not provided – Main economic activity: not provided – Any other institution: livestock extension centre

The impact of the telekiosks on the life of people living in and around these villages cannot be only measured in terms of the hours and minutes they spent using the ICT services available. What is more important is that these telekiosks have ended their isolation from the rest of the world. The residents of these villages were previously cut off even from other parts of Bhutan. It took mail five to seven days to reach them. In case of emergency, they had to walk for two to seven days to access the nearest telephone connection from where they could communicate with their relatives or government officials.

[13] Ibid, page 58.
[14] The telekiosk at Merak does not offer fax services.
[15] Pradosh Nath and Vishnu Mohan Calindi, op.cit. page 20.
[16] The usage is for one year (2007–2008). It is low because these are very remote locations with small populations and low literacy levels. Before the project, even telecommunication connectivity was absent in these locations.

These villages now have access to telephone, fax, Internet and e-post, and people can receive and send messages from and to any place in Bhutan or anywhere else in the world. Their lives have changed significantly. The basic health units (BHUs) and renewable natural resources centres in these villages and their headquarters are now in direct contact with each other for mutual consultations. The officials working in these villages also find the Internet a valuable source of information related to their work. The Livestock Extension Officer at Laya, Pema Dezang said "There are so many resources on the Internet and I often use them to help me at my work… There's unlimited information on GID and warble infestation, two common diseases, which affect the yak, the beast of burden for Layaps.[17] Dissemination of information is also much quicker than in the past. One striking example of how things have now changed was the announcement of the results of the first general elections held in Bhutan in 2008 from the five remote locations in real time, using the post office facilities. Earlier, it would have taken several days for the results to reach Thimphu.[18]

The potential of the telekiosks to bring about socio-economic changes in Bhutan was brought out in a story published in *Kuensel,* the popular English newspaper, on 26 October 2005, barely a fortnight after the telekiosk at Merak was commissioned.[19]

Box: Extract of a report on the telekiosk at Merak published in **Kuensel** *on 26 October 2005*

Reaching the unreached

By Samten Wangchuk in Merak

Lobsang Dema, 46, of remote Merak gewog in northern Trashigang, vaguely recalls making a telephone call several years ago. To do that she had to walk all the way down to the nearest telephone facility in Rangjung, a day's hike from Sakten. On October 10, she walked about five minutes from her home to the [telekiosk] and called her brother and sister who work in Thimphu. "Talking over the phone is as good as meeting them in person", said Lobsang Dema. "I have not met my brother and sister in three years."

[…] According to the caretaker of the new service, Phurpa Tshering, a 20 year-old class 10 dropout, more than 30 people use the telephone every day. When there are callers on the other end, Phurpa sets a time for them to call back and then rushes to the village, about five minutes away, to pass the information. If the call is for somebody in Gengu, another small community in Merak, which is about 15 minutes' walk, Phurpa sends a message through a person headed there.
According to Phurpa, the people of Merak call as far as Mysore, Bangalore and Chennai, in south India, Delhi in the north and the bordering Indian state of Arunachal Pradesh to talk to their children, friends and close relatives, besides making calls to all parts of the country [Bhutan]. For every call within the country, he charges Nu 10 a minute and Nu 20 a minute for calls outside the country. At the end of each day, he makes a collection of about Nu 500 to Nu 1000. But the people of Merak don't mind paying considering the amount of time taken hiking to Rangjung to make an emergency call in the past.

"Besides helping me to keep in touch with my two brothers who are monks in Mysore [India], I can now make deals with businessmen in Arunachal Pradesh", said 25-year-old Dewa. "I can ask them to keep the goods I need ready and they can in turn tell me about the kinds of and the quantity of various livestock products they need from here."

[Norbu Wangdi] said that it was very difficult when serious patients carried all the way from Sakten needed to be admitted immediately to the Trashigang hospital. "Now we can call the hospital from here itself and fix a date and time for the ambulance to pick our patients", said the Merak gup, Sangay Khandu.

He added that the development activities in the gewog should also progress more smoothly with the communication link. "For timely completion of development works we have to constantly keep in touch with the dzongkhag officials. Now it is possible." said gup Sangay Khandu.

The use of the Internet at these telekiosks is limited at present but it is expected to grow gradually in the coming years. The impetus for this growth comes from increased economic activity and migration of people from rural to urban areas. As elsewhere, social mobility is driven by the rapid increase in the number of educated Bhutanese and their willingness to move out of their villages in search of employment and other opportunities. The Royal Government of Bhutan places

[17] Small PCO, big impact, Kuensel, 9 December 2009.
[18] Pradosh Nath and Vishnu Mohan Calindi, op. cit. page v and page 18.
[19] Ibid, page 24.

a very strong emphasis on providing education to all Bhutanese people. One of the key objectives of the national policy on literacy is to eradicate illiteracy by 2012. To achieve this goal, the Government provides eleven years of education free of charge. As a result of these policies, opportunities for receiving education are now available to almost all people in Bhutan.

The socio-economic changes which are taking place in Bhutan are illustrated in a story published in the *Bhutan Observer* (16 May 2008), a weekly news magazine published from Thimphu.[20] The story concerns Aum Kali, a 76-year-old woman who brought up her five children on her own after the death of her husband. She lives in Puduna village, in the Sama gewog of Haa District. Sombeykha, one of the five VSAT locations, is also part of the Haa District, and about 90 km from Haa. Aum Kali makes her living by selling milk and milk products at the Dorokha market. She lives with her widowed daughter and four grandchildren, three of whom are studying in a school in Haa. The grandchild who has completed schooling helps her to take care of her cattle. One of her daughters is employed in a private company in distant Thimphu.

It is not unusual to meet an Aum Kali in any of the remote post offices of Bhutan, a customer who walks for a few hours to reach the post office and then waits for someone to help her get connected to a son or a daughter working far away. For her, the Internet is not a necessity and the telephone is sufficient to connect with her loved ones. But for her grandchildren, the Internet meets the specific need for education supplements, general information updates and entertainment.

By any measure, Aum Kali's family is typical of thousands of families in rural Bhutan, and representative of an emerging social trend whereby formal education is becoming more valued and accessible, and younger people are willing to make a life for themselves in distant towns and cities. And in some cases, educated people wish to return to their roots. For all three categories, the Internet is indispensable – ideally with faster connectivity.

Beneficiaries of the kiosks at the remaining non-VSAT locations

In the remaining 32 non-VSAT locations, while the basic telecommunications connectivity was available, it was mostly limited to voice communication. The majority of people living in these locations did not own computers or have access to the Internet. Telekiosks in these locations provided such people with access to the Internet and Internet-based services for the first time. The post offices with telekiosks provide a number of services such as e-post, Internet, fax, telephone, scanning, photography using digital cameras, and photocopying. Up to 2007, fax services were, and perhaps even now are, mostly used for money transfer through post offices. While the bulk of the revenue of the telekiosks was generated from voice communication and fax-based services, the use of the Internet was growing.

Students, in general, are the primary users and beneficiaries of the telekiosk services. They access the Internet not only to see their school results and obtain their mark-sheets, but also to gather study-related information. It is, therefore, reasonable to expect that the telekiosks will open the door to a knowledge-based society in Bhutan.

The other major group of users are members of the public who want to access e-government services. In recent times, the government has made many of its services available on the Web. Some of the more popular services involve applications for driving licences and passports, as well as loans and work permit renewals for migrant workers.

Construction work is being undertaken in all parts of Bhutan. In fact, the construction sector has emerged as the second biggest employer after agriculture. Construction activity has led to an increased demand for services provided by telekiosks such as photocopying and fax services. In addition, it has generated a need for Internet access in order to obtain copies of tender notifications and application forms for building-related permits and submit them online.

Fax and photocopying machines and web cameras were not initially supplied to telekiosks as part of this project. Inspired by its success, government and non-government agencies contributed this additional equipment, which in turn led to greater use of telekiosks.

Webcams made it possible for customers to obtain the digital picture required in order to obtain licences and permits. This facility for obtaining photographs in post offices is very important because in most of the smaller towns in Bhutan it is not otherwise available. People need to travel for two to three hours to reach a professional photographer.

As in the case of the telekiosks at the six VSAT locations, the facilities at the 32 non-VSAT locations are being accessed not only by the local communities but also by the villagers in surrounding areas, and by others who live further away. In many cases, users travelled 10 to 15 km to access the telekiosk.

Road networks in Bhutan are limited. There are small villages with only a few households from where people have to walk miles to reach the nearest post office. The villagers therefore access the ICT services only when it is absolutely necessary or when they can combine it with other activities to make the long journey worthwhile. It was quite a revelation to find that in some cases users came from as far as 50 km away to use the telephone or fax services, and in some cases the Internet. They were of course among the occasional users of these services; nevertheless, it shows how telekiosks improve the quality of life for people living in remote and rural areas.[21]

[20] Ibid, page 7.
[21] Ibid, page 27.

The 32 offices with non-VSAT telekiosks were equipped with computers, Internet connectivity, scanners and fax machines. Some of these were later provided with photocopying machines and web cams. The survey on the use of these services received replies from only half the offices. Table 3 below shows the ranking of various services in post offices according to the use of the facilities.

Table 3: Ranking of services in terms of use

Post office	*Telephone*	*Internet*	*Fax*	*Photocopying/ scanning*	*Digital camera*
Bumthang	1	3	4	2	
Dagana	3	4	1	2	
Deothang	2		1		
Haa	1	2			
Kanglung	4	3	1	2	
Lhuentse	1		2	3	
Mongar	2		1		
Paro	2	1			
Phuntshling	1	4	3	2	
Punakha	1	3	2	4	
Rangjung		4	1	3	2
Samste	1	4	2	3	
Tsirang	4	3		1	2
Wamrong	2	4	1	3	
Wangdue	1	3	2		
Zemgang	2	4	1	3	

Telephone and fax services were ranked first by seven post offices. One post office each ranked the Internet and photocopying as the most accessed service.

Usage depends upon many factors. Phuntsholing, a border town and a major trading centre, receives a large number of traders from right across the country. Punakha and Bumthang are very popular tourist spots. Demand for telephone services is heavy in these towns because of the constant presence of substantial number of traders, visitors and tourists. On the other hand, in the case of Haa, Samste and Lhuentse, demand for telephone services exists because the post office at these places is the most convenient access point for telephone connectivity.

Fax service is an equally popular service. The demand for fax services is linked to money transfers, and rises substantially at the beginning of the school season when school fees have to be deposited.

Photocopying services are also in high demand, with students the major users. It is also required for various legal and official purposes.

Internet service was ranked first by one post office and second by another. Five post offices ranked it third and one post office ranked it fourth. It was ranked first by the post office in Paro, where the only international airport is located. It receives a large number of foreign visitors who are the main users of the service. The use of the Internet is gaining in popularity.

E-post is the only service introduced in the telekiosks which has not lived up to its potential. As in the case of the telekiosks located at the five VSAT stations, e-post service has not proved to be popular in the remaining 32 telekiosks. E-post was tried by all the post offices with various degrees of acceptability. At the peak of its usage, e-post comprised almost 25% of the total mail volume processed by Bumthang post office. However, in none of the post offices was the service able to continue beyond the initial few months. There were problems on both the service providers' side and the users' side. Most of the post offices found delivery of e-post cumbersome. In addition, there were technical problems related to connectivity and readability. In many cases, the post office staff were asked by the users to write the message, which proved to be a strain on the limited manpower in the post offices. Users have also shown a preference for voice communication due to privacy concerns and the advantage of instant communication. The introduction of mobile telephony has made voice communication easier for illiterate users, and literate users prefer e-mail over e-post.[22]

[22] Ibid, page 28.

Additional benefits – modernization of Bhutan Post

Since Bhutan Post was selected as a medium for providing access to information and communication facilities, a significant consequence of this project was the modernization of Bhutan Post and its integration with the global communication system. Before the project, services at postal counters were provided manually in 35 out of the 42 regular post offices, with Internet connectivity available in only two post offices.[23] After the project, counter services were computerized in 33 post offices and there were plans to extend automation to the remaining nine post offices. In addition, 32 post offices gained access to Internet connectivity. These post offices were also connected with the headquarters at Thimphu. Online connectivity of these post offices with the headquarters has significantly improved the management information system within Bhutan Post. Faster exchange of information has also led to better management and control over the postal system and quicker resolution of public complaints.

Access to the Internet at these post offices has also helped them to utilize IPS Light to improve the quality of international postal deliveries. Tracking and tracing of international EMS and parcels has now become possible. IPS Light is the light version of International Postal System, a Web-based system hosted by the UPU's Postal Technology Centre in Berne which enables data sharing between postal organizations around the world and is mainly used for tracking of international postal deliveries.

Online tracking of domestic express, registered and parcel mail has been introduced in selected post offices and is expected to become available at the remaining post offices connected to the Internet soon. Software for the online tracking system and E-post has been developed in-house. Electronic international money remittance is available through collaboration with a private player. The online connectivity between the headquarters of Bhutan Post and post offices has enabled Bhutan Post to look into the feasibility of introducing banking services. It also has plans to enter new business areas such as e-ticketing and e-commerce for indigenous products.

In a country where very few institutions have computerized their operations at the local level, computerization of post offices and their conversion into telekiosks has served to raise the profile of the post office and its employees. This has improved the morale of postal employees and the quality of their work culture. They have become innovative and committed to the organization. In many cases, postmasters keep telekiosks open beyond normal office hours and on holidays to accommodate customers.

Bhutan Post is currently working with the Royal Government of Bhutan to convert some of the telekiosks into fully fledged government information centres. The post offices will receive applications for various services from the public and forward these to the relevant government agencies.

Before the project started, Bhutan Post had an elementary ICT infrastructure both in terms of equipment and the IT skills of its staff. Now, Bhutan Post has established a separate IT unit at its headquarters at Thimphu where the hardware and software-related complaints from post offices are addressed. It is also responsible for training post office personnel. The training is given onsite and the expert is required to travel from one post office to another, which given the difficult terrain could require him to walk for many days. The IT unit is also responsible for monitoring and resolving operational problems in the telekiosks. In addition, the unit has taken the initiative to develop an online tracking system for domestic express, registered and parcel mail.

Lessons learned and future considerations

ICT is widely regarded as an instrument of poverty alleviation and of inclusive economic growth. This project offers concrete evidence that digital technology can deliver significant benefits to communities with low levels of income and literacy, including those living in rural and remote areas. Its availability through the medium of upgraded post offices has led to better social interaction; the creation of networks to increase knowledge for professional and other purposes; generation of information about alternative means of income, and the launch of new government schemes and programmes. In addition, it has become a vehicle for participatory planned development and enhanced efficiency in the functioning of government and its interaction with the public.

When this project was formulated, there were genuine concerns about whether it would be possible to take the modern information and communication technologies to people with virtually no exposure to these technologies owing to the formidable logistical difficulties on the ground. In six locations there was neither electricity nor telecommunication connectivity. Furthermore, it took two to five days to reach the nearest motorable road. In spite of these formidable difficulties the project was satisfactorily concluded. The successful implementation of the project also served to demonstrate what cooperation among diverse entities can achieve even in the most difficult of places. "The project had the support of two governments – the Royal Government of Bhutan and the Government of India, of two international organizations – ITU and UPU, and of two national agencies – Bhutan Telecom and Bhutan Post, and all partners cooperated effectively throughout, leading to the successful implementation of the project. This project and the cooperation displayed by all partners are exemplary and worth emulating elsewhere."[24] An important lesson is that such projects can be replicated anywhere as long as there is genuine cooperation and commitment on the part of partners implementing it.

[23] Thimphu central post office and Phuentsholing central post office.
[24] Pradosh Nath and Vishnu Mohan Calindi, op. cit., page iv.

The VSAT network is regarded as an advanced technological system. The need for training of the personnel required to operate and maintain it at the local stations and also at the hub in Thimphu was recognized from the outset, and substantial resources were earmarked for this. Bhutan Telecom technicians from Thimphu were provided with one week's training in VSAT systems at the Advanced Level Telecommunications Training Institute in Ghaziabad, India. Locally recruited staff at the VSAT stations were trained on-site in basic computing, VSAT operations and handling of e-post.

Bhutan Telecom felt that the one-week training given in 2005 needed to be augmented, and wanted its technical personnel to be attached as trainees to sites where the INSAT system was in operation in India. Most of the employees at the VSAT stations felt that they needed more training in the new technologies. In view of this experience, an important lesson which can be drawn is the need for greater emphasis on training where projects have a higher degree of technical content.

Adequate publicity is a pre-requisite for the successful introduction of new services. Bhutan Post launched a nationwide media campaign on telekiosks and e-post, but this was of short duration owing to limited funds. The postmasters were of the view that more efforts should have been made to raise awareness about the services offered. It is clear that sufficient funds for publicity should be factored into the cost of the project. Since affordable radios and mobile phones have become increasingly available, they should be the preferred medium for advertising campaigns.

Voice and data services had to be temporarily suspended in one or two cases because of shortage of critical spare parts such as voice and data cards. In one case, the problems could not be resolved quickly because of the time it took to obtain spare parts. To avoid recurrence of such problems, Bhutan Telecom now maintains an adequate stock of necessary materials. Adequate inventory of critical spare parts, particularly those which are difficult to procure, should be maintained.

Other problems faced by the project included the difficulty of retaining trained staff, the slow speed of Internet connectivity, and power breakdowns in some of the VSAT stations resulting from poor weather conditions which affected battery recharging and consequently the life of batteries. The operations of the VSAT network were also affected by the departure of some experienced personnel, which reduced the pool of skilled staff. Because of the rapid growth in the use of ICTs, such personnel are in high demand. Organizations need to ensure that attrition levels are kept low by devising attractive retention packages. While in the case of Bhutan resource constraints did not permit opting for faster connectivity, the speed of connectivity is another critical requirement in the success of ICT-based projects. Similarly, though Bhutan power problems were unavoidable due to Bhutan's extreme weather conditions, reliable power is another basic necessity.

Revenue increased in the telekiosks, including at the five remote VSAT stations, but not at a pace that made all of them financially viable.[25] The problem of financial viability was particularly acute in the case of the five VSAT-connected telekiosks since the level of use of services was lower than at the other telekiosks. The average revenue generated by these five telekiosks was between 2000 and 5000 Nu (50–100 USD) a month. According to Bhutan Telecom which finances them, this was not enough to meet the operational costs.

There was also not much diversification in the use of the services in the telekiosks. Voice communication and fax services were the favoured services. Demand for Internet services was at a nascent stage. The main users were students and personnel from academic institutions. On average, Internet use was about five hours a week, and only in urban areas. The ICT services provided through the telekiosks in semi-urban areas or areas which have educational institutions nearly generated reasonably good business for the post offices. But since good business attracts competition, private players providing similar services at lower cost emerged at these locations. Post offices, with their higher administrative costs, found it difficult to compete with them. Moreover, wherever there is higher demand, there is also demand for faster connectivity. The post offices are still not in a position to acquire the more expensive broadband connectivity which the private providers had installed. Since in some telekiosks Bhutan Post is losing ground in providing access to the Internet, it comes as little consolation to note that the community is benefiting from multiple players offering cheaper and faster connectivity.

The introduction of the e-post service initially received an enthusiastic response. However, the early success gradually tapered off with the increased availability of mobile telephones. The mobile telephone service was introduced towards the end of 2003 and people seem to have preferred direct voice communication over e-post. This was not anticipated in 2001–2002 when the project was planned. Around that time, India Post had introduced e-post and it seemed an ideal solution for providing fast and reliable means of communication to the digitally "unconnected". The rapid expansion of voice connectivity in the last decade has impeded the growth of e-post as a means of personal communication. However, that does not mean that there are only limited prospects for the growth of e-post in Bhutan. Once the difficulties in providing this service described earlier are addressed, and the availability of e-post becomes better known, the service will be able to grow, since voice communication cannot address all the communication needs of the population.

Economic development due to the expansion of physical infrastructure, growth and diversification of economic activities and spread of education will undoubtedly lead to greater use of ICT-based services in Bhutan. However, since economic development is a slow process, and private providers who expect to benefit are already present, it will take some time before all telekiosks become financially self-sustaining. It needs to be recognized that any ICT project located in

[25] Ibid, page 33.

remote and rural areas is bound to be fragile. Nurturing over an extended period is therefore indispensable in such cases.

Since Bhutan Post and Bhutan Telecom are mandated to provide universal service, they are continuing their financial support for the telekiosks regardless of the drain on their own resources. Nonetheless, even societal responsibility projects ultimately need to be financially sustainable. In this context, there is a need to explore mainstream and alternative models of financial viability. The Royal Government of Bhutan is reportedly considering two options.

The first option involves sharing costs. When the project was planned and launched, Bhutan Telecom was the only operator providing telecommunication services in the country. Another mobile operator was subsequently licensed and began to provide nationwide mobile services. This adversely affected the revenue of Bhutan Telecom, which was of the view that it should not have to bear alone the burden of financing the universal service obligation. The government needs to put in place appropriate policy measures to ensure long-term provision of services in rural and remote areas that require large investments on the part of the operator without corresponding returns. This could take the form of a government subsidy or the creation and operation of a universal service fund. The Royal Government of Bhutan, which has expressed its long term commitment to the telekiosk project, is examining these issues.

The second option is to explore the possibility of a public-community partnership. Drawing from the experience of Viet Nam, where such a model has been a success, management of the telekiosks could be shifted to local communities.[26] In Viet Nam, the day-to-day operation of the kiosk is left to an educated and trained person chosen and paid by the local community from the revenue earned. The maintenance and repair of the equipment and training of the personnel are covered by Viet Nam Post. The objective of this model is both financial and social. "The mainstay of this model is not earning more revenue, but to make ICT more accessible and familiar to the local communities; and make them a partner in sharing the benefits as well as the cost of the services."[27]

Critical elements for success

A decisive factor that contributed to the success of the project was the combination of favourable policy and a suitable regulatory framework. A variety of ideological, technological, logistical, political and administrative factors were associated with this.

The objective of the project was to bring the benefits of digital technology to the population in rural and remote areas of Bhutan for the sake of integrated, sustainable, community-level development and improving the quality of public services. A cost effective way of providing such services is by means of facilities located at public institutions. "Post offices – probably more than any other institution – play a central role in people's lives. Everyone can be said to visit the post office at some time or the other."[28]. Furthermore, in rural areas of developing countries, the post office is often the only embodiment of government.

The post office was identified as the most suitable and cost-effective medium to deliver the benefits of ICTs to all parts of Bhutan. This was enthusiastically endorsed by all participants in the project, particularly the postal operator.

Bhutan Post became a government-owned corporation in 1996 with a mandate which included the obligation to provide universal service. The operator saw in this project an ideal opportunity to advance towards this goal through e-post, a modern, fast and a cost-effective service for long distance written communication. Bhutan has a difficult terrain. It takes about three to seven days for the mail to reach post offices located in remote regions. By setting up telekiosks in post offices equipped with the necessary communication equipment and information technology tools, including Internet access, Bhutan Post could introduce electronic services and reduce the need to expand its time and money-consuming physical network.

Implementation of the project depended on establishing not only Internet connectivity but also telecommunications connectivity, since six of the identified locations still lacked the latter. It was therefore imperative to co-opt Bhutan Telecom as a partner in the implementation of the project. Bhutan Telecom was at that time the exclusive provider of telecommunication services in the country. Like Bhutan Post, it also had a universal service obligation, applicable in its case to telecommunication services. This project offered the opportunity of advancing towards the goal of providing telecom connectivity to the locations which were hitherto deprived of this connectivity.[29] After Bhutan Telecom joined the project, it was fully involved in selecting the locations where telekiosks were to be established.

It was realized early on that provision of a few electronic postal services and an Internet facility alone could not make the telekiosks financially viable. The telekiosks needed to provide a wider array of services, for which the commitment of the Royal Government of Bhutan was necessary. Before the project document was signed in 2002, the Government's endorsement was sought. This was readily given, since the Government's stated objective was to reduce the digital divide by establishing connectivity in the areas where it was non-existent, and strengthening it in other places.

[26] Ibid, page 36.
[27] Ibid, page 36.
[28] Ibid, page iv.
[29] "But for this project, it may have taken years for Bhutan Telecom to reach these remote areas" – Mr Thinley Dorji, Managing Director, Bhutan Telecom, quoted in a report posted on the website of the Bhutanese official newspaper, *Kuensel* on 22 March 2006, as cited in Pradosh Nath & Vishnu Mohan Calindi, page 9.

Indeed, the Government was already engaged in establishing a nationwide digital infrastructure, and was committed to turning Bhutan into a modern e-society, so it duly joined the project, and gave the assurance that the post office network would be used as the pre-eminent channel for facilitating access to digital services. Setting up telekiosks in 38 post offices spread all over the country would make the Internet more widely accessible. This was very significant because in Bhutan, outside Thimphu, very few people owned computers or had access to cybercafés.

The policy and regulatory framework earned the support of the top political and administrative officials. The proposal to establish telekiosks in post offices was personally developed by Mr Meghraj Gurung, the then Managing Director of Bhutan Post. He was also instrumental in bringing on board the Managing Director of Bhutan Telecom and obtaining the support of the Royal Government of Bhutan. Both Gurung and his Bhutan Telecom counterpart travelled to India to secure the support of the Indian Government. The project also received consistent support from Bhutan's political and administrative establishment. The Minister of Information and Communication and the Secretary to his Ministry took a special interest in the implementation of the project. Coordination meetings of the stakeholders, which were held periodically to review the progress of the project and resolve the problems encountered in its implementation, were always chaired by the Secretary to the Information Ministry. The sincerity and dedication of the staff of Bhutan Post and Bhutan Telecom also contributed hugely to the successful implementation of the project.

An equally important element was the multi-member partnership and regional approach which was adopted to implement the project, which began with a partnership between Bhutan Post, Bhutan Telecom, ITU and the UPU. Subsequently, the Royal Government of Bhutan and the Government of India also joined the project. Bhutan Post and Bhutan Telecom played a critical role as the implementing agencies on the ground. The technical and financial support provided by the Government of India was no less important. It provided the necessary training to the staff of Bhutan Telecom, and facilitated telecom connectivity at the six remote locations by establishing VSAT links and by providing space segment on its communication satellite free of charge for the duration of the project. The sharing of infrastructure with India considerably reduced the cost of the project for Bhutan. The contribution of the Royal Government of Bhutan was also significant. It facilitated the legal and regulatory clearances from the authorities concerned, and also waived the various government duties and levies on equipment imported for the purposes of the project.

The commitment of ITU and the UPU to the project also facilitated its implementation. The technical and financial difficulties which arose during the implementation of the project were successfully resolved thanks to the efforts of ITU, in cooperation with the UPU.

A carefully considered strategy for implementing the project in stages was another important element which led to its success. The project was implemented in three phases, each comprising a distinct self-contained module separate from the other two phases. This phased approach enabled Bhutan Post to consolidate the gains resulting from each phase before initiating the next phase. It also allowed adequate time for Bhutan Post to absorb the new technologies and enable its personnel to sharpen their technical skills so that in future they would not only be able to maintain the equipment but also facilitate expansion of its operations. In addition, lessons learnt during the implementation of the first phase were acted upon in the next two phases. For example, one lesson was the need for an extended training programme. As a result, in-house training was provided on a continuous basis, allowing a large number of staff members to become familiar with new technologies.

Staggered implementation of the project also made it easier to raise the required financial resources. When the project was launched in 2003, funds were available for establishing telekiosks in only 17 post offices. Even before the implementation of the first phase began, efforts were initiated to raise resources for the second phase, which primarily consisted of establishing telecommunication connectivity at the six remote locations in Bhutan. The first phase was completed by January 2004. In December 2003, the Government of India formally agreed to finance the major portion of the second phase. By the time the second phase was completed in July 2006, funds had been raised for the implementation of the third phase. Riding on the success of the first phase, each partner was able to raise additional resources for the next two phases.

Conclusion

The main objective of the project to bring the benefits of ICTs to communities in the rural and remote areas of Bhutan has been achieved. What makes the success of the project remarkable is that, up to now, it has been running without any subsidy from the Government. Furthermore, Bhutan Post has not given any financial incentives to its staff members to make greater use of ICTs in providing postal services, nor have any incentives been given to customers. The staff seem to be motivated by a commitment to better service, and customers are happy with the improvement in services.

In the beginning, the postal employees were not comfortable using computers and other ICT-based applications, and were also skeptical about the project's benefits. There has now been a profound change in their attitude. They feel that they cannot run the post office without access to ICTs and want more ICT-based services. It was probably due to their enthusiasm that some post offices were included among the venues at which the Microsoft-initiated Community Information Centres were established.

The change in the employees' attitude has in turn led to a remarkable change in the organizational culture of Bhutan Post. The initial objective of the project was to improve community access to ICTs and thus contribute to the narrowing of the digital divide, in the spirit of a corporate societal responsi-

bility project. Once the basic ICT infrastructure became available, Bhutan Post's entrepreneurial instincts became sharper and it started thinking about how to make the best use of its ICT infrastructure. It is now considering moving up the value chain and examining the feasibility of entering into banking and e-commerce services.

In conclusion, in view of its proven potential, the Bhutan project should be recognized as a catalyzing force whose cascading nature and multiple impacts will be more visible in the future. Thousands of people who were once in a rural cocoon now feel empowered by being in touch, both with one another and with the government. Apart from securing some immediate benefits, as they become more informed they will expect more and hopefully get more from a government sensitized to their needs. A more inclusive and prosperous society and a more responsive government should ideally result from this.

ICT facilities in rural Botswana through the national postal service

Graeme Lee

Introduction

In this chapter we discuss the introduction of ICT facilities in rural Botswana through the national postal service. Botswana is recognized as one of sub-Saharan Africa's most stable and progressive countries. While there has been rapid development of electronic communication services such as Internet, e-mail and text messaging throughout Botswana society, the postal service still remains one of the most universal and accessible means of communication in most parts of Botswana. The services of BotswanaPost remain essential tools in the exchange of information, and the physical communications network serves not only as a vital link in the economic development of Botswana, but also as a reliable means of exchanging information.

This chapter will discuss the development of Kitsong (knowledge) centres. Kitsong centres are a means by which the Government of Botswana narrows the digital divide between urban and rural communities. BotswanaPost was the natural choice to provide such centres, with its network of 192 postal facilities throughout the country. The Government and BotswanaPost have already installed 49 Kitsong centres, with a further five due to open in 2010. The example of Botswana will demonstrate how integrating government policies can lead to the development of new services. It will also show the importance of linking sector policies to a wider national policy, which in the case of Botswana is the Botswana Vision 2016.

Background to BotswanaPost

The area now known as Botswana can trace postal services back to the late 19th century. The post office network originally grew along railway lines, with a steady growth in both post offices and postal agencies to the current 119 post offices and 73 agencies. Key dates in the history of the BotswanaPostal services include:

- 1932: First official stamp issue.
- 1957: Protectorate Government took over control of the post office.
- 1963: Establishment of Postal Savings Bank.
- 1980: Split of postal and telecommunications businesses.
- 1989: Corporatization of BotswanaPost.
- 2000: Introduction of counter automation.
- 2007: Introduction of BotswanaPost's first Kitsong centre.
- 2008: Phase 1 Kitsong centres – Introduction of 24 centres.
- 2009–2010: Phase 2 Kitsong centres – Introduction of 29 centres.
- 2010: All post offices due to be automated.

In addition to traditional mail services, BotswanaPost provides services on behalf of Government, parastatals and the private sector, including:

- *Department of Social Benefits:* payment of old age pensions.
- *Botswana Savings Bank:* opening of accounts, savings and withdrawals.
- *Motor Vehicle Accident Fund:* assistance in filling in forms for the Fund.
- *Botswana Power Corporation:* collection of bill payments.
- *Botswana Life Assurance Limited:* applications for insurance and payment of monthly premiums.

Automating all post offices will increase the ability of BotswanaPost to provide an expanded range of services on behalf of other customers, such as those listed above. It will also enable acceptance of bill payments to be extended to other companies besides Botswana Power Corporation.

Other services provided by BotswanaPost include collection of mail, delivery of mail to P.O. boxes, EMS services, money transfers and a range of products and services for business customers.

BotswanaPost also fully owns Botswana Couriers, which provides local across-town services in Gaborone and Francistown three to four times a day, regional same-day service between Gaborone and Francistown and points in between, and next-day services to all major centres throughout the country. Botswana Couriers is fully owned by BotswanaPost but operates as a private limited company, with its own network and vehicles.

The introduction of information technology in BotswanaPost began in earnest in 2000 with counter automation in a number of major post offices. This was a full four years before the development of the Kitsong centre initiative and seven years before the opening of BotswanaPost's first Kitsong centre. Counter automation was introduced to help develop additional services such as banking, bill payments and the sale of insurance policies. It also allowed BotswanaPost to develop better track and trace systems for its express and EMS products and services. BotswanaPost currently has counter automation installed in 76 post offices and plans to automate all 119 main post offices by the end of 2010.

BotswanaPost had also begun to implement its own Internet cafes prior to the Kitsong initiative. The main difference between those Internet cafes and the Kitsong centres was location. The Internet cafes were opened as purely commercial ventures in the urban centres of Gaborone, where there were three cafes, and Francistown and Kasane, with one cafe in each.

However, the Kitsong centres and automated post offices are generally independent of each other. Counter automation has been implemented on the basis of its commercial value to BotswanaPost. It is therefore implemented in urban areas, where each post office serves a large number of people. In contrast, Kitsong centres are located in the most rural locations and can be considered a social venture.

Country information

Botswana is a land-locked country located in southern Africa. Bordering South Africa, Namibia and Zimbabwe it is one of southern Africa's most stable economies. Since gaining independence in 1966 Botswana has enjoyed a stable political environment which has helped it to become one of the richest countries in the region. A middle-income country with a GDP of almost 14,000 USD per capita, it is also considered as the best credit risk in Africa by two major investment services. While Botswana's wealth is built on diamonds, with over 30% of GDP related to diamond extraction, tourism is becoming an increasingly important part of the economy as Botswana seeks to exploit the potential of its many wildlife reserves and natural beauty. It is seen as a model throughout the world of a country that has harnessed its natural resources to build a stable and growing economy. It is also recognized as a model for its progressive social policies, and the Kitsong centre initiative is one example of such social policy.

At 62 years, life expectancy is adversely affected by the relatively high rate of HIV/AIDS in Botswana, although the country also has one of the region's most comprehensive programmes for dealing with the disease. Adult literacy is high at 81%, and policies are in place to ensure this figure is raised in future generations.

Population	1,990,000
Area	581,730 km^2
GDP per capita	13,900 USD
Life expectancy	62 years
Adult literacy	81%

Botswana has one of the lowest population densities in the world, with two million people occupying an area of over 580,000 km^2, an average of only three people per km^2, similar to the averages for Mongolia, Namibia and Australia. In contrast, there are 112 people per km^2 in the European Union, 31 in the United States, and 39 in South Africa. Delivering any type of universal service with such a sparse and widespread population presents enormous challenges to the Government. Delivering ICT services in localities suffering from intermittent electricity supply and temperamental Internet connectivity is an even greater challenge.

Government policy

Botswana Vision 2016 is the Government's strategy to meet the social challenges faced by the country. Botswana Vision 2016 underpins many of Botswana's wider sector policies and represents a strategy to transform the country into a competitive and prosperous nation. The year 2016 is a particularly important milestone for Botswana as it will mark the 50th anniversary of independence. Botswana Vision 2016 reflects the long-term aspirations of the people of Botswana and is based around seven key pillars:

Work on defining Botswana Vision 2016 began in 1996 with a nine-person Presidential Task Group. Later expanded to 31 people, the Task Group was charged with consulting the people of Botswana to discover their common aspirations for the future of the nation. The public were invited to contribute to the vision through written submissions and through a series of open hearings in the main district centres. However, such consultations did not take account of the opinions and views of the rural population, because they had limited means of hearing about Vision 2016 and were unable to attend the meetings because they were held in district centres. Therefore, the University of Botswana was tasked with carrying out consultations in a selection of small villages and remote settlements. These consultations showed that rural communities had quite different aspirations and needs compared to people living in the main urban centres. This was a very important revelation which laid the foundation for the development of the Kitsong centres. Vision 2016 sets out the aspirations and dreams of the type of society every Batswana[1] wishes to have by the year 2016, on the 50th anniversary of independence.

Underpinning Botswana Vision 2016 are national development plans covering different sectors. While the postal sector has its own postal sector policy, it is also affected by the ICT sector policy. Botswana's national ICT policy is known as Maitlamo. The vision and objectives of Maitlamo were developed in April 2004:

[1] The Batswana are the habitants of Botswana.

Botswana will be a globally competitive, knowledge and information society where lasting improvements in social, economic and cultural development is achieved through effective use of ICT. The following priorities have been identified:

– *creation of an enabling environment for the growth of an ICT industry in the country;*
– *provision of universal service and access to information and communication facilities in the country; and*
– *making Botswana a Regional ICT hub so as to make the country's ICT sector globally competitive.*

BotswanaPost is a key player in helping achieve the objective of providing universal service and access to information through its network of post offices. As a Government-owned entity under the control of the Ministry of Transport and Communication (MTC), BotswanaPost is mandated with the provision, development, operation and management of postal services in Botswana. It has a network of 119 post offices and 73 postal agencies throughout the country. These 192 service points extend throughout the whole country and make it the "right organization with the required infrastructure right around the country" and the most suitable government partner for dealing with the provision of information to rural communities.

The Government developed a number of postal sector policy statements including the following goal for the postal sector: *The goal of the Government of Botswana is to reform and develop the postal sector to cope with the socio-economic and technological changes, and increase response to market needs while ensuring access to basic postal services by all citizens and guarantee the provision of the same at acceptable costs and high quality.*

The Government's goal can be seen as both a "carrot" and a "stick" for BotswanaPost. On the one hand it talks about reforming and developing the postal sector, which might mean liberalization of the sector to give customers wider choice. On the other hand, it talks about ensuring access to basic postal services to all citizens, which can be seen as a commitment to protecting the interests of BotswanaPost in providing universal services. The difficulty for the Government is ensuring a suitable balance that will adequately meet social and commercial obligations.

The Government's vision of the postal sector is:
To develop modern postal services, which will contribute to the social and economic development of Botswana as well as to ensure continued universal service provision.

While the vision is not explicitly focused on BotswanaPost it suggests strong support from Government for ensuring that the national postal operator is able to provide universal services that contribute to the social and economic development of Botswana. If the vision is implicitly focused on the role of BotswanaPost, the specific objectives of the postal sector policy are clearly focused on the national operator.

Underpinning the postal sector goal and vision are nine specific objectives:

1 *Meeting of unfulfilled demand and improvement of the quality of postal services*
2 *Maximization of network capacity*
3 *Deregulation of the postal market*
4 *Strengthen the policy management and regulatory role of Government*
5 *Reduction of dependence on the state budget*
6 *Stimulate investment*
7 *Elimination of cross-subsidies*
8 *Increasing private sector development*
9 *Integration of communication policies*

A number of the postal sector policy objectives set the base on which BotswanaPost became a player in the provision of ICT services. **Maximizing network capacity** is a clear reference to increasing the services provided through post office outlets. BotswanaPost faces the same challenge as most countries: how to generate additional income in the 80% of post offices that are located in rural and semi-rural locations. Having counter automation in such offices enables BotswanaPost to provide an increased range of services and increase the utilization of staff.

Reduction of dependence on the state budget and elimination of cross-subsidies[2] are two more objectives that require BotswanaPost to invest in providing new services to increase revenue. BotswanaPost has already developed relationships with Botswana Savings Bank, the Motor Vehicle Accident Fund, Botswana Power Corporation and Botswana Life Assurance Ltd to provide their services through post offices. Counter automation provides opportunities for such partnerships to be extended to many other organizations.

The ninth objective of "integration of communication policies" in particular merits closer review:

9 *Integration of communication policies – to increase access for the population to all communications services in the framework of the telecommunications, ICT–Maitlamo, broadcasting and printed media policies and postal policies with combined activities in smaller communities within the country through the use of so-called Kitsong centres.*

The ninth objective of the postal sector policy in particular enlists BotswanaPost to aid in the delivery of Maitlamo (ICT policy). The principle of objective 9 is to utilize post offices to deliver integrated communications services in rural locations. This effectively means the conversion of post offices into Kitsong centres. The objective is to improve BotswanaPost's customer service delivery options by turning ordinary postal outlets into contemporary communication and postal delivery centres.

[2] Elimination of cross-subsidies is one of the nine specific objectives of the Government. However, it should be outlined that cross-subsidies are increasingly seen as an asset for inclusion policies in the latest views of donors and economists. This is why "bad" and "good" cross-subsidies must be distinguished – the "bad" being anti-competitive and introducing barriers to entry, while the "good" are pro-inclusive and help overcome a market failure in the provision of services.

Background and ICT context

The Kitsong centre initiative is a result of a joint effort between the Government of Botswana and BotswanaPost. It is part of the strategy to reduce the digital divide between urban and rural communities. At a micro level, the driving force behind the initiative was the observation that Batswana have become more sophisticated with their demands for technology-driven services. These expectations have played a critical role in influencing the decision to proceed with the Kitsong project.

Kitsong centres are the result of a study undertaken in the year 2000 by the Botswana Technology Centre (BOTEC). The BOTEC study looked at how the Internet and ICTs could be developed to benefit rural communities. It identified that ICTs could provide more timely provision of, and better links to, information, collection, storage and use of relevant information, and could save communities travel time and associated costs. In Botswana, where population densities are very low, many rural communities lack access to good quality roads, with travel to the closest urban centre taking many hours and involving overnight stays.

The Government of Botswana established BOTEC in 1979 as a leading research and technology organization. It supports the national development goals by aligning research, science and technology products with the Vision 2016 ideals and the national development plans. Since its inception, BOTEC has consistently pursued the Government's policy objective of technology promotion and innovation as a tool for economic development and improvement of the quality of life in Botswana.

BOTEC undertook a study in 14 villages and five settlements throughout Botswana to better understand the needs of rural communities. This wider study identified how ICTs could provide information on agricultural issues or health issues for women taking care of elderly family members, facilitate long-distance education, and open up new markets for produce. Provision of ICTs could also give rural communities information on government policies, business development initiatives and financial resources.

Findings from the study led to a pilot project on ICT facilities that would serve as one-stop service centres providing computers and telecommunication systems support. BOTEC called the facilities "Kitsong centres", a name which reflected the acquisition of knowledge that would lead to the socio-economic development of rural communities.

"Kitsong" means "knowledge" in the local Botswana language

The initial pilot involved three Kitsong centres in Hukuntsi, Leflhateng and Gumare. The three pilot centres were not implemented in post office locations. The pilot project proved to be so successful that the Government wanted to roll them out to many rural communities, and therefore set about looking for a suitable partner to host the centres.

BotswanaPost was a natural choice of partner to provide the Kitsong centres. Its network of secure post offices throughout Botswana, with electricity supply, offered a suitable infrastructure for the provision of Kitsong services. The provision of such services was also in line with the UPU strategic direction, as stipulated in the Nairobi Postal Strategy 2009–2012:

– stimulate the use of information communication and technologies in order to improve the development of the postal networks; and
– modernize and diversify postal products and services.

Being government-owned there was also an interest in revitalizing the services offered by BotswanaPost and reducing the reliance on government subsidies. The other advantage of being government-owned was the implicit support of the Government in those rural areas where the centres would not be commercially viable. As a social project there is an aim for revenue to cover the marginal costs of operating the business but this revenue is by no means guaranteed.

The first Kitsong centre was installed in the Ncojane post office in 2007. After Ncojane, the centres opened in two distinct phases. During the first phase, 24 centres were opened in 2008. The second phase is ongoing but a further 24 centres were already opened during 2009. With five more centres in development and due to open in 2010, BotswanaPost will soon have more than 50 post offices providing Kitsong services.

As well as the Internet services that formed part of the original brief, Kitsong centres provide the following range of services: fax, photocopying, desktop publishing, printing and digital photography. Through the Internet the centres also provide content of benefit to the local community which they serve. Such local content includes agricultural and business development information, tourist information, a community bulletin board, a localized directory of government services, and links to financial and educational institutions.

How it works

As a social project aimed at connecting rural communities to information, it was recognized that the project would require some investment, which could not be expected to achieve guaranteed financial returns. Therefore, the Government of Botswana paid for the cost of equipment and the cost of implementing the Kitsong centres. In turn, BotswanaPost provides staff to operate the centres and is expected to generate a sufficient return to pay for all ongoing costs and replacement costs of materials used in the provision of services. These include printer cartridges, paper, lamination materials and other such consumables, and the cost of replacing computers and other hardware and software at the end of their useful life.

As a joint project between the Government of Botswana and BotswanaPost, the two partners had the following responsibilities in the implementation of the Kitsong centres.

BotswanaPost	*Ministry of Transport and Communications*
1 Provision of physical locations 2 Setting up of Kitsong centres, including preparation of post office sites, installation of portable buildings (when required) and connecting to utilities 3 Procurement and installation of Kitsong centre equipment 4 Taking on ownership of Kitsong centre equipment and assuming responsibility for maintaining such equipment 5 Provision of staff to run the Kitsong centres 6 Provision of monthly progress reports on the implementation of Kitsong centres 7 Provision of monthly expenditure and revenue information to the Project Committee 8 Setting and charging of appropriate fees for the Kitsong centre services 9 Provision of branding for the Kitsong centre product according to BotswanaPost's long-term branding strategy	1 Provision of funds for purchasing Kitsong centre equipment (including the purchase of portable buildings, when required) 2 Provision of funds for costs of construction on existing post office sites or to install portable buildings 3 Provision of wide area network connectivity to post offices and Poso House (BotswanaPost head office building) 4 Provision of Government Data Network and Internet access, including Internet bandwidth to an acceptable standard 5 Refrain from setting up similar facilities in the same locations in direct competition with the Kitsong centres 6 Commitment to permit BotswanaPost to operate the Kitsong centres as it sees fit, in accordance with ministry objectives 7 Provide representation in the two project-governing structures, the Project Implementation Committee (PIC) and the Project Steering Committee (PSC)

Officially BotswanaPost will not receive any subsidies for operating Kitsong centres after the initial investment from the Government. However, given the social importance of the centres in rural communities the Government and BotswanaPost are closely monitoring the operational viability of the centres to establish whether a subsidy is required or not. However, in some areas the cost of renting VSAT connectivity is such that it is unrealistic for a centre to be viable even on a marginal cost basis. The Government may therefore choose to support specific sites if they are found not to be commercially viable.

For BotswanaPost, the Kitsong centre initiative provides an opportunity to improve its customer service delivery options by turning ordinary postal outlets into contemporary communication centres. This offers the potential to turn previously "redundant" post offices into the centre of the community once again by providing a range of modern integrated communication services. The main aims of the Kitsong initiative for BotswanaPost are to:

- keep up with current global market trends and set benchmarks for other countries to follow;
- improve and increase services offered by individual post offices;
- retain the current customer base and attract new customers;
- improve the information dissemination options available to customers;
- keep up with customer demands and expectations;
- take ICTs to the people, specifically the rural population; and
- benefit from the investment in ICT by providing additional services that require counter automation systems.

In implementing Kitsong centres, BotswanaPost is targeting many different types of customers, including students, teachers, NGOs, tourists and travellers. The extent of the new customer base will also depend to a degree on the standing of the local post office manager in the community and his or her ability to "sell" the Kitsong centre to fellow members of the community. From current use, it already appears that the centres have gained a high level of acceptance and are appreciated by customers from different economic backgrounds. It has also been noted that, in general, revenue for traditional postal services is 25% higher at these post offices than at comparable offices without Kitsong facilities.

Facilities and equipment

Where space allows, Kitsong centres are housed within existing post offices. However, this is seldom the case, because post offices in rural locations tend to be small. Where post offices have sufficient space a considerable amount of construction and refurbishment is usually required to prepare the building for all the equipment needed to make a Kitsong centre operational. Such building works are put out to tender in line with BotswanaPost's internal tender procedures.

If the post office does not have sufficient space to house all the required equipment a portable building is used to house the Kitsong centre. Such facilities are, in many ways, easier to install because they come pre-installed with networking, air conditioning, power outlets, and in some cases furniture. The tender requirements will therefore be for preparation of the site to accommodate the portable building. The lead time to install a portable building is also much quicker, given that it arrives on site as a virtual "plug and play" Kitsong centre.

Irrespective of whether a centre is housed in a post office building or a portable building, the basic configuration contains five workstations, two printers and a scanner. The full equipment of a centre is listed below:

Equipment	*Quantity*
Portable building	1
Air conditioning unit	1
Furniture (desks, chairs, shelving, workbenches)	5
Workstations (computers)	5
Flatbed scanner	1
Receipt printer	1
Server	1
Laser printer	1
Colour laser printer	1
Switch	1
Router	1
Security cables	5
Network points	10
Hub cabinet, patch panel	1
Payphones	2
Fax machine	1
Laminating machine	1
Digital camera	1
Binding machine	1
Photocopier	1
Uninterruptible power supply (UPS)	6
Licences (Internet café licence, software, anti-virus)	5

The range of equipment turns the Kitsong centre into a complete communications centre, providing telephone and Internet services and a wide range of secretarial services. The task of converting existing sites or preparing sites for the installation of a portable building is no small undertaking, and considerable investment is made to convert, refurbish and decorate the Kitsong centres.

Owing to a lack of landlines in many rural areas it is not easy to connect rural communities to the Internet. The Kitsong centres are connected in one of three ways:

Option A	*Option B*	*Option C*
ADSL installation	Frame-relay installation	VSAT installation
ADSL rental	Frame-relay (256/320k)	VSAT rental

The choice of installation depends on what is available locally. Option A is the cheapest option and Option C is the most expensive. However, many rural areas do not have access to fixed telephone lines and therefore the only option for connecting the community is through a VSAT installation. VSAT connectivity is not without its problems, and many centres suffer from frequent losses in connectivity.

The Internet bandwidth used by each centre is purchased centrally to cover all the corporate needs of BotswanaPost. Each site will be allocated an associated bandwidth cost based on the amount used.

Staff training

The transformation of rural post offices into Kitsong centres is a massive undertaking which presents huge challenges to staff working at those post office sites. From a purely manual operation with a limited range of traditional postal services, the post offices have been converted into state-of-the-art centres with complex technology. Training staff in the use of computers, printers, scanners, fax machines, telephones and other customer-focused activities requires a considerable investment in time. Of equal importance is the training required to keep the Kitsong centres operational. Given the rural nature of the centres it is not possible to have a fully trained IT technician on hand to resolve all potential problems that can affect the operation of the centre. Such problems can include temporary loss of power, loss of Internet connectivity (both internally and externally), and network failures, among other problems. Added to such technical failures are the typical Internet cafe problems such as blocked printers, software problems and other customer-related issues. It is essential the local manager has the capacity to deal with such "simple" failures that occur on a daily basis.

During the first phase of implementing the Kitsong centres staff with specialist IT knowledge were recruited to operate and manage the sites. Whilst this increased the headcount of BotswanaPost by 25 employees, it reduced the risk associated with training existing staff. Instead, the new employees were trained in the internal policies and procedures of BotswanaPost and the basic management requirements in operating the centres. Given the wide scope of IT knowledge required to operate the centre the new staff were also trained in any technical areas in which they lacked experience.

During the second phase of implementing Kitsong centres there has been no new recruitment of new staff. Existing staff have been trained to operate the centres, which was a considerable challenge given the technical requirements of keeping a Kitsong centre operational. The challenge was somewhat eased by having 25 centres operating during 2008 from which lessons could be transferred to the second-phase centres. Ideally BotswanaPost would have like to have recruited IT-trained staff for the second phase as well. The difficulty for BotswanaPost was to justify adding additional staff to the headcount in rural areas. Despite Kitsong centres being a social success and providing valuable access to knowledge in rural areas they do not contribute sufficient income to BotswanaPost to justify additional resources.

Instead, BotswanaPost took on the task of training existing staff in the operation of Kitsong centres. Training rural employees, familiar with manual operations, in the operation of a portable building with temperamental Internet connectivity, lots of computers, other hardware and a range of software applications has not been easy. But on the positive

side it has led to existing staff developing new skills that can be passed on to the local community. In rural areas employees in each post office are not just post office workers, they are also an important and trusted part of the community. BotswanaPost is convinced training its own staff to manage the Kitsong centres will pay dividends in the future, even if it requires significantly more investment in training than recruiting ready-qualified staff.

How it compares to previous projects

The Kitsong centre is unique in providing ICT services to rural communities, making this the first project of its kind in Botswana. There are many privately operated Internet cafes, but these tend to operate in urban centres where financial viability is more certain. However, since the introduction of Kitsong centres a number of other groups have also started to operate similar centres in rural areas. Village development communities, youth groups and the Botswana National Library Service have all opened similar centres, which suggests that such centres are economically and socially viable. In some cases, these centres are in direct competition to Kitsong centres, but this can only be considered positive for the communities served, and further demonstrates the Government's commitment to providing ICTs to every corner of Botswana.

The BotswanaPost Kitsong initiative is still the largest network in the country with 49 post offices out of 192 offices and agencies providing such services. In addition, a further five post offices are in the process of being transformed into Kitsong centres, which will mean that over a quarter of all post offices and agencies are providing such facilities.

Constraints and limitations

A number of obstacles make the introduction of Kitsong centres challenging. One major obstacle in delivering solutions to rural Botswana is the size of the country and low population density. Although the majority of the population lives in the south east of the country around Gaborone, there are towns and villages across the whole country. In particular, the regional towns of Ghanzi, Kasane, Maun and Orapa are located a considerable distance from the main population centres.

As shown in the map of Botswana, post offices are spread far and wide throughout the country. In the west and north-west of the country there are vast distances to be covered between post offices, in what are very rural areas. The north west is also home to the Okavango Delta, the world's largest inland delta. Rains from Angola surge into the delta during January and February, causing significant flooding during the following months.

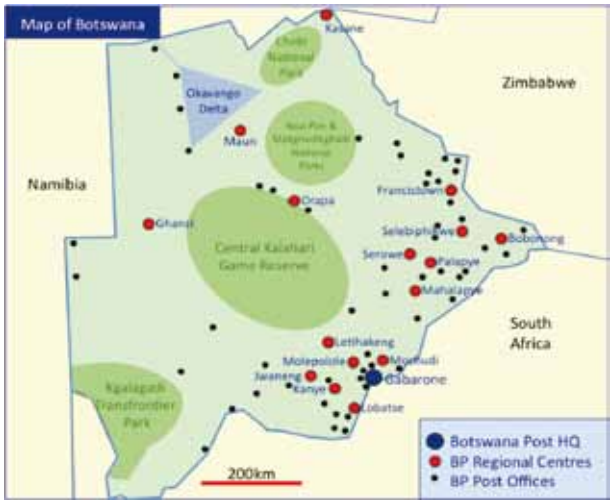
The size of the country, low population density and spread of the population create numerous other obstacles. In many rural areas the per capita cost of providing utilities is high, and providing other services is prohibitively expensive.

Power cuts are common occurrences which impact on the provision of services in the Kitsong centres. This is a major problem since it closes down the whole centre until power can be restored. In addition to suffering from power cuts, the Internet service in rural locations is also very unreliable. Although the Ministry of Transport and Communications is committed to providing acceptable Internet connectivity this cannot always be achieved. In some cases there is no service, but typically the problem is very slow access. Both issues lead to frustration among customers and often result in them being refunded for the service to avoid customer dissatisfaction. This makes the task of making the centres financially viable that much more difficult.

The location of Kitsong centres also makes them very difficult and expensive to maintain. Maintenance of Kitsong centres by the IT department of BotswanaPost is a major challenge. IT specialists must travel long distances, at times over poor terrain, which can result in longer than desired delays in making centres operational. If an IT issue relates to just one computer this is a minor problem that does not stop the centre from operating. However, if the issue is related to a problem of connectivity it can result in the whole Kitsong centre being non-operational until the IT specialist has arrived.

One constraint identified by users of the Kitsong centres is that the traditional opening hours of post offices are not compatible with their needs in using the centre. Many customers want to use Kitsong centres after normal post office hours. Students are regular users of Kitsong centres but prefer to use them after completing their afternoon studies. BotswanaPost is considering opening post offices until 17.30 or 18.00 in the afternoon to benefit from such customers. Extending opening hours is an important step for BotswanaPost in making the Kitsong centres commercially viable. It is also a test of BotswanaPost's ability to become more customer-focused by providing services to customers at appropriate times. If BotswanaPost cannot do it through its own staff it should consider establishing relationships with the private sector, which might be interested in operating the centres during evening hours and weekends on a commission basis.

This is also an issue that is likely to be faced by many post offices throughout the world. It is a clear example of how



post offices must not only change their product offer, but also change their customer approach. Post offices must adapt their opening times to reflect the changing needs of customers. If customers require Internet access in the evenings, Posts must find a way of opening their offices to make best use of the investment in equipment. As post offices become increasingly automated and focused on commercial activities they must find ways of increasing access to their equipment and services at hours demanded by their customers.

To an outsider the Kitsong initiative may appear to have missed a big opportunity. By definition, being placed in rural communities, Kitsong centres are located in post offices that did not previously have counter automation. Yet, despite the Kitsong centres being networked through VSAT, ADSL or Frame Relay connections, these offices are not yet fitted with counter automation services. This may be due to rural post offices having a different need for traditional postal services compared to urban post offices. There may be little need for track and trace or payment of utility bills in rural areas, but evidence from the World Bank and CGAP (the Consultative Group to Assist the Poor) suggests that even the very poor will save given the opportunity. It is considered an oversight that Kitsong centres have not been given counter automation facilities given the investment in technology in the centres.

Despite the enormous impact of the Kitsong centres on the operation of BotswanaPost there has been little change in the organizational structure of the business to reflect this impact. With 50 centres soon to be operational there is a significant strain on the IT department in BotswanaPost because it has not grown relative to the growth of the Kitsong project. This is something that BotswanaPost must monitor in the future to ensure it has enough IT support to deal with over one quarter of its post office sites being Kitsong centres. This is by no means a criticism of BotswanaPost but is perhaps a reflection of its status as a government entity. Changing the corporate structure is often not easy, and justifying additional senior management positions can be prone to delays and political considerations. However, from a commercial and operational perspective it is clear that the Kitsong centres are becoming an increasingly important element of the BotswanaPost business.

Given the impact of the Kitsong centres on the business as a whole and the opportunity they provide to generate additional revenue for BotswanaPost it is important to measure the progress of Kitsong centres and the performance of each centre. Best practice can be taken from the most successful centres and implemented in less well-performing centres. Such knowledge-sharing between the centres is even more pertinent given the meaning of Kitsong.

Impact

The success of the project can be seen in the number of centres that have been rolled out since the pilot project was completed in 2004. Such was the impact of the pilot project that there are now 49 fully implemented Kitsong centres, with another five under construction and ready for operation in 2010. The following are some of the key achievements of the Kitsong centres:

- The number of people using the centres continues to grow each day, with an ever more varied range of people using the centres.
- The centres have managed to meet the information needs of the communities in such a way that individuals see how ICT services can improve their lives and business activities.
- The project has enhanced the awareness of a variety of corporate stakeholders about the benefits of providing ICT services to rural communities and how such technology can be used to enhance service delivery in those communities.
- The impact of training was also highlighted as key to individuals gaining maximum benefit from the centres.
- Revenue in post offices with Kitsong facilities has grown by an average of 25%, representing both the use of the new services and increased use of traditional services.
- The Kitsong facilities have revitalized BotswanaPost by providing an injection of new technology-based services.
- The Kitsong initiative is a benchmark by which other countries can implement similar models.

The impact of the Kitsong centres has many tangible benefits and many intangible ones. One tangible benefit is the growing number of users of the centres. As more members of the communities become aware of the benefits of the centres and training is provided, more people will use the centres. The increased numbers using the centres are of commercial value to BotswanaPost because they result in higher revenue. BotswanaPost should publish such figures to show how customer numbers are increasing and thus demonstrate the success of the project to the Government and the wider public. Such figures should also be analyzed internally to see why some centres are increasing customer numbers at a faster rate than others.

There are also many intangible benefits. If the number of customers is growing there must be a perceived benefit to each individual using the centre. This may be for business reasons, in obtaining information about markets; it may be for educational reasons, with e-learning programmes; or it may simply be for social reasons such as chatting or gaming. Whatever an individual's reason for using the Kitsong centre, it is clear that they are being used more and more as people grow more aware of their benefits. In assessing the value or worth of the centres the Government must look beyond the revenue they generate. Establishing their real value would require detailed economic studies, but a more pragmatic approach might be to take a political view. If throughput is increasing in the centres this can be considered a social success, particularly given that Kitsong centres are located in post offices that previously received falling throughput and very low revenue.

It is also clear that the more training is provided, the more the centres are used. From a government perspective the

project is viewed with increasing pride in terms of the results achieved. It is also seen as tangible evidence of a contribution to the Vision 2016 pillars of "a prosperous productive and innovative nation" and "an educated and informed nation". It may also be seen that the Kitsong project contributes to other national objectives, including helping to meet the United Nations Millennium Development Goals. Another factor that is difficult to measure is how the spread of information has increased in the communities involved in the Kitsong centres. Even if only one person from a community accesses information in a centre it is likely that the individual will share information across the community. Measuring such transfer of information is extremely difficult.

Lessons learned

During the initial pilot phase a number of important lessons were learned that were taken into account when rolling out the centres. These were as follows:

- There was a continuous increase in patronage of the centres as people became aware of them and their purpose, reflecting a growing demand for ICT services in such communities. This highlights the importance of being patient for the centres to be successful and also of marketing the centres in the communities in which they are located.
- The Internet was a particularly important resource in the centres, highlighting the desire and need for information in the communities.
- The centres were more popular with young people than the elderly and it was therefore important to devise approaches that could encourage older members of the community to use the facilities.
- There was a wide awareness of the centres across all levels of the communities.
- A major factor preventing wider use of the centres was lack of computer literacy, which can be easily resolved by providing regular training sessions within the centres.
- Female customers were generally fewer in number, despite making up the majority of the population in rural communities.

Such lessons were important in developing future centres. As a result of the pilot project the need to provide computer training within the community was identified. Such training would build up the computer skills of the community, lead to a better understanding of the benefits of the centres, and in turn generate more use of the centres.

Further monitoring of the wider implementation of Kitsong centres has highlighted a number of other important lessons:

- The timescales for implementing some of the centres were too tight, which led to a number of problems. Contractors were under pressure to implement them to tight schedules, which led in some cases to poor quality work, in other cases to missed deadlines and in a few rare cases to contractors abandoning the work altogether.
- In locations where portable buildings were required it was observed that they are relatively small to accommodate all the relevant features of the Kitsong centres. In more popular centres the portable buildings have no waiting facilities, leading to people waiting outside in the heat. In future sites larger portable buildings will be used to create more space for waiting areas.
- In addition to being too small the design of the portable building was not considered to be as customer-friendly as it might be. Future portable buildings will also rectify this situation to make them more accommodating with additional features to enhance the service delivery.
- Coordination of information has also been a weakness in the organization of the project. Various stakeholders had different expectations of what the final Kitsong centre product would look like and this affected inspections during the implementation process. This will be resolved in future implementations by making each stakeholder aware of what the final product will be prior to them undertaking inspections.
- Finally, the success of Kitsong centres has led to the emergence of new competitors. The challenge for BotswanaPost is now to go beyond the initial scope of the project and to move up the value chain by proposing new services such as financial services (savings, social payments, etc.) or electronic services (e-commerce). In doing so, the Post has one major comparative advantage: its Kitsong centres are part of a postal network which comprises access points all across the country and a potentially wide product offer based on the three dimensions of the Post (physical, financial and electronic).

The Kitsong centre project can be considered to be a work in progress. With the implementation of each new centre come additional learning points, in the planning, construction, training or operation of the centres. It is essential that BotswanaPost and the Government learn from each implementation to ensure each Kitsong centre is marginally better than the previous one. But with 49 centres operational it is already clear the centres can be considered successful from a social perspective. The goal for BotswanaPost is to make them a commercial success as well.

Critical elements for success

Many factors have contributed to the success of the Kitsong Project. One of the main reasons the project has been successful is because it has been planned meticulously and implemented with its audience in mind. A review of the steps in implementation will highlight some of the reasons the project has been successful:

1 *Coordination of policies* – The Maitlamo (ICT) and postal sector policies are coordinated to achieve the same goals for the country. The Maitlamo has an objective of providing universal service and access to information through ICTs, and the postal sector policy has a vision to develop modern postal services. In turn, both policies clearly link to the seven pillars within Botswana

Vision 2016, particularly the two pillars of "an educated and informed nation" and "a prosperous, productive and innovative nation". The Presidential Task Group tasked with developing Botswana Vision 2016 must be given particular credit. Their decision to recruit the University of Botswana to carry out consultations in small villages and remote settlements indirectly led to the development of the Kitsong centre initiative.

2 *Partnership between Government and BotswanaPost* – The Kitsong centre project could not have happened without this partnership. The Government has provided the investment for the centres and tasked BotswanaPost with the implementation. It is a good match for both parties and for the wider community. The Government has realized an opportunity to expand the role of one of its parastatals and also to fulfil one of its main objectives of providing ICT for all. BotswanaPost has been given the opportunity to make use of the investment in technology to expand its services in addition to providing the specific Kitsong centre services. It has also provided BotswanaPost with a massive opportunity to reinvent itself as a modern company providing a large range of integrated products and services that serve the needs of the community in which they are located. For the wider community, accessing the service through the country's largest retail network gives familiarity to the Kitsong service.

3 *Project design* – The project was extremely well researched by BOTEC. The analysis undertaken in 14 villages and five settlements was key to identifying the issues important within rural communities. This helped BOTEC design the specification of the Kitsong centres in terms of equipment, connectivity requirements and training.

4 *BotswanaPost staff training* – It was essential that the BotswanaPost staff knew how to operate the centre and provide advice to locals on the power of the Internet. In this first phase this was achieved by bringing in professional IT staff to manage the centres. But these staff still had to be well trained in the policies and procedures of BotswanaPost. In the second phase there will be no such recruits. Staff, knowledgeable about a basic range of postal services, will have to become familiar with the Internet, computer and printer hardware and software, connectivity issues and on how to resolve basic technical issues that can prevent an Internet cafe from functioning. This will require considerable planning to develop a suitable training course and sufficient time for staff to take in all the new information.

5 *Community involvement* – Involving the community prior to implementing a Kitsong centre was key to ensuring success. Such involvement provided a sense of ownership to the community and an understanding of what the centre could provide to the community at large and to individuals. This shared ownership leads to increased use of the centre by a greater number of individuals.

6 *Network* – The size of the BotswanaPost network is at the heart of the success of the Kitsong centre project. With almost 200 postal access points evenly spread throughout the whole of Botswana it is the largest and most widespread network in the country. Already 25% of post offices are Kitsong centres, located in the most remote areas of Botswana. If the initiative continues and BotswanaPost can continue to increase the throughput of the centres, there is no reason why all post offices cannot be a Kitsong centre in the near future.

7 *Community training* – A barrier to using technology is a lack of understanding of what the given technology can provide to the individual. Part of the success of the Kitsong centres can be attributed to the training given to the community to highlight how the centre can be used. A key element of this training was to demonstrate how the facilities at the Kitsong centre are able to directly benefit the individual. It is important that such training focuses on all sectors of the community to ensure everyone can see the benefit of the centre. The main challenge in Botswana is to encourage the use of centres by the elderly and female members of the communities.

8 *Review of Kitsong centres* – A final success factor in the implementation of the centre is to review every new centre. Lessons are learned with every new centre and these lessons are fed into the planning of the next centre. A clear example is the decision to use bigger portable buildings in the next phase of centres to provide space for waiting. A second example is the redesign of the layout of the portable buildings to make the customer experience more comfortable.

A key feeling about the Kitsong centre is that it is a project that belongs to everyone. It is facilitated by the Government, and delivered and operated by BotswanaPost, but ultimately, and most importantly, it is owned by the people. It is this ownership that is the most important success factor in the whole project. It is also unlikely that a partner other than BotswanaPost could have made the people feel such ownership. Post offices in many countries have a sense of being owned by the people and therefore they are the most appropriate vehicles for initiatives such as Kitsong centres.

Summary

The long-term financial viability of the Kitsong centres is yet to be fully demonstrated but they should not be judged on financial viability alone. Their success should be viewed against the seven pillars of Vision 2016:

1 *An educated and informed nation* – The very word "Kitsong" means knowledge, and one of the main purposes of the Kitsong centres is to educate and inform those living in rural communities. Kitsong centres have already helped the Government deliver this first pillar of 2016 by providing access to information and training to those not familiar with computers.

2 *A prosperous, productive and innovative nation* – Another key aspect of the Kitsong centre is to provide information to local producers that will enable them to obtain better prices for their produce and increase their access to markets.
3 *A compassionate, just and caring nation* – The very nature of providing information to those people in the most rural of communities fulfils the objective of this pillar.
4 *A safe and secure nation* – Kitsong centres provide a bridge between rural communities and regional and central government, enabling such communities to play a meaningful part in the security of Botswana.
5 *An open, democratic and accountable nation* – A society can only be open, democratic and accountable if all its inhabitants have an input into how the society functions. The Kitsong centres provide rural communities with the opportunity to interact with Government and therefore be a part of the democratic process.
6 *A moral and tolerant nation* – Provision of such centres, regardless of their financial viability, shows that Botswana places high moral importance on giving all people access to information.
7 *A united and proud nation* – The Kitsong centres help to unite all Batswana, and the whole nation should be proud of this achievement.

Botswana Vision 2016 is an extremely important document for the nation and for all Batswana. It sets out the objectives of the people, for the people, and the Kitsong project is one project that helps fulfil many of the objectives of Vision 2016.

For BotswanaPost the Kitsong initiative has given a much-needed boost to its business proposition. The Government has already invested substantial funds in the creation of 49 Kitsong centres and plans to open a further five in the coming year. Whilst this initiative is mainly aimed at developing rural locations, it also offers BotswanaPost the opportunity to sell itself as a supplier of technology solutions to all Batswana. It has given BotswanaPost enormous opportunities to publicize its services through the development of the centres. Every time a new Kitsong centre is opened it provides for free publicity in a very positive way. BotswanaPost has the chance to use such publicity not only to publicize the Kitsong centre, but also to publicize its commercial services.

Being seen as a key partner in the delivery of Botswana Vision 2016 is also a major marketing tool for BotswanaPost to help develop other products and services. Botswana Vision 2016 was developed by Batswana for Batswana and being a key contributor to its delivery can only build trust in BotswanaPost. Trust is an important commodity for all post offices, allowing expand services beyond traditional postal products into many other areas. Botswana Vision 2016 promises a bright and prosperous future for Batswana and an equally bright and prosperous future for BotswanaPost.

Banco Postal: Flagship product of Brazil's ICT/ Postal network

Juan B. Ianni

1 Introduction

In 2002, the Brazilian Ministry of Communications launched Banco Postal (BP), a project to establish the Brazilian public postal operator, Empresa Brasileira de Correios e Telégrafos (ECT), as a "banking correspondent"[1] capable of providing basic banking services through its retail network. The key to implementing this project was to combine a physical network, ECT's comprehensive universal service infrastructure, with an ICT network and thereby create a new network of nationwide financial services, operating in real time. In addition to the goal of enabling and supporting BP, the incorporation of ICT into the ECT network also provided a wide range of additional benefits, including:

- Creation or improvement of a broad range of ICT-enhanced postal products such as SEDEX, SEDEX Mundi, and e-SEDEX to expedite and track delivery of time-sensitive and high-value documents and parcels, domestic and international hybrid telegrams via the Internet, digital certification and more.
- Enhanced treatment (e.g. timed distribution and delivery) of numerous services (e.g. Exporta Fácil[2], distribution of medicines, textbooks, and voting materials) distributed through ECT's network.
- Use of the new ECT/ICT network to provide the necessary information tools to improve ECT's internal operations and finances.
- Added value and revenue for ECT's retail and delivery network and thus increased financial ability to meet its universal service obligation.
- Distribution of personal, permanent e-mail addresses to citizens.
- Integration of three critical business flows (information, goods, and funds) at the local ICT/post office "hub".
- Overall support for economic development through increased national savings, expanded access to credit, support for SME growth and local industries, greater access to government services and increased government accountability; and reduced rural marginalization and isolation, etc.

This chapter will explore the impetus and driving forces behind the Banco Postal (BP) project; how it was developed and implemented, the impact it has had in the seven years since the first post office was "wired up" for financial services and finally, what lessons can be learned from the Brazilian experience, both for ICT and Posts and those seeking to build synergies by combining the two.

2 Project rationale, design and goals

2.1 Project rationale

At the time of the BP project, it was estimated that over 45 million adults in Brazil were "unbanked" and lacked access to any formal financial network; 76% of all banking branches were located in the more developed southern and south eastern parts of the country.[3] Some unbanked individuals had small amounts of savings that they virtually kept under the mattress. These individuals, along with many small and medium-sized enterprises (SMEs), had very limited access to credit and had to spend long amounts of time waiting in line to pay utilities and other bills. From a national perspective, in 2001 over 1,750 Brazilian municipalities in rural and isolated areas, representing some 40% of all municipalities, had no access to banking services.[4]

Thus the Federal Government of Brazil, through the Ministry of Communications and ECT, ascertained that as a result of new regulatory changes allowing non-banking commercial businesses (pharmacies, shops, supermarkets, post offices, etc.) to offer financial services as banking "correspondents", ECT was now in a position to help reduce the number of unbanked individuals by offering basic banking services through its post offices. This was particularly relevant to the national development goal of financial inclusion since the majority of these offices were located in rural and remote areas that were not of interest to commercial banks. This group of services would eventually be branded "Banco Postal" and would help meet the overall government objective of transforming an environment of social and economic exclusion into one of social and economic inclusion.[5]

2.2 Key players and stakeholders

Clearly, an undertaking of this scope required significant input from many government and private sector partners. In practical terms the key players behind the project were ECT, being the focal point, the Ministry of Communications and the Central Bank which developed the specifics of the bank correspondent relationship and participated in the pilot project. Key stakeholders included the Government (a means of increasing economic inclusion), ECT (adding value to the postal network), banks (adding reach and new customers at minimal cost) and of course the 45 million Brazilians who

[1] A "correspondent" is established when a contact is set up by a bank with a commercial business (in this case ECT) in which the business carries out retail banking activities on behalf of the bank.
[2] Exporta Fácil is a simplified export procedure for shipments worth less than 50,000 USD.
[3] José Ansón and Laia Bosch Gual. "Financial Inclusion through the Banco Postal: an Evaluation". March 2009.
[4] Ivatury, Gautam, "Brazil's Banking Correspondents; CGAP, available at www.microfinancegateway.org"; Crew and Kleindorfer; Handbook of Worldwide Postal Reform.
[5] See www.postfi.wordpress.com for further information on using the postal network to achieve financial inclusion.

lacked access to banking services. The Universal Postal Union (UPU) also played an important advisory role in moving the project forward.

2.3 Critical elements for success

There were several elements that were critical to the project's success. Firstly, the system had to offer real-time financial services that were integrated and available online, on an interactive, customer-friendly basis. Secondly, initial deployment of the system had to be focused on populations in rural areas and citizens with limited economic means and little or no access to formal financial channels; otherwise, it would be in direct competition with private banks for customers who already had access to banking services.

It was also important to take advantage of the dense network of postal offices and postal agencies in Brazil. At the time of the project's inception, there were 5,300 ECT post offices and 1,659 "franchises" (post offices run by private individuals on a contract basis). Even in a large country like Brazil, this is a relatively dense postal network and clearly the most comprehensive national retail network. Introducing postal banking services where they were not already in place would significantly extend the financial network and, through the launch of a new and profitable business line, help cut the cost of maintaining universal postal services.

Last but not least, it was important for the new banking services to come with the confidence inspired by having an established bank as a partner. Even though ECT itself enjoyed (and continues to enjoy) an exceptionally high level of public confidence, in order to succeed, this new venture would require the reputation of an established financial partner with banking experience. This, along with ECT's lack of banking expertise and the restrictions imposed by the banking regulatory framework in Brazil, prompted project designers to go with a partnership/operational arrangement[6] rather than with some of the models used to run postal banking services in other countries. These alternate models include: 100% *State-owned* – France and Japan; *shareholding (equity) partnerships* – Germany, Ireland; and *joint venture* – Great Britain, the Netherlands.[7]

3 Project context

Demographic and economic indicators	*2008*
Population (millions)	196
Population growth (annual %)	1.05
Life expectancy	72.7
Literacy rate	90%
GDP (current USD trillions – PPP method)	2.0
GDP growth (annual %)	5.1%
GDP per capita (USD – PPP method)	10,200
Inflation consumer prices (annual %)	5.7
External debt stock (% of GNI)	19%
Labour force (millions)	94
Unemployment total (% of total labour force)	7.4%

Source: World Bank

3.1 Demographics

Brazil is a large country extending roughly 4,347 miles at its furthest point from north to south and east to west, covering an area of 8,511,965 km². It has a population of 196 million people (2008 estimate), a growth rate of 1.05%, and a population density of 22.3 persons per km²; this population is heavily concentrated in the southern and south eastern parts of the country while a large swathe of the country remains sparsely populated. The urbanization rate is a relatively high 85%; major cities include Brasília (2.5 million), Sao Paulo (10.9 million), Rio de Janeiro (6.1 million), Belo Horizonte (2.4 million), Salvador (2.9 million), Fortaleza (2.4 million), Recife (1.5 million), Porto Alegre (1.4 million), Curitiba (1.8 million). Life expectancy at birth stands at 72.7 years, literacy at 90%, and secondary school enrollment at 88%. An estimated 31% of the population lives below the poverty line and unemployment hovers at 7.4%. The labour force is 94 million.

3.2 Economy

Brazil is an upper middle-income country with a gross national income per person of 10,200 USD (2008 estimate – PPP method).[8] Agriculture constitutes about 6.7% of overall GDP while industry makes up 28% and services 65.3%. The services industry in Brazil is diverse and sophisticated and includes developed telecommunications, banking, energy, commerce, and computing sectors. The financial sector is strong and provides local firms with a wide range of products; nevertheless, interest rates remain very high. After posting growth rates of 5.7% in 2007 and 5.1% in 2008, Brazil's GDP dropped 0.8% in the first quarter of 2009. However, several steps have been taken to minimize the impact of the crisis, resulting in positive growth estimates for the second half of 2009 and 2010. Brazil is a net creditor nation and has in recent years experienced sustained growth (despite the global financial downturn), strong exports, healthy external accounts, moderate inflation, falling unemployment, and reductions in the debt-to-GDP ratio. Brazil encourages foreign investment and is the largest recipient of foreign direct investment (FDI) in Latin America.

[6] Australia, New Zealand, and South Africa also use the partnership arrangement.
[7] Banking services offered through postal networks enjoy a significant worldwide presence: over 68 countries offer some form of banking services through their postal networks and hold over 3 trillion USD in deposits (Source UPU); however, Brazil is one of the few countries in the LAC region that utilizes this financial channel.
[8] Data from World Bank Brazil Country Profile and CIA Factbook.

In 2007, the Government of Brazil initiated a significant infrastructure development programme, the Growth Acceleration Programme (PAC), to address the country's significant infrastructural needs, including road, rail, and energy supply. The programme is a central component of the Government's development strategy and key to incorporating rural and other disadvantaged areas into general economic development. Development strategies overall are focused on economic growth and poverty reduction. Promoting exports, particularly those generated by SMEs, is an important component of plans to strengthen economic growth and is seen as a way of reducing vulnerability to international financial market volatility.[9]

3.3.1 ICT context

ICT in Brazil – Indicator	*2007*	*Upper middle income group*
Telecommunications revenue (% of GDP)	4.7	3.3
Telephone lines*	20.6	22.6
Mobile subscriptions*	63.1	84.1
Internet subscribers*	4.1	9.4
Personal computers*	16.1	12.4
Internet users*	35.2	26.6
E-government Web measure index**	0.60	0.37
* per 100 people ** Scale of 0–1 where 1 = highest presence		

Source: World Bank

Brazil is a regional Information Technology leader. Its IT market is the largest in Latin America and an average 2% of GDP is spent on the sector, with significant growth projected in the near future. At the same time, the country has become a net exporter of telecoms equipment, with export sales totalling an estimated 3 billion USD in 2006. With just over 100 million subscribers, it is also the world's fifth largest market for mobile telephony. Nevertheless, ICT infrastructure requires further development. In 2007, more than 22 million people, or 44% of the country's 5,562 municipalities, had no private telecommunications or Internet service. This scarcity highlights the continuing value of using public Internet access at government telecentres and ICT-enabled post offices to close the digital gap.

Brazil also has the highest number of Internet users in Latin America; however, due to the country's economic disparities, a significant digital divide remains prevalent: only 16% of households own a PC and just 3% of the population has broadband access.[10] Brazil is addressing these issues by taking steps to lower the cost of PCs as well as working to equip its 33 million schoolchildren with laptops. Brazil is striving to improve connectivity to all of its municipalities, which is relatively low as many of them are located in rural and remote areas.

Brazil is strong in terms of e-government communications; it scores 0.60 in terms of e-government presence compared to an average figure of 0.37 for other upper middle-income countries. However, there is room for improvement in terms of access to these services. The government has moved to address this deficiency by setting up telecentres in disadvantaged communities.

3.4 Postal context

Postal performance indicator	*Brazil*	*Avg – 5 countries* GDP/capita <Brazil[11]	*Avg – 5 countries* GDP/capita >Brazil
GDP/capita (USD – PPP method)	10,200	9,600	11,420
Letters per capita	44.8	15.5	21.3
Population/office	15,520	72,045	15,241
Area/office	689	4,663	230
% of total office franchised	51	34	3
% home delivery	79	69	68
Postal revenue/100 people (USD)	286	12.69	12.69
Letters/postal employee	80,160	18,209	20,675

Source: UPU – 2007

Brazil's postal market operates much like the postal sectors in more developed countries. Firstly, letter class volumes average around 45 items per person annually compared to between 15.5 and 21.3 items in countries at similar levels of economic development.[12] A healthy mail market, along with a large, highly literate population, mail-intensive economic sectors (the service segment constitutes 65% of national GDP), and a strong advertising and marketing industry, all combine to produce large mail volumes. ECT's traditionally high level of efficiency has limited de facto competition for basic letterpost, particularly when compared to other regional counterparts where up to 90% of the market is typically handled by private postal operators.[13]

In addition, the existence of 257 cities with more than 100,000 inhabitants serves to concentrate volumes and provide savings that can be used to cover more costly service areas. Thus, at 85%, Brazil's level of urbanization is closely linked to its

[9] U.S. State Department: Brazil Background Notes; SMEs account for 44% of employment in Brazil.
[10] "Brazil: Bridge-building needed for digital divide"; by Alice Woudhuysen; from The Economist Intelligence Unit; 28 June, 2007; found at www.globaltechforum.eiu.com.
[11] GDP/capita equivalent countries: Angola, Belarus, Colombia, Costa Rica, FYROM, Montenegro, Panama, Saint Lucia, Serbia and South Africa.
[12] Total value of the Brazilian postal market is estimated at 11 billion USD (2009); the basic charge for a 20 gramme letter is 0.34 USD.
[13] See Crew and Kleindorfer.

percentage of home delivery (80%) and the concentration of mail volumes (83%) across just 20% of its states. Brazil has a robust addressing system (46 million addresses) and this, combined with large mail volumes, allows ECT to utilize advanced and less costly mail processing procedures while maintaining high quality of service.

Thirdly, ECT employs innovative delivery techniques methods such as neighbourhood "delivery cluster boxes" and mobile post offices to lower costs and to ensure delivery even in many isolated regions. This allows ECT to offer a very high level of universal services compared with similar countries despite significant geographic and demographic challenges (see chart above).

From a regulatory and competitive standpoint, Brazil has taken a distinct path from its regional counterparts where postal markets have been almost entirely liberalized, either through specific legislation (Argentina) or by de facto capture of the market by numerous licensed and unlicensed operators. Brazil, by contrast, reserves all letters, postcards, and telegrams for the public operator. ECT's monopoly, (which accounts for approximately 55% of its revenues) and profitability provide sufficient universal service, even earmarking profits for investment in future development. ECT receives no subsidies and regularly pays a "dividend" to the Government.[14] Competition is allowed in the parcels, printed papers, and courier (express) mail markets.

Unlike many of its regional postal counterparts, ECT boasts a high level of autonomy and commercial freedom. It can also borrow development funds from banks and enter into operational agreements such as the one converting it to a banking correspondent through BP. Finally, and perhaps most importantly for any public enterprise offering financial services and handling other customers' funds, ECT enjoys an exceptionally high level of public confidence. It has been recognized in public surveys as having the highest level of credibility (90 on a scale of 100) among all public and private institutions in Brazil[15] including religious and educational institutions. In the same survey, banks scored a confidence level of 42.

3.5 Policy and regulatory issue

The Banco Postal project reflected the wider development goal of social and economic inclusion being pursued by the Government of Brazil. The lack of access to formal financial channels was viewed as a major impediment to achieving these development goals; only one third of the population had a bank account and significant portions of the population had little or no experience with or knowledge of electronic banking processes and products. Establishing banking correspondents addressed this problem and from 2000 to 2004, 32,000 correspondent outlets were set up.[16] The BP project benefited from this development strategy, as well as from the Ministry of Communications' ambitious (and well-funded) Recovery and Expansion Programme for Telecommunications and Postal Systems (PASTE). As early as 1998, development of banking services within ECT was included in the overall PASTE list of projects. Moreover from the outset, ongoing and consistent effort was made to ensure that the goals of BP were in congruence with and provided support for overall public policy goals.

The legal foundation for correspondent banks was established in 1999, when the National Monetary Council of Brazil passed resolution 2460/1999 which allowed commercial and government banks to enter into contract with retail businesses (shops, drug stores, supermarkets, post offices, etc.) to offer basic banking services through their networks. This legislation had the important advantage of bypassing the need to have the Central Bank license an additional government-owned bank, which was highly unlikely at the time. In practical terms, this authorization only covered areas with no banking presence. Thus resolution 2707/2000 revised resolution 2649/1999 to extend this option to all areas. A Technical Cooperation Agreement between the Federal Government and the Bank of Brazil (17/01/2000 and No. 2000/001), was also drawn up, involving pilot tests with 36 post offices to give them experience with the banking correspondent functions and processes and to "dry run" the system to determine where modifications were needed.

The pilot began in March 2000, primarily in rural and poor communities. It consisted of implementation, testing, modification and evaluation phases and was accompanied by a strong public relations campaign to raise awareness among stakeholders and potential customers. The results of the pilot were used to fine tune the business model and processes, training procedures, technological approach and helped establish the process for selection of a banking partner (see below).[17]

It should be noted that the three years (1999 to 2001) of planning that preceded BP's implementation included extensive research, analysis, and presentation of results, comprising at least ten workshops (including representation by postal labour unions) along with thousands of pages of reports, cost/benefit analyses, preparation of draft legislation, and convincing key stakeholders (such as the Central Bank) whose support was critical to implementing the project. External consultants, including ING Postbank International Consultancy and ING Brazil, played an important coaching and advisory role over the three years. It was also extremely important to convince ECT's labour organizations that incorporating BP into postal operations would result in higher employment.

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[14] UPU, Postal Statistics and Status and Structures, 2009.
[15] ECT – Presentation at UPU, 2002.
[16] Kumar, Anjali; Nair, Ajai; Parsons, Adam; and Undapilleta, Eduardo, Expanding Outreach through Retail Partnership – Correspondent Banking in Brazil; World Bank Working Paper No. 85.
[17] In fact, following consultation with the Bank of Brazil, a Ministerial Decree was issued in 1999 approving implementation of Banco Postal on a pilot basis.

4 Project implementation

4.1 Selecting a banking partner

The Communications Ministry decided that ECT's partner bank should be selected by a competitive, public tender-bidding process. To structure the bid, post offices were divided into five groups based on workload volume; to ensure the groupings were representative, each group contained offices from each state in the Federation. All bidders had to submit three proposals for each group based on the fees it would pay ECT for each type of transaction in each group and for the interest (by percentage) it would pay on accounts. Finally, each bidder had to propose a "down payment" fee to help ECT cover the cost of developing the BP system component.

Bradesco, the largest private bank in Brazil at the time, won all of the bids and became the banking partner of ECT. Bradesco's network coverage complemented ECT's network since it had 3,304 outlets, mainly in urban areas, whereas ECT's network at the time consisted of 5,300 post offices, mainly in rural areas. Bradesco and ECT therefore signed a non-exclusive five-year contract, according to which Bradesco was required to give priority to connecting BP outlets in municipalities where no banking services were currently available. Bradesco was also responsible for transporting money to and from postal outlets.[18] Likewise, customers of both parties would have access to the two networks via post offices and ATMs. Furthermore, BP would offer a wider range of financial products than most other bank correspondents (including checking accounts), which, combined with ECT's excellent public reputation and comprehensive retail network, gave it a competitive edge. It is worth pointing out that as of today, the correspondent network offered through BP is by far the most extensive of any correspondent network. The most important factor in the bidding process was usage of the ECT network, this being an attractive possibility for potential banking partners. If ECT had not been as efficient or did not have the outstanding reputation it enjoyed, the bidding process would have been far less competitive and the results less productive for the partners.

4.2 BP systems design and development

In practical terms, the first step in developing an online banking-correspondent network had already been taken with the initial creation of ECT's Corporate Network (see description below). However, the BP project required a significant amount of new external expertise to enhance the existing system and to design, develop, and deploy the BP application in addition to promoting the system among potential stakeholders. The first step was to conduct the due diligence (a feasibility study) necessary to determine the potential demand for retail banking services, so that the BP system component would avail of the banking products and operational capacity to meet customer demand. Extensive research was focused on lower and lower-middle income segments of the population and found that such customers' desired product attributes included:

- convenience and easy access in terms of location and hours;
- clear, transparent and standardized products and processes;
- affordable fees and rates;
- time-saving services that would eliminate the need to pay bills in person;
- security for funds deposited; and
- financial products aimed at small savers (i.e. not large businesses).

For purposes of systems design, the Ministry of Communications in conjunction with ING Postbank International Consultancy, oversaw research by university specialists to estimate the potential levels of demand for banking services offered through the postal network. It was ascertained that from this market, 7.1 million USD would be deposited in savings accounts and 2.3 to 2.8 million USD in current accounts every year. These results allowed project developers to design and develop a suitable system.

ECT issued another public bid and contracted IBM to build a solution (hardware and software) and to integrate all of the technical systems using the Embratel VSAT solution, a Brazilian Telecom company – another large project held to design the corporate nationwide data network (WAN). The BP project also required a great deal of planning to ensure that the milestones were achievable and sustainable over time. This phase of the project received significant input from the Ministry of Communications and ING Postbank International Consultancy. These entities oversaw the contributions of the French postal operator (La Poste), the Ministry of Industry and Communications of France, and three local, private Brazilian consultancies (ING–Barings Brazil, GV Consult (FGV–SP), and FIA/USP).

4.3 Challenges and deployment

There were significant challenges to implementing the BP system. The first of these was the speed with which the system had to be developed. All parties had agreed that the first BP outlet would be operational within three months signing the ECT-Bradesco contract on 24 September 2001 and that 1,000 offices would be up and running within six months. The extensive territory covered by the national postal network and the remote location of many of the first outlets also made start-up challenging. ECT's technical implementation team had no previous experience in developing and deploying integrated financial services systems, let alone one of this scope and dimension. ECT tackled these challenges by establishing accountability for milestones and firm deadlines for critical project steps; furthermore, technical teams were formed in each region to ensure that the system was successfully rolled out, while converting ECT counters into joint postal/banking retail points (see description below). Bradesco supported the initial roll-out by training ECT front desk personnel and managers in selling Bradesco products with a Banco Postal brand name.

[18] Indeed, if purely commercial goals had predominated, the first outlets would have been placed in major cities; however, the government's priority was to place them where no services existed, as a means of expanding economic and financial inclusion.

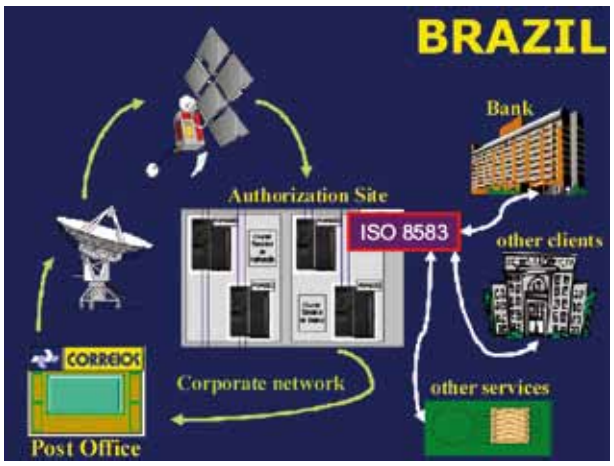
In fact, training was one of the biggest challenges in BP implementation because it had to cover 5,000 municipalities and involved fostering a banking "culture" in both ECT employees and customers. While ECT employees were familiar with traditional postal retail processes, they lacked experience in retail banking functions and regulations, detection of counterfeit money, accepting account and loan transactions, etc. Furthermore, many customers were not up to speed when it came to formal financial channels and the training had to include methods of improving the financial literacy of previously unbanked individuals. A robust and comprehensive training package was developed in a joint endeavour by ECT, IBM, and Bradesco, aiming to train at least two employees (a window clerk and a back office agent) at each site, in addition to financial managers within each region. The basic approach taken was to "train multipliers (teachers)" so that a core group of 72 could pass on their training to approximately 20,000 clerks and heads of offices.

These efforts paid off and the system was rolled out rapidly: on 5 April 2002, BP opened 27 outlets with one for every state in Brazil, including the Federal District. By June 2002, BP services were available in 1,000 post offices; by September 2003 in 2,740 post offices and by June 2004, a total of 5,300 post offices offered BP services. The aggressive milestones were challenging but also key to moving the project forward at an effective pace. ECT invested several million USD preparing its outlets to provide BP services, primarily on equipment and application systems, site preparation, training, security systems and equipment, but also in some cases on painting, infrastructure and refurnishing.

5 Using ICT to modernize ECT and launch Banco Postal

5.1 Overview

The best way to understand the total impact of the incorporation of ICT into ECT's operations is to view it as made up of two component ICT networks. The first of these is ECT's Corporate Network which is used to manage the operator's daily operational and financial activities. The second is the Banco Postal network, used to manage ECT's banking correspondent activities.



Interface of Corporate and BP Networks

5.2 ECT Corporate Network – incorporating ICT into postal management and products

In 2001, ECT began a series of PASTE-supported ICT projects designed to create a Corporate Network that would improve current postal operations and management while simultaneously establishing the structure needed for the future addition of correspondent banking services. The ICT projects were based on implementing counter automation and VSAT technology that would improve postal functions and an Internet function that could connect with existing banking communications systems. In the long run, addition of these banking services would provide significant ROI for the basic Corporate Network. The corporate goals of the new ICT system fell into three basic groups: support for business (commercial) operations; modernization of management; and modernization of the postal infrastructure (mail processing and retail operations).

A critical first step was to create a set of uniform corporate data elements and standardized reports that could be shared throughout an integrated information system and be accessed by all levels of the postal infrastructure. Furthermore at each step, data elements and information processes had to pass rigorous quality tests before being distributed system-wide. These important actions should be taken as part of any postal ICT systems development project well before deploying postal automation throughout the postal system. Otherwise, there is no way of ensuring that information being gathered and disseminated is relevant and useable and this raises the potential for simply automating "garbage in – garbage out". It was also necessary at this stage to ensure that the Corporate Network being developed would eventually be compatible with a future banking partner.

From a corporate perspective, using ICT to create a Corporate Network would result in the implementation of an integrated solution, namely a Business Management approach (ERP) to ECT's general direction. This was first implemented in the financial area and eventually led to the integration of administrative, operational and business activities based on optimization of resource utilization, increased network efficiency in mail processing, transportation, and delivery and increased commercial competitiveness. Previous standardization and systems integration allowed ECT to distribute and share corporate information throughout the company, thereby increasing management control while simultaneously decentralizing decision making. ICT was also used to improve mail processing operations. Starting in 2001, mail processing functions were also upgraded through the installation of computerized sorting machines to automate processing of letters, parcels and pouches. The expansion of tracking systems allowed customers to follow the progress of their shipments via Internet or telephone.

Today, the Corporate Network is a real-time operations-driven network that supports business applications on more than 12,000 online counter terminals and provides customers with decentralized, real-time services in every city and municipality in Brazil. The control room, designed to monitor the status

of all components (network, systems, hardware, databases) 24/7, was built with four monitoring cubes right beside the Corporate Data Centre at ECT Headquarters. It has 6,500 links providing access for retail activities; formerly 70% of these were satellite and 30% surface links; today those percentages are reversed. In addition there are 240 IP Multimedia links dedicated to management systems. Internet connections have a speed of 100 Mbps; over five million individual users access ECT's website every month. From a local perspective, each ECT retail site has a Simple Network Management Protocol (SNMP) node and security cameras that are monitored 24/7 under a maintenance contract that covers the entire system, including sites where corporate data is concentrated. Evaluation of systems maintenance and monitoring functions is based on system down times and delays.

Corporate data centres are located in Brasília and São Paulo and are integrated with all of ECT's corporate systems. They operate on a 24/7 basis through 1,000 corporate servers and provide 300 Tbytes of data storage to run over 400 management and retail information systems (both corporate and regional). Security of data and information is ensured through backup files maintained at a separate site. The ECT helpdesk also responds to over 52,000 customer inquiries per month. The Corporate Network (including the BP component) interfaces with the banking partner (Bradesco) via two 1 Mbps channels with the backup channel; all three are run over private lines.

5.2 BP network – establishing an ICT structure for correspondent services

5.2.1 Systems Description

The BP network is an integrated system of simple, automated procedures for customers to access banking services with the help of ECT personnel; each BP outlet is linked via satellite to the central authorization site at the Headquarters of ECT, which has three dedicated links to the Headquarters of Bradesco. This ensures that transactions can be processed in real time. The entire system functions on minicomputers and peripherals compatible with Windows NT and Windows 2000 operating systems. The typical office equipment configuration includes an EFTPOS device to read debit cards, a bar scanner that reads invoices for payment, a PC and a PIN Pad to input and encrypt the cardholder's PIN.

There are three layers of functions in the BP system:
- customer presentation of the transaction;
- transaction; and
- transfer of the transaction and data storage.

Presentation functions in the ECT post office are divided into counter terminal functions (activities) and "back office" functions.

Transaction functions include:
- systems integration;
- routing;
- authorization;
- management;
- environmental controls;
- updating data archives;
- updating software;
- updating pricing.

Data storage functions are also housed at the authorization site. Data banks are stored on a cluster server using Oracle Database © 10g RAC (Real Application Clusters).

5.2.2 Management structure

ECT counters (windows) function as banking and postal outlets and window employees are trained to handle all BP transactions. In essence, BP is responsible for receiving transactions for account services, loans, accepting deposits, and paying withdrawals; Bradesco is responsible for approving these proposals and for investing funds that have been deposited. BP's administrative headquarters is in Brasília and is overseen by eight executives.

BP's strategic and product focus along with IT-based management (including a fully computerized central control room), ensures it has fewer intermediate management levels than a traditional postal structure, and it is therefore considered to be a model for the rest of ECT's corporate departments. Perhaps just as importantly, ECT has established separate accounting systems for its BP operations, providing transparency and security for these funds.

6 Impact of ICT

6.1 Banco Postal – ECT's Flagship ICT/Postal Product

6.1.1 BP Product line

Before BP, ECT's financial services were extremely limited, consisting of money orders and some utility payment functions, in all representing less than 1% of corporate revenues.[19] Today, BP offers computer-based, real-time basic banking products through over 6,000 of ECT's post offices. These products are based on savings, credit, and payment services including:
- savings accounts;
- current accounts;
- checking accounts;
- deposits;
- withdrawals;
- account balance inquiries and statements;
- loans and microcredits, including "e-loans";
- credit cards;
- bill/invoice/tax payments;
- payroll and social benefits payments.

[19] "The Role of Postal Networks in Expanding Access to Financial Services – The Latin American and Caribbean Region"; report by World Bank Group and Postbank Advisory, ING Bank; 2005.

BP fees are lower than Bradesco's (and most commercial banks') and its offices are open for longer hours. Lending services are based on small loans with the credit risk wholly assumed by Bradesco. A post office current account requires an identity card, a social security number, and proof of residence; each client is provided with a debit card. One important principle is that BP was expected to turn a profit from the outset, albeit a modest one. Each account is charged a monthly fee of 1.65 USD which covers 14 free transactions per month (four balance inquiries; four withdrawals; four printed statements and two money transfers). There is a charge of 0.32 USD for transactions beyond the first 14 transactions. The percentage of transactions processed by BP can be characterized across the network as shown below:

Transaction type	*% of total transactions*
Bills, invoices, tax payments	38.5
Account balance/statements	19.2
Deposits	18.0
Withdrawals	17.2
Social benefit payments	3.7
New accounts	0.7
Loans	0.4
Others	2.4
Total	**100%**

6.1.2 BP customer profile

BP's financial products are aimed at lower and lower-middle income individuals. Considering the minimum guaranteed monthly salary in Brazil of 272 USD, the customer base can be characterized as:

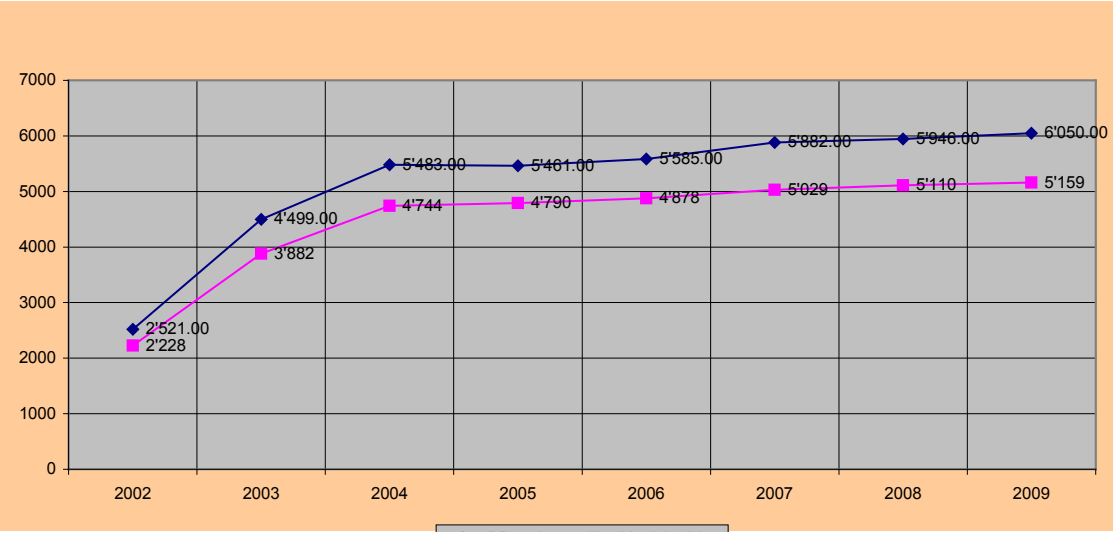
Salary	*Percentage*
Up to minimum monthly wage (272 USD)	56%
1 to 3 minimum monthly wages (816 USD)	37%
More than 3 minimum monthly wages	7%

As shown above, 93% of BP account holders earn 816 USD or less per month; nearly 60% of account holders who also have their salaries paid through BP earn 153 USD or less per month. The typical savings or current account holds between 120 and 240 USD. This demonstrates that BP's customer base has fulfilled the basic goal of the BP project, namely to make formal financial networks more accessible to the unbanked and other lower-income individuals.

6.1.3 BP growth and expansion

The BP network has grown significantly over the past seven years. As shown in Chart 6.1.3, most of this growth was in the first five years, indicating that distribution of financial services through the basic postal network may be reaching its limits and that further expansion will have to be through postal franchise units. Today, over 6,000 post offices (91% in the interior) in more than 5,000 municipalities are connected to the Internet and offer BP services. Furthermore, over 9.5 million new checking accounts have been opened since 2002 and over 600,000 people visit BP branches every day; over 1.2 million BP transactions are now handled on a daily basis. By the end of 2006, 1.93 million loans had been granted by BP and today, more than 700,000 pensioners receive their payments through BP. BP currently has 5.3% of the national correspondent banking business and 34.4% of the correspondent market for account openings, 24.4% for deposits, 17.4% for withdrawals, and 18.3% for loan transactions. Furthermore, except for the first year of operations, the amount of withdrawals from accounts has stayed relatively low, indicating that customers see their deposits in BP as a long-term investment.

Chart 6.1.3 – Growth of BP Newtork



Source: Banco Postal

6.1.4 Future plans for BP

As discussed above, deployment of BP through corporate post offices may be reaching a natural limit and therefore plans are being discussed to extend its reach to franchise units. There is also an ongoing effort to improve quality of service throughout the BP network. Popular investments such as security bonds and mutual funds could probably be offered next year, and new financial products such as postal insurance are being considered for the future.

Snapshot of BP on June 9, 2009	
Counters	12,134
Offices	6,050
Coverage	(100% of municipalities)
Transactions*	1,136,983
New accounts	4,267
*Record day for transactions:	1,981,539 on 10/9/2007

6.2 Incorporating ICT within ECT

6.2.1 Improving ECT management and control

In addition to establishing an ICT foundation for the deployment of BP, the Corporate Network described above has also enabled ECT to strengthen its own management and the overall direction of the corporation. It should be noted that before the Corporate Network was developed and deployed in 2001, ECT relied on off-line systems to gather, analyze, and distribute critical management information and data. This limited the amount and timeliness of data collected and was a significant cost element. ECT also uses ICTs to measure quality of service, perhaps the most critical element in the success of any postal operator, and today achieves the following very high levels of service.

Quality of Service	*Target*	*% Achieved (to Oct 2009)*
Within cities	D+1	98%
City to City	D+1	98.1%
State Capital to/ from Interior	D+1	98.1
Interior to Interior	≥D+2	98.1%
State Capital to State Capital	Ranges from D+2 to D+3	88.5% (mainly D+2)

Source: ECT

ICTs are also key elements in managing and controlling ECT's extensive transportation and processing networks which include 26 airline links, 637 surface links, 57 major processing plants, 6,246 collection and delivery links, 34,000 collection points, 50,000 delivery routes and 46 million addresses.

6.2.2 Strengthening ECT postal products

Incorporating ICT into ECT's operations and retail network has provided opportunities to develop new, customer-driven products and services and to make existing products better and more competitive. As an example of the system-wide integration made possible by ICTs, volume discounts can now be given to large volume mailers on a nationwide basis irrespective of where mail is deposited or collected. High-value, time-sensitive products can be tracked and traced throughout their journey, putting them on an equal footing with competitors. ECT can now also offer SEDEX, eSEDEX, and SEDEX Mundi (international EMS) through a computerized system that supports delivery of goods ordered over the Internet, (over 70% of ECT parcel traffic is generated this way) and overnight delivery of time-sensitive parcels. In its first five years, eSEDEX (designed for parcels ordered over the Internet) enjoyed 188% growth (3.4 million items in 2004) and in its first six, SEDEX achieved 1,234% growth (five million items in 2004).

ECT also offers a hybrid telegram product that allows customers to send a telegram domestically or internationally via the Internet with direct delivery by postal personnel. Reverse hybrid mail is another ICT-enhanced product that allows customers to scan documents such as forms and vouchers and then transmit them electronically for digital or physical delivery. ECT's interactive website provides information and transactions covering: postal products and services (basic postal products, direct mail marketing, tracking and tracing, telegrams, etc.); financial services (BP, electronic bill and tax payments, money orders and other money transfers); and goods transfers (Exporta Fácil, Correios Log services[20]). It also provides e-commerce opportunities (CorreiosNet Shopping, Correios Online) and other commercial services (e.g., digital certification) as well as a portal to e-Government services (pension verification, notice of government contracts, etc.).

Future improvements to existing services are being considered, such as automating a number of basic postal services to make them more accessible to customers and the possible introduction of a hybrid mail product to serve both national and international destinations. The sale of notebook computers for teachers is another growing ICT-related project. Bradesco provides the financing; ECT collects the notebooks from the manufacturer, then transports and delivers them to teachers at their homes. In the future, this project could be expanded so that the sale, financing and delivery of any product, not just computer notebooks, could be handled through a seamless ICT/Postal/Financial channel.

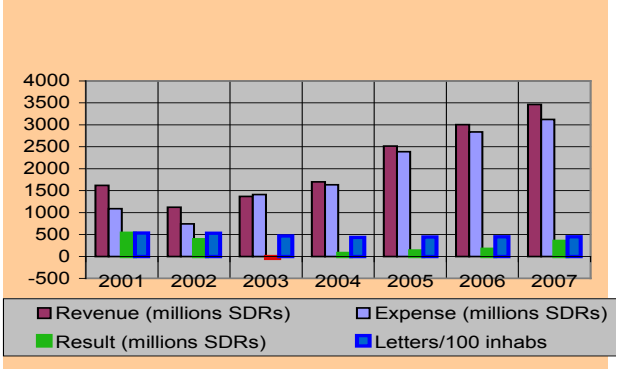
6.2.3 Sustaining ECT finances and universal service coverage

Establishing BP has allowed ECT to maintain profitability and to strengthen universal service; in some post offices, BP revenues now exceed postal revenues. This service has increased the profitability of many local post offices that were

[20] Correios Log provides customized consulting logistics services and computerized management of customers' warehouses, inventory, dispatch, transportation, delivery and other aspects of the customers' supply chain.

hitherto losing money (through banking transaction fees and increased walk-in business), and thus helped to keep these offices open. As shown in Chart 6.2.3, this has enabled ECT to maintain profitability and even increase it after 2003, despite flat and in some cases declining mail volumes.

Chart 6.2.3 – ECT profitability vs volumes



Furthermore, incorporation of BP has helped ECT maintain coverage and employment. In 2002 ECT had 5,300 post offices; today, it has 6,197 post offices including over 400 new offices opened in remote rural areas. Employment has also grown; in 2002 ECT had 95,700 employees, today it has 113,000. From an employee morale standpoint, BP has provided an opportunity to give ECT employees extra recompense in the form of bonuses for both management and employees as well as hiring new employees. These employees now have more interesting and potentially more profitable jobs.

Thus the universal postal network has been maintained and even expanded, primarily by incorporating technology and expanding beyond the basic postal portfolio to include banking services and other ICT-based products. As a result, individual and business customers see ECT as more responsive, and post offices as a one stop shop for their business transactions.

6.3 Impact beyond ECT – using ICTs to support national development and growth

From a wider perspective, combining ICT technology with postal presence has significantly enhanced the numerous nationwide services that are provided through the ECT network. These services have both societal and economic value and it is unlikely that any network other than ECT's could make them as accessible to as many people in as many places. The chart below lists just some of these services and also shows the distinct value that ICTs and postal components bring to their delivery.

Chart 6.3 – Services distributed through the ECT network

Product/service	*Coverage/ description*	*ICT added value*	*Postal added value*	*Economic/social Benefits*
Election Voting	5,561 municipalities 115 million voters 250,000 machines	Real time voting Reduced fraud Electronic voting box – flexibility	Trusted sites Voter verification Locale customized	More voter participation Improved accountability Increased social inclusion Reduced rural isolation
Medicine Distribution	Nationwide	Track/trace Data gathering Information sharing	Extended network Controlled distribution	Rural areas reached Improved national health
Product/service	*Coverage/ description*	*ICT added value*	*Postal added value*	*Economic/social Benefits*
Schoolbook distribution	120 million books/ year 136,000 schools 32 million students	Track/trace Data gathering	Predictable shipping "Last mile" delivery Customized by locale	Higher education levels Greater competitiveness
Address database management	46 million addresses	Automated updating	Added-value product offering for advertisers	Information for mass mailers Information for security, taxes
E-Government	Applications, permits, legal documents, social security verification	Online access	On-site certification of government documents	Travel/waiting time saved Two-way communication Accessible government
E-Commerce	CorreiosNet: online shopping Listing of SMEs on website	Track/trace Designed for Internet-based businesses	Door to door collection and delivery Secure handling Overnight delivery	Economic activity growth Stimulation of SMEs
Exporta Fácil	Simplified process for exports below 50,000 USD	Track/trace Expedited customs	Nationwide shipping	Support for SMEs Improved exports

Product/service	*Coverage/ description*	*ICT added value*	*Postal added value*	*Economic/social Benefits*
International financial remittances – VIE	All municipalities (6,050 post offices) UPU based – 20 countries Eurogiro – 22 countries Electronic money orders – 20 countries	Fully automated in Brazil Money laundering control coordinated with national authorities	Comprehensive national coverage Established relationships with other postal operators	Lowest price and exchange "spread" Strong support for SME and rural economic growth Reduction of illegal remittance market
Digital certification	All the benefits of the traditional paper-based postmark for electronic documents	Date and time stamping, digital identity capture, content verification/ encryption.	Combined with traditional postal products	Proof that the content of an electronic message has not been altered Increased and simplified document verification

One example of the benefits provided by "wiring" the ECT network is the success of Exporta Fácil ("Easy Export"). As part of the national endeavour to promote simplified export procedures for micro, small and medium-sized enterprises, ECT introduced "Exporta Fácil" via its network. Between January and September 2003, Exporta Fácil's volumes grew by 192.4% in terms of items and ECT eventually captured 32% of this segment of the export market; overall, Exporta Fácil increased the national export base by 10%.[21] Another area is public access to the Internet and digital communications, also available through ECT's network and facilitated through the assignment of permanent e-mail addresses to customers. The distribution of critical government services such as dispatch of medicines and schoolbooks, and providing voting facilities through the postal network has not only added value to the postal network, but has also allowed the government to reach out to more remote areas of the country by using established and reliable transportation and delivery systems. The extension of voting facilities has boosted democratization and social inclusion and increased governmental accountability, while greatly expediting elections.

Another important area where ICTs have added value to the postal network is e-commerce. The e-commerce market in Brazil grew at a rate of over 40% a year from 2002 to 2005. ECT was determined to enter this market to offer more options to its customers and created CorreiosNet: an Internet-based virtual shopping mall.[22] CorreiosNet has three areas of activity:

– Selling ECT's products and services.
– Selling third-party products.
– Taking integrated logistics orders.

These activities were brought online in a series of projects from 2003 to 2005 and have shown steady growth in the ensuing years, while supporting overall economic growth.

7 Using ICT and Posts to empower individuals and communities

Figure 7 – BP national coverage – 2009

7.1 Reducing distance and expense

Four hundred and five municipalities included in the BP project were located more than 100 km from the nearest financial centre and in most cases were not connected to these centres by paved roads. For another 75 municipalities, the only access was by boat or small aircraft.[23] Citizens in these localities had to spend time and money to access any financial services including receiving pensions. By combining ICT technology with postal presence in an already existing post office, BP was able to eliminate this costly travel and provide immediate and local access to financial services.

[21] While Brazilian exports decreased overall during the first semester of 2009, Exporta Fácil's volumes continued to grow.
[22] ~~PTC/UPU In~~fo Note on CorreiosNet.
[23] Source: Banco Postal (Deban).

The story of the residents of the small district of Castelo dos Sonhos, in the municipality of Altamira, Pará, illustrates how the simple act of opening a checking account can transform lives. The nearest bank was in Novo Progresso, 158 km by dirt road, impassable in the rainy season. Retirees often spent up to 30 USD, and two days of bus travel, to go to Novo Progresso to draw their pensions. Today, correspondent banks (including BP) in Castelo dos Sonhos enable retirees and others to access their benefits immediately and without extra cost.

7.2 Empowering individuals

Access to financial services represents not only an increase in the value of the retirement payment and pensions (and many other transactions), but also a reduction in the red tape necessary to cash a cheque at a private bank or other financial institution (including opening a high minimum account; BP's minimum is approximately 3 USD). Furthermore, the ability to cash in or deposit remittances from overseas at BP outlets can reduce the high exchange fees that are sometimes charged for this service. Finally, having locally-accessible accounts increases personal security by eliminating the need to keep cash at home or to carry it for long distances from town to town.

More than 88% of BP account holders deposit some funds in savings accounts, thereby earning interest on funds that were previously "hidden in the mattress." Eighteen percent also have checking accounts, a rarity amongst lower-income individuals in developing countries, but just as importantly, a potential source of increased mail volumes used for paying bills.

"Eucila" (not pictured) is disabled and receives a minimum social security wage which is supplemented by repairing watches. When BP established a branch in town, Eucila opened an account and took a first-time loan of 295 USD to buy shelves and purchase other convenience products for sale in the watch shop. Eventually, the first loan was paid off, a second loan taken to further diversify and expand merchandise and upgrade Eucila's home; Eucila was also considering a third loan to expand the size of the shop.

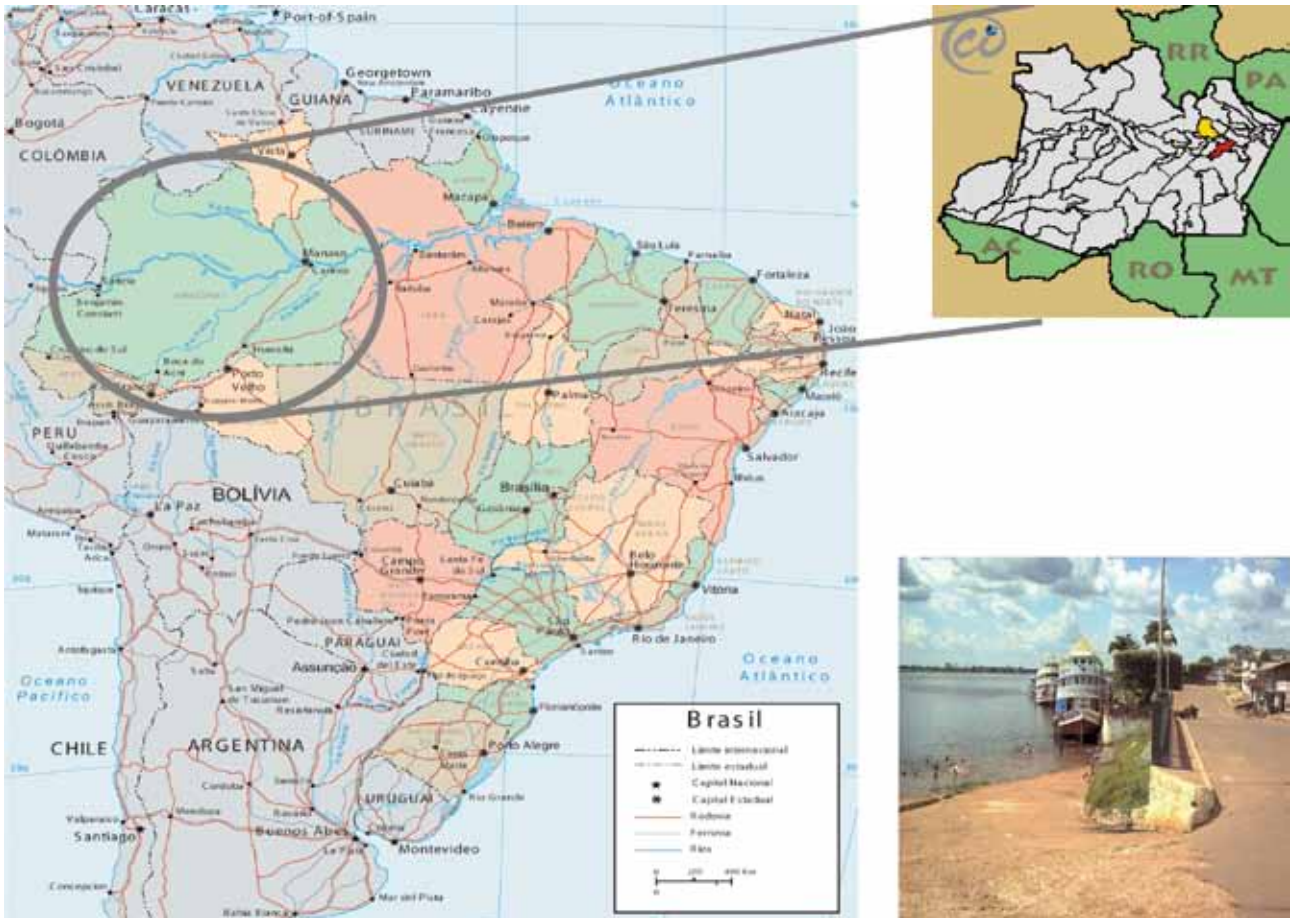
7.3 Empowering municipalities and regions

BP's coverage of previously unbanked villages and municipalities has been remarkable. In 2002, 1,750 Brazilian municipalities were identified as having no banking services; by 2005 BP was operating in 96% of these areas; by 2009, 6,050 BP branches provided access to 14 million individuals. This expanded coverage helps empower villages and municipalities in two ways: firstly, by keeping money circulating locally instead of having it flow to distant cities and secondly, by allowing individuals to access money where they live, BP helps support local businesses, eliminates the need to transport expensive goods from large cities, and produces a "multiplier" benefit for the local economy.
Mairipotaba, a small town of 2,269 inhabitants (2004) in the State of Goiás is nearly 100 km away from the state capital. Before BP arrived, it was following the course of many municipalities; steadily losing population and income with no prospects for growth. When BP opened in June 2002, the payroll of the 235 city employees and the collection of municipal taxes were transferred to the Bank. Soon, funds were available for local farmers who then used them to expand their businesses and increase employment.

By providing access to loans and micro credits for small borrowers, BP provides an important stimulus for local SMEs and indigenous businesses. Since 2002, BP has granted 1.93 million loans; loans and credits have been used to open and expand local businesses and are part of the business "virtuous

circle" of investment, expansion, advertising, order fulfillment, and bill presentment and payment that strengthens the postal sector and the economy around it. Finally, local access to financial services helps keep local populations stable, since civil servants and others are less likely to be forced to move to another location to receive their monthly income. It should also be remembered that the funds currently held in BP accounts, to say nothing of the funds in other banking correspondents, reflect resources that would not previously have been included in national savings totals nor been available for investment and development.

8 Autazes: a concrete example of ICT/Postal supporting economic growth



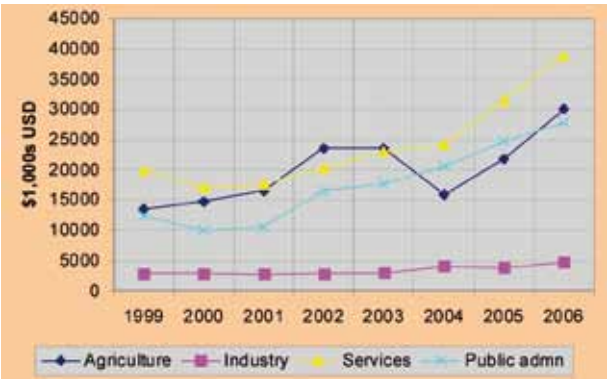
Autazes is a river city of 30,000 inhabitants (including surrounding regions) located in the remote state of Amazonia in north western Brazil. Although it has a relatively high level of urbanization (41.7%) and 40 small communities, the overall population density is only 3.2 inhabitants per square kilometre.[24] In 2002, the local GDP was 47 million USD, made up of 48% agriculture (mainly dairy production), 41% services, and 5% industrial production. Government subsidies and payments made up 33% of all local income. There were only 10 small stores and the nearest banking services were in Manaus, 140 km away and most easily accessed by a 14-hour boat ride. Distance and isolation were causing the local residents severe logistical hardship. Paying the salary of the 415 municipal public servants of Autazes, for example, was a tactical nightmare. A representative with armed guards had to be sent to Manaus, to collect nearly 180,000 USD using a chartered twin-engine plane and transport it in a sealed container. The entire operation was time-consuming, expensive and inconvenient. Other citizens faced similar challenges and frequently had to pay someone going to Manaus to receive their cash, make deposits, and pay their bills; typically, such services cost 10–20 USD and were not secure.

In April 2002, the first BP outlet was opened in Autazes and a BP ATM was set up at the local supermarket; municipal employee salaries could now be paid directly into individual accounts and accessed locally without delay. By 2004, this new portal to the outside financial world was paying additional dividends. BP had 3,000 accounts and was processing 8,800 financial transactions and 100 loans per month in an area where no bank existed just two years before. There were 26 new businesses, some accepting credit cards, and a 90% increase in local tax revenues.

Eventually, BP reached 7,657 accounts in Autazes and, attracted by the growing economic activity, Bradesco opened up its own bank in Autazes. In addition, four other banking correspondents opened branches in Autazes. ICT access has significantly been increased and Autazes even has its own blog, conexaoautazes.blogspot.com, promoting local business and investment opportunities, development initiatives, social and financial services, stories of indigenous entrepreneurs, local crafts and culture, and a wide array of business and other important information. In more macroeconomic terms, the impact of ICT and economic empowerment on Autazes can be seen in the overall GDP growth, which far exceeds that of Brazil as a nation over the same period of time. While it may not be possible to directly attribute all of this growth to the availability of financial services offered through the postal operator[25], it is interesting that the sector which grew fastest (services), is most directly tied to postal and SME growth.

[24] Presentation by the Brazilian delegation at UPU Council of Administration, November 2009; information supplied by ECT.
[25] See Ansón and Gual.

Chart 8 – Autazes GDP with BP



All this, notwithstanding, several banking problems have occurred and there is of course room for improvement. Autazes is far from being a "cashless" society and the use of credit cards is still slow to take off. Furthermore, the supply of cash for withdrawals from local ATMs is not always sufficient to meet demand, particularly on weekends. Strictly speaking, this is neither an ICT nor a postal problem, but rather a logistics and transportation issue since cash must be shipped in from other cities. Coverage is far from comprehensive and there are still communities lacking financial services. The community of Novo Céu for example, has 6,000 inhabitants but no banking services. The nearest banking outlet is a one hour and twenty minute boat ride away, costing 12 USD. This represents a significant portion of the 50 USD monthly social benefit given to each individual by the government, to say nothing of the travel and time required. Nevertheless, it is clear that the combination of ICT and postal presence has made the lives of individuals easier and the future of the economy more promising.

Typical ICT/Postal configuration in rural area.

9 Project evaluation

In evaluating the success of a project such as Banco Postal, it is important to consider five questions:

- Was the project developed and deployed correctly?
- Did the project achieve its original goals?
- Has the return on investment been adequate?
- Is the project sustainable over time?
- Has the project achieved benefits beyond the original goals?

BP was designed to be operational in a very short time following the signing of the original agreement between ECT and Bradesco, despite formidable development and deployment challenges that included tight deadlines, extensive training, incorporation of new technologies and processes, and broad geographic coverage. However, by the end of 2005, over 5,421 offices (97% of the goal) had been brought online. By 2009, 6,050 post offices and 100% of municipalities had banking coverage.[26] There was also a target of three million new account holders by the third year of operation, which was exceeded. This was only possible because of the extensive preparations which ECT and other stakeholders made prior to developing and deploying the BP system.

A key project goal was financial inclusion, i.e., to extend banking services to those without access and to increase the level of financial literacy amongst the population. This was clearly achieved and (along with financial networks established by other banking correspondents) BP has brought millions of previously unbanked individuals into formal financial networks; 12.4 million people living in 1,525 municipalities had no available banking services until BP arrived; today, this gap has been closed and 9.3 million individuals have been newly "banked."[27] Furthermore, opening these accounts provides a credit history that can help subsequent loan applications. Since BP's network is based on the existing universal postal network, it also tends to be more evenly distributed nationally than other financial networks based on national population and wealth distribution. Furthermore, the project has made life more convenient for many of Brazil's low-income citizens, including the 700,000 social security beneficiaries who receive their payments via BP; this also helps meet the government's objectives of using the correspondent system to distribute social benefits.

From ECT's viewpoint, the return on investment has been more than adequate as BP has proven to be a financial "winner". BP has also helped ECT maintain financial stability and even increase its universal service network. Bradesco also views its involvement with the project and its overall investment as a success; approximately 93% of Bradesco's new accounts in 2008 came from BP and it has 34.1%, by far the largest portion, of all the correspondent branches in Brazil;[28] in contrast, it could cost perhaps 500,000 to 1 million USD to open a bank branch in a large city. Bradesco has even been able to close some of its branches where BP has proved to be an adequate substitute. In others, it has opened a new branch where none previously existed in response to increased economic growth generated by BP.[29]

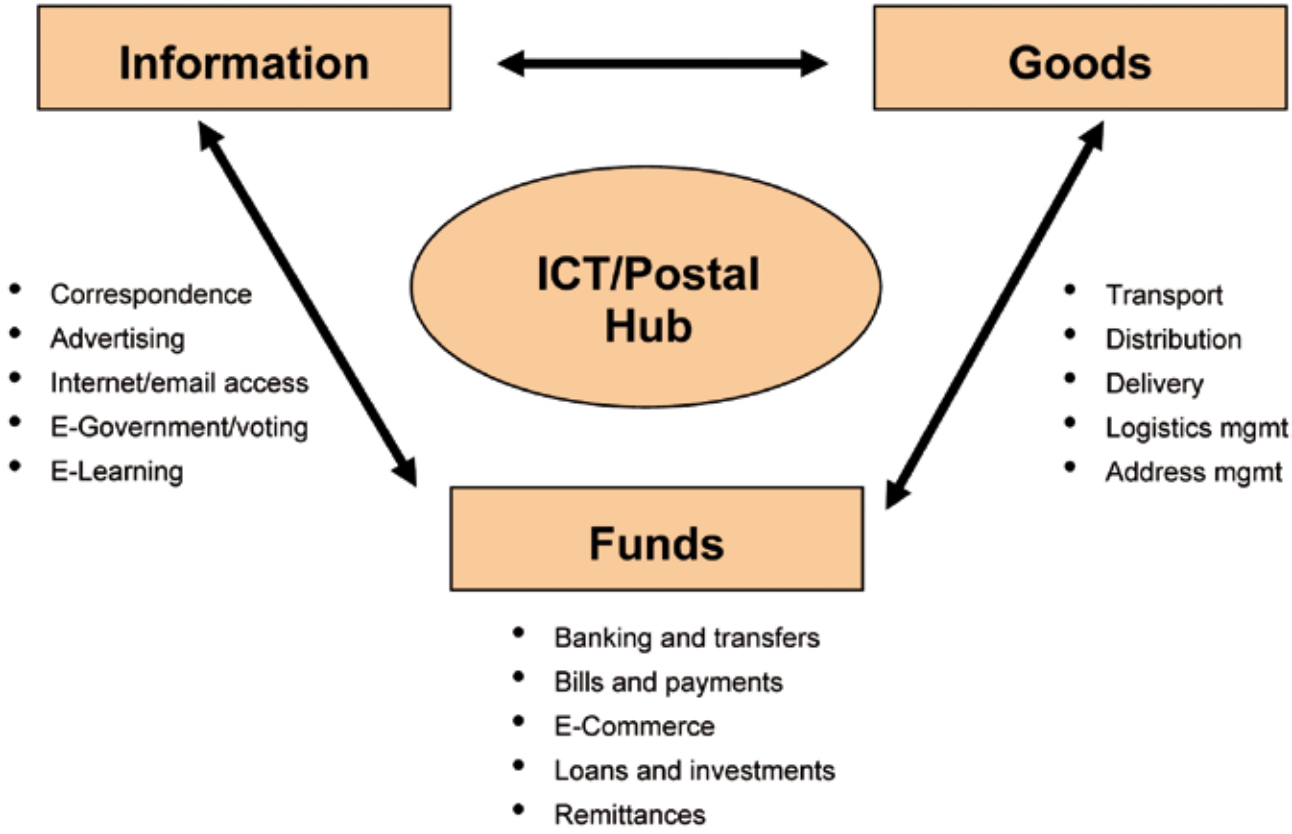
According to a recent article in Exame, one of Brazil's most important business magazines, "Among the private banks, Bradesco is the most present at the base of the pyramid. The Bradesco agency that opens most accounts in Brazil is in Montes Claros, Minas Gerais, but it is through the Banco Postal and its correspondents that the bank is able to keep costs under control and reach the enviable mark of 16 new, low-income clients per minute."[30]

It would certainly appear that benefits achieved by BP can be sustained over time; in fact, as recently as 2008, 1.2 million new accounts were opened, showing that there is still strong interest in this banking option and justifying expansion to include postal franchises. To a large extent, continued growth will depend (as will the whole postal business) on the Brazilian economy. But if the BP approach and other "bottom up" economic development strategies continue to produce results in Brazil, there will be a growing need for basic-level financial services throughout the country. In fact, the partnership between ECT and Bradesco has been awarded a Corporate Social Responsibility Award – Mail Awards, for its success in aligning the interests of all stakeholders while extending economic and social inclusion.[31]

Finally, the benefits of "wiring" the posts in Brazil, both digitally and financially, have gone far beyond the extension of financial services and the modernization of the postal operator. The additional benefits in terms of e-Government and e-Commerce are significant and the government and social services deployed through the postal network (distribution of medicines, schoolbooks, voting materials, simplified export processes) can now be controlled and delivered with real-time information concerning transportation and delivery and customized to meet local needs and characteristics. The combination of ICT and Post has also enabled the sharing and leveraging of multiple networks to achieve economies of scale while providing support for overall economic and social inclusion.

[26] Ministry of Communications presentation at UPU, 2005.
[27] See Ansón and Gual.
[28] Source: Febraban.
[29] Joëlle Toledano and José Ansón, ed., Postal Economics for Developing Countries: Posts, Infrastructure of the 21st Century?
[30] www.thebrazilianeconomy.com; accessed 23 November 2009.
[31] Kugemann, Monika, Workshop Report – UPU–AFI Workshop on Financial Inclusion and Postal Banking; Bern, November, 2009.

10 Conclusions – using ICT and Posts to connect three business flows



The development of the Corporate Network created a "win-win" scenario for the establishment of BP. ECT already had a technological platform and satellite communications network in place that had been designed as a foundation for financial services. Therefore, after improvements were made to support banking applications, Bradesco simply had to set up a line between the bank and ECT headquarters in Brasília. Bradesco had standard financial systems and processes (including investment structures) in place so that ECT only had to adapt its network of local computers to these. Furthermore, ECT boasted the physical infrastructure of offices, a high level of efficiency, and an excellent reputation, all of which made offering Bradesco's services through ECT more attractive (and in many areas more practicable and profitable) than setting up new Bradesco branches and ATMs. All this meant the upfront investment on both sides was minimal.

Adding banking services and other ICT-enabled non-postal services to ECT's network also allowed it to fulfill the broader definition of universal service described by many postal reformers. In this definition, post offices become a hub where a "basket" of essential universal services (mail, telecommunications, transportation, funds, etc.) intersect to support national economic and social development. This is an interesting trend when one considers that for the past 20 or more years, postal and telecommunications reformers have sought to split these services in order to reduce cross subsidies and increase the independent privatization and commercialization of both. However, as the opportunities grow for posts and telecommunications to be seen as complimentary rather than "cannibalistic", it may become increasingly attractive to combine the two in ways that produce profits for both. Brazil's incorporation of ICTs into its postal network is a perfect example of realizing this opportunity, not only in its ability to combine differing technologies, but also in use of a public (ECT) – private (Bradesco) partnership to produce a commercially successful product (BP) that benefits the most economically vulnerable sector of the population.

Furthermore, the integration of a wide range of services within the ICT/Postal Hub, including financial services, transportation and delivery, export facilities, e-Commerce, etc., helps to counterbalance the marginalization of some portions of the population that typically occurs during the development cycle as wealth and access become more concentrated. There is some evidence that this integration provides "countercyclical" benefits such as Exporta Fácil's growth during a general economic downturn in Brazil. Similar trends have been noted in the ability of international remittance flows to help offset the effects of worldwide economic shocks and stabilize local economies. These benefits are most likely tied to the relative immunity that peripheral economic sectors have, at least initially, to outside economic influences.

The use of ICTs in the BP project was the key to its success. Some other national postal operators have tried to introduce or maintain financial services with limited success or even sometimes outright failure. Where these efforts have fallen short, three negative factors can often be seen.

First, the existing postal operation did not inspire customer confidence in the financial products that were provided. This problem has sometimes been exacerbated by a lack of support from governmental and banking authorities who regarded postal financial services as unnecessary competition for commercial banks. In Brazil's case, ECT's outstanding reputation for efficiency inspired confidence in a new range of non-postal products and helped garner strong governmental and banking authority support for the BP initiative.

Secondly, there was inadequate demand for the financial product, which only became obvious after it was launched. By contrast, ECT conducted extensive due diligence and demand analysis to validate and properly measure the BP project. This was an important part of the three years of planning and development that preceded BP's launch.

Finally, many failures in launching postal-based financial products can be traced to the lack of adequate ICT development, for example relying on cell phones, faxes, or similar media to transfer information regarding funds transfers. This can lead to delays, mistakes, and even fraud, undermining public confidence in the operator's ability to handle their money. ECT however, avoided this error by designing, developing, deploying and maintaining an ICT structure with the capacity and adaptability necessary to meet the needs of a growing financial services market. This extensive preparation helped make ECT an attractive potential partner once it launched the bidding process.

11 Lessons learned from the BP Project

- Digital and physical networks such as ICTs and Posts can be successfully combined to provide "win-win" scenarios that include improved efficiency, competitiveness, and profitability for the Posts and increased utilization of and access for ICTs.
- Such "hybrids" can also produce new networks such as electronic financial services delivered through a postal infrastructure, while simultaneously ensuring that these are universally available.
- New, non-postal products such as correspondent banking services that are offered through the postal network can add value to this network, lower the costs of maintaining universal service and lessen the impact of future declines in basic mail volumes.
- Adding technology, value, and scope to the postal network can transform post offices into universal service "hubs" that provide for the seamless flow of information, goods, and funds.
- The combination of ICT and Posts can provide inclusive and sustainable benefits in other sectors by increasing economic activity, reducing economic and social marginalization, increasing governmental accountability, stimulating local businesses, and thereby help justify maintaining the universal service.
- However, an important element in launching any new ICT/Postal product (particularly in the financial transaction area) is the level of confidence which the public has in the operator; in this regard, ECT is the most trusted institution (public or private) in Brazil.
- Conversely, the ICT environment must be sufficiently developed to support new systems and products in other sectors.
- Furthermore, when incorporating advanced technologies within postal operations, it is extremely beneficial (and cost efficient) if these technologies support a profitable new product or service; in this sense, BP would not have been possible without ICT. Conversely, the success of BP justified the investment in ICT.
- A supportive policy and regulatory environment, as well as buy-in from major stakeholders, is needed to facilitate the required policy and regulatory changes.
- If the project is nationwide or similarly large in scope, it will require significant resources including technical expertise and adequate funding along with the time (three years in Brazil's case) needed for project research, planning, design, training, pilot testing, "marketing" to stakeholders and potential customers, deployment and modification.
- Deployment schedules for projects like BP should be aggressive but achievable within the time and resources allotted.
- Projects as large as BP also require a high degree of standardization and integration across data elements, information systems, reports, national and local applications, and human resources.
- It is similarly important that each partner focus on the unique strengths and value (for ECT, managing a comprehensive retail, transportation, and delivery network; for Bradesco, managing a bank) which it brings to the partnership and that these be reflected in the binding contract of formal arrangement.
- To be sustainable over time, projects such as BP must continue to be managed efficiently, provide ongoing benefits, and support wider development goals such as expanding economic and social inclusion and supporting local economic growth and diversification.

PosteMobile: delivering innovative mobile banking and commerce solutions

Dr Kristian J. Sund

1 Introduction

In late 2007, Poste Italiane Group (PI) launched PosteMobile and entered the mobile telecommunications business, as a mobile virtual network operator. Since then, by offering a series of innovative mobile postal, banking and payment solutions, PosteMobile has capitalized on its unique combination of the highly recognized and respected PI brand, a national network of 14,000 post office outlets, and its affiliation with BancoPosta, the banking arm of PI. In addition to traditional voice and data services, PosteMobile customers can link their SIM card directly to their BancoPosta current account or their Postepay prepaid card, enabling them to make transfers and payments directly from their mobile phone. In less than two years of operation PosteMobile has signed up over a million customers, and is currently preparing to enter the B2B market and extend its range of services and price plans.

This chapter discusses the creation and first two years of operation of PosteMobile, outlining amongst other things why this innovation was a logical step for PI, the context within which the idea developed, what the main elements of the business plan are, some of the early successes of the venture, and how PosteMobile is a vital component of the long-term strategy of the group as a whole.

Although clearly a success so far, the project has taken several years to get off the ground and has required substantial investments. These investments have been primarily in intangible assets, such as the software and ICT platforms required to run the virtual network operator. These potential challenges were overcome through efficient strategy implementation and successful collaboration with suppliers. The early successes illustrate the kinds of opportunities open to postal operators by diversifying into new business areas offering synergies with existing capabilities and service offerings.

2 Poste Italiane and the Italian policy and regulatory context

Originally a part of the Ministry of Post and Telecommunication (Amministrazione Poste e Telecomunicazioni, or APT), Poste Italiane gained some measure of independence from government in 1994, when the Ente Poste Italiane (EPI) was formed as a simple state entity. In 1998 EPI was again transformed into Poste Italiane SpA, a fully commercial undertaking 100% controlled by the state. Poste Italiane is thus owned 65% by the Ministry of the Economy and Finance and 35% by Cassa Depositi e Prestiti SpA (CDP), the Italian development bank, itself a joint stock company under public control.

The long-term plan is to eventually privatize PI and float its shares on the stock exchange, but the Government has so far put off these plans.

Crucial to today's financial health of PI is the fact that as part of the 1994 transformation, the accumulated losses of the APT were taken over by the Italian state. During its long history the Italian postal service has traditionally been a big loss-maker. This situation continued throughout the 1990s, with the Italian state effectively subsidizing the postal service to the tune of 9 billion EUR between 1994 and 1999. This subsidy was later the subject of a formal investigation by the European Commission, aimed at establishing whether the state aid provided to EPI was in any way unlawful. In 2002 the investigation concluded that the extra cost of the general service mission entrusted to EPI had been around 3,000 billion ITL (1.5 billion EUR) per year during that period, and, thus, the amounts paid by the Italian State to EPI were, in fact, less than the cost of the universal service obligations of EPI. This high cost was explained by the historically low efficiency of the Italian postal system, the historically low number of postal items per capita sent in Italy relative to the size of the network, and especially the very heavy burden imposed by a preferential tariff for the press and non-profit publications.

The transition from a state entity to a publicly owned company was a turning point in the history of PI. Not only did PI become a company focused on its customers and its bottom line, but it also embarked on a long-term transformation, aimed at improving productivity and growing new business areas. In 2002 PI posted profits for the first time in fifty years.

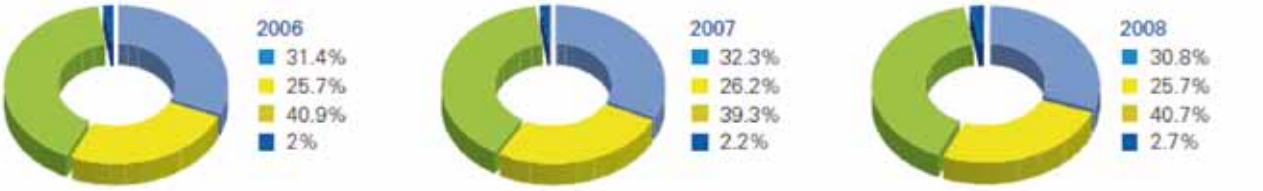
With 156,000 employees, 14,000 post offices, 5,000 ATMs and 44,000 vehicles, PI is today a diversified company active not only in the traditional mail market, but also in parcels, express, banking, insurance, and now mobile telecommunications. The postal services unit accounted for about 30% of the 18 billion EUR of total revenues in 2008 (see figure 1). The total mail volume handled was 6.4 billion items, of which 3 billion represented unrecorded items (priority and bulk). 2008 saw a decline in mail volume of 2.6%, confirming a gradual decline seen for several years in Italy, as in many other countries in Europe and the world. Financial services accounted for over 4.5 billion EUR in revenues, and insurance over 7 billion EUR. The financial services unit, BancoPosta, manages 5.5 million accounts, with over 250 billion EUR held in current accounts. PI has thus come a long way in the last 15 years, not only becoming a profitable enterprise, but going on to win the Cisco Networkers Innovation Award for technological innovation and being included among Fortune's list of the World's Most Admired Companies since 2007.

[1] Source: European Commission Press Release IP/02/391, 12/03/2002.

Figure 1

POSTE ITALIANE GROUP

Total revenues: segment information



(€m)	2006	2007	2008	2007 vs 2006	2008 vs 2007
Postal Services	5,351	5,553	5,506	3.8%	-0.8%
Financial Services	4,383	4,505	4,594	2.8%	2.0%
Insurance Services	6,976	6,750	7,268	-3.2%	7.7%
Other Services	346	379	484	9.5%	27.7%
Total	**17,056**	**17,187**	**17,852**	**0.8%**	**3.9%**

General Regulatory Situation

Poste Italiane Spa is the Italian universal postal service provider, appointed under legislative decree 261/99, implementing EU directive 97/67/CE, concerning domestic postal services development and quality of service improvement. With a decree of 17 April 2000 the Ministry of Communication confirmed attribution of the universal service obligation (USO) licence to Poste Italiane until 2014. The Italian universal service includes collection, transportation, sorting and delivery of mail items up to 2 kg and parcels up to 20 kg, as well as registered and insured items. Within this scope PI offers postal services throughout the national territory, at reasonable prices and on the basis of precise quality standards. The remaining postal services, such as express mail, do not fall within the universal service.

In order to grant the universal service provider balanced economic conditions, the first European postal directive (directive 97/67/CE) defined a reserved area, which enables the provider to cover the costs in the less profitable areas, where the service must in any case be provided. As of today, consistent with directive 2002/39/CE (second postal directive), this reserved area consists of mail items up to 50 grammes, where prices do not exceed 1.50 EUR. A third postal directive (directive 2008/6/CE), published in February 2008 and still to be implemented by member states, provides for the removal of the reserved area and the full opening of the postal market by 1 January 2011 for 11 countries. Some countries (Sweden, Finland, United Kingdom, Germany and the Netherlands) liberalized their market earlier, whereas others, for economic, size, or territorial reasons, can postpone the full opening of their postal market until 1 January 2013.

The Italian postal market will be fully liberalized as of 1 January 2011, in line with the Directive's provisions. In fact, some segments of the universal service are already fully opened to competition, such as registered and insured mail items, standard parcels and direct mail. Other segments falling outside of the universal service, such as express mail, are characterized by the level of competition seen internationally, and these markets are shared with some of the big international competitors.

Universal service obligation and Poste Italiane

Despite the coming liberalization, a USO still exists and has to be imposed, that is to say a service that everybody can access everywhere on the national territory, at reasonable prices. At the time of full market opening, owing to the distinctive features of the Italian postal market, where a low number of per capita mail items spread over a large area increases the costs of the universal service, it will be necessary to find effective solutions for financing the postal service. This may include an alternative to the postal reserve, which up until now has ensured service affordability by providing the universal service provider with exclusive revenues.

The relationship between PI and the Government, with regard to the universal service obligation, is regulated by a three-year programme agreement with the Ministry for Economic Development. In 2003, after the Interdepartmental Committee for Economic Planning (CIPE) approved the "Guidelines for postal sector regulation" (resolution CIPE 77/03), a new regulatory system for the Italian postal sector was defined, focusing on a tight connection between the programme agreement, business plan and price policies.

The specific conditions include:

– rate adjustments calculated on the basis of a price cap mechanism. This mechanism enables the adjustment of the rates of regulated products by taking into account the inflation trend, business efficiency recovery and the achievement of quality targets;
– state transfers (subsidies) to PI as the universal service provider, for partial coverage of the universal service costs, set up according to a subsidy cap mechanism. This mechanism takes into account the programmed

inflation and business efficiency recovery and transfers decrease over time;
– quality targets for postal services, through indicators based on mail and parcels delivery times. Related penalties are specified in case targets are not achieved.

Quality of service targets

The Ministry for Economic Development, as regulatory body for the postal sector, lays down the quality standards for the postal service, aligning these to European guidelines. The quality of PI's delivery times for mail items (falling within the universal service) is monitored by the regulator, and for 2008 the Ministry for Economic Development certified PI's achievement of delivery targets. With a decree of 1 October 2008, the Regulator further raised the quality targets for the years to come. In particular, for priority mail, additional levels of delivery sub-objectives have been introduced for each kind of route. Crucially, PI has been performing mostly above its targets and has been able to continually improve its performance over the past few years.

Delivery within	*2007*		*2008*	
	Target	*Actual*	*Target*	*Actual*
Priority mail 1 day	88.50%	88.20%	89.00%	90.60%
International mail				
– inbound 3 days	85.00%	93.10%	85.00%	94.60%
– outbound 3 days	85.00%	92.40%	85.00%	94.10%
Registered mail 3 days	92.50%	93.80%	92.50%	94.40%
Insured mail 3 days	92.50%	98.60%	92.50%	98.60%

Post office network

With its 14,000 post offices, Italy is one of the few European countries where the postal operator directly manages the whole network with its own staff. In fact PI is the most capillary contact point between individuals and public administrations. The number of post offices has been steadily rising over the past few years, reaching 13,991 post offices in 2008. Very strict legal obligations ensure the presence of post offices on the territory and in particular in small towns. The decree of 7 October 2008 introduced the postal network distribution criteria, including the definition of a maximum distance of access to services for the resident population, the number of offices in single towns, opening hours, and the average number of residents per mailbox. These obligations add to the pre-existing rules concerning limits on the reorganization of opening hours in summertime (decree of 28 June 2007).

3 Background and the first years of PosteMobile

Launched in November 2007, PosteMobile traces its strategic origins back to the beginning of 2006 and is but one element of an overall strategy of diversification and modernization. Poste Italiane Group has, since that time, been actively increasing the use of information and communication technologies (ICTs) to streamline operations and offer new value-added services to its customers, across all areas of business.

Modernization and Diversification at Poste Italiane

In recent years, PI has undertaken a complex process of redevelopment aimed at increasing the quality of its services and expanding its product offer. This strategic vision, along with a programme of heavy investment in infrastructure and training, has allowed the company to raise efficiency standards significantly and very quickly, increase employees' professional qualifications, upgrade post office facilities, maintain growing customer satisfaction, and close financial statements with a profit. In fact the level of profitability currently places Poste Italiane in a top position among Europe's leading major postal service providers. During this accelerated process of development, PI has remained committed to the principles of its corporate mission expressed through its widespread presence throughout Italy – with 14,000 post offices and a staff of 150,000 employees – and to its traditional mission of responding to the needs of its customers, be they ordinary citizens, businesses, or public administration offices.

In 2002, Mr Massimo Sarmi was appointed as the new CEO of Poste Italiane Group, continuing a tradition of bringing in top managers with a deep understanding of technology. Mr Sarmi was, in fact, previously managing director of Siemens Italy and had had a long experience with Telecom Italia, where he was also in the team that first launched mobile telephony in Italy. Under his leadership, Poste Italiane balanced its books for the first time, after 50 years of losses, and then continued to go from strength to strength.

Although Poste Italiane did not, and still does not, possess a full banking licence, since 1875 the postal administration has offered postal savings books distributed exclusively on behalf of Cassa Depositi e Prestiti (CDP), a joint-stock company under public control. Created on the French model, CDP issues postal savings bonds and offers passbook savings accounts, which are directly guaranteed by the Italian state. With the savings thus collected, CDP provides public financing, directly financing investments by the state, local authorities and other public entities. In 1924, interest-bearing postal savings bonds were introduced. The combination of state guarantee, safe yields, a high degree of liquidity, small denominations and the extensive distribution network of the post offices throughout the country made public fund-raising easier this way than through treasury bills.

With the creation of BancoPosta and the subsequent introduction into the marketplace of a wide range of financial services products (BancoPosta accounts, Postepay prepaid cards, insurance policies, bonds, investment funds, personal loans and mortgages), which took their place alongside Poste Italiane's traditional passbook savings accounts and interest-bearing bonds, the revenues generated by the financial arm of PI grew tremendously. These products were all introduced in partnership with third-party companies, such as banks or investment funds. In 1999 Poste Vita was launched as the insurance company of Gruppo Poste Italiane. Today, Ban-

coPosta is the largest retail financial service provider in Italy, and the largest life insurer. The recent global recession only strengthened its position, as many customers fled the traditional banks and entrusted their savings with BancoPosta. As of the end of 2008, BancoPosta managed over 300 billion EUR of savings. Close to 80% of the group's operating profits were generated by the financial services, making it by far the most profitable enterprise of PI.

The thorough modernization of PI, as well as the creation of BancoPosta and subsequent diversification into financial and insurance products, were all important first steps towards PosteMobile. Among BancoPosta's products, the Postepay prepaid credit card, introduced at the end of 2003, probably represents one of the most outstanding successes in PI's recent history. Over 5.5 million individuals in Italy have chosen the Postepay prepaid card, which can be topped up and which allows customers to make purchases and withdraw cash from automatic teller machines (ATMs). Postepay's success confirms the front-line role that PI has played in the development of new tools for electronic purchasing. In all, PI has issued 12 million payment cards, making it a true market leader.

The development of the financial services promoted by PI over recent years has also played a leading role in the gradual integration of the new immigrant population. These customers have been offered dedicated post office counters able to perform foreign money transfers. The service is provided via a partnership with MoneyGram.

PI is constantly in pursuit of technological innovation and the modernization of its systems and processes aimed at enhancing overall quality. Investments in innovation to date have allowed the company to guarantee its customers cutting-edge services, and have made PI an important player in Italy's general economic growth and modernization. In 2008 alone, the volume of investments earmarked for expanding infrastructure networks and ICT systems reached 712 million EUR (compared to 608 million EUR invested the previous year).

Of these total investments, 485 million EUR concerned investments in property, plant and equipment, primarily relating to the reorganization of delivery services (restructuring of sorting offices, purchase of equipment for the activities of the new delivery centres), and to the restructuring, modernization and upgrading of post offices owned by the company (purchases of hardware for new information technology systems for post offices and head office premises, and continued work on the restyling of offices). A further 226 million EUR concerned investments in Intangible assets, such as the purchase and entry into service of new software applications for both the maintenance and development of accounting systems and technology infrastructure used to support service provision, above all financial and insurance services. The investments carried out by PosteMobile regarding software for the ICT platform used in its role as a mobile virtual network operator are included in this sum.

Today, the entire postal system is governed by a technological infrastructure that is among the most advanced in the world. That infrastructure, in turn, allows Poste Italiane to improve its products and services through the simplification and expansion of services which can be accessed via the Internet, telephone, self-service machines, and, soon, even through DTTV (Digital Terrestrial TV). The numbers offer a clear picture of customer satisfaction: every day a million and a half people visit post offices, over 23 million items are handled and 20 million real-time financial transactions are carried out.

The level of excellence achieved by PI in the area of technology and infrastructures helped the company win the Cisco Networkers Innovation Award 2007 in the Best Corporate IP Network of the Year category with the ICT Plus project, classed by an international commission as the best case history of the year. The project envisages the post office as a "hub" for offering customers an expanded range of services. Poste Italiane also received the Service Provider of The Year Award in the 2009 Postal Technology International Awards ceremony (Hannover, 29 September 2009).

This combination of innovation and efficiency gain has laid the foundations for the current success, which can be clearly seen from the company's financial figures. Financial statements have recorded ever increasing profits for seven years running, a significant achievement after 50 years of red ink. In 2008, the Poste Italiane Group recorded a net profit of 882.6 million EUR, up 4.6% compared to the previous financial year. The operating result stood at 1.44 billion EUR (compared to 1.78 in 2007). Total revenue increased to almost 16 billion EUR. In particular, results for financial and insurance services have been very positive.

Developing PosteMobile

The inspiration for PI to launch mobile services came from the CEO of PI himself, Mr Massimo Sarmi, in early 2006. The original business plan was rapidly developed mainly by Mr Sarmi and a mobile communication expert, Mr Roberto Giacchi, who later went on to become the CEO of PosteMobile. The project was approved by the Board of Poste Italiane in March 2007. From approval to start-up, implementing the project took less than a year, a record time considering the investments, recruitment and training needed to launch the operation.

Before being appointed at PI, Mr Sarmi was a former managing director at Telecom Italia Mobile, Italy's leading mobile telecommunications operator. As previously mentioned he also worked as CEO of Siemens Italy. His experience of mobile communications and his deep understanding of that market helped shape the idea and subsequent strategy for entering this new market.

Mobile phone penetration in Italy is one of the highest in the world. Not surprisingly then, the mobile services market is large and relatively profitable. It is also a mature market. Recognizing the opportunity of offering integrated postal and financial services via mobile phone, PI signed a deal with Vodafone to become a mobile virtual network operator, using

Vodafone's physical infrastructure. This approach has allowed PosteMobile to focus on offering advanced services and more importantly, to differentiate itself from other mobile operators in a mature market. Investments have mainly been in assets such as software, ICT infrastructure and human resources.

PosteMobile was set up as a separate entity fully owned by the parent group, alongside other sister companies.

Differentiation from the competition

Underlying the decision to enter this market was not only the realization that a business opportunity existed, but also the recognition that PI possessed a number of unique competitive advantages that would increase the likelihood of success. These factors included (and continue to include):
- a strong existing brand;
- a large existing customer base;
- internal synergies with existing services; and
- consolidated distribution channels.

PosteMobile has a clear mission, which is to "simplify people's lives and improve relationships through innovative, simple and convenient mobile services". The vision is to use the mobile phone not only as a simple and cheap communication tool, but also as a utility resource linked to financial services.

PosteMobile's competitive positioning in the market is based on a number of factors:
- Innovation: exclusive, distinctive services able to make everyday life easier.
- Simplicity: not only innovative, but also highly user-friendly services.
- Transparency: transparent prices with no connection fees and no hidden costs.
- Convenience: highly competitive tariff plans.
- Reliability: PosteMobile leverages on Poste Italiane's well-known umbrella brand.
- Proximity: 24 hour access.
- Quality: high quality of service.
- Customer orientation: meeting the needs of the customer.

The initial focus has been on existing BancoPosta and Poste Italiane customers, but also on employees and their families. In general, by establishing itself as a convenient provider in traditional voice and text services, and pushing pre-pay packages, PosteMobile is aiming primarily for families, young people, and the lower-income market, including that of immigrants. This has earned it the first million customers.

At present, PosteMobile has two types of price plans: the traditional prepaid offer, and a monthly flat-rate tariff, billed as a prepaid service. PosteMobile is considering launching post paid tariffs in 2010. Discounts are offered to customers who link their SIM card to a BancoPosta account or a credit card. This reduces the price of the flat-rate plan from 9 to 7 EUR a month.

In the next few years, small- and medium-sized businesses will be targeted, as well as PI customers more generally. In addition, the range of services is being expanded to include gaming, advertising, insurance, digital signature and other services. This will make the PosteMobile SIM card capable of a full range of mobile services including mobile e-commerce and e-government services.

During 2007 and 2008, over 35 million EUR was invested in PosteMobile, and during its first 14 months of operation, the company generated close to 40 million EUR in revenues. Although still a loss-making business, it is anticipated that break-even will be reached shortly, in the course of 2010.

4 PosteMobile: how it works

As a virtual mobile network provider, PosteMobile does not use proprietary network infrastructure, but rather relies on the infrastructure of one of the mobile phone operators with a mobile network licence. Currently there are four such licensed operators in Italy: Telecom Italia Mobile (TIM), Vodafone, Wind, and 3 (UMTS and HSDPA only). There are a number of other virtual providers, competing more or less directly with PosteMobile, including A-Mobile, CoopVoce, Telepass Mobile, Tiscali and others. As is the case with all virtual providers, PosteMobile negotiated an agreement with a hosting network provider, which can be assimilated to a roaming agreement. So far, the hosting provider has been Vodafone. This type of roaming agreement means Poste Italiane can avoid expensive network investments, and focus on delivering its unique range of services.

Value-added consumer services

In order to deliver and support its mobile services, PosteMobile decided to equip itself with proprietary IT systems, both for the business support system management (billing, customer relationship management, etc.) and for the various value-added services. This is why PosteMobile can be considered a mobile virtual network operator (MVNO) on the network side, and a real content service provider in the provision of value-added services on the content side. This kind of agreement and the completely independent IT systems allow PosteMobile to develop its own product and service portfolio as well as managing its own customers, independently from the network infrastructure owner.

PosteMobile's current service offerings include:
- Basic mobile services, such as:
  - voice;
  - text messages (SMS);
  - multimedia messages;
  - video calls;
  - 3G data connections.
- Standard value-added services, such as:
  - browsing;
  - news;
  - entertainment;
  - music;
  - games.

– Distinctive value-added services, such as:
  - m-banking;
  - m-payment;
  - m-commerce;
  - m-postal services (e.g. bills, telegrams etc.).

Central to the PosteMobile model is the capability of providing the distinctive value-added mobile services, identified in PosteMobile's portfolio under the brand "Servizi Semplifica" ("make-it-simple" services). To access all the distinctive "Semplifica" services customers have to link the PosteMobile SIM card to a Banco Posta bank account and/or to a PostePay prepaid card. Through this association and with a few simple commands from the mobile phone, it is possible to engage in a number of services, such as:

– performing a bank transfer to another BancoPosta bank account or to any other bank account;
– recharging a PostePay prepaid card from the BancoPosta bank account;
– transferring money from one PostePay prepaid card to another;
– recharging the prepaid telephone credit from a Banco Posta bank account or from a PostePay prepaid card;
– checking the balance or the list of the latest transactions of a Banco Posta bank account or of a PostePay prepaid card;
– purchasing products and services, with payment from the Banco Posta bank account or the PostePay prepaid card;
– paying bills and sending telegrams;
– transferring money abroad.

Services for the business market

In addition to the value-added services previously mentioned, PosteMobile is gradually developing services for the business market. For the time being, the focus within B2B has been on financial services and on PI itself. With an open model, PosteMobile is available to all payment tools and is seeking partnerships with all banking and financial institutions in Italy and abroad. The aim is for customers to be free to choose whatever payment tool they wish to carry out any given transaction on the move.

Within the Poste Italiane Group, the postal arm has been identified as a potential beneficiary of the technology. The postal arm of PI operates across the whole of Italy with around 43,000 postmen. The network includes 4,260 postal delivery centres and handles a yearly 290 million pieces of recorded mail.

PosteMobile has designed and developed a new system infrastructure with a Windows Mobile client application, allowing postmen to transfer track and trace information about mail delivery via mobile phone. A dedicated Web management console continuously monitors the entire system and provides detailed reports for each area and office.

The aim of this particular application is to improve the management of the postal mobile workforce, and in particular to optimize delivery processes. This will allow PI to make the next step towards door-to-door mail mobility tracking. As of the autumn of 2009, 167 delivery centres had adopted this new solution, serving 6,000 mobile terminals in the field. 4,920 postmen currently use this service on a daily basis. This amounts to three million mail items delivered using the system each month. The system is still on trial, but is expected to roll out shortly to a further 7,000 postmen, and ultimately to all 43,000 across the country.

In the medium term the aim is to move further into the B2B market by offering price-competitive solutions to small- and medium-sized businesses. There are over four million small businesses employing fewer than 10 people in Italy. These businesses operate around 10 million SIM cards at the moment. In addition, there are around 25,000 medium-sized companies with between 10 and 50 employees, operating almost half a million SIM cards. These types of companies are likely to find PosteMobile appealing, not only because of the competitive prices, but also because of the unique services offered.

The key to services: the PosteMobile SIM card

The key to delivering the unique value-added services of PosteMobile is the programmable SIM card, supplied by the physical network operator, but customized by PosteMobile.

The SIM card is among the most advanced in the market in terms of performance and technical capabilities. It supports the 3GPP and Global Platform standards (encryption algorithms, OBKG, security domains), enabling secure transactions and the transmission of encrypted data compliant with the TS 23.048 standard.

Security is a major concern when dealing with these types of online and mobile financial services. To ensure the security of financial transactions and mobile payments, PosteMobile has developed what it considers to be one of the most advanced systems in the market in terms of security and technical capabilities. The innovative technology is based on encryption and the digital signature of data authorizing transactions.

Each SIM card is provided with a unique digital certificate and ciphering key to protect and sign the requests of the user who linked a payment mode to that SIM card, enabling security and identification of each transaction. Moreover, to avoid any unauthorized use of the phone a confirmation is required using a PIN code known only by the end user.

In addition to being secure, the system is simple and intuitive to use for the customer, with direct access from the SIM menu. There is no need for a WAP or Web data connection, and the SIM is compatible with most mobile phones on the market. The Dynamic SIM Toolkit technology allows continuous updating, thus reducing time-to-market to a few days.

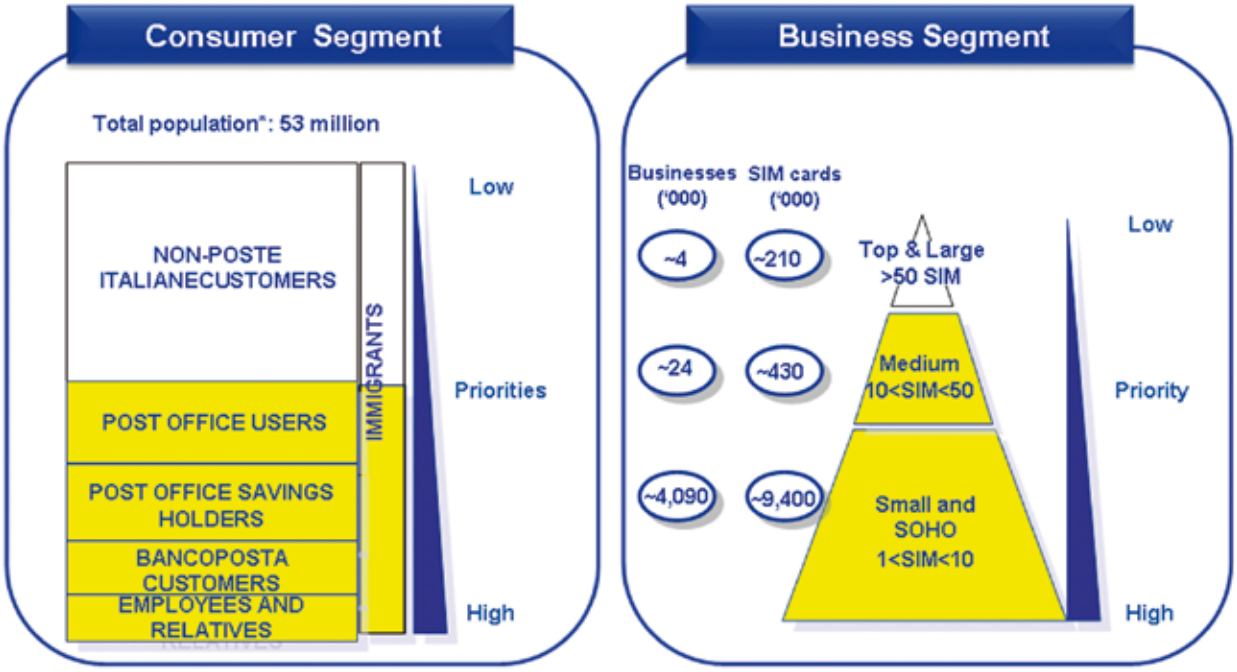
Implementation and growth

The past experience and knowledge of the CEO of PI no doubt played a crucial role in developing the idea, gaining rapid approval from the Board, and taking the project from

idea to actual launch in record time. PosteMobile launched in November 2007, and within a year gained its first 670,000 customers. By the end of 2009, the number of customers had reached 1.2 million.

This growth has come in a market where mobile penetration stands at almost 150% and many customers have a second or third SIM card. Only a year into its operation, 83% of its mobile customers had linked their SIM card to a Banco Posta account or Postepay card, indicating that this ability is indeed the unique selling proposition of PosteMobile. The company also recorded 2 million phone transactions within six months of launching the mobile offer attached to these services.

Figure 2



PosteMobile relies on a strong distribution network through its parent company PI, which manages 14,000 post offices providing points of sale for its own SIM cards and top-ups. In addition, services are sold online and there are plans to create a few specialized shops within larger PI branches.

The SIM card itself is the most important channel for top-ups, with customers making 50% of recharges through either their BancoPosta accounts or Postepay cards. The company carries out marketing through channels including TV, radio and the press. Whilst there are some obvious restrictions on cross-marketing with PI, because of the parent company's dominance in the postal market, the two have implemented commercial initiatives together.

As indicated in figure 2, the main targets in the consumer market have initially been employees of PI and their relatives, as well as BancoPosta customers. In addition to this, Italy's large immigrant community has been identified as particularly interested in the convenient and price-competitive prepay services offered by PosteMobile. Special price plans have been designed for this immigrant community, offering attractive call prices to foreign countries. Employees and relatives represent a potential market of over half a million customers. BancoPosta customers represent a further 8.4 million.

The next target groups are post office savings book holders, of whom there are around 7.7 million, as well as post office customers, a further 7.6 million. Finally, all postal customers represent a further 28.6 million. The total population aged 10 or above represents 53 million people.

Challenges

Building up the new PosteMobile organization was not without its challenges, which included convincing the Board of Poste Italiane to finance the necessary investments, finding the right employees to staff this innovative new company, setting up the necessary agreements with external partners, and developing and launching the actual services. The key to successfully overcoming these challenges has been the effective collaboration between all parties concerned. The Board was very rapidly convinced of and approved the initial business plan. The fact that the idea stemmed directly from the CEO and had the backing of the Chairman played a large part in ensuring this rapid approval.

There was strong cooperation with the Group for both the design of the security applet on the SIM card (i.e. the Semplifica applet) and for the development of the new mobile financial services. In fact, PosteMobile's success can largely be

ascribed to the synergies and deep understanding between PosteMobile and all the companies belonging to the Poste Italiane "family".

The mechanisms linked to security were created within PI, leveraging the existing knowledge and corporate assets. SIM cards and communication security mechanisms were fully designed, from the very beginning, by the PosteMobile Technology Department. Additional technology components were acquired from partners, mainly to implement the business support systems. For these systems, PosteMobile cooperates with the best in class companies in the market. It was decided to select a small member of reliable partners, one for system integration and another for the telecom network.

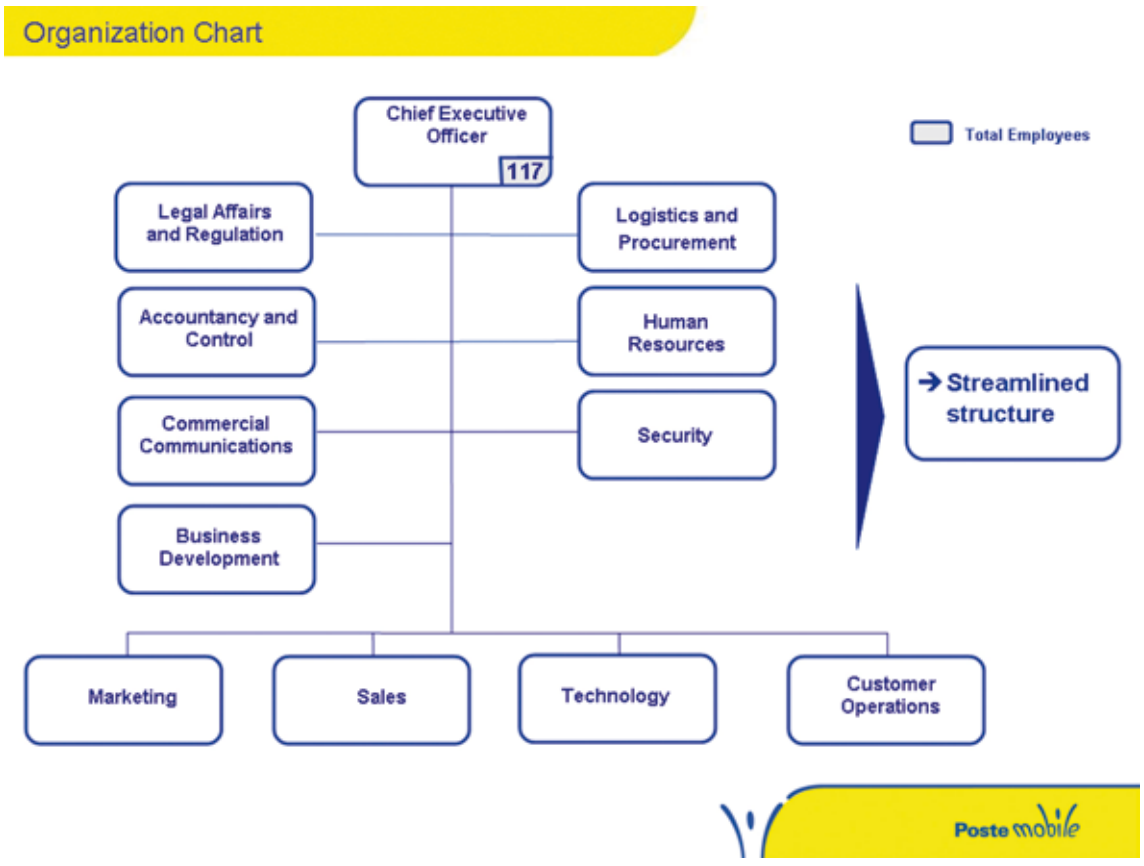
One particular security concern is fraud. For its fraud management system, PosteMobile teamed up with Accenture, which implemented and maintains PosteMobile's fraud management solution, based on the HP CentralView software platform. With this solution, PosteMobile has monitoring and analysis tools providing intelligence for more informed decisions on the company's strategic business interests, such as pinpointing fraud and assessing dealers' impact on profitability.

The decision of what to develop in-house, and what to buy from outside, was made in a rational way. It was decided that strategic components, such as security or financial value-added services, would mainly be developed internally, while the more "standard" support system technology components were based on off-the-shelf packages, to reduce investment and maintenance costs.

The ramifications of launching PosteMobile were widespread throughout the PI organization, given its intimate link with both BancoPosta and the PI post office network. For example, post offices are one of the main distribution channels for prepay top-up cards. It was therefore necessary to upgrade equipment at post office counters to allow a fast and efficient service to customers. Datalogic Scanning provided post offices with around 30,000 new omni-directional scanners, capable of reading a variety of barcodes, such as those on printed registered mail, those on the PosteMobile telephone cards, and those on retail items sold by the post office. The scanners also have the ability to capture images, such as a customer's signature.

When it came to staffing the new company, employees were sourced mainly from outside the group, more specifically from the telecommunications sector. The main skills and know-how needed for PosteMobile do not differ much from any other information and communication technology company, both in the business lines and in staff areas. With mobile financial services at the core of the competitive strategy, recruitment was also aimed at acquiring specific skills and know-how in order to develop these innovative services. By the end of its first year of operation, in December 2008, PosteMobile employed 90 people. The organizational structure is shown in figure 3.

Figure 3



5 Looking forward: impacts and lessons learned

The original aim of PosteMobile was to capture 2 million customers in its first two years of operation. In reality, up to the end of 2009, only a little over half of this target was actually achieved. A key issue going forward will therefore be to reignite and sustain growth in both the number of customers, and the revenue per customer.

Although a separate entity from PI, PosteMobile is set to become an important source of revenues and profits for the Poste Italiane Group. PosteMobile complements the group's range of products and services. Using their mobile phone, customers can easily access many of PI's postal services, as well as financial services. This is a way to improve and intensify the relationship between PI and its customers, who so far appear to appreciate this innovation. In addition, by implementing the PosteMobile technology within the PI postal delivery network, this small start-up company is helping the parent company in its quest to continually innovate and improve performance. This is seen for example through the continual upgrading of technologies used in post offices around the country. Thus, although small compared to the overall size of the parent company, PosteMobile manages to contribute directly to the future development of PI, and to play a pivotal role between several entities within the Group.

Capitalizing on its initial successes, PosteMobile intends to launch more m-commerce facilities in the future, allowing customers to buy products and services with their phones. PosteMobile plans to begin by making it possible for customers to purchase tickets for rail and urban transportation, and later on other services such as other travel tickets and insurance. For instance, in January 2010, a deal was struck between PosteMobile and Rome's public transport company, allowing customers to buy their tickets via PosteMobile.

PosteMobile also launched services that let customers send remittances abroad, in collaboration with MoneyGram. PosteMobile additionally plans to launch mobile financial security functions, and the company could introduce commercial near field communication (NFC) services. NFC is a short-range high frequency wireless communication technology which can be used to transfer data wirelessly at short distances (typically around 10 centimetres). The advantage of NFC over other technologies such as Bluetooth is the shorter connection set-up time. Devices can connect automatically in less than a tenth of a second. The short distance between devices increases security. PosteMobile is thinking of carrying out its first NFC trials in 2010.

The main challenge ahead for PosteMobile will be to spread the use of the mobile financial services and mobile commerce from early pioneers to the mass market. In other words, the challenge will be to encourage and manage a rapid business growth. Furthermore, the innovative and ergonomic mobile user interface for financial services will have to be continually improved and updated.

The results achieved so far show that PosteMobile is following the right path. An important target has already been reached, with over 8 million EUR transferred via PosteMobile each month, and over a million users. The development of new services continues to require a strong integration of all the actors of the value chain. PosteMobile, backed by the Poste Italiane Group, is in a perfect position to continue the success and grow this innovative mobile business.

Case study of Internet-based e-commerce – ePOST shopping in the Republic of Korea

Hoon Jung

1 Introduction

Case 1: ePOST shopping by customer

Assistant manager Han-Kook Kim works in Yeouido Stock Street in Seoul's financial district. During the recent Chuseok (Korean Thanksgiving Day) holidays, he was not able to visit his home town of Gwangju because of work obligations. After explaining the situation to his parents, he decided to send them a gift of some fine Korean delicacies. He connected with www.epost.kr, Korea Post's Internet post office. From the various products available in the online postal shopping mall, he selected a luxury pack of mushrooms produced in Wonju, on sale at a discounted price of 58 USD and had it delivered to his home town of Gwangju with just a click of the mouse. For Han-Kook Kim, the disappointment of not being able to go to his home town during the holidays was mitigated considerably by the Post's shopping facility, which guarantees the quality of products and takes responsibility for their safe delivery.

Case 2: Handling parcels during peak periods

During the recent Lunar New Year holiday season, a huge amount of parcels for home delivery – more than five times the usual amount generated by the Korea Post shopping mall – flooded the Daegu mail sorting centre. The situation was especially acute because the period of the Lunar New Year holidays was shorter than usual, meaning that many people chose to dispatch gifts by post instead of returning to their home towns. But in spite of much higher volumes of items to be delivered than normal, the Daegu mail sorting centre was able to process and dispatch all the parcels for delivery without any errors using its high-tech sorting machines and information system.

It was the e-commerce system and the sub-infrastructure of ePOST that made it possible for both the users and the postal service provider to handle the flow and enabled the public to use the Korea Post shopping service without a hitch even during this exceptional holiday period.

This study will review the history, the present situation and the factors for success of South Korea's Post Office Shopping (POS) service, which is a major element of Korea Post's e-commerce activities, and also describe the strategies for future development.

2 Policy and regulatory issues of POS

The POS service introduced in this chapter is a professional shopping mall which mainly sells farming and fishing products from rural communities through post office counters and ePOST (Korea Post's Internet post office). Over the past few years, POS and ePOST have been enjoying remarkable growth. ePOST offers online most of the postal services available in real post offices such as acceptance and inquiry of mails and purchase of additional services in addition to POS. Also, POS through ePOST supports various types of e-commerce including shopping (B2C), marketplace (open market) and B2B services.

Figure 1 – Home page of ePOST shopping service

The POS service contributes to the revitalization of the local economy by selling typical local products. This service narrows the income gap between urban and rural communities and supplies the best and the most reliable products to consumers through a publicly certified agency: the post office. In addition, it features a strict quality control system and operates a system of product selection and delivery always from the consumer's viewpoint. To improve the revenue return for the rural communities, it is operated directly without any intermediary between the consumer and the producer or seller.

An elaborate procedure is followed by the Post to select products and ensure that its suppliers are reliable. For each category of products, a strict three-stage selection system is followed. Documents and products are examined on the recommendation of local post offices in the first stage, and direct on-site inspection is carried out in the second stage. During the final stage of the selection, various government agencies such as the Ministry for Food, Agriculture, Forestry and Fisheries (MIFAFF) or the Korea Food and Drug Administration (KFDA) directly perform examinations. In addition, the POS service has formed an advisory group on product selection composed of the Consumers' Union of Korea and experts from other consumer organizations in order to take account of the opinions and preferences of customers.

Even after a company is registered as a seller for POS, it has to undergo a continuous product quality inspection process. A differentiated quality control system has been established, taking into consideration the characteristics and type of each product to offer a convenient and safe shopping service. In particular, the POS service conducts on-site inspections of the suppliers and provides hygiene education through professional trainers on a regular basis. There are approximately 7,200 items (451 categories) currently being sold in the post office shopping mall.

Currently, POS operations are managed by KOVIX (Korea Post Business Value, Information and Express). KOVIX, which is an affiliate of Korea Post, is a professional public agency which supports the propagation of postal culture and the operation of POS for Korea Post. The contract is renewed annually after a performance evaluation by Korea Post. From a regulatory point of view, POS is recognized as a postal service under the postal law and regulations. In fact, all the products delivered through POS are handled by the home delivery service of the post office. Therefore, products ordered by customers benefit from protection under the regulations on the treatment of registered mail.

However, e-commerce is not governed by the postal law but the basic law on e-commerce and general civil law. The e-commerce market is one with fierce competition in which many large companies are already active. Under these environments, ePOST is regulated by Postal Law as well as e-commerce law.

Currently, the e-commerce market in Korea is dominated by open market providers such as G-Market and eBay. POS is also a player in this market through its ePost market place service. The post office market place provided on behalf of third parties lays the foundation for POS to move from being a specialized service mainly for agricultural and fishery products to becoming a general shopping mall.

However, some believe that the open market by its nature has difficulties managing products on behalf of sellers and ensuring reliability and that if Korea Post expands its business in this market this could have a negative effect on the consumer trust and reliability which POS has accumulated so far.

Let's take a look at the organization which is involved with the operation and management of POS. Entering the 21st century, the postal ordering and sales system, the predecessor of POS, needed to improve its structure, which implied a huge change for a traditional state-run organization. The launch of the new Korea Post in July 2000 was a start. It was recognized that the public postal and banking industry in the traditional government mould would not respond well to such environmental changes as the slowdown in the growth of mail volumes, banking institutions becoming bigger following the opening-up of the banking industry, and increasingly fierce competition in the banking and logistics industries. For these reasons, the Government decided to establish a new Korea Post in order to cope with the internal and external environmental changes while maintaining the postal and banking business as a government-run system.

Because of these changes in the governance of the postal service, the current POS is supervised by Korea Post, an independent organization with responsibility and authority for all brand assets, and POS is operated by KOVIX, a subsidiary company set up by Korea Post to provide it with competitive professional management abilities in a fierce market.

3 The history of POS

The POS service was introduced in 1986. At that time, the Ministry of Information and Communication (now the Ministry of Knowledge Economy) was trying to find effective measures to turn the Post, which traditionally dealt with mail, postal banking and banking insurance, into a composite information centre in local communities closely connected to citizens. One of the measures taken was to sell products using the postal logistics networks. This meant that the Post, in addition to letters and parcels, would also sell typical local products.

This was similar to Japan Post's "Hometown Parcel" service, but additional features to take account of suppliers' difficulties and improve the customer's shopping experience were added after analyzing the pros and cons of that service. In particular, the new postal product ordering system used an electronic account book system created in 1986 to speed up the process. At that time, the customer could send a greeting of up to 15 Korean characters when he or she remitted money using the electronic account book. By applying additional characters with the greeting to this new system, it became possible for the supplier to notify the contents of

the order and the address of the recipient to the delivery post office.

The following features describe the operation of the system as of 1988:

– *Services:*
  - establish contracts with product suppliers;
  - control quality and price of products;
  - produce and distribute a list of products;
  - advertise the postal product ordering system;
  - conduct market research and survey consumers' responses; and
  - provide guidance on the improvement of packaging.
– *System publicity:*
  - put advertisements in newspapers and electronic media to increase usage;
  - strengthen the use of brochures, outdoor banners and vehicles to increase publicity;
  - focus PR activities on festive days such as the end and beginning of the year, Lunar New Year's Day and Chuseok (Korean Thanksgiving Day); and
  - update the list of products regularly.
– *Expansion of number of products for sale:*
  - support the development of unique special products in each area;
  - develop sale of industrial products;
  - develop sale of exclusive goods; and
  - recruit persons experienced in retail promotion.
– *Expansion of the business:*
  - operate a car fleet to take mobile orders;
  - launch a department to advise companies on the selection of gifts;
  - open counters to accept postal order products;
  - survey consumers' opinions; and
  - computerize sales records and data management.

The postal product ordering system grew in this way for the next ten years until 1998. Even though the system became the recognized reference for the sale of typical local products, there were many weaknesses in the system.

First of all, as the system stood, a customer had to go to the trouble of visiting the nearest post office in person to order the particular items. Also, it was not easy to obtain a catalogue, and there were no records of past purchases, which made it hard to manage individual customers. In addition, there was a great deal of waste of resources as each specific post office designated by the seller or the Ministry of Information and Communication had to recruit additional manpower to take care of individual sellers, and there was a large amount of paperwork associated with the orders. All the processes of order management, customer management and product management had to be performed manually and as a result, the working time was prolonged and there were many errors.

Korea Post was keen to overcome these problems. Around this time, the development of high-speed Internet was contributing to the rapid growth of Internet shopping. Korea Post decided to seize the opportunity provided by the growth of e-commerce to transform its postal ordering system into an Internet shopping mall. So, the postal product ordering system was rebranded as "Post Office Shopping" (POS) and launched on 1 July 1999 as an Internet shopping mall. One of the major innovations was the adoption of e-commerce practices in its operations.

It was understood in Korea Post that the strength of the Post laid in the field of logistics, which was a key factor in the successful establishment of an Internet shopping mall. A master plan for Korea Post's postal logistics network was prepared in 1995 to totally reform the existing post office logistics system into a hub and spoke system. This was gradually implemented between 1996 and 2002, centering around the Daejeon Exchange Centre (2000), the 22 mail sorting centres located nationwide, and the more than 400 delivery centres. The objective was to support the effective development of e-commerce, which was expected to grow rapidly in Korea, by developing the parcel transportation networks as a principal axis of the national logistics networks. In reality, as the sole agency with a nationwide banking network, postal network and parcel transportation network, only the Post could develop the necessary synergies.

The purpose of the establishment of the postal information system was to take a lead in the growth of e-commerce in Korea by establishing credit-based e-commerce practices such as quality guarantee, certification and refund systems through the operation of a reliable e-commerce system by the Post. Its national networks – postal service, banking service and parcel transportation – also contribute to strengthening the competitiveness of the nation by reducing logistics costs and enabling quick and safe delivery.

The Korean Government established a master plan for construction of high-speed Internet in 1995 to prepare the ground for a national informatization strategy. Based on this plan, the Government promoted several informatization support projects. In particular, the Post's e-commerce business was designated as a strategic project within the Korean Government's policy on the promotion of IT industry, which would form part of the country's informatization support project, aimed at promoting the use of PCs, establishing Internet network infrastructures and electronic libraries, and fostering e-commerce.

The main principles underlying the postal e-commerce operation were as follows:

– establish a platform where as many e-commerce businesses as possible could appear directly or be linked to the Post's e-commerce system;
– play the role of a shopping portal through linkage with several shopping malls and major retailers;
– establish and operate an independent system for payment and certification services.

On its launch on 1 July 1999, ePOST's shopping mall received an extremely favourable response from customers and sales

surged dramatically. The number of orders in July was 1,479, rising to 1,580 in August. Then, in September, during the peak period of Chuseok, sales grew tenfold to reach 17,421 orders. As a result, within the first three months, the service had recorded 20,480 orders and sales of 0.6 million USD.

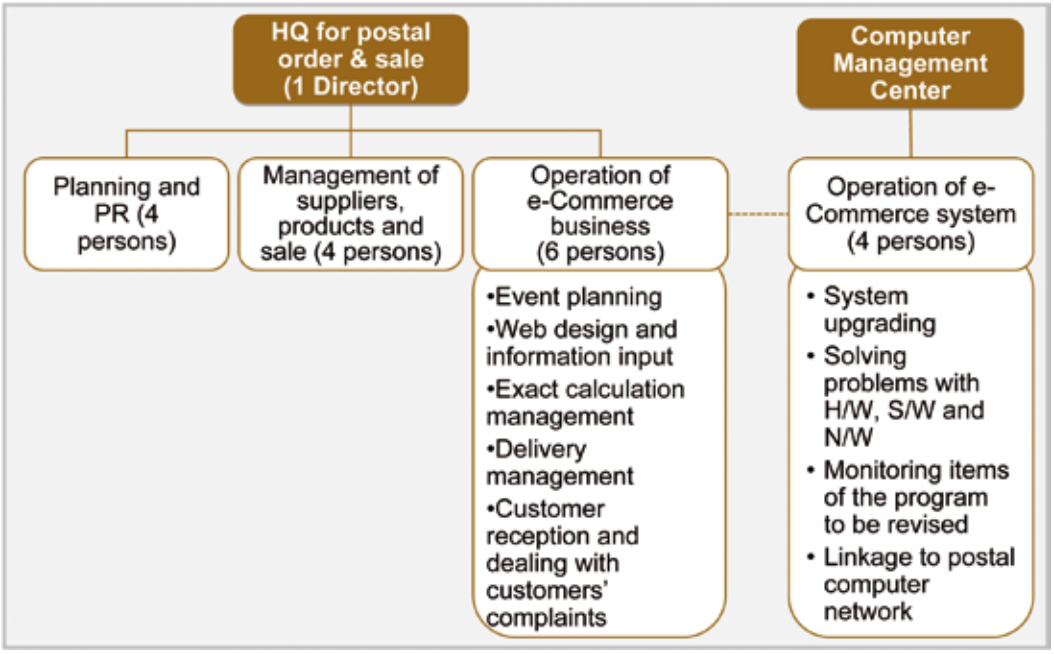
Figure 2 – Local farmed apples sold by ePOST shopping

The POS service owed its rapid popularity, to the fact that from the outset it featured more than 2,500 items, mostly offered by retailers specializing in local products, covering a wide range of traditional products from across the country. Also, the average price of the products was about 20 USD, which made them affordable to consumers. POS enlisted more than 33,000 members within five months of its opening. Furthermore, from November 1999, a parcel tracking service, which enabled customers to track the status of their orders on the Internet, was added to improve the service.

To launch ePOST shopping, a temporary organization was established within Korea Post. More specifically, it was decided that the server for the pilot system would be managed exclusively by the staff of the Computer Management Centre (now the Korea Post Information Centre). This centre could easily be linked to the postal computer system and was equipped with an environment for the management of electronic devices.

Three options were considered for the central operating organization of the e-commerce business: establishing an exclusive organization in the form of a government agency, entrusting the operation to a private shopping mall operator, or commissioning KOVIX for the operation. In the end, KOVIX was selected to run the business as it had the necessary professionalism, operational know-how, experience in the management of products and suppliers, as well as PR and marketing expertise with postal ordering services, thanks to more than ten years of collaboration with Korea Post. The following figure shows the organizational structure used to implement the pilot project when POS was first launched.

Figure 3 – Ad hoc organization for the implementation of POS



4 POS work process

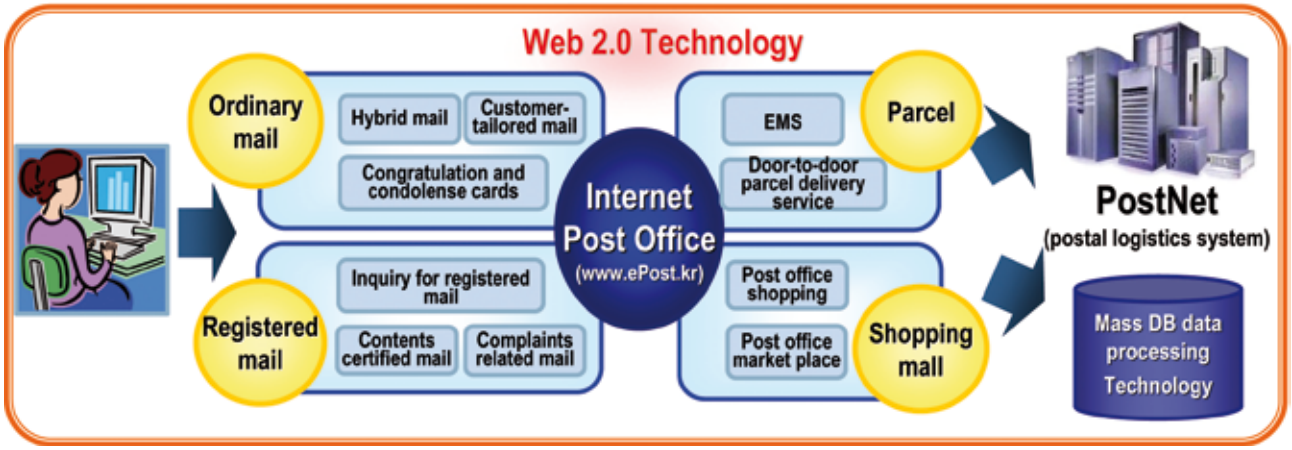
To show how the Internet-based POS is using ICTs, we will look at the Internet post office (www.epost.go.kr) within which POS operates.

The Post's e-commerce site started as an informatization project in 1998, became a rudimentary e-commerce website in 1999 with the ePOST shopping mall, and was expanded in 2000 as an Internet post office (ePOST) under the concept of an e-commerce portal also offering a form of public postal service.

The Internet post office which began service in December 2000 ushered in the era of the "home post office" in which customers can obtain post office services at their home or

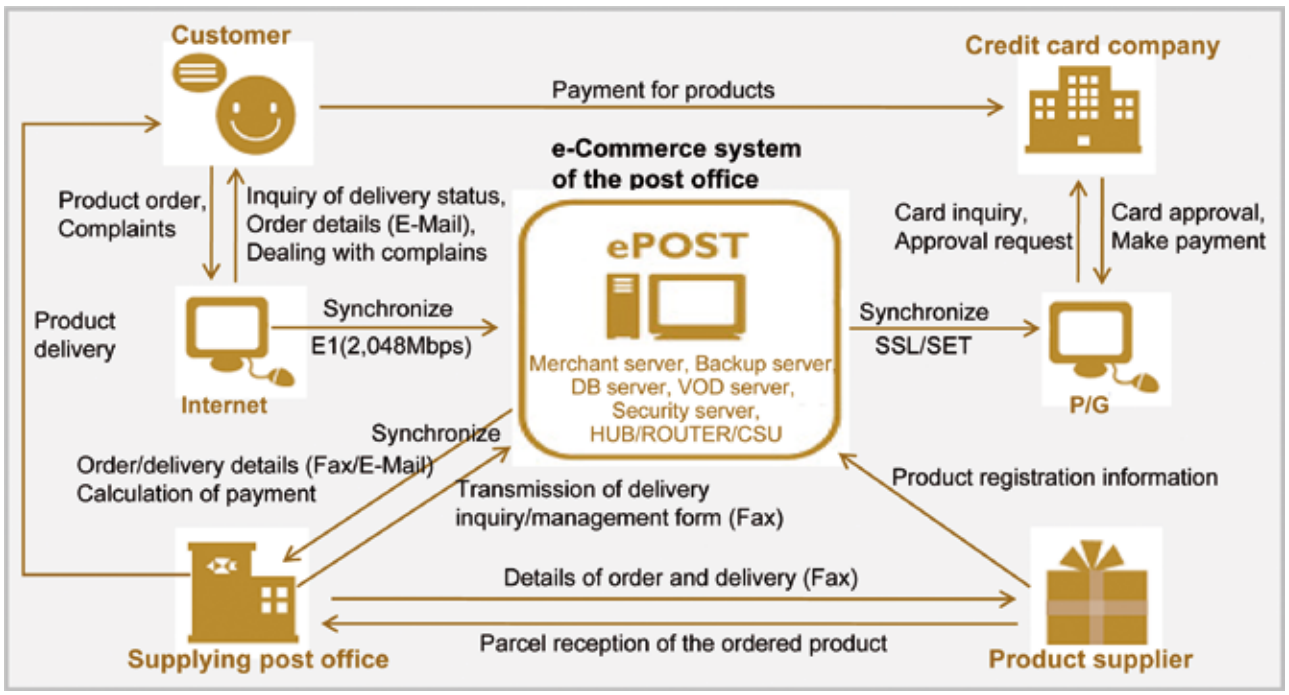
office. Using the Internet post office, it became possible to send a parcel or an international express mail item, report a change of address or send congratulations and condolence cards, services which could previously only be obtained by visiting the post office in person. At the same time, the Internet domain "epost.go.kr" which had been used for the e-commerce service became the domain of the Internet post office, a public portal providing public postal services. And POS became a sub-domain (mall.epost.go.kr) and a sub-brand of the Internet post office.

Figure 4 – Services provided by ePOST



With the opening of the Internet post office, a dedicated computer system was developed so that postal counters become a one-stop service. The previous system used the Post's banking network. The objective of the development was to increase user convenience and to handle operations more efficiently. The new system processes a number of operations much faster, transmits the details of orders in real time, retrieves information such as the balance of an account from the Post's banking system, transmits money from the account, etc. In addition, work efficiency has been improved thanks to the integration into the system of products and of suppliers' management tools. Another important feature is a track and trace service connected to the domestic registered mail system which enables rapid handling of the order.

Figure 5 – Flowchart of ePOST process



Let's take a look at the ePOST flowchart. First, a customer connects to the Internet with a personal computer to inquire about a product, place an order or submit an application for various services related to delivery through the ePOST website. The order is then transmitted to the postal information system server. Details for delivery are sent to the supplying post office via e-mail and a synchronization process involving exact calculation of the payment is performed. Currently, fax is seldom used in the ePOST system.

At the same time, as soon as a customer's order is processed, a series of payment operations are performed with the credit card company through the transaction system, such as card referral, request for approval, card approval and payment. Also, a customer can make the payment by account transfer or deposit without a bank book. The supplier of the product can confirm the dispatch of the ordered product in real time on the ePost seller's screen and can also print out the labels for home delivery.

The supplying post office then packs up the concerned product once it has been checked, prints out the label for home delivery, and directly delivers the product to the customer who placed the order. It also tracks the whole process. The printed labels for the home delivery service are composed of three pieces: one for the recipient, one for the management of the sending post office, and one for attachment to the parcel.

Figure 6 – Flowchart of POS product handling

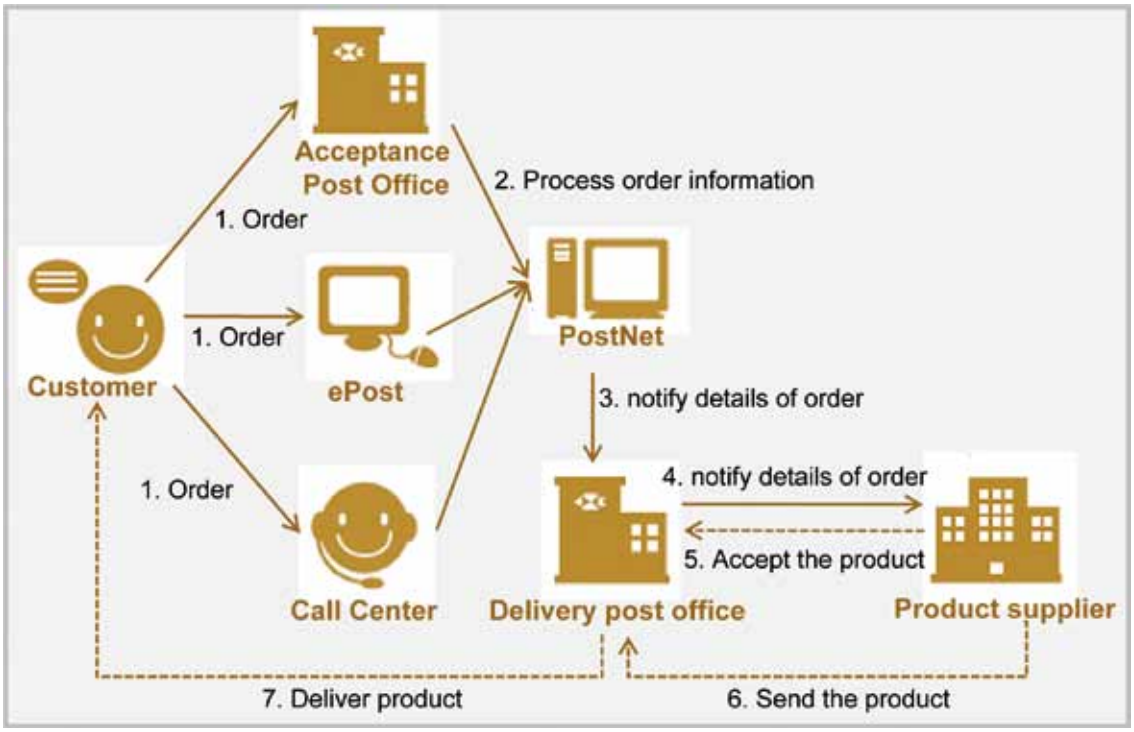
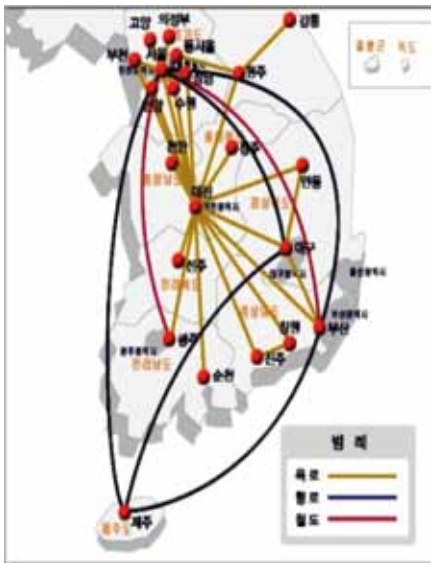


Figure 6 shows the process of ordering and handling the product by the POS service. A customer can place an order through three channels: through the Internet post office, via a call centre, or by visiting a post office in person. The information on an order is processed in the postal logistics information system (PostNet). The related data is registered and linked to the registration number of the product to be delivered later. The concerned delivery post office confirms the order from the acceptance post office and notifies it to the supplier in the relevant area. The supplier sends the ordered product through the delivery post office's home delivery service to complete the process.

The actual operation of the Post's e-commerce service is based on the Post's logistics transportation networks. These are currently composed of a national delivery infrastructure including the Daejeon Exchange Centre, 25 mail sorting centres and 521 delivery centres which form the backbone of the national logistics networks.

Figure 7 – The postal logistics networks of Korea Post



5 Evolution of POS information system

In this section, we will review the differences between the information system of the current POS and that of previous systems.

The ePOST system, a major information system which provides the platform for POS, forms part of a larger project, launched in 2006, to establish a next-generation postal logistics system. First of all, to reduce system overload and service response time, a service-oriented architecture (SOA) was established, in other words a decentralized environment for the IT infrastructure relating to the postal information system, which serves as the core for the operation of POS. Unlike the centralized information system that it replaced, the SOA provides for decentralized handling of different services. In addition, an exclusive system for home delivery and EMS has been established, as all POS products are delivered through regular home delivery or EMS. The establishment of an exclusive information system was necessitated by the need to control the vast amount of information for home delivery service and EMS, such as information on the sender, recipient, product, and shipping. In addition, modules have been developed for a warehouse management system (WMS), order management system (OMS), and transportation management system (TMS) to improve all logistics aspects. With this upgraded system, POS is better integrated into the Internet environment and is able to provide customers with screens mostly created in Web format.

The main improvement offered by the current system over the previous one has been the creation of a paperless web environment for documents such as the catalogue, order forms, order history, etc. The following are some of the major changes.

Table 1 – Difference between the Internet POS and sale by traditional postal ordering

	ePOST	*Traditional postal ordering*
Order acceptance	Place order and enter order info through the Internet	Fill in an order form
Order management	Process by database	Create a document file
Product check	Check inventory data and automatic notification	Check the document, compare it with the actual product and notify by phone
Product info management	Dynamic Web page using multimedia	Print out photo and document info
Advertisement	Internet banner	Paper catalogue
Payment	Internet-based payment	Physical payment

6 Problems with POS

At the beginning, POS had to face many unexpected difficulties. Though ePOST's initial purpose was to establish the basis for informatization of the Post and to contribute to the development of e-commerce, most of the first-line post offices were not Internet-enabled and so it was impossible to use the e-commerce service. Some absurd situations occurred where the information on an order placed through the Internet was notified by fax to the supplying post office.

The Internet environment was first established in the post offices which dealt with postal ordering and the flower delivery service. The responsible manager at the supplying post office was instructed to connect with the mail server to confirm the information on an order and notify it to the supplier, and enter the acceptance number of a parcel.

Another problem which occurred after the opening of the system was that the exact calculation of the sales amount was not performed in real time due to the change of payment method. Before ePOST shopping, when orders were placed at the counter, the amount of the product was paid to the supplier on the same day. But with ePOST, for products sold on the Internet shopping mall and paid for by credit card, the payment to the suppliers was delayed because the credit card companies have their own separate cycle of payment. Therefore, Korea Post asked credit card companies to make payments three times a month (5th, 15th and 25th day of each month) which made it possible to settle accounts with the suppliers the day after the receipt of the payment.

Difficulties experienced during the early stages of operation have been overcome by the active acquisition of know-how by the operating body and the stabilization of the system. However, in the fierce e-commerce market in Korea, the limitations of ePOST due to its size and the marketing network became evident.

Regarding the distribution of responsibilities, the functions of planning and operation of the post office shopping system are shared between Korea Post, Korea Post Information Centre, KOVIX, and others. As a result, the speed of decision-making can be slow. This is a disadvantage in comparison with other companies in the sector. Competitors include home shopping channels for farming and fishing products, and specialized shopping malls such as Auction. Also, the size of the operating organization is too small in comparison with its competitors. As of April 2007, KOVIX had a total workforce of 12 employees (excluding the development team)

working solely on the operation of POS, which is extremely small compared to other companies which employ hundreds of professionals.

The comparative advantages of POS are:
- image of high reliability of a government agency;
- very good proximity to the customers through the post office network;
- smooth connection with home delivery and banking services;
- variety in product range with many suppliers in various regions offering items which cannot be found easily in other shopping malls.

On the other hand, POS has the following comparative disadvantages:
- limited autonomy of a government organization, limited speed in decision-making and limited driving force due to the dispersed organization structure (difficult to carry out an aggressive marketing campaign and to invest in system improvement at the right time because Korea Post operates as a government organization);
- insufficient manpower for operation, especially to deal with the number of merchants, which is the core business of ePOST;
- less adequate system operation and maintenance (with maintenance and improvements of the POS information system handled by Korea Post Information Centre, and not the KOVIX operators, it is difficult to respond immediately to certain situations);
- comparatively smaller number of subscribing members and not enough incentives and customized services for members.

7 Performance of POS

Beginning with eight items in its catalogue, including Sunchang Gochujang (Korean red pepper paste) and Wando anchovy in 1986, POS has grown into a large-scale shopping mall with 162 billion Korean won (135 million USD) in annual sales and a range of more than 7,200 items. More than 20 years ago, when little was known in Korea about mail ordering, POS began with the purpose of enabling consumers to buy quality local products easily. It was also intended to provide producers, who were facing competition due to the opening up of the agricultural market, with a new distribution channel. It has now positioned itself as Korea's premier shopping mall for local specialities.

Beginning as a modest postal ordering system, POS has developed into a distribution channel which directly connects producers nationwide with consumers. Its achievements have been recognized by a number of awards, including the World Mail Award, Korea's Prestigious Brand Grand Prize and the Grand Prize for e-commerce shopping malls. Moreover, it has built up an image of a "safe distribution channel" where consumers can trust and buy good quality typical products from every region of the nation. And, it has boosted nine small- and medium-sized businesses located in rural areas by providing them with more than one billion Korean won (0.8 million USD) in annual sales generated by the POS distribution channel, which in turn has contributed significantly to the revival of the local economy. This was made possible by the combination of public trust which it enjoyed as a government agency, strict quality control, reasonable prices and quick and accurate delivery.

A major achievement of POS is that it secured a trustworthy distribution channel in the area of agricultural and marine products. In the midst of competition with numerous distribution companies including large supermarkets, department stores, Internet shopping, and TV home shopping, it is recognized as a "quiet but strong player in distribution". In addition, its policy of low commission is helping farmers and fishermen greatly. It charges commission of 4% compared to 15–25% in ordinary TV home shopping, 15–30% in department stores and large supermarkets, and 10–30% in e-commerce sites.

Its combination with the ePOST environment provides it with a convenient e-commerce system which can be used for one-stop payments and enquiries, handy searches for product images, and checking of the opinions of other purchasers.

Given all these factors, the performances of POS and ePOST can be summarized as follows:
- Over 1.4 trillion Korean won (1.2 billion USD) in accumulated sales from 1986 to 2009, with 162 billion Korean won (135 million USD) in sales in 2009, including 25.4 billion Korean won (21 million USD) in parcel revenue.
- Remarkable growth in the number of participating companies (100 times more than at the outset).
- Contribution to the local economy of farming and fishing communities: In the mid-1990s, the economic crisis and the opening of the market due to the Uruguay Round[1] led to a search for ways to revive the local economy of farming and fishing communities. As early as 1986, the Post created the postal ordering system for typical local products as a way to regenerate the local economies in farming and fishing communities. Because the main objective of the postal ordering system is to serve the public interest, POS charges only 4% in sales commission, which is the lowest of all distribution companies.
- Contribution to providing safe, good quality local foods: For the past 20 years, the POS system has contributed to providing consumers with safe, good quality local foods. Despite growth in imports of agricultural and fish products, more and more Koreans have been seeking fresh and nutritious local foods, and POS offers a reliable source of such products.
- Perpetuation of the trusted intermediary tradition: Though POS has changed much since its launch in 1986, the most important thing has remained unchanged: "trust". Trust in the Post made it possible for consumers to buy products without seeing the supplier or the product. This is the basis for the success of POS today.
- Contribution to the expansion of ICTs in Korea: Having been established in 1999 as a part of the main infor-

matization project by the Ministry of Information and Communication, POS through ePOST has contributed to the expansion of ICTs in Korea. More specifically, it has worked in the public interest by promoting use of the Internet and propagating PCs in every corner of the farming and fishing communities, which had been somewhat deprived in the area of ICTs. This was an important factor in reducing the digital divide in the information infrastructure and software field between cities and farming and fishing villages.

Moreover, the influence of Internet-based POS on the e-commerce market in Korea and the image of the nation cannot be overlooked. Postal e-commerce began in 1993, the dawn of the history of the Internet in Korea, using the PC communication services of Chollian and Hitel (the country's pre-eminent Internet service providers), heralding the advent of the Information Age for suppliers in farming and fishing communities and training suppliers to adapt to the Internet business environment.

From the beginning of ePOST, Korea Post let suppliers manage products and take care of complaints relating to issues such as product payment and delivery directly from the ePOST website, which improved their know-how of business management in the Information Age.

Considering that more than 3,500 companies have established relationships with ePOST shopping over the past 10 years and many people are working for them, the contribution of POS to the spread of the Internet in farming and fishing communities and the expansion of Internet business in Korea cannot be ignored.

8 Success factors and future strategy of POS

The key success factors of ICT-based POS are as follows:

– Clear understanding of the purpose and methods of operation of POS: The purpose of POS was to achieve the goal of increasing the income of the farming and fishing communities, create a transparent distribution channel and expand the postal market within the boundaries of public interest, all aspects in which it succeeded. The purpose of the establishment of the postal logistics information system was to establish new credit-based e-commerce practices such as quality guarantee, certification and refund systems through the operation of a reliable e-commerce system by the Post. It was also important to strengthen the competitiveness of the nation by reducing logistics costs through the establishment and operation of infrastructure for quick and safe delivery. Achieving these goals was a major success factor.
– Accurate understanding of the gradual changes in the postal logistics information system: In the framework of the development of the postal logistics information system put in place in the late 1990s and the establishment of the next-generation postal logistics information system underway since 2006, it was possible to establish a system which is appropriate for the customers and has minimum effect on the existing postal logistics environment. This was made possible thanks to proper understanding of the already established environment of postal informatization, ePOST and the information system related to POS.
– A strategy to strengthen marketing capability and the customer management system: The postal information system based on ePOST has integrated a customer management system, enabling POS to manage customers efficiently both online and offline.
– Ability to develop and manage information systems: Through its Korea Post Information Centre, Korea Post possesses an independent department to manage its information system. It also has staff with diversified competencies including outsourcing systems, specialized software development companies, systems integration companies and third-party vendor companies.

In order for POS to sustain the success achieved so far and build an environment for long-term growth, Korea Post should investigate all related markets. Looking at the current situation of e-commerce, the overall market is growing, especially the open market dubbed the e-marketplace. There is a continuing trend towards concentration into larger companies (Auction and G-market). It appears that a company cannot get the upper hand in competition or enjoy a meaningful growth in sales unless it has strong distinctive competitive advantages. Some aspects of the "winner-takes-all" market seem to be at work here.

Therefore, a considerable amount of investment and powerful capabilities are necessary for POS to remain successful. But due to the inbuilt restrictions placed on Korea Post, as a government agency, it does not have sufficient flexibility in allocating necessary funds or hiring personnel, and there is therefore a limit to the growth of the shopping mall, either as a composite shopping mall or a specialized shopping mall.

The specialized shopping mall appears to be the more promising option of the two. Some specialized shopping malls in Korea, handling books and cosmetics that can be reduced in size and/or standardized, are growing at a tremendous rate, and as a result recently there has even been a trend towards "combination of specialization and strategic alliance". Integrated shopping malls are appearing through strategic alliances between small- and medium-sized shopping malls specializing in cosmetics, books, groceries, etc. For example, the classified shopping malls under the 11th Street Shopping Mall, which is operated by SK, a leading conglomerate in Korea, maintain an exclusive infrastructure but share the same Internet server.

[1] Eighth round of Multilateral Trade Negotiations conducted within the framework of the General Agreement on Tariffs and Trade (GATT), which came into effect in 1995.

In conclusion, evolution into a composite shopping mall may lead to growth in sales, but taking into account the evolution of the market, and the necessary capabilities and restrictions of Korea Post, the preferred strategy should be to focus on expanding specialized areas rather than evolving into a composite shopping mall.

Currently, in the customer satisfaction survey conducted each year, POS is said to have the strongest competitiveness in typical local products, and superiority in terms of public trust and reliability. The fact that it scores highly on delivery service, safety of payment and provision of a trusted transaction environment is also a strong competitive advantage.

Nevertheless, the majority of customers said that POS should reinforce its professionalism in the area of typical local products, which means that it should firmly establish the image of a professional brand for speciality products and further strengthen the system for the management and distribution of speciality products. Other customer opinions stated that it should strengthen price competitiveness and expand the range of products, which is a basic requirement for Internet shopping malls.

The following is an analysis of the key success factors for domestic Internet shopping malls (Korean Association of Online Shopping Malls, 2005):

Table 2 – Key success factors of Internet shopping malls

Item	*Weight*	*Major criteria of evaluation*
Securing fixed customers	22.7%	Number of current members, number of purchasing customers, rate of repurchase, etc.
Establishing a suitable Internet mall	18.7%	Various awards including selection as a good Internet mall
Price of products	14.7%	Price competitiveness
Advertising, PR	13.3%	Usage of the results of recognition survey
Quality of products	12.0%	Number of products available for purchase, quality evaluation
Offering accurate product information	6.7%	Degree of explanation of products, accuracy
Speed of delivery	5.3%	Required time for delivery
After-sales service	2.7%	Ease of refund, ease of exchange
Others	3.9%	CEOs plan for investment in e-commerce
Total	**100%**	

We will now examine the target market of POS and how the service should be positioned in the future. Here is a description of the target market based on the analysis of customers' behaviour and psychology:

– middle-aged consumers who are interested in buying traditional local products;
– housewives who think that they should give their family the best foods;
– consumers from a particular region who want to have a taste of their home town;
– consumers in their 20s and 30s who want to present a meaningful gift to their parents, favourite teachers, relatives, etc;
– potential customers who cannot use Internet shopping easily due to lack of Internet infrastructure, poor usage of the shopping mall, reluctance to provide credit card information, etc.

Consequently, the positioning of POS in the future e-commerce market should be as follows:

– Focus on specialized product categories:
  • It should establish a customer-friendly Web environment so that POS is easy for anyone to use. In addition, it should provide its clients with recipes using the traditional products they buy.
  • It should establish a shopping mall where customers can efficiently purchase traditional products not only from Korea but also from abroad. The e-commerce cooperation between Korea Post and Hongkong Post established in 2009 is limited to consultation of each other's website; it should be turned into a more integrated environment able to minimize difficulties for customers, in areas such as payment environment and product descriptions.

– Reinforcing the solid image of POS:
  • The service needs to establish an image of proximity to the people. This is very important for customers planning to present a gift to middle-aged and elderly people, who should have a positive impression of POS.
  • It should keep on contributing to bridging the digital divide by helping all Koreans to use the site easily. In particular, it should be positioned as a shopping mall which provides total confidence in online shopping on the basis of the public trust the Post enjoys as a government agency.

9 Conclusions

We have seen how the Korea Post POS service was given a new lease of life by a service of new use of ICTs. Korea Post is continuously developing its service by establishing a next-generation postal logistics system, making efforts to make the logistics process more efficient, and improving customer management and marketing abilities.

Though it began as an inconvenient offline postal ordering system, ePOST is now recognized as Korea's representative e-commerce site, specializing in traditional local agricultural and marine products. In addition, POS serves both as a nationwide distribution network and as a means of e-commerce, which most suppliers of local specialities located in farming and fishing communities lacked and which has enabled it to develop along with the industry itself. It has served to boost competitiveness among small- and medium-sized manufacturers in a market that was formerly dominated by big-time players.

This success story made Korea Post realize the importance of ICTs and how they could contribute significantly to the overall growth of the company, first by improving the functioning of traditional activities (mail, parcels, financial services), and then by creating new business opportunities.

Russian Federation: ICTs, new services and transformation of the postal system

Johannes P. Boon

Summary

Background, context and origins

The Russian Federation presents a uniquely broad territory covering 10 time zones. The Russian Post is currently organized as a Federal State Unitary Enterprise and is preparing itself for corporatization. It operates through more than 40,000 post offices. In Russia's vast and dispersed rural areas, the post office is often the "last" outpost in terms of access to infrastructure, communications and basic financial services. On average, each post office serves some 3,500 inhabitants.

The origins of the Russian Post date back many centuries, but its role as a network binding the nation developed during Soviet times. The transformation since the early 1990s towards a market economy brought several phases of change and many new challenges to the Russian Post, in terms of its legal and institutional framework, management, services and products, and the business model for logistics, distribution and ICTs.

Many of the challenges became more apparent after the separation from the incumbent telecommunications operators, the waves of crises in the 1990s, and the emergence of new technologies supporting or substituting traditional mail services.

A new concept of postal service development was adopted by the Russian Government in 2001, based on a proposal by the Minister of Communications and Informatization. Another important milestone was the Government's approval in 2002 of "E-Russia" as a multi-sectoral plan to bring forward and coordinate the development of the information society.

These two concepts can be considered the cornerstones of the government policy of introducing ICT-based new services in the Russian postal system, and of reshaping one of the last unreformed public services into a nationwide network facilitating payments, communications, logistics and trade.

Within this policy framework, the Russian Post has focused on introducing a series of new ICT-based services, generally referred to as "Cyber" services, such as Cyber Post, Cyber Press, Cyber Money and other e-government applications, and on improving its internal management and control systems through the increased usage of ICTs.

What is being done

Consistent with the above-mentioned government policy, the Russian Post started to experiment in the second half of the 1990s with electronic money orders. That resulted in a new and widely used application called "Cyber Money", offered in an increasing number of post offices across the Russian Federation. This ICT application for post offices was also an important element to accelerate the development of the UPU's IFS and STEFI money transfer solutions. Cyber Money allows millions of citizens to rapidly and securely transfer money from one place to another. This is a very relevant service for many families and for (seasonal) migrants, soldiers and pensioners, where one or both sides have no bank account or simply do not have a bank branch within 50 or 100 kilometres. In the past five years the service has been extended to neighbouring countries, under UPU agreements, which has eased the situation for the increasing flow of migrants into the Russian Federation. More than 20,000 post offices are equipped and provide a relevant alternative to cash transfers through banks, many of which advertise low commission rates but neglect to mention the cost of currency exchange and travel to the nearest bank branch.

Cyber Money constitutes an appropriate substitute for the old paper-based postal money order, and attracts those who prefer the reliability, convenience and proximity of the postal network. Volumes and values have reached astronomical levels, with nearly 200 million transactions in 2009 and a value in the order of 15 billion USD. While competition in similar products provided by banks and agents is fierce, it should also be noted that the ICT-based evolution continues and that an increasing number of solutions facilitate money transfers via Internet or mobile phone (GSM) technology. Mobile money transfers, however, require a conversion of the SMS message into cash. In that respect, the Russian Post has anticipated and secured partnerships with GSM operators throughout the Russian Federation, so as to be ready for the next generation of ICT-based transfers.

Given the widely varying levels of economic development and of communication infrastructure facilities, the Russian Post has helped to close the "digital divide" through the Cyber Post project. This project consists in providing Internet access at post offices. The number of post offices providing Internet access has increased from just 2,000 in 2001 to nearly 24,000 in 2009. It appeals to the need for households, students and others to access the Internet in an affordable manner. The Russian Post was also an active player in the programme "A computer in every house", as promoted by the Government to initiate in 2007–2008 the sale of low-cost Internet-enabled computers.

Cyber Press is the brand for the ICT-based 'hybrid mail' solution, especially for the smaller newspapers with a subscriber base across the country.

Limitations and constraints

The development of ICT-based new services through the postal system has involved various challenges. In part, these are related to the limitations and constraints in the existing ICT infrastructure, but they also concern the investments needed to roll out the ICT-based services. There were also limitations in terms of the organizational capacity, as many large projects had to be dealt with at the same time.

Transforming the organization and improving the quality of mail services was, and continues to be, a top priority. There are also limitations in the interfaces and interconnectivity with other major players, e.g. in the field of e-government and payments processing (clearing and settlement). As regards e-government, e-services for municipalities and regional administrations will be introduced within the next few years.

As regards the development of ICT-based financial services, accessible at every post office, the project for the creation of a "Postbank" has been revived and major decisions are expected to be taken later in 2010. This project would need to fill in current gaps in the range of services and ICT applications, networks, back office processing systems and further interfaces and connectivity with the banking sector. In terms of its internal management system, used for quality control, accounting and communications, the Russian Post has decided to resolve the current constraints through the development of its own internal corporate network.

Impact

ICT-based services have impacted on the growth and learning curve of the Russian Post. It has been able to improve the quality and timeliness of its services, strengthen its image and, most importantly, expand its range of services with state-of-the-art ICT-based services accessible in areas where the ICT infrastructure is relatively limited. The application of ICTs has been a major contributor in the transformation of the organization, from paper-based and de facto decentralized into a much more corporate structure, with certain centralized real-time online management functions forming a basis for further growth.

Benefits

The benefits for the Russian Post include its ability to increase accessibility to services and quality of service, and to support its corporate transformation and, consequently, its role in an increasingly competitive and globalized market. A major benefit for the country is the existence of ICT-based new services provided through a single network that can be easily accessed by citizens, including those in remote, scarcely populated rural regions and the poor.

Lessons learned

Development is a "learning curve" implying that even when rapid change is technically feasible, it requires a change process, including human capital building as well as a large financial budget. The process is to further change the postal services by providing the public and SMEs with a broad range of ICT-based services through a quality and efficient logistics operation and a dense network. Key points include:

- continued expansion of the range of ICT services, including financial, e-government and e-commerce services;
- development of a proprietary internal corporate network, needed in view of the size of the Russian Post, its post office network and logistics operations and for the sake of business continuity;
- development of new partnerships with (GSM) telecom operators to continue adding services and combining communications via mail, mobile and the Internet, as well as with financial institution(s) in relation to the back office processing of payments/money transfer operations;
- availability and access to capital resources in order to finance the implementation of ICT-based services;
- agreements for international technical standards for ICT-based postal services (for IFS/STEFI this has worked, for other applications both in terms of financial services, hybrid mail/newspapers, e-government or e-commerce this could be taken into consideration).

Introduction

The development and wide application of ICTs is a global trend of world development and scientific and technological revolution of recent decades. The application of ICTs is a crucial tool for developing and promoting the economy and for improving public administration and local self-government.

ICT services can be considered as key success factors in all socio-economic areas. They have gained critical importance in improving the efficiency of public administration, especially in the field of accountancy, information and reporting, national security, targeted social assistance, education and health systems.

The rapid development of ICTs in Russia provides new opportunities for communication in various fields, one of them being the postal network. The postal service in Russia remains the only publicly-owned and accessible communication mechanism for citizens; this can be seen as one of the factors that ensure the political and economic integrity of Russia.

According to research conducted by the World Bank, the postal network is the most widely available means of physical communication in the world. This definitely applies to Russia where the postal network includes more than 40,000 publicly accessible post offices across the country.

Postal communication is essential to the economic and social progress of society. The effectiveness of postal communication refers to conditions which are indispensable for the normal functioning of production and circulation of goods and services, money flows, as well as human activity in modern society. By linking production and consumption of goods and services, serving producers and consumers, the postal network actively impacts on the economy, management, business development and people's welfare.

By the end of the twentieth century, changes in society related to introduction and development of ICTs and the Internet had led to the establishment of the "information society" concept. The strategy of building a global information society based on ICTs is a major and integral part of the national development of any country and has a considerable impact on the development of the private and public sectors, as well as on non-profit organizations. The introduction of ICTs and the effective development of postal markets is a prerequisite for the creation and development of certain new important areas of business in Russia (such as sale by mail, direct mail, e-commerce, targeted distribution of printed and promotional items, etc.).

The technical equipment of postal communication and the introduction of modern ICTs enabled the Russian Post to develop a new market segment of postal services and to realize such projects as:

- Cyber Post – Creation of a network of public Internet access points at post offices. Through this project, access points to Internet (API) have been opened in all regions of Russia. There are some 24,000 APIs, with more than 3.5 million users, most of whom do not have Internet access at home or work.
- Cyber Press – Acceptance of online newspapers, printing at post offices and delivery to subscribers.
- Merging local networks of post offices into a single infrastructure based on radio transmission (region of Ivanov).
- Cyber Money – Fast transfer of money from person to person, and to companies, for the secure transmission of financial information.
- A PC in every home – The Russian Post has helped many households to obtain their own PC and Internet connection, by acting as a sales, distribution and delivery channel for low-cost PCs.

The postal network of Russia is an important instrument for the implementation of the Federal Target Programme "E-Russia" (2002–2010), its sequel, and other federal programmes aimed at the entry of Russia into the GIS and the WTO, thus making an additional contribution to the solution of socially important problems of Russian society.

The postal infrastructure of Russia acts as a significant provider of Internet access and of a whole range of new ICT services within the scope of e-business, e-commerce, advertising, tele-education, etc.

Introduction of new ICTs and ICT-based services is a promising and ongoing step in the modernization of the Russian Post, a process which is extremely complex in such a vast country.

1. Policy and regulatory issues

The legal regulation of the information and telecommunication services market in Russia is under the responsibility of federal authorities, in particular the Ministry of Communications and Mass Media. The legal framework regulates the processes of formation and development of the ICT market and the activities of market participants, and establishes the authority of the State to regulate the ICT market. The current system provides for regulation of a general and special nature. There is an independent federal agency, "Rossviazy", which is responsible for regulating the sector and the application of the legal framework.

The general Acts include the Constitution of the Russian Federation, the Civil Code of Russia, the Code of Administrative Offences, the Federal Laws on "Natural monopolies" (1995), "Joint stock companies" (1995), "Foreign investments in Russia" (1999), "Investment activity in Russia, carried out in the form of capital investment" (1999), the laws of Russia on "Competition and limitation of monopolistic activity on commodity markets" (1991),"Protection of consumer rights" (1992) and others, Presidential decrees, decrees of the Government of Russia and the Acts of federal organs of executive power.

Among the Acts of a technical nature related to the regulation of the ICT services market are regulations covering, inter alia, the following issues: ownership of the network, communication, competition, antitrust regulation, licensing, certification, interconnection of networks, tariff regulation, the activity of regulating the "communication and information" sector, the distribution of limited resources and national security in communications.

The Russian Federation has also formed a system of normative legal regulation of the communications and information technology sector, covering the development of the telecommunications market and balancing the interests of users of these services, the designated postal operator and the various types of telecom operators and private postal operators. On the basis of the regulatory framework, the Post has been granted licences, most recently as of 6 December 2007, to operate ICT-based services through the postal network. In this regard, the licence to operate Public Internet Access Points (PIAPs) can be considered the most critical one, as it forms the basis for a new type of universal service obligation whereby the post office network grants public access to the Internet and other electronic services.

The legal regulation of ICTs is based on the following principles:

- Unity of information space in Russia, elimination of regional and departmental barriers to dissemination of information.
- Smooth integration of Russia into the international system of information exchange; the right for everyone to freely receive information from publicly available information systems.
- Transparency and openness of development of regulatory standards, involvement of the public.
- Transparency and openness when considering applications for licences and certificates, public control over the validity of their issuance or refusal.
- Creation of equal conditions and elimination of monopolies in the field of ICTs.
- Creation of legal conditions for the use of electronic documents in the public administration and civil sphere.
- Legal solutions associated with the rapidly increasing investigative activity in computer networks.
- Facilitation of imports and exports of hi-tech products produced in the field of ICTs.
- Comprehensive approach to improve the legislation of Russia in the field of ICTs and its harmonization with international conventions and laws of the States of the European Union.
- Ensuring transparency in the activities of public authorities and public accessibility of government information resources, creating conditions for effective cooperation between public authorities and citizens through the use of ICTs.

The federal target programme "E-Russia (2002–2010)" and its sequels provide the prerequisites for formation of legislation in the field of ICTs and development of information and

telecommunication infrastructures. It also ensures effective cooperation between the State, local governments, citizens and economic entities and describes the role of the postal service on the basis of broad introduction of ICTs. In the process of implementing "E-Russia (2002–2010)" and its follow-up, the overall goal of developing ICTs has been identified as one of the main priorities of the socio-economic development of the country.

Along with such prerequisites, "E-Russia (2002–2010)" provides a package of bills aimed at solving issues associated with the creation and distribution of electronic documents, e-commerce development, reduction of administrative barriers, barriers for Russian organizations to access ICT markets, harmonization of ICT legislation in Russia with the provisions of international conventions and laws of the European Union.

A key event for the regulatory framework of the ICT industry was the adoption and promulgation of the Federal Law on Communication. This law presents the principles of creating equal conditions of access for all citizens of Russia to communication services.

The Ministry of Communications and Mass Media has developed several key documents, including the "Strategy development and use of information and communication technologies in Russia until 2010" and successor documents, which identify the key areas, goals and objectives of state regulation in this area. The Post has been mentioned as one of the key areas.

Certain provisions of this strategy are revealed and developed in several concepts. Thus, the concept of using information technology activities of federal bodies of state authority, approved by the Federal Government, defines the basic principles for formation of an effective e-government in Russia.

The Ministry of Communications and Mass Media also set a task to form a model for market regulation, which will maintain the balance of interests of society, business and government and encourage the rapid development of ICTs.

In order to actively promote Russia to the Information Society, the concept of developing the IT sector in Russia was established. This concept identifies the key issues for public support and nationwide development of ICTs and their transformation into one of the main drivers of economic growth.

In the "Concept of regional informatization to 2010" and follow-up documents, the main tasks and directions of implementation of ICTs for socio-economic development and improvement of regional and municipal government are established.

One of the main instruments for regulating and harmonizing the development of telecommunications over the last 20 years has been the International Telecommunication Regulations (ITRs).

During that time, there have been major changes in ITRs, including the emergence and introduction of new technologies and the liberalization of the postal and telecommunications markets.

According to the Deputy Minister of Informatization and Mass Communication, based on resolution 146 of the 2006 Plenipotentiary Conference, there is a need for consistent work with International Telecommunication Union for revision of the ITRs in 2012.

In order to make adjustments and improve the regulatory framework of the ICT field in Russia, the coherent interaction of state bodies, including the State Commission for Information under the Ministry of Communications and Mass Media and the Council of Regional Information Technology has been established in conjunction with the postal authorities, which has led to the establishment of integrated solutions for the development of the ICT sector in Russia and its promotion into a global information and economic space.

In addition, new regulations have been issued by the Central Bank of Russia, including the ICT requirements applicable to the provision of financial services in general, and of e-money and mobile money services in particular. These new regulations have allowed hundreds of thousands of ICT-based self-service, small-value payments to be made.

With the above-mentioned regulatory and policy frameworks, the Post has been seen as one of the key players to functionally assist in the development of the Information Society, through projects such as Cyber Money, Cyber Post, and Cyber Press. These projects have also been undertaken on the basis of the concept of market development of the postal sector. In these concepts, it has also been foreseen that ICT-based communication gradually substitutes several forms of postal mail communications.

2. Context and origins – Key players and institutions involved

The information environment in Russia is developing quite rapidly. Today, the ICT sector is not only seen by some as the most promising market segment, but also as a unique "golden key", which enables the country to maintain its rightful place among the leaders of the world economy.

The fast development of ICTs and their increased use in all spheres of social life contributes to a more progressive structure of the economy and creates new opportunities. As such, Russia has already undertaken a number of programmes covering the use of ICTs in public administration, education, commerce and other areas.

The mechanism that allows these programmes to be implemented is the creation of access points and points of collective access based on the network of post offices, schools and libraries. Such access points not only constitute Internet access infrastructure, but they enable access to information

resources on social benefits, pensions, socially significant information authorities, legal knowledge, training materials, remote medical consultation for rural patients and further education.

The most significant among the programmes is "E-Russia", the implementation of which has had an impact on many spheres of social life (health, telemedicine, education, distance learning, housing and development of rural areas) throughout the country. "E-Russia" is an effective means of coordinating the integration of ICTs into government activities at all levels, and its adoption set a new stage of state policy in the sphere of informatization.

The main objectives of this programme cover the creation of conditions for developing democracy, enhancing the efficiency of the economy, public administration and local self-government, and increasing training for ICT specialists and qualified users through the introduction and widespread use of ICTs.

The implementation of the programme enables the country to effectively use the intellectual and human potential of Russia in the field of ICTs, to ensure the harmonious entry of Russia into the world economy on the basis of cooperation and information transparency, to overcome the gap between Russia and industrialized countries in the level of use and development of ICTs, to ensure that Russian citizens enter the global information society on an equal footing based on respect for human rights, including the right to freely seek, receive, transfer, produce and disseminate information, as well as the right to ensure the confidentiality of any legally protected information held in information systems.

The programme provides for faster growth and continuous increase in the number of computer network users and in the volume of information transmitted.

Moreover, the programme activities are targeted to application of modern ICTs by Federal executive bodies, executive and local authorities of the Russian Federation, thus enabling such bodies to reduce the costs of governance and to integrate state and local government information resources into a single information system that will reduce the likelihood of financial fraud, violations of laws and tax evasion.

The programme activities enable a unique procedure to be established for the collection, processing, storage, retrieval and dissemination of information, which significantly increases the possibility of coordinating the activities of enforcement agencies and improves safety and defence. An active role of the Post in transforming financial transactions from paper-based into electronic records is seen as an important contribution.

The implementation of the "E-Russia" programme and of all above-specified measures would significantly contribute to increasing the competitiveness of the economy by reducing costs and improving the quality of products and services. The capacity of public administration and local government to reduce the gap with respect to industrialized countries would be increased, informational and economic isolation from the world economy and the global community would be avoided, and the development process and international integration of the Russian Federation would be ensured.

The "E-Russia" programme falls directly under the Ministry of Communications and Mass Media, which also directly supervises the Russian Post and is well positioned to ensure the engagement and involvement of the Russian Post in realizing the programme through specific projects in this field. In particular, the programme provides for targeted measures to foster development of the traditional postal service, since the Russian Post is one of the most important instruments for introducing and implementing ICTs throughout the country. To this end, a new draft Federal Law on Postal Communication has been developed by the Ministry of Communications.

3. The "Cyber" projects

Within the framework of E-Russia and the concept of postal development, the Russian Post has implemented several important projects, most of which have been labelled as "Cyber". One such key project is "Cyber Money".

The provision of postal money transfer services is socially important, especially for the often under-banked users in rural areas. To enhance its competitiveness, new modern information technologies have been actively introduced for implementation of high-speed transfers, which has required large capital inputs.

Several banks in Russia have created their own information technology enabling transfers to be made between legal entities and individuals without bank accounts, but most provide remittance services by means of agreements with specialized money transfer operators such as Western Union, MoneyGram, Contact, Anelik, BistrayaPochta and Unistream.

The Federal Postal Service of Russia used to provide simple postal transfers, which were sent using the same paper-based technology as registered letters and parcels. The process used in the Soviet Union did not significantly change in the 1990s.

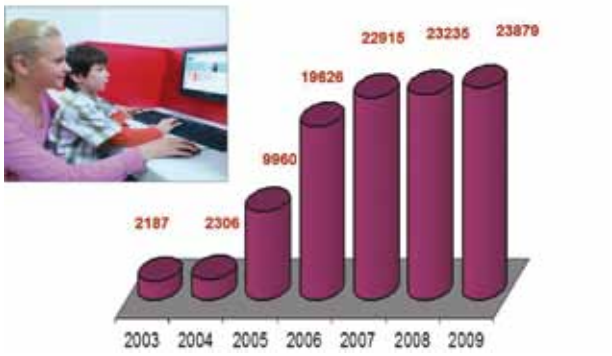
In the 1990s, express postal orders were sent via a telecommunications network, available only at large post offices. Most post offices had not been equipped with a system for electronic postal transfers, which has resulted in low competitiveness of postal orders in terms of speed of delivery.

To improve the situation, the Russian Post has deployed a single postal order system (UPCS). In 2003, transition to the implementation of postal remittances by electronic technology throughout Russia was planned. This required investments of 40 million USD. It has been successfully realized, leading to money transfer volumes with a value of more than one billion USD equivalent in international transfers in 2009. The growth in domestic money orders and transfers has been at least as significant. The volume of transactions grew to 184 million in 2008, with a value equivalent to more than 15 billion USD.

In 2003, the Russian Post started to implement high-speed remittance transfers and the competitive balance in the market segment of these postal services has continued to grow until 2010.

Cyber Money is one of the successes. Another project which has made significant progress is "Cyber Post". This refers to the provision of "collective Internet access" at post offices, often known as Public Internet Access Points (PIAPs).

PIAP network expansion **2003–2009**



The graph above shows the rapid progress in the network expansion. More than 60% of the post offices provide access. The Internet traffic in 2008 via the public points was nearly 1 TB. The access function is relevant for rural areas, where Internet at home or work is often limited or non-existent. It has also proven to be useful for travellers, who can check their e-mail online. The expansion of CyberPost has been undertaken with the intervention and support of the Federal Budget in the context of E-Russia.

Another project has been called Cyber Press and can be seen as a specific hybrid mail application. Cyber Press has been developed to help the timely delivery of newspapers across the large distances and time zones within the Russian Federation. This service avoids subscribers or interested readers having to wait for one or more days to receive the printed copy from the place where the newspaper was printed.

More recently, the Russian Post has begun to introduce "e-government" services in several regions. This is the next step in implementing E-Russia and developing Cyber Post into a universal service for access to the information society. The first step is to encourage municipalities and local administrations to provide services previously provided only at the town hall or office of the regional administration through the Cyber Post PIAPs. For the user it means proximity and convenience and, particularly in rural areas, less time and travel expenditure. The applications started on a pilot basis at the end of 2009 and will be expanded gradually in 2010. Expansion in this context refers to geographic scope (more regions and more municipalities), as well as to functionality.

4. Limitations and constraints

Despite the rapid development of ICTs in the 1990s, Russia could not fully reduce the backlog inherited from the Soviet Union in the level of informatization of the economy and society. This situation was partly due to general economic factors (protracted economic crisis and low level of well-being of majority of population). A number of negative factors hindered the development of ICTs, including:

- Imperfect legal and regulatory framework, developed without taking into account the capabilities of modern ICTs.
- Lack of development of ICTs in public administration, lack of preparedness of public authorities in the use of effective technologies for management and organization of interaction with citizens and economic entities.
- Lack of a coherent information infrastructure and effective information support of markets for goods and services, including e-commerce; inadequate training in the development and use of ICTs.
- Barriers resulting from shortcomings in the regulation of the economic activity of Russian enterprises and other organizations in Russia's sphere of ICTs and global markets.
- High level of monopolization of communication networks, which creates barriers to their use and leads to distortions in pricing policies.
- Inadequacy of existing regulatory frameworks (not adapted to the use of modern ICTs).
- Uneven development of telecommunications infrastructure, with a significant gap between different population groups with regard to access to ICTs.
- Increasing security threats facing information and telecommunications systems and networks and information resources; increase in computer crime and severity of these acts.
- Inadequate development of digital broadcasting technologies in the regions.
- Inconsistency of training specialists in the field of international ICT standards.
- Unreliability of statistical information on the ICT market.

Under the E-Russia programme, many of these issues have been addressed and have improved the situation. The implementation of the "Cyber" projects through the Russian Post's network has contributed to solving several of these national issues.

To address the aforementioned issues, it was also considered necessary to continue to closely cooperate with the CIS members, united in the Regional Commonwealth in the field of Communications (RCC), on:

- improving and harmonizing the legal framework at the international and national levels, including in the field of copyright and intellectual property rights and regulation of the Internet;

- access of the population, businesses, public organizations and government agencies to modern info-communications services, including in remote and isolated areas, via post offices;
- creation of an adequate regulatory framework for postal services, enabling the development of new ICTs and innovation;
- equalization of opportunities for access to information and communication technologies for various population groups, businesses, public organizations and public bodies, including in difficult and remote areas and reduction in the digital divide among regions;
- development of national production in the field of ICTs, increasing the competitiveness of the industry;
- creation and implementation of mechanisms for the application of electronic signatures, including by postal operators, and data protection systems;
- implementation of socially significant projects on ICTs, including in the field of telemedicine and distance education, also via the Post;
- implementation of national programmes in the field of ICTs, also with the involvement of Posts;
- creation of "electronic" government information portals, development of skills among civil servants and local government in terms of ICTs, also via post offices;
- creation of a system of training and retraining of ICT specialists in accordance with accepted international standards;
- introduction of "universal service", development of digital television and sound broadcasting networks;
- effective interaction with RCC Communications Administrations to establish satellite communications and broadcasting systems;
- cooperation with RCC in the planning and international coordination of digital broadcasting;
- strengthening of cooperation in the field of information security.

To improve the situation and to reduce the constraints to more effective use of ICTs, a wide range of federal, regional and departmental programmes and activities are being undertaken and planned.

In the above context, the Russian Post has also played a guiding role in the RCC, promoting cooperation in the above fields between postal operators in the RCC, while the Russian Federation Ministry for Communication and Mass Media has taken many initiatives and assumed leadership in terms of intergovernmental cooperation.

Within the Russian Post and in the course of implementation, various constraints were experienced. Several of these can be considered as a mirror of those at national level.

- Lack of an adequate regulatory framework; in the initial phase (until 2006–2007), constraints were experienced as a result of the legal and regulatory framework not being fully adjusted to the ICTs applied, which meant that both digital and traditional, paper-based processes needed to be maintained. This applied especially for documents related to the various steps in the accounting system, as well as to the usage of stamps and signatures. Although some constraints remain, the major limitations appear to have been overcome and greater efficiency and effectivity achieved.
- Lack of coherent action and preparedness within the different divisions of the Russian Post and with the different public administrative entities. The degree of preparedness to apply ICTs in the Post for the public varied. Cyber Money was one of the earliest initiatives and required intensive coordination with other authorities, including the Bank of Russia and the Tax Inspectorate, while the implementation of e-government services, in cooperation with municipalities and regional administrations, has taken a longer road to implementation.
- Uneven development of the telecommunications infrastructure and high dependency on external communications infrastructures. The Russian Post could not immediately build up its own internal communications, for regulatory, technical and financial reasons; this has been a gradual process, including usage of VSAT dishes and other applications. This has been experienced as a limitation to the consistency in the communications infrastructure and as a constraint to the reliability, security and consistency of data. Taking note of the progress in the development of the telecommunications infrastructure, the Russian Post prepared in 2009 the requirements and specifications for its own internal corporate ICT network. On that basis, the Russian Post invited telecom operators to bid for a partnership and concluded the process in early 2010. The next phase will be to effectively build the partnership and hence the internal corporate ICT network across the Federation, as a strategic component for further expansion of ICTs.
- Human capital building; limitations in the set-up and introduction of the ICTs were encountered due to the issue of divergence of backgrounds, training and experience of the ICT experts, both within the Russian Post and among telecom operators and other organizations. Although differences continue to exist, the level of convergence has significantly improved both within the Russian Post and with its counterparts, thus creating a basis for more rapid progress.

5. Impact of the project

The establishment of an information and telecommunications infrastructure in Russia is seen as an important factor for increasing the national economy and the business and intellectual activity of the society, as well as for strengthening the country's prestige in the international community. In this context, the designated postal operator is often seen as a facilitator in this process as well as an entity that applies the solutions developed.

The main purpose of the use of information technology by the federal government authorities is to continue to increase the effectiveness of governance mechanisms on the basis of a common information technology infrastructure, including

public information systems and resources, as well as a means of ensuring their functioning and interaction in the provision of public services.

The introduction of ICTs and their use by executive authorities and local municipalities and communities has created favourable conditions for improving governance and the quality of public services offered to citizens and organizations, increasing the effectiveness and transparency of the state apparatus for eliminating fraud and corruption, and achieving other improvements within the scope of their activity.

The introduction of information technology by federal bodies is carried out at a sustained pace; a number of local communities have already created a framework of information technology infrastructure, together with the Russian Post, and have set organizational, methodological and staffing principles for effective use of ICTs.

In most federal government agencies, geographically distributed computer networks have been set up, including access to the Internet. The Russian Post recently decided to build its own centralized corporate ICT network. The share of expenditure on the purchase of software and integration services in the structure of budget expenditures for the use of information technology activities of federal organs of state power is increasing, which generally reflects the development of the functionality and complexity of information systems and resources used in the activities of federal organs of state power.

A significant number of federal government agencies implement selected and dedicated programmes related to their functions, generally with qualified personnel responsible for the creation and implementation of departmental information systems and resources.

Projects have been successfully implemented for the introduction of automated information systems in the field of electronic document management, logistics management, financial and human resources as well as for integration of government information resources through the introduction of electronic administrative regulations for public services. The postal service has played an active role in this and has brought many ICT-based services closer to people, especially in rural areas. This has involved a learning curve for the end-users, the Post and third parties, such as government agencies. It seems that the range of ICT-based services provided via the Post is gradually expanding, especially now that the Post is planning to build its own corporate IT network with a telecom operator. Moreover, the discussion on the creation of a postal bank is likely to further trigger the development of ICTs within post offices to support a broader range of financial services.

The federal government authorities create and use websites to send information about their activities, as well as to provide services and interactive information services to citizens and organizations.

The ongoing annual evaluation of the effectiveness of the use of information technology activities by federal government authorities is the basis for clarifying areas of public policy and making adjustments to government programmes and projects in this area.

The implementation of ICTs and of the "E-Russia" programme and other federal programmes generally helps to enable successful development in all areas of public and business life in the Russian Federation.

The implementation of ICTs has also helped the Russian Post to transform and to change its role both in society and in an increasingly competitive market. It is increasingly clear that this process has only just begun and that further transformation and development is likely to occur in the near future.

ICTs have directly impacted on the Russian Post and on its overall transformation process. The steps that have been taken are very relevant in upgrading the basic infrastructure and services of the Russian Post and in gearing it towards the information society. ICTs have helped in a multifaceted way. One key element is the development and modernization of its internal communications infrastructure, and the building and strengthening of centralized online real-time management information systems. This is an essential aspect of the functioning of the Russian Post in a competitive environment, and of the accountability and effectiveness of its operations.

A more visible outward component is that ICTs allow the postal network to be used for the provision of a new "universal service". This concerns the role of the post office as a public access point to basic financial services (Cyber Money), access to the digital world (Cyber Post) and many more digital or e-services such as e-government, e-commerce and e-learning. The transformation with ICTs has also demonstrated that the Post can continue to play a valuable role in money transfers and continue to support the overall transformation process from "unbanked" to "banked" and from "cash" to "cashless". The active role of the Russian Post in transforming the postal money transfer system has not been limited to the confines of the Russian Federation, but has had a significant impact on the ICT-based transformation of the postal money transfer system in other countries to where migrants in Russia send their money.

The steps made so far also indicate that ICTs and Posts represent a process with a learning or development curve. The basics have been built over the past decade, and have led to improvement and upgrading of both services (range and quality) and management capacity. The next major step underway is a phase of ensuring the role of the (rural) postal network as an infrastructural component in the provision of access to basic universal services, such as financial services, digital communications, e-government, e-commerce and e-learning. It has also become clear that ICTs do not substitute mail and parcels, but provide a broad spectrum of added value to the execution of these services, such as track and trace, quality management, client convenience and security,

as well as new ways of direct marketing, both paper-based and digital.

The lessons learned so far indicate that, in view of the rapid developments in ICTs, there is likely to be one certainty: a continued changing environment and on-going transformation.

6. Conclusion

The development of the ICT sector will help Russia with its great intellectual resources to solve the problem of improving and transforming its economy, to create conditions for investment and to integrate into the global information and economic space as an equal partner. The Post and its unique network are positioned to fulfil an essential facilitating role in binding the nation and providing broad and efficient access to ICT-based services, ranging from communications, information and mass media to financial services, education and government services. Rapid progress has been made over the last 10 years in implementing a basic narrow range of services that can gradually be expanded by the Post in the next few years.

The ICT industry is developing rapidly and should play the role of a locomotive in the transition of economies in the post-industrial era. The economic turbulence associated with this "great transition" has already begun. Despite the difficulties, new technologies have become a sort of bridge over the crisis, and the ICT industry and mass communication is designed to make the first real steps towards a knowledge economy. In this respect, the post office plays an essential role as a "portal" or public access point.

An important result of the spread of ICTs and their penetration into all spheres of public life is the creation of legal, organizational and technological conditions for the development of democracy, enabling citizens to freely seek, receive, transfer, produce and disseminate information.

ICTs have become not only a major mechanism of support for rapid and effective decisions in government, but have helped to make life easier for citizens and businesses. It is about creating effective schemes of cooperation between state authorities, the general public and economic entities, to which end the Post has already proven to be a facilitator and intermediary. Businesses have made significant savings on their transaction costs and have seen substantial quality improvements and a reduction in the administrative barriers they face. Moreover, they are now able to participate more actively in ICT projects in terms of co-financing, which is a good stimulus for their development. Citizens have benefited from a significant simplification of procedures for interaction with local officials. Most importantly, many rural citizens benefit from the easy access that post offices offer to new universal services based on ICTs in the field of financial services, communications and information and other e-services.

It is clearly not an easy process and much remains to be done. The Russian Post, under the guidance of the Ministry responsible for ICT development, has ambitious plans for the future. Its goal is to play a key role in the further development of the ICT-based society, through the build-up of its own corporate ICT network, the creation of e-government and municipality services and the creation of a postal banking operation that will heavily rely on ICTs.

Saudi Post Innovative Address System: Integrating Electronic and Physical Platforms

Farah Abdallah
Matthias Finger

Introduction[1]

In 2004, H.E. Dr Mohammad Benten was appointed president of Saudi Post (SP), a government-owned company facing critical challenges affecting its survival. The company's customers perceived the Post as a traditional channel of communication for the exchange of letters. They believed that, due to the evolution of new technologies, the role of the Post in their daily life would become obsolete. The national mail market was also characterized by growing competition from private international logistics companies, especially in the parcel and EMS segments. Moreover, the company's network infrastructure was unable to keep pace with the growing development of local and international businesses operating in the Kingdom of Saudi Arabia. Indeed the company faced difficulties in efficiently providing its core service, the delivering of packages and mail. One reason behind these difficulties was the absence of a standardized postal addressing system in the country. Until recently, the citizens of the Kingdom used an inaccurate postal address to communicate by post, or had to rent a P.O. box at their nearest post office to pick up their mail. Homes did not have mailboxes at all, and the country lacked a single, unified addressing system. That limitation led various institutions, such as government agencies or private logistics companies, to create their own grids and use different addressing systems for the same location, complicating the operational process for mail as well as duplicating the infrastructure costs.

Dr Benten therefore had a vital mission: he had to conceive a new way to do postal business and transform the traditional Post into a competitive company providing cutting edge services to the citizens and contributing to the economical development of the country. He saw that one way to reach this goal was to turn the Post into an innovative platform integrating the electronic and the physical infrastructures and providing ubiquitous services to its customers. Subsequently, the Wasel project was launched in 2005 to provide private resident mail delivery (Wasel means reachable in Arabic). One of its basic components was to assign to each location an address enabling the automation of the mail process and enhancing the mail delivery service. The organization worked with international technological companies to build an address-mapping solution based on global positioning technology. As a result, the mail process was transformed from a rudimentary one to a high-tech one, and the quality of service improved substantially. But to make SP an innovative organization helping its customers and the nation to migrate to the worlds of e-commerce and e-government, Dr Benten had to take other measures.

This is the story of a visionary company using new information and communication technologies (ICTs) not only to improve the efficiency of its traditional business, but also to create synergy between the electronic and the physical infrastructures in order to build new value for the customers and provide them with e-commerce and e-government services. The first section of this chapter explains the motivation behind the postal addressing project. The second and third sections describe the two initial phases: using ICTs to improve the postal business, and then using the postal infrastructure to develop new electronic services. In the fourth section, we attempt to understand the organizational process for achieving this dynamism between post and ICTs by providing a typology of technological innovation in the postal sector and some guidelines for postal operators to enhance their technological innovative capabilities. We end by drawing conclusions and discussing the implications for managers and decision-makers in the industry.

I. Background and motivation

The motivation of SP to design and install an innovative and accurate postal addressing system using the latest technologies came from various changes under way at the governmental, industrial and organizational levels. In the following sections, we explain these changes.

A. The Kingdom Government's Strategy

In recent years, the Kingdom of Saudi Arabia has accelerated its efforts to reduce its economic dependency on oil-based businesses and to diversify into new revenue-generating sectors. The Government has been encouraging foreign investments and finding ways to boost the growth of local businesses, and has been applying the latest technologies to improve services in all government institutions.

To this end, in 2001 the Kingdom Government approved a privatization strategic plan, one objective of which was to provide services to citizens and investors in a timely and cost-effective manner. A key institution helping the country in achieving its goals is SP – the Kingdom's official postal operator. The Saudi Council of Ministers therefore issued a decision on 29/3/1423H (10 June 2002) transforming the General Directorate of Post into a public corporation operating on private sector lines, and establishing an independent agency to regulate communications services and another to regulate postal services.

Another directive of the Kingdom Government involved the use of ICTs to foster the creation of e-government standards and to apply them through administrative and governmental sector departments. The aim was to facilitate procedures, save time and money, and foster economic and social growth. Mail distribution to residential addresses hence became a primary requirement, as it was a legitimate right for all the citizens to access government services.

B. Changes in the postal industry

The business environment of the mail industry is changing. Postal operators face growing pressure of competition from

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regional and global operators, forcing them to reduce their operational costs and to enhance the value of their services. Moreover, they are profoundly affected by the growing role of ICTs. In fact, the development of ICTs, such as e-mails, phones and faxes, is threatening the postal operators' traditional business, such as the letter mail, and operators are compelled to provide new high quality services at competitive prices. Customers' lifestyles and demands have evolved substantially. Customers today ask for customized, reliable, ubiquitous services (Abdallah, Felisberto, and Finger, 2006).

Fortunately, postal operators have reacted very positively to the challenges raised by ICTs, and are willing to use these techniques to create new business opportunities. A survey conducted in 2006 among CEOs of national operators showed that most of them agreed that the future competitiveness of their companies would depend on the good use of ICTs (94.7% of respondents) and that Posts were increasing their ICT budget (89.5% of respondents) (Abdallah, Felisberto, & Finger, 2006).

As part of this changing industry, SP was also facing growing competition from international private postal operators such as DHL and FedEx. The impact of ICTs was also noteworthy. When asked about the Saudi postal market, Dr Benten answered: "Very few people depend on the Post to do their business. People used the Post in the past because they were writing letters due to the difficulty in communicating services. Unfortunately for quite a while, with the evolution of telecommunications and technology, such as e-mail, many people thought that their dependence on the Post would diminish and that they wouldn't need the latter anymore. Their correspondence today depends mostly on e-mail, fax, SMS, and phone calls." (Faryal Mirza, 2009)

C. Saudi Post's strategy and Wasel project

Saudi Post manages a collection and distribution network of more than 6,321 points of presence covering 5,458 villages and cities in Saudi Arabia over a total area of 2,149,690 km^2. 10,264 employees provide the mail service for about 27,019,731 inhabitants including 5.5 million foreign residents. The company processes 900 million mail items a year.

The government-owned organization, operating on private sector lines, has undertaken a series of initiatives to support the new government strategy and to respond to the new industry challenges. It first conducted a series of studies and analysis of the company's corporate management and of mail market development. As a result, SP was restructured to become a private holding company of eight business units each corresponding to a segment of the postal value chain (i.e. transport, delivery, EMS, post offices, postal services, financial services, property management, IT and telecommunication). International and national competitors thus no longer compete with the Post, but rather with a business unit of the Post responsible for a certain business model.[2] IT and telecommunication is one of these business units functioning on a commercial basis, showing the important role of ICTs in SP's new strategy.

In 2004, this new strategy stated that advanced technical solutions were the principal guarantee for postal service quality and efficiency in the Kingdom, and underlined the importance of investing in Saudi human resources, which were the foundation of postal operations and modern postal technology. Subsequently, the company considered partnering with a number of private national and international companies in a series of new IT-based projects. The aim of these projects was to provide the highest quality and the widest range of postal products and services to meet customers' needs in all areas of the Kingdom.

One of these projects is the Wasel service project. Since 2005, the organization has been carrying out this strategic project to establish an automated mail process from reception to delivery. This groundbreaking project is designed to lead the way towards improved quality and speed of delivery at residential addresses, and ultimately to support e-commerce and e-government initiatives in Saudi Arabia. Evoking the reasons behind the Wasel project, Dr Usamah Altaf, Advisor to the Ministry of Information and Communication Technology, explained: "We urgently needed to make the delivery service more efficient by automating processes. The primary aim was to improve postal services, but it was also crucial for the development of e-commerce and e-government. It could enhance the economy by presenting a positive image of the country and inspiring confidence of international businesses." (Microsoft, 2008)

Before long, SP was actively engaged in partnering with leading technological companies as well as in developing innovative postal technology solutions in order to implement the Wasel project. The new technologies were used to build a new electronic infrastructure connecting all postal centres across the Kingdom. SP also used the ICTs to expand and enhance automatic mail sorting and e-reading of messages at all its sites. In particular, the ICTs provided a means to develop a delivery system which reached each citizen at his or her residential address. This chapter focuses on the use of ICTs to build this address system.

D. The quest for a new address system

In order to achieve the ambitious goal of Wasel, SP had to overcome one major challenge: the lack of a standardized address system. Collecting mail from and delivering it to customers' residential addresses was difficult since people were using a relative address system rather than a unified one; in fact, each city had a different scheme for numbering homes using numeric and alphanumeric characters. Hence, postal workers delivering mail to homes had to rely on their experience to find addresses, and training new employees was a challenge. The absence of postal zip codes also made it difficult for postal workers to sort the items. These factors

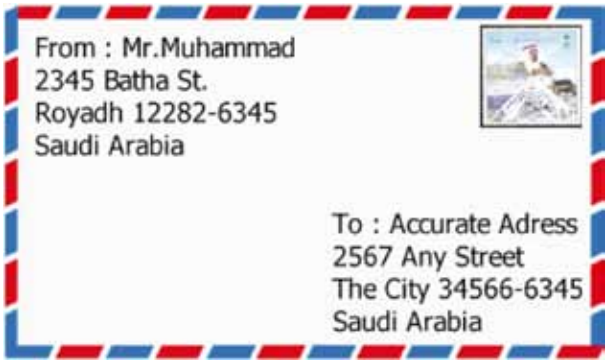
[2] For instance, the logistics business unit established a company called Naqel, which competes with many other companies to perform transportation across Saudi Arabia, the market being open.

were driving up the costs of providing the postal service. Besides, citizens had to rent a P.O. box at the nearest post office and collect their mail in person if they wished to have an accurate postal address. Developing a new standard postal address system, called Wasel address system, was thus vital. Eng. Majed Al-Esmail, Vice President and Chief Information Officer for Saudi Post, set out the vision of the address system project: "We wanted to create a powerful IT infrastructure and a standardized postal address system which provided a unique address for each building. The aim was to improve the efficiency of the delivery process."

Figure 1 shows the evolution which the address system had to undergo. Traditionally, customers needed to indicate the city, avenue, district, street, some landmarks (which could change over time), the building name, the floor, etc. Street names and house numbers were lacking. Also, addresses could be written in Arabic or English. Destination names in Arabic often had multiple spellings in English. For instance, "محمد" can be written "Mohamed" or "Muhammad", etc. The new Wasel address consists of a numerical code which can be automatically read and processed in the sorting centres, and helps the postman to see at first glance the destination of a mail piece without knowledge of the surrounding area. The standard Wasel address code has a unit number, street name, and a numeric postal code.

Figure 1: From a traditional to a digital postal address

Traditional postal address



Wasel digital postal address

II. From ICTs to Post

SP decided to internally develop the new postal Wasel address system, which became the property of the company. It used systems and software which are at the cutting edge of modern technology and geographic information systems (GIS) to build more than 2 million accurate digital postal addresses of locations in the Kingdom. The process of creating the new digital address is described below.

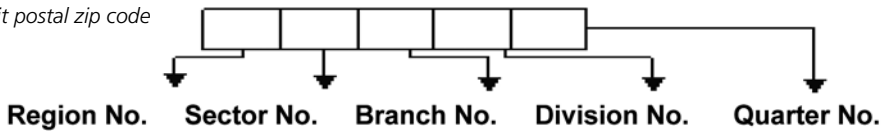
A. How was the Wasel postal address system created?

The new postal address project's aim was to allocate a unique 13-digit numeric code to each square metre of land. This number, which was entirely conceived by SP, consists of a combination of a five-digit postal zip code number, a four-digit building number and four-digit additional number. Behind this combination of digits there are technology and mathematics which make SP's address system one of the most accurate systems in the world for locating an address.

1. Building a five-digit zip code number for each location

Firstly, SP used high resolution satellite images such as QuickBird images (60 cm resolution). The images were transformed into digital maps by using advanced GIS software in order to be treated by computer systems. Then, on these digital maps, the Kingdom of Saudi Arabia was divided into regions, which were divided into sectors. These sectors were divided into branches, which in turn were divided into divisions. Finally, these divisions were divided into quarters. The serial five-digit number of this composition was called the postal zip code (see Figure 2). In Annex 1, we explain in detail how each digit was constructed.

Figure 2: The five-digit postal zip code



2. Providing a 13-digit number to each location

After building the five-digit postal zip code, postal addresses were created for each location within this zip code. Saudi Post developed a local coordinate system on the basis of a world coordinate system of the Universal Transverse Mercator (UTM) projection. Based on this system, X and Y coordinates were assigned to each location. A sophisticated mathematical technique was used to compute the four-digit building number based on the X and Y coordinates and on the position of the building. For instance, for a road in an east/west

direction, the building number would be an odd number if the position of the building was on the right side of the street, but would be an even number if the building was on the left side of the street.

The four-digit additional number was reserved for numbering of residential units inside the buildings. The units were numbered sequentially (1, 2,…, until all the units in the building were assigned with a number). Following this methodology, each location within the Kingdom has been given a unique and systematic postal address called a Wasel address, composed of 13 digits.

3. Field survey

After providing each location with a Wasel postal address, SP conducted a detailed field survey to verify the accordance between digital maps completed with the address digit code and the reality in the field. SP validated the information related to the land use type, building type, number of floors and apartments in each building, building boundaries in crowded areas if these were not clear from the satellite imagery, street and public service names, etc. Then, the digital maps were corrected based on the survey's findings.

4. Installation of boards and boxes

Having created an accurate postal address for each location, SP fixed a board on each building with the building number, and installed boxes for each apartment within the building. These boxes were equipped with a passive RFID tag which stores the 13-digit Wasel address. The tags, which had nine bits of programmable memory and functioned at 915 MHZ, were embedded in a plastic housing attached to the steel mail box. The housing was used to keep the metal from interfering with the tag, and also to protect the tags from Saudi Arabia's sand, as well as windstorms and other harsh weather factors.

B. From collection to delivery

SP integrated the new address system with its existing electronic systems, namely its customer relationship management (CRM) system, its electronic readers, and its Express Mail Service database. The address system was also integrated into the physical infrastructure, such as vans and sorting centres. Hence, SP succeeded in re-engineering the mail process and in achieving integration between the electronic and physical infrastructures. Hereafter, we describe the new mail process from collection to delivery (see Figure 3).

Figure 3: The Wasel service mail process

Citizens residing in a region where Wasel service is provided can register to benefit from the service by filling in a specific form, electronically or at a post office. Within a short time, Saudi Post activates the customer's Wasel Box and gives him the key to the box, free of charge. Receipt of mail in the Wasel Box is a free service; however, the customer pays a yearly fee for the other services. For instance, he has to pay 90 Saudi riyals (24 USD) per year for the service of collecting the mail at home, or the e-signature service.

When a registered customer wants to send mail, he goes to SP's official website. Through this site, he can calculate the cost of the postal service based on the type of mail and the destination address. Then, he affixes the required stamp[3] on the mail and places it in the mailbox installed outside his house. Through the SP website or by SMS, the customer schedules the collection time by Wasel service staff and can also ask for a notification-of-delivery service.

When the postman passes to collect the mail from the mail box, he reads the microchip with a handheld terminal (HHT) and the electronic collection is recorded in the Mail Delivery and Management System (MDMS).

At the sorting centre, the letters are sorted by electronic sorting machines. The machines read the digital zip code and put the mail on the corresponding stack. After a series of rounds, mail is automatically sequenced according to house numbers, and then to apartments. If a customer has changed his address, then the mail is automatically redirected by printing the new address on the envelope. Also, a customer can ask to store his mail at the nearest postal centre for a certain period, if he is travelling for instance. This sorting method, where sorting machines are linked to the mapping system, does much to efficiently determine the shortest delivery route for the postman.

The mail is then transferred by postal vans equipped with a GPS system, which makes it easy for the postman to locate the site of a building or a house. Thanks to the GPS system, SP can also control the routes of the vehicles and determine their location electronically. The van control room can thus detect if a vehicle has gone outside the appropriate zip code for delivery or has exceeded the speed limit.

Next, the postman inserts the mail item into the recipient mailbox; he scans the RFID chip using the HHT device. This can be used as an e-signature from the recipient. The electronic information is directly communicated to the CRM system. A notification of delivery is then sent to the sender by e-mail or by SMS. The recipient customer is also informed by e-mail or SMS that he has received a mail item. The electronic information is also sent to a control room where the postmen's performance is monitored; for instance, the system can rapidly check the number of mail items delivered by each postman. Postal service quality is hence guaranteed.

[3] Currently, the client still has to buy the stamp from the post office beforehand. However, Saudi Post is considering the introduction of e-stamps.

C. Impact of Wasel address system

Launched in October 2007, the Wasel service is currently available in 25 cities[4] serving two million locations, and to 58% of the Saudi population. In this section, we will discuss the impact of the new addressing system on SP performance.

1. Efficiency

The Wasel addressing system has improved the overall efficiency of the mail process:

– The processing capacity of SP has improved. The postal service, which previously had to rely on its customers visiting post offices to collect mail, has achieved 100 per cent automation of the dispatching process. Dr Altaf has indicated that "Saudi Post can now handle many more items of mail a day than previously. We have recorded a 100% increase in the number of items processed a day compared to the same quarter last year" (Microsoft, 2008). Improving the efficiency of the mail process before providing citizens with new services is vital in the postal business environment. Actually adding to the value of being connected to the postal infrastructure usually leads to a network effect where the number of customers increases exponentially. If the postal infrastructure is not efficient enough to serve this new number of customers, the quality of the services provided may be affected, leading to the rapid loss of the new customers.

– Delivery service is now 99.99% accurate. By using zip codes to identify a location anywhere in the Kingdom, mail can be delivered to the correct recipient even without the individual's name. As postal workers quickly find the right destination, the mail delivery and collection times are reduced. As Eng. Esmail explains, "By using the latest technologies, we have provided an accurate address to each citizen in the country. We can now track the mail, direct postal workers to the right address, and help ensure delivery within the appropriate time. As a result, our customers are highly satisfied with the service."

– Postal service quality has substantially improved. Thanks to the implementation of the new addressing system, SP can regularly monitor staff performance and is able to make a timely decision to improve postal services on the basis of status of delivery to subscribers' mailboxes using the data supplied by the embedded RFID tag, and the statistical and operational reports generated by the system.

2. High customer satisfaction

Saudis are highly satisfied with the addressing system and find it helpful in different aspects of their daily lives:

– The new addressing system responds to customers' growing need for mobility. In fact, at least 45% of the Kingdom's citizens move every year. The new system responds to this need by directly forwarding the mail items to the new address.

– The new system is also adaptable to the customer's time preferences. A survey addressed by SP to its customers shows that their preferences concerning the timing of receipt of their mail are very different (see Figure 4). The new service allows them to send/receive their mail at their convenience.

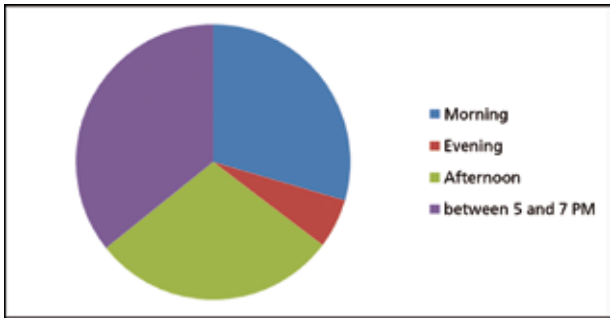


Figure 4: Customers' answers to the question: what is the best time to receive your goods?

– Moreover, thanks to the new address system, customers are able to send/receive EMS and registered mail securely at their residential location. Reading the RFID microchip fixed on the mail box instead of having the customer's signature is considered as a proof of delivery (e-signature).

– The new addressing system is helping Saudis in their daily activities. After developing the postal system, SP saw a great opportunity to enable citizens to easily locate any address in the Kingdom by providing them with the Locator service. Customers can access the Locator service through the SP website or by installing an application on their mobile devices.

Figure 5: Saudi Locator service

– Customers going to the SP website can benefit for free from the Saudi Locator service. Through the page, they can search for a specific post office or a particular loca-

[4] Saudi Post plans to provide the Wasel service for all the population. Since the deployment of such an infrastructure is costly and difficult, SP has progressively begun to install the Wasel system, by giving priority to the most heavily populated cities, and following a ranking provided by the Government.

tion by indicating the appropriate postal zip code or the postal address (postal zip code, building number and additional number). They can also verify the existence of a postal address. The Locator displays the search results on a digital map, and shows points of interests nearby such as public services, supermarkets, hotels, clubs, mosques, hospitals, etc. (see Figure 5).

– In addition, SP provides Saudi Locator NAV for people to use in their vehicles. This is a navigation system which functions like a GPS, based on postal addresses: If you know the building number and district name, the system will guide you to the location.
– It is also possible to use Saudi Locator on PDAs. The customer can use the building number and name of district to simply move around on the map, zooming in or out if required.

Figure 6 summarizes the opinion of 1,487 surveyed customers on why Wasel is proving useful for them. It shows that most enjoy receiving postal services at home and having access to governmental services.

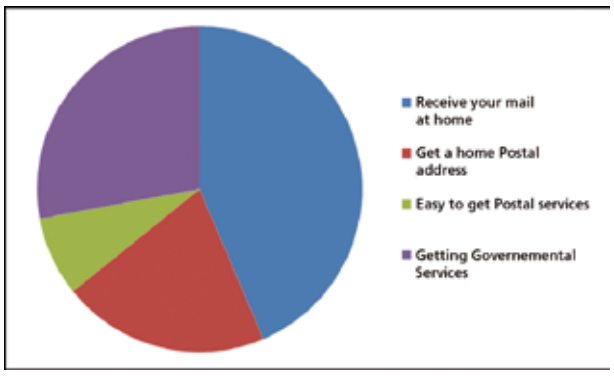


Figure 6: Customers' answers to the question: Wasel helps you to:

3. Creation of new services

The newly created address system is helping the Government and companies to develop new services for Saudi citizens. For instance, the presence of an accurate system and of the Locator service dramatically improved orientation in the country. This helped in the development of the business of many organizations whose services rely on quick orientation, such as Pizza Hut (commercial sector), the Red Crescent (medical sector), Hafil Co, taxi drivers (transportation sector), firefighters, Jeddah Municipality, Makka Municipality, and the Ministry of Water and Electricity (service sector).

The new address system also enabled SP to create an accurate database of its customers. Thanks to this database, SP now has profiles – including name, age, profession, and number of family members – of all Wasel subscribers. Businesses can access this data by paying a licence subscription fee[5] to SP, and use it with appropriate guidelines for marketing and communication activities, such as direct mail campaigns, or for the creation of new services. As Dr Altaf explained: *"Large enterprises, government and non-government agencies, and especially small and medium-sized enterprises can now develop new value propositions. These developments in Saudi industry will lead to newer revenue streams and higher competition. We specifically expect the retail industry to diversify business models and improve its offering."* (Microsoft, 2008)

III. From Post to ICTs

Integrating the electronic and physical infrastructures in the postal service requires postal operators to not only use ICTs to develop their business, but also to use the existence of a national and global postal infrastructure to create new e-services and contribute to the development of e-commerce and e-government for the benefit of the organization, of the citizen and of the global economy. As part of this vision, SP is copyrighting the postcode technology to be used for the creation of new ICT-based services. According to Dr Benten, *"The postcode has a lot of technology and mathematics behind it. When it is copyrighted[6], we can make use of technology in other areas in the world"* (Faryal Mirza, 2009). Next, we will show how the postal code system and the related mapping technology is being used to develop new IT-based services.

A. E-services

By using the new postal address system and integrating it with the CRM system, SP has now launched a series of new e-services that customers can access online through the company's website. As previously mentioned, by registering with the SP website, customers can track and trace their mail items, find a post office branch, search for the zip code of a particular location, and find locations of businesses and government agencies using a Wasel address.

Furthermore, to respond to customers' growing need to be mobile, SP has developed the Postal Mobile service. Customers subscribed to this service can track their consignments by phone text messages. They can also arrange for pick-up of their outgoing mail from their mail box by means of an SMS sent to SP. They will receive a reply by SMS, and a further SMS upon collection of their outgoing mail. Dr Altaf says *"Users can also access services through their Web-based mobile devices. These world-class services are available to residents of Saudi Arabia for the first time and have resulted in a significant increase in the Saudi Post customer base."* (Microsoft, 2008)

Below, we describe two main services which were developed thanks to the existence of an address system and of an innovative postal infrastructure, namely the e-mall and the postal e-mail service.

[5] These subscription fees differ according to the model. They may be annual fees for using the data, shareholder, etc.

[6] The copyright guarantees for Saudi Post the intellectual property rights relating to the postcode system, but it cannot be used as an economic right to authorize or prohibit the use of the postcode by a third party.

1. The e-mall service

After establishing the new address system, SP realized the potential of its infrastructure, which is the only one in the country capable of delivering goods to every citizen. The aim was now to boost the exchange of goods through the network to generate profits. It found that playing the role of an interface between the customers and the suppliers was an attractive business opportunity, and so the idea of developing an e-mall business was born. External consultants were hired to help in defining the business process of the project. The website was implemented by SP and launched in 2009. Even without an aggressive advertising campaign the e-mall is already generating profits for SP. During an interview given to the Universal Postal Union, Dr Benten explained that the reason behind the success of SP's e-mall was the variety of goods that people could purchase through the website, as well as the existence of an accurate address to ensure timely and secure delivery to homes (Faryal Mirza, 2009).

SP's e-mall (www.e-mall.com.sa) is similar to amazon.com. Saudi Arabia is a country with a large land area and many small towns, villages and rural areas. While the major cities benefit from the existence of fancy malls and big department stores, such facilities are not available in rural areas. Through the postal e-mall, any citizen in the country can have access to a large catalogue of products and buy them online. Citizens living in an area where the Wasel service is not yet provided or who do not have an Internet connection can go to the nearest post office and buy their articles with the help of one of the post office agents. Then, the goods are delivered to their home the next day. SP relies on its capacity in transporting mail and parcels through its vast network, with 6,000 points of access across the country, to provide services to all citizens. People in a village can shop at a major department store in a city two hours' flight away just by going to a post office. Moreover, the prices of products in the e-mall are lower than in the market place, and people can navigate to compare prices between traders in order to obtain the best value.

More importantly, the e-mall does not only offer products from large stores, but also helps local craftsmen in remote areas to sell their products. In some of Saudi Arabia's villages, craftsmen still make traditional ornaments and jewellery which cannot be found elsewhere. SP has surveyed such artisans and catalogued their products so that anyone can buy their handmade goods through the e-mall. According to Dr Benten, "SP is utilizing its delivery and logistic networks, as well as its offices and computer network to provide services to the people anywhere and foster Saudi economy".

2. The postal e-mail service

In 2007, Dr Benten signed an agreement with Bill Gates, founder of Microsoft Corporation, to launch a long-term strategic relationship between the two companies whose objective was to integrate the traditional post with modern electronic services, e-government, and e-commerce services. According to this agreement, five million e-mail addresses were provided free to Saudi citizens. This will supposedly raise the use of e-services among the population to 25%. SP provides every Wasel subscriber with a secure e-mail address which is composed of the 13-digit address code followed by the Wasel domain (e.g. the e-mail for Figure 1's customer is 2345@12282.wasel.sp). This e-mail address is linked to a unique number identifying the customer in the Saudi Post database. If the customer changes his residential address, e-mails are directly forwarded to his new e-mail address.[7] The postal address thus becomes linked to the unique identity of the client which is stored in the electronic CRM system, enabling the seamless integration of the physical and electronic platforms and consequently the creation of ubiquitous services.

Through this trusted postal e-mail address, citizens of the Kingdom can benefit from secured e-government and e-commerce services. For instance, SP has launched a new direct mail company that sends relevant JPEG-formatted promotional materials to the inboxes of willing clients, according to their registered profile, who can then choose whether to receive further materials and samples by post. The result is a highly targeted and cost-effective marketing platform, with positive environmental implications.

B. E-commerce

The new addressing system is contributing significantly to the growth of the national and global e-commerce. Due to the increased reliability of the postal service, businesses in Saudi Arabia are starting to adopt e-commerce business models and sell their products online. Saudi Post provides two new services: Saudi Locator for Business Sector and a USA address service, linking the new addressing system to the development of e-commerce.

1. Saudi Locator for business sector

Saudi Locator for business sector solves the problem of locating addresses, which is considered an obstacle for providing various e-commerce solutions in Saudi Arabia. Businesses which do not have their own geographic system can use Saudi Post Locator to develop e-services and effectively reach their clients. Companies can also integrate their existing geographical system with postal address data. Thanks to the locator, companies can save on operational costs by accurately locating addresses. As Dr Altaf points out, "*The new postal service is great for businesses because now it contributes to reducing operational costs by helping them save time, money, and effort when transacting with customers—this was not possible earlier*".

[7] If a citizen called Mohammad moves out of his house, he has to notify his contacts that he has changed his residential and e-mail addresses. He also benefits from a certain period of time where his mail and e-mail sent to his old addresses are directly forwarded to his new ones. Also, the new client who moved into the house where Mohammad used to live will receive the same address with an additional number (2345.1@12282.wasel.sp) so as not to receive e-mails for the former resident. Using the same logic, each member of a family resident in the same place can have his or her own e-mail address (e.g. Mohammad's wife will have 2345.1@12282.wasel.sp and Mohammad's son's e-mail would be 2345.2@12282.wasel.sp).

2. The USA virtual address service

Saudi Post now offers all Wasel subscribers the ability to shop at American e-stores via the Internet by providing them with a US virtual personal address. Thanks to this US address, customers can shop from stores that require a postal address in the United States, as well as benefit from offers presented by some websites which deliver the purchases free of charge inside America, while also benefiting from advantageous rates for shipping to Saudi Arabia. Any purchases bought online in the United States and delivered to this virtual address will be forwarded directly to the Wasel address in Saudi Arabia. Eng. Esmail points out that *"during the four first months of the launch of the US address service, the volume of parcels was significant. SP is also planning to provide the same service for China and Europe as many goods there can be attractive for the Saudis"*. The postal address model has hence become a necessity for the growth of cross-border e-commerce.

C. E-government

Government security agencies can rely on the new postal address to provide e-government services in a secure way. For instance, the postal e-mail address has opened up new channels of communication between citizens and the government. Dr Benten points out that *"the e-mail address we provide to Wasel subscribers represents also the physical address data. As a result, government agencies can use our address database or online services to communicate with residents."* (Faryal Mirza, 2009)

The availability of data on the location of homes and their owners has, moreover, proved to be an asset for many government organizations in Saudi Arabia. A prime example is the use of this data by the Social Security Agency to deliver welfare benefits to beneficiaries anywhere in the Kingdom. Saudi Post has also provided the mapping service to the police system and emergency services. As Dr Altaf explains, *"previously, if citizens required an ambulance, they struggled to provide travel directions to their address. Now, using the mapping service, hospitals can quickly send emergency help to patients."* (Microsoft, 2008)

In particular, the water sector has benefited significantly from the new address system to provide e-services for the citizens. Sometimes, Jeddah's population has difficulties finding water tankers when there is a cut in water supply to their houses. Usually, they go in person to one of Al-Ashyab water stations, where they find crowds with hundreds of people requesting water tanks to provide their houses with water. Saudi Post's detailed maps have been integrated within the Suqia project in order to solve the problem. Anyone who needs water provision to his house will simply need to call a unified station number and give his new postal address. The employee will then enter this address into the Suqia system. He will see on the screen a map of the client's location with the adjacent street names. Water tankers are continuously filled up with water from the water station and automatically transported to the exit gate. There, the map shown on the screen is printed with the postal address and the telephone number of the customer to call in case of problem.

In November 2008, the Minister of Water and Electricity signed a cooperation agreement with SP to benefit from the new addressing and distribution systems. He has indicated that the digital postal number may be used as an alternative to water and electricity meters' identification numbers, making the postcode a unique identification number for the various infrastructures in the country. The Minister also pointed out that the Ministry of Water has been closer to its customers thanks to the Wasel project and the new address system. [8]

IV. Creating entrepreneurial organizations in the postal business

In the previous sections, we have shown that SP has created a dynamic synergy between the physical postal and electronic infrastructures to create new, radical, innovative services. Obviously, in order to reach this goal, SP followed an interesting organizational change process from which other organizations can learn to improve their competitiveness. In this section, we analyze and show how SP became an entrepreneurial organization transforming the traditional postal business into a competitive business changing the economic landscape.

Answering this question is particularly important in the postal sector. A previous study conducted by the Chair MIR at the Ecole Polytechnique Fédérale de Lausanne (EPFL) showed that the main factors driving the changes in the postal industry are: growing competition, new customers' demands, the growing role played by the ICTs, a serious need to reduce costs, and sector regulation (Abdallah, Felisberto and Finger, 2006). The ability of any operator to create and sustain competitive advantages in the long run will depend largely on how well the operator deals with these changes in its environment by managing to exhibit innovative behaviour. The study showed that postal operators are aware that ICTs are indeed an opportunity for the mail industry, as 95% of the respondents agreed that their future competitiveness will heavily depend on the good use of ICTs. Nevertheless, 69% of incumbents confessed that they could improve the way they made use of ICTs. These figures show that not all operators are able to master the active role played by the ICTs to transform the *"traditional Post from a well-managed organization providing basic services" into a "commercial Post, where products and services are developed based on market opportunities and the requirement of the shareholders"*.[9] Thus, it is important to understand the process of change that SP has undergone in order to succeed in creating the synergy between the traditional Post and ICTs. To this end, we will first analyze the different types of innovation that have oc-

[8] http://archive.al-jazirah.com.sa/2008jaz/jan/11/ln6.htm.

[9] UPU Strategic Planning Group (March 2006). The future of the postal sector in a changing global environment 2012. Berne: UPU, page 16.

curred during the process of change. Later we will determine some organizational capabilities that postal operators should develop to master the change and become entrepreneurial.

A. Types of technological innovation

Technological innovations are often categorized into different types, each requiring different kinds of underlying knowledge and organizational capabilities and having different impacts on the industry's customers and firm's performances. We suggest that the types of technological innovation that are occurring in the postal sector can be classified according to two dimensions: 1 the nature of the technological change (component or system level); and 2 the market value (preserved or new) (see Figure 7).

Figure 7: Typology of technological innovation in the postal sector

		Market value	
		Sustained	New
Technological change level	Component	Incremental	Niche
	System	Architectural	Radical

The first dimension is related to the nature of the postal network. The postal network is, indeed, a networked system, which means that it is an interconnected group of systems which are made up of the linkage between different components. Postal operators can thus use new technology to improve their business at two levels; either the component level (e.g. a sorting machine), or the linkage level (e.g. linking the CRM system to the sorting system to directly forward the mail). The second dimension refers to the impact of the technological innovation in terms of market value. Technological innovation can preserve the same market value for the postal operator but can help it in cutting operational costs and enhancing the service quality (e.g. a technological sorting machine does not change the value of the postal service but enhances the process efficiency). Otherwise, technological innovation can create new value for the postal market (e.g. introducing the e-mail service). Below, we explain each of the innovation types, based on the example of the address postal system of Saudi Arabia.

i Incremental innovation: An incremental innovation uses new technologies to enhance the efficiency of one segment of the postal process. Originally, a digital code address system was required to enhance the mail delivery process in the Kingdom. The project's purpose was to automate the mail process delivery and hence to cut SP operational costs, such as training employees, and the time to sort and deliver the mail. However, customers cannot perceive new value in the mail service on the basis of this innovative strategy alone.

ii Niche innovation: A niche innovation occurs when the technological change at the component level is used to create new value. For instance, thanks to the implementation of the address system and the post boxes, people are able to send and receive mail at their residence, or easily locate an address, etc.

iii Architectural innovation: An architectural innovation takes place when the technological change occurs at the linkage level between two components of the same system or between two systems. An architectural innovation usually has an impact on the overall efficiency of the postal network. One example is the linkage of the mapping system, Wasel vans, the HHT readers, and the control room. This linkage allows SP to monitor the pick-up and delivery process and to make the right decision at the right time, thus enhancing the overall mail process.

iv Radical innovation: When the technological innovation at the linkage level is the basis of the creation of new services and products, it is a radical innovation. Usually, this type of innovation allows postal operators to generate new income and, hence, gain competitive advantage. The linkage between the addressing system and the CRM system has allowed SP to provide each citizen with a unique e-mail address which can be used to track mail, and receive e-services and e-government services, thus benefiting from the synergy between the physical and electronic infrastructure. The e-mall and the US address services are also radical innovations stemming from the integration of the physical and the electronic infrastructures.

The typology explained above shows that postal organizations have to master the development of different forms of technological innovation to improve their business performances. However, the highest income is generated when the technological change occurs at the linkage level between the physical and the electronic infrastructure and helps create new market value for the customers. Reaching this goal is not a straightforward task for organizations, and requires developing certain unique organizational capabilities, and overcoming significant challenges.

B. Organizational capabilities for technological innovation

Entrepreneurial postal organizations with strong capabilities to innovate do not only adapt to the changes in the business ecosystems, but also shape these ecosystems by creating new business models. We have shown that the integration of the electronic and physical infrastructures is a first step toward creating these business models. Next, we will list and explain some major organizational capabilities that SP has developed in order to transform itself into an entrepreneurial organization.

1. Creating a new vision for the organization

The historical organizational structure of incumbents is often a barrier for innovation and incompatible with the fast development cycle of ICTs. Developing a new vision and an appropriate corporate structure for the organization becomes a must in order to master the use of new technologies and enable the creation of new business models. Top managers at SP have begun to think about how the future can be different from the past. They re-invented the mail identity (the logo of the company) as a symbol of the beginning of a very significant strategic change. The organization was restruc-

tured and an independent IT business unit was established to ensure that the organization could keep pace with the latest technology, and to assist all the other units, such as post offices, logistics and banks in embracing the ICT age. Hence, the IT unit created the right dynamics between the different business units which ultimately led to the creation of new business models. Also, one of the divisions of the IT business unit is the "Postal Technology Centre", which aims to develop new postal technological solutions. This centre conducts specific research in order to decide on the best technology to use and adapts external innovation to the postal business environment.

2. Choosing the right technology

Once a new idea about a new project is generated, the choice of the technology to implement this project becomes important. Choosing the most recent and costly technology may be risky. First, the technology may not be mature enough and the cost of replacing it shortly by a new version can be high. For instance, SP did not choose to provide each letter with an RFID tag, but only the post boxes, mainly because the RFID technology is not yet mature and is still costly.

Secondly, the external technology should be adapted to the postal environment. We have seen how the new addressing system takes into consideration political and geographical factors related to the Saudi environment. Also, the RFID tags were designed to be resistant to weather factors.

In addition, the choice of technology provider is critical in using ICTs effectively. As Eng. Esmail explains, *"We appreciate working with partners with whom we already had success stories. We used technology for which support is more widely available within the country compared to others. Also, we chose the technology which can be integrated easily with our existing technologies and helps us maximize return on our previous IT investments."*

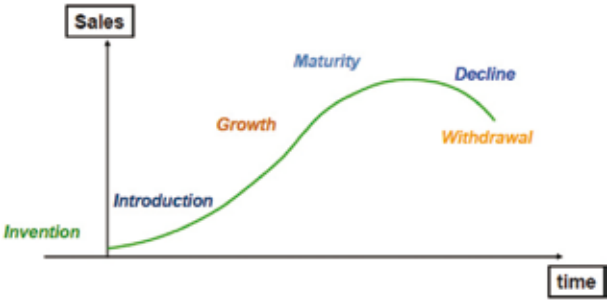
3. Supporting creativity

ICT developments outside the postal industry are just a tool for operators to enhance their businesses. To make the most of the use of ICTs, postal operators have to support internal creativity in their organizations by giving incentives to their employees to propose solutions for integrating ICTs into the postal world. Eng. Esmail points out that SP had to rely on young professional people to understand the use of the new technology and to adapt it to the postal world. He added that the culture of team work inside the IT department is very important for creating new ideas and for realizing integration between the different systems. For instance, SP employees have realized the integration of the mapping system and the CRM system enabling the creation of an application whose aim is to geographically monitor the number of mail items sent and received, and the nature of the mail services that customers are willing to pay for. The application thus assists decision-makers in the organization in monitoring their business performance and can also serve as information for marketing companies. In addition, in order to encourage the creative spirit of SP employees, a reward for the best developer in the IT department is offered twice a year. And training courses are organized so as to improve the qualifications of employees (780 Saudis were trained to work in the postal field in 2008).

4. Communicating the change to the different stakeholders and to the market

An invention becomes an innovation when it is commercialized. An invention is the creation of new products and processes by developing new knowledge or combining existing knowledge in a new way. A product becomes a successful innovation not only by being technologically feasible, but also by being sellable and meeting customers' demand. It is claimed that every product has a life period; i.e., it is first launched, then it grows, and at some point, it may die (see Figure 8. However, most products fail in the introduction phase. Certain knowledge and capabilities from managers are then required to succeed in the introduction phase and move as soon as possible to the growth phase where products become profitable for the enterprise.

Figure 8: Product life cycle



Source: Schilling, 2005

SP is still in the introduction phase of the address system and is facing several challenges from which postal operators and decision-makers can draw lessons for the future.

First, the operators had difficulties in convincing municipalities to implement the project. Municipalities resisted accepting the implementation of the address system by the postal operator either because they had their own system in which they believed, or because they thought that it was their role to implement such a system for their cities and hence secure adequate support from the Government. Saudi Post started the negotiations with Riyadh, Jeddah and Dammam municipalities. It tried to convince them that conducting the project at the municipality level would lead to a lack of interoperability between the different municipalities' address systems, and a national address system for the whole country was hence required. Later on, the municipalities became convinced that the Post was the only actor that could realize a project that could prove beneficial for the whole country, and could be used by the different government agencies.

We know that for instance other Arab countries are also trying to implement their own address system and are facing similar challenges. As Dr Benten says, *"Talking about numbering is usually controversial in some countries. It is not an easy issue to tackle as there are questions about who should do it, and whether it should be the Post, the authorities or the*

federal government. We think people in the Arab world and Asia will figure out that with formal addressing you can use map navigators and be reached through GPS and databases." (Faryal Mirza, 2009)

Second, SP is facing problems in creating awareness about the value that the customers can derive from using the new system and the related services. Changing the culture of the people vis-à-vis the Post is a fairly challenging task. Saudi people still have in mind the old traditional image and are not aware of the critical role of the Post in helping them to access the different services. SP has tried to communicate the change through different channels such as television, brochures, and conferences. However, it is still not enough for people to assimilate the new image of the Post and to participate in the change. SP therefore has to maintain two parallel systems: the old P.O. box system, and the Wasel (delivery at home) system, since many people still have not migrated to the new service. When asked about SP's focus in the future, Dr Benten replied, *"We will make sure that people realize that the Post is an infrastructure for their life. We want them to understand that we are here to serve them, and that e-commerce and e-government services cannot be developed without the Post."* (Faryal Mirza, 2009)

Conclusion

To summarize, this chapter presents and analyzes Saudi Post's new address system. We began by determining the incentives for the postal organization to implement a new digital address system. In the second section, we explained how advanced technologies have been used to create the address system. We also analyzed the impact of the project on the mail process and on the postal business. The third section analyzed how SP has succeeded in integrating its electronic and physical platforms to enable the creation of new e-services and the development of e-commerce and e-government services. The last section was particularly important in clarifying the organizational change process which SP had to undergo so as to integrate the electronic and physical infrastructures and ultimately provide innovative technological services.

This chapter is intended to raise decision-makers' awareness about the critical role that the postal industry has to play in developing national e-government strategies and in promoting global e-commerce. It also shows the impact of the synergy created between ICTs and the postal industry in terms of the generation of economic growth in emerging countries. Furthermore, it provides managers in the postal sector with some guidelines for pursuing similar innovative projects, and especially highlights the role of top managers in supporting innovation and the creation of an organizational culture striving to exploit new business opportunities related to the use of ICTs. It also shows that technical issues can be reduced if organizations hire qualified employees who are capable of integrating the different technological solutions into the postal environment. In addition, the case highlights some of the major challenges for undertaking new projects at the infrastructure level. Using new technologies developed in other industries is essential, but there is substantial work to be done by postal organizations to integrate these external innovations to the postal business. Also, engaging the different stakeholders in the projects can be difficult, though essential for the implementation of such network infrastructure projects. Communicating the change to the customers remains a critical mission to create awareness about the new identity of the Post and encourage them to adopt the newly proposed services in order to reach a level where the network achieves its desired efficiency.

Recognition and awards

SP's address system has been recognized by multiple international awards:

2007 The World Mail Award for Transformation
2007 The Word Mail Award for Corporate Social Responsibility
2007 Cisco Best Corporate IP Network Award
2007 Oracle Excellence Award
2007 ECDL Award for Leadership in the Diffusion of New Technologies
2007 Microsoft Postal Industry Innovation Award
2008 UPU Quality Award with class A
2008 Oracle Excellence Award
2009 Intermec Award for Innovation
2009 Environmental Systems Research Institute Award for GIS Technology Innovation

Annex 1: Building the five-digit zip code

1. Postal regions

The entire Kingdom has been divided by SP into eight key regions on the basis of administrative divisions that exist in the Kingdom and the distribution of road network and geographical features.

2. Postal sectors

Each region has been divided into a maximum of eight sectors on the basis of the following rules:

2.1 Excluding sector No. (1) as it has been reserved for the use of Government or other special services.

2.2 Assigning the first sector number to the region's commercial capital.

2.3 Attributing even numbers for sectors which are located in the southern part of the commercial capital, and odd numbers for those in the northern part. (The purpose of this kind of distribution of numbers for sectors is to facilitate easy reach to a postal sector, which is, geographically located in a particular region. (See Figure 9)

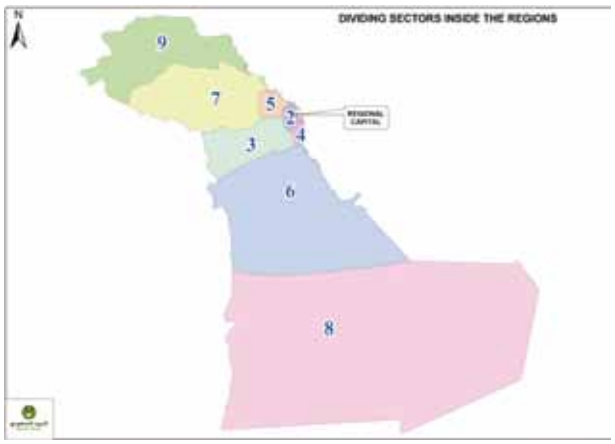
2.4 Considering the boundaries of governorates, which are the divisions of administrative areas of the Kingdom.

2.5 Considering the natural and geographical factors such as mountains, plains, and valleys that fall between the governorates.

2.6 Considering the economic expenditure for granting services like mail distribution.

2.7 Considering population density and its distribution over the sectors.

Figure 9: Numbering postal sectors



3. Postal branches

Each sector has been divided into a maximum of eight branches on the basis of the following rules:

3.1 Excluding branch No.1 as it has been reserved for the use of Government or other special services.

3.2 The boundaries of all branches should either intersect with the main roads if possible, or with the main streets at least.

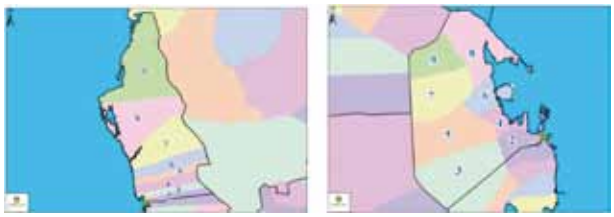
3.3 The branches should be numbered differently based on the geographic nature of the sector: landlocked or coastal:

3.3.1 For landlocked sectors (see Figure 10): First the point of the main axis of each sector is identified. Then, branches which are located in the western part of the point of axis take odd numbers which are 3, 5, 7, and 9 in ascending order. This means that the postman has to move towards the west of the axis to increase the odd numbers. And branches which are located in the eastern part of the point of axis take even numbers which are 2, 4, 6, and 8. This means that the postman has to move towards the east of the axis to increase the even numbers.

3.3.2 For coastal sectors (see Figure 11): The branches in these sectors have been numbered in an ascending order starting from the main axis to the northern direction. The branches of coastal sectors which are not lying completely parallel to the coastline have taken even numbers and those farther from the coastline have taken odd numbers.

Figure 10: Numbering postal branches of landlocked sectors

Figure 11: Numbering of postal branches of coastal sectors



4. Postal divisions

Each postal branch has been divided into a maximum of nine divisions on the basis of the following rules:

4.1 The postal branch has been divided into divisions of approximately equal size. Where the divisions differ in size, this is due to geographical factors between the divisions or differences in the population densities of the areas.

4.2 The postal divisions are divided on the basis of main streets and collector streets from the classification of roads. The postal division which is the nearest to the point of axis takes the smallest number. Moving away from the point of axis, the quarter's number increases (see Figure 12).

Figure 12: Numbering postal divisions

5. Postal quarters.

The last digit of the zip code number corresponds to the postal quarter. All postal divisions are divided into a maximum of nine quarters on the basis of the following rules:

5.1 The area of the quarter has been fixed at not more than 4 x 4 kilometres. The more populated quarters are kept at 2 x 2 kilometres, and the most crowded quarters with buildings are kept to 1 x 1 kilometre.

5.2 Postal quarters are numbered in the division based on the distance from the axis point: The nearest takes the smallest number and the quarter's number increases as you move away from the point of axis.

5.3 The boundaries of quarters are in compliance with all types of roads.

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ICTs, new services and transformation of the Post: Guidelines

Faced with competition from private operators on the one hand, and faster alternative means of communications on the other, the traditional mail business of most public postal operators is under pressure. Today, product and service diversification is needed. As a result, postal operators are searching for new business opportunities, particularly in the financial and logistics sector. Fortunately, there is growing realization among operators that they have to extensively use and leverage ICTs to compete with the established players in these sectors.

A significant fact which has emerged from the case studies described in the preceding chapters is that while the success which was achieved was rooted in the inherent strengths of the postal enterprises, their nationwide retail, distribution and delivery network and also the public confidence reposed in them, the ICT-based projects which were implemented in turn enriched these postal enterprises, making it possible for them to improve the quality of their existing services and introduce new value-added services.

While ICTs can be leveraged in many ways to improve efficiency and productivity and boost revenues of postal enterprises, the case studies in this book contain some very interesting examples of how ICTs can be leveraged.

Since financial inclusion is considered a key to economic growth, governments in many developing countries are encouraging postal enterprises to use their vast rural network to provide a range of financial services. It is widely acknowledged that savings play an important role in stimulating economic growth. India's Chief Economic Adviser, Dr Kaushik Basu, has recently noted that "strong economic growth came to India on the back of high savings in the economy, averaging about 38% and expected to cross 40% in the next couple of years", adding that, "as already discussed regarding East Asian economies, India's saving and investment rate will be key to its achieving a high rate of growth". He identified one of the key reasons for the high savings rate as being the rapid expansion of bank branches in the hinterland, making "financial services available to the rural populace".[1] The Post's rural network provides a cost-effective option for mobilizing rural savings and extending microcredit to small farmers and traders.

Many postal enterprises in developing countries which do not yet provide banking services are looking forward to doing so because of the decline in their traditional mail business. This resolve has been strengthened by recent success stories with the French Postal Bank and the Kiwi Bank of New Zealand Post (launched in 2002). Postal enterprises which already provide banking and financial services are keen to bring their services to the level of private banks, where the use of ICTs is predominant.

The Banco Postal study demonstrates how Brazil's rural economy was stimulated by providing the financial services to the "unbanked". It has also shown that financial inclusion can emerge as a profitable business by leveraging technology to lower costs while increasing the range of services. The installation of cash dispensers or low-cost ATMs in rural branches and automated processing for small loans have lowered the operating costs.

Many governments in the developing and least developed countries are keen to make the benefits of ICTs available, particularly to disadvantaged communities in rural and remote areas. According to a recent OECD study, since the late 1990s, when the Internet fully arrived on the scene, development agencies and governments have incorporated ICTs into their network of development policy tools. The OECD feels it would now be better to regard ICTs "not just as one tool among many, but as a unique technology with a transformative potential for development".[2] With its vast and extensive network of outlets, the Post is usually seen as a natural partner for efforts to bring the development initiatives of governments and international development agencies to disadvantaged communities in rural and remote areas. The Bhutan Post and BotswanaPost studies have shown how the post office network and the ICTs can be combined to benefit both the Post and excluded remote and rural communities.

Many postal enterprises are keen to enter e-commerce and Internet shopping sector, since they already have a strong distribution and delivery network, which is critical to the success of any e-commerce venture. Since efficient distribution is not possible without a proper address, many developing countries that do not have a proper addressing system want to introduce such a system in order to conduct e-commerce ventures and improve the quality of their services. The case studies of Saudi Post, Korea Post and Poste Italiane show how successful such ventures can be.

Although the efforts of the seven postal enterprises in question were successful, it is important not to underestimate the challenges and difficulties of ICT projects. Here, guidelines for preparing and implementing projects involving the use of ICTs will prove useful to postal enterprises interested in undertaking similar projects.

The insights gained from the experience of others can be very useful for initiating new projects. An attempt has been made in this chapter to analyze the projects described, with a view to identifying the critical factors that either contributed to their success or posed serious challenges to their successful execution and operation. On the basis of this experience, guidelines have been prepared for the successful replication of ICT-based projects elsewhere.

[1] The Indian Express (New Delhi), 5 January 2010.
[2] The Development Dimension, ICTs for Development, Improving Policy Coherence, OECD, 2009.

Critical elements of success

While the projects described in this collection had different scopes and objectives, an analysis of them reveals that their success was due to several common factors.

A supportive policy and regulatory environment

A supportive policy and regulatory framework have played a key role in ensuring the success of these projects.

Bhutan Post's project to set up telekiosks in post offices to make the benefits of ICTs available was directly linked to Bhutanese government policy. The Royal Government of Bhutan recognized that the development of information and communication technology offered the country the vast potential to overcome the constraints resulting from its isolation, mountainous terrain and difficult access. It sought to "harness the opportunities arising from developments in information and communication technology to enhance communications, e-governance and, as a source of employment".[3] The key objectives of the communication and ICT sector in the Ninth Plan (2002–2008) were the expansion of telecommunication services and the promotion of e-governance. The strategies adopted to achieve these objectives included the establishment of public telekiosks to "enable people to obtain government information and forms online and send and receive letters and other correspondences electronically".[4]

When the ITU and the UPU invited the Royal Government of Bhutan to join the project, it readily agreed since the project's objective was consistent with its goal of making Bhutan a modern e-society. The Royal Government also played a valuable role in the project's implementation, facilitating the legal and regulatory clearances from the authorities concerned and waiving the various government duties and levies on the equipment imported into the Kingdom for the project.

Botswana's government has a national ICT policy known as the "Maitlamo", whose main objectives are to make Botswana a "globally competitive, knowledge and information society where lasting improvements in social, economic and cultural development are achieved through the effective use of ICT", create an "enabling environment for the growth of an ICT industry in the country" and provide "access to information and communication facilities in the country". BotswanaPost gives the government critical support for achieving its objective of providing access to ICT services through its network of post offices. One of the goals of the postal sector policy is "to increase access for the population to all communications services in the framework of the telecommunications, ICT–Maitlamo, broadcasting and printed media policies and postal policies with combined activities in smaller communities within the country through the use of so-called Kitsong centres". The project to establish Kitsong centres in post offices is jointly financed by the Government of Botswana and BotswanaPost, because the project's objectives relate directly to the government's national ICT policy.

ECT's Banco Postal project reflects "the wider development goal of social and economic inclusion being pursued by the Government of Brazil". With the government regarding the lack of access to banking services as a major hindrance to achieving its development goals, the Brazil's National Monetary Council passed a resolution in 1999 allowing commercial and government banks to contract with retail businesses (shops, pharmacies, supermarkets, post offices, etc.) to offer basic banking services through their networks. It was this regulatory change that enabled ECT to offer financial services as a banking "correspondent". From the beginning, the operator wanted to "ensure that the goals of Banco Postal were in congruence with and provided support for overall public policy goals". The government's view that post offices were ideally suited to operate as banking correspondents is evident from the technical agreement it concluded with the Bank of Brazil in 2000 "to complete pilot tests with 36 post offices to gain experience with the banking correspondent functions and processes …".

For Poste Italiane, while there was no specific government policy facilitating its project's success, there were no policy constraints either. Unlike mobile phone operators, which require a mobile network licence, PosteMobile did not need a licence to operate as a virtual mobile network provider. Furthermore, one critical factor contributing to the success of PosteMobile was the link-up of the PosteMobile SIM card to a BancoPosta bank account and/or to a PostePay pre-paid card. The postal administration has offered savings accounts and savings bonds on behalf of Cassa Depositi e Prestiti (CDP), a joint-stock company under public control since 1875. It did not need a banking licence to create BancoPosta as a separate entity in 1998, offering many new financial services and products in partnership with third-party companies, including banks and investment funds. BancoPosta owed its creation to the absence of any hindrances relating to policy. The difficulty in obtaining a licence or authorization to provide banking and other financial services is a well-known fact.

Saudi Post's Wasel project was aided by the Kingdom's policy of applying "the latest technologies to improve services in all government organizations" and to "foster economic and social growth".

In the case of Korea Post, the Korean government nurtured the postal shopping project from the outset. In the 1980s, the government was seeking effective measures to boost the rural economy and reduce economic disparities between the rural and urban areas. One initiative it launched in 1986 was a service to sell local farm and marine produce through the postal network. The government's resolve to encourage the growth of postal shopping was further strengthened when the Asian economic crisis, and the opening up of domestic markets (including the agricultural market) by the Uruguay Round in the mid-1990s, exposed local producers to foreign competition. It felt that the growth of e-commerce would help to make the country more competitive and regarded the

[3] Ninth Five-Year Plan, Royal Government of Bhutan, page 96.
[4] Ibid, page 97.

Post's e-commerce business as a strategic project that was part of governmental policy to promote the IT industry and business. It expected Korea Post to contribute to the development of sound e-commerce practices (quality guarantee, certification and refund systems) through its ePOST service.

The Russian Post's efforts to introduce new electronic services such as Cyber Money, Cyber Post and Cyber Press and its increased use of ICTs in its operations can be traced to the Russian Government's approval in 2001 of a "new concept of postal service development" and its approval in 2002 of "e-Russia" as a multi-sector plan to "bring forward and coordinate the development of the information society". These two concepts can be regarded as the "cornerstones of the government policy of introducing ICT-based new services in the Russian postal system, and of reshaping one of the last unreformed public services into a nationwide network facilitating payments, communications, logistics and trade". The Post has been granted licences with authorization to operate the ICT-based services through the postal network. The licence to operate Public Internet Access Points "can be considered the most critical one, as it forms the basis for a new type of universal service obligation whereby the post office network grants public access to the Internet and other electronic services".

ICT infrastructure and IT capability

The importance of building an appropriate ICT infrastructure and IT capability was duly recognized by all postal enterprises. IT infrastructure is understood as comprising "computer and communication technologies and shareable technical platforms and databases".[5] IT capability is defined as an organization's ability to make the best use of an IT infrastructure, which could require changes in its structure and culture, business processes and human resource capabilities.

The origins of the Banco Postal project go back to 2001, when ECT began implementing ICT projects "to create a corporate network" and "improve current postal operations and management", while laying the foundation for future services. ECT now has a "real-time operations-driven network that supports business applications at more than 12,000 online counter terminals … in every city and municipality in Brazil". The operator has spent some 177 million USD on ICT projects, including its Banco Postal project.

The job of Banco Postal is to collect and pay out the funds received from customers, while its partner, Bradesco, is responsible for managing these funds. Banco Postal has its administrative headquarters in Brasília and is managed by eight executives; there are also 11 regional managers and 150 local managers. ECT cooperated with IBM and Bradesco to develop a "comprehensive training package" to enable post office employees to carry out retail banking transactions and process loan applications.

After its conversion from a state entity to a publicly owned company in 1998, Poste Italiane "embarked on a long-term transformation, aimed at improving productivity and growing new business areas". It adopted an "overall strategy of diversification and modernization" and began to make increasing use of ICTs to improve the efficiency of its operations.

It is Poste Italiane's role to continually pursue "technological innovation and the modernization of systems". Its serious investment in infrastructure and training has improved the professional qualifications of its employees and has modernized post office facilities. In 2008 alone, it invested a total of 712 million euros in infrastructure networks and ICT systems, up from 608 million euros in the previous year. The Poste Italiane Group's postal system is now "supported by a technological infrastructure that is among the most advanced in the world".

PosteMobile was set up as a separate entity fully owned by the parent group. Its staff was recruited mainly from the telecommunications sector. Their principal skills and know-how did "not differ much from any other information and communication technology company, both in the business lines and in staff areas". People with "specific skills and know-how" were recruited to provide mobile financial services.

Saudi Arabia's government restructured Saudi Post in 2002 as a "private holding company of eight business units, each corresponding to a segment of the postal value chain (transport, delivery, EMS, post offices, postal services, financial services, property management, IT and telecommunication)". It also established a postal technology centre as a division of the IT business centre "to develop new postal technological solutions … and determine the most suitable technology to use in the postal business".

After creating a suitable organizational structure, Saudi Post endeavoured to adopt "advanced technical solutions" in order to "enhance postal service quality and efficiency in the Kingdom", focusing on human resources development to achieve that goal. It designed and implemented many new IT-based projects with the help of national and international companies to "provide the widest range of postal products and services to meet customers' needs in all areas". One such project was the introduction of a 13-digit postal address system described as "one of the most accurate systems in the world" for locating an address.

Until early 2002, Korea Post had operated as a traditional government department with very little autonomy. Its organizational structure was considered inappropriate for the growth of ePOST shopping. The government also felt that traditional government enterprises were unable to take on such external challenges as the increasing competition in the banking and logistics industries. A new Korea Post endowed with greater autonomy was created in 2002 as an independent organiza-

[5] Ross et al., cited in Man Zhang, et al "Effects of organizational structure and information technology capability on organizational effectiveness in emerging markets", Journal of the Academy of Business and Economics, January 2004.

tion that nevertheless remained part of the government. To support ePOST shopping's IT systems, a Computer Management Centre was set up within Korea Post and has since developed into an independent department – the Korea Post Information Centre – capable of developing and managing Korea Post's information systems.

The new Korea Post launched a series of IT projects designed to systematically strengthen its ICT infrastructure and capability, including the Business Process Reengineering and Information Strategy Planning project from August 2001 to December 2001 and the project to install IT systems for mail acceptance, transport and delivery, implemented from December 2001 to August 2003. Between September 2003 and July 2004, it extended these systems to include e-post shopping, hybrid mail and call centre and customer relations management. Once these systems had stabilized, the operator introduced the next generation of postal logistics systems in 2006, followed by a disaster recovery system in March 2007 and a portal system for business customers in 2008.

The Russian Post realized early on that a huge amount of investment would be required to build an ICT infrastructure to support the cyber services it planned to introduce. It invested 40 million USD so that postal remittances could be sent electronically throughout Russia.

Bhutan Post's basic ICT infrastructure was the outcome of its project entitled "E-services for development: Initiatives through post offices in Bhutan". Prior to that project, its ICT infrastructure (equipment and IT staff skills) was considered rudimentary at best. Substantial resources for IT skills training were included in the project budget and basic training was organized for staff in Bhutan and India in cooperation with India Post. Bhutan Post established a separate IT unit at its headquarters in Thimphu to handle problems or complaints from post offices relating to hardware and software, and to train post office staff. The unit has taken the initiative to develop online tracking system for domestic express and registered mail and parcels.

BotswanaPost began building its ICT infrastructure in the early 2000s by computerizing counter services and back office operations in selected post offices. The project also consisted in analyzing all counter products and operations, including those in the back office, introducing revised procedures and software customization and developing operating manuals and training programmes. Counter automation was seen as a means of delivering "additional services such as banking, bill payment and the sale of insurance". By early 2010, counters in 76 of the country's 119 main post offices had been automated. BotswanaPost plans to automate counters in the remaining offices by late 2010 so that all transactions can be conducted online in real time. Staff with specialized IT knowledge were recruited to operate and manage 24 of the country's 49 Kitsong centres to reduce the "risk associated with training existing staff". This new staff received training in areas where they lacked the necessary postal skills.

Feasibility study, due diligence and extensive research

For the majority of these projects, research of some kind was carried out to establish their viability beforehand.

Before the launch of the Banco Postal project in 2003, ECT, together with the Ministry of Communications, the Central Bank, the government-owned Bank of Brazil and Caixa Econômica Federal, undertook a pilot project in 2000 involving 36 post offices in mainly rural areas and poor communities "to gain experience with the banking correspondent functions and processes and to 'dry run' the system to determine where modifications were needed". The experience gained was used to "fine-tune the business model and business processes, training procedures [and] technological approach". ECT had spent three years planning the project's implementation, which involved "extensive research, analysis and presentation of results, including at least ten workshops (including representation by postal labour unions), together with thousands of pages of reports, cost/benefit analyses, draft legislation, and the lobbying of key stakeholders, such as the Central Bank, whose support was critical to the project". External consultants, including ING Postbank International Consultancy and ING Brazil, played an important "advisory role during those three years".

The pilot project led to the establishment of guidelines by the Central Bank for retail entities (including post offices) operating as banking correspondents, and confirmed the fact that post offices were in a position to act as banking correspondents. A feasibility study was also conducted to "determine the potential demand for retail banking services" and the "desired product attributes". Because lower- and lower-middle-income segments of the population were considered the potential market for Banco Postal products, the research done focused on these segments. There was also research carried out to "estimate the potential levels of demand for banking services offered through the postal network". This research was supervised by the Ministry of Communications, in cooperation with ING Postbank International Consultancy of the Netherlands. The Ministry had decided that ECT's partner bank should be selected by a public tendering process. Three banks responded to the call for tenders and the combination of a down payment bid of 75 million USD and the highest transaction fees and percentage interest proposed made Bradesco's the winning bid. The fact that previous research had established Banco Postal as a profitable offering accounted mainly for the interest shown in the call for tenders and the amount of the winning bid.

In Botswana, the government's decision to establish Kitsong centres was based on careful research. In 2000, the Botswana Technology Centre (BOTEC), a research and development institution established by the government, had carried out an assessment of information needs, concluding that rural communities needed information for their day-to-day professional and social activities and that these needs could be met through access to ICT facilities. To better understand the needs of rural communities, the Centre conducted a further

study in 14 villages and five settlements, leading to the formulation of a pilot project to develop an Internet-based computer communication system aimed at providing rural communities with online access to locally generated content delivered in a user-friendly manner. The pilot project focused on three Kitsong centres, where it was observed that the number of users continued to increase, that more users were male and that frequent users were more often young rather than elderly. It was also noted that a lack of computer skills was one of the main reasons why people did not use these centres. Computer training given at these centres was therefore necessary. Also considered during the pilot phase was the need to keep the distribution of information at one-stop centres cost-effective, to disseminate information that was relevant to specific community needs, to provide the best solutions to local problems from both national and international sources and to make the information easily available.

The Ministry of Communications, Science and Technology rolled out the Kitsong centres through the intermediary of BotswanaPost only after the pilot project had demonstrated it was possible to provide ICT services in rural areas to meet the growing information needs of their communities.

Lastly, in the case of Bhutan, the ITU had commissioned an external consultant to conduct a feasibility study, and it was only after evaluating his report that it decided to take the initiative forward and implement the project.

Project planning

Project plans were prepared by all postal enterprises before the implementation phase. Most of the structured planning and monitoring stages were duly followed. Project goals were defined, deliverables and key performance indicators identified and milestones established. One of the main reasons for the success of Botswana's Kitsong centres was the meticulous planning and implementation of the project. For Banco Postal, detailed project planning was carried out in cooperation with numerous local and international consultants. One of the lessons learned from implementation of the Banco Postal project was that large projects "require significant resources including technical expertise and adequate funding, along with the time needed for project research, planning, design, training, pilot testing, deployment and modification". In the case of Poste Italiane, a project plan had been formulated in early 2006 by the company's CEO, assisted by his Strategic Planning Director and a mobile communication expert, for the approval of the Board of Poste Italiane, which was obtained in late 2006. Although the details of the project plan are not given in the case study, it is implicit that the project plan would have followed the project's planning stages.

Business strategy

Each of the postal enterprises crafted a well-thought-out business strategy to ensure the success of its venture.

In the case of ECT, the management devised a strategy involving the provision of "financial services that were integrated and available online, in real time, in an interactive, customer-friendly basis … focused on populations in rural areas and citizens with limited economic means and limited access to formal financial channels" in order to avoid "competition with private banks for customers who already had access to banking services" and in partnership with an established bank which inspired confidence. The Banco Postal project focused on providing banking services in areas without a banking presence. In 2001, an estimated 1,750 municipalities did not have any banking services. By 2005, Banco Postal was operating in 96% of those municipalities, 405 of which were located more than 100 km from the nearest financial centre and, in most cases, were not connected to these centres by paved roads.

PosteMobile followed a strategy of differentiation from the competition. The decision to enter the mobile market was based not only on the fact that a business opportunity existed, "but also on the recognition that Poste Italiane possessed a number of unique competitive advantages that would increase the likelihood of success", including a large consumer base and an effective distribution channel. PosteMobile's strategy was based on the provision of "innovative, simple and convenient mobile services" and use of the mobile phone "not only as a simple and cheap communication tool, but also as a utility resource linked to financial services". It was also decided to focus initially on existing BancoPosta and Poste Italiane customers, immigrants and employees and their families. This business strategy proved to be highly successful. In its first year of operation, 83% of PosteMobile's customers had connected their SIM card to a BancoPosta account or Postepay card, demonstrating that this was indeed "the unique selling proposition of PosteMobile".

In Korea (Rep.), both "composite" and "specialized" shopping malls are in operation. Although the e-commerce market is dominated by the composite malls, specialized malls are also seeing steady growth. Competition in the composite mall arena is fiercer, owing to the presence of larger companies. Aware of how important it is to position its service strategically, Korea Post chose to operate as a specialized mall, focusing mainly on the sale of farming and fishing products. It succeeded very well because of its strategy of selling products from all regions of the country that could not "easily be found in other shopping malls". Another feature of its strategy was to sell "the best and the most reliable" products. There is an elaborate procedure for selecting its products and ensuring that its suppliers are reliable.

Another key element of Korea Post's strategy was the recognition early on that logistics and distribution were also critical to the success of any e-commerce venture. Until the mid-1990s, the country had only one mail centre for processing and forwarding mail to delivery post offices. In 1995, Korea Post modelled its new distribution system on a hub-and-spoke concept and prepared a master plan establishing the hub at the centre of the country in Daejeon and 22 mail sorting centres nationwide as the spokes. These sorting centres were, in turn, linked to more than 400 delivery centres. The Daejeon Exchange Centre, as hub, began operations in

November 1999, with the sorting centres gradually opening from 1996 to 2002, thus creating a nationwide delivery infrastructure.

Choice of appropriate partner

For Bhutan Post, a critical factor contributing to the success of its project was the multi-member partnership and regional approach adopted. The project began as a partnership between Bhutan Post, Bhutan Telecom, the ITU and the UPU, later joined by the governments of Bhutan and India. Bhutan Telecom played a key role in the project's implementation, ensuring Internet connections at the 32 telekiosks and basic telecommunication connections at five of them. The government of Bhutan facilitated the legal and regulatory clearances needed from the authorities concerned, while the Indian government provided not only the necessary technical and financial support, but also the space segment on its communication satellite free of charge for the duration of the project. The sharing of infrastructure with India significantly reduced the cost of the project for Bhutan. The ITU and the UPU also provided financial and technical support. In fact, the technical and financial difficulties encountered during the implementation were successfully resolved thanks to the efforts of the ITU and the UPU.

BotswanaPost implemented its project in partnership with the government of Botswana. The Kitsong centres are jointly financed by the government of Botswana and BotswanaPost. The government covers the cost of the equipment and the cost of operating the centres. In turn, BotswanaPost provides the operating staff and is expected to pay "all ongoing costs and replacement costs of materials used in the provision of services". The Kitsong centre project "could not have happened without this partnership". The government saw the project as an opportunity to fulfil its mandate of providing ICTs to all its citizens, while BotswanaPost viewed it as investment in technology to "expand its services … [and] to reinvent itself as a modern company providing a large range of integrated products and services …".

In Brazil, despite the high level of public confidence in ECT, the postal operator, owing to its lack of banking expertise, felt it necessary to have an established bank as partner. The restrictions imposed by the banking regulatory framework also played a role. The decision to partner with Bradesco, Brazil's largest private bank, proved to be a winning move. It not only offered the highest down payment (75 million USD) and transaction fees, but also had network coverage complementing that of ECT: its outlets were primarily in urban areas, while ECT's were mainly in rural areas. One of the main factors inhibiting the Post from providing banking services was the difficulty in arranging the supply of money at its outlets. Bradesco agreed to take on the responsibility of transporting money to and from postal outlets. Moreover, since Banco Postal account holders would also be considered Bradesco customers, they would have access to the bank's extensive ATM network and other services, such as Internet and phone banking.

Forming a strategic partnership with Vodafone proved beneficial for PosteMobile. It signed the deal with the British group to become a mobile virtual network operator, using Vodafone's physical infrastructure to "avoid expensive network investments, and focus on delivering its unique range of services". PosteMobile at the same time equipped itself with its own IT systems (for billing, customer relations management, etc.) and for a number of value-added services, enabling it to develop its own products and services and manage its own customers.

PosteMobile also entered into a partnership with Accenture for its fraud management system. Accenture provided and maintains the fraud management solution, which provides PosteMobile with information to "pinpoint fraud".

Saudi Post implemented the Wasel project with external technical assistance and subsequently signed an agreement with Microsoft Corporation in 2007 to launch a long-term strategic relationship in order to integrate "the traditional post with modern electronic services, e-government, and e-commerce services". One outcome of the agreement has been the free supply of five million e-mail addresses to Saudi citizens.

Korea Post considered a number of options for managing its e-commerce business: either create a new organization in the form of a government agency or entrust its e-commerce business to either a private shopping mall operator or to an external professional body, Korea Post Business Value, Information and Express (KOVIX), with which it had been associated for more than 10 years. KOVIX was chosen because of its "professionalism, operational know-how, experience in the management of products and suppliers" and its expertise in marketing and public relations. Besides managing Korea Post's e-commerce business, KOVIX is also responsible for the planning and management of suppliers and products. KOVIX's management work is based on an annual contract subject to renewal on the basis of a performance evaluation by Korea Post.

Management and institutional support

The role which can be played by determined leadership is best illustrated by Italy's PosteMobile success story. The idea to launch mobile services came from Poste Italiane's CEO himself, Massimo Sarmi. Before taking over the reins at Poste Italiane, Mr Sarmi had been Director General of Telecom Italia Mobile, Italy's leading mobile telecommunications operator. It was his "experience of mobile communications and deep understanding of that market" that shaped "the idea and subsequent strategy for entering this new market".

The driving force behind Saudi Post's Wasel project was Dr Mohammad Benten, President of Saudi Post, and his vision of making Saudi Post a competitive and innovative company offering e-commerce and e-government services by "integrating the electronic and the physical infrastructures and providing ubiquitous services to its customers".

In the case of Bhutan Post, the proposal to establish telekiosks in post offices was developed personally by Meghraj Gurung, the then Managing Director of Bhutan Post. He was also instrumental in bringing on board the Managing Director of Bhutan Telecom and obtaining the support of the Royal Government of Bhutan. He, together with the Managing Director of Bhutan Telecom, travelled to India to secure the support of the Indian government. The project also received consistent support from the country's top political and administrative officials. The Minister of Information and Communication and the Secretary of the Ministry of Information and Communication took a personal interest in the project. The coordination meetings of stakeholders, which were held periodically to review the project's progress and resolve the problems encountered along the way were all chaired by the Secretary of the Ministry of Information and Communication.

Creation of demand for services, incentives and tariff structures

While consumers are willing to pay higher tariffs for better services and products, all else being equal, they do want "value for money". The experience of the postal enterprises included in this collection shows that competitive tariffs played an important role in the success of their projects. Not only are Banco Postal's fees lower than those of Bradesco and most commercial banks, its offices are open longer. Italy's PosteMobile positioned itself as a low-cost provider in traditional voice and text services and targeted the lower-income market, including immigrants. It offered highly competitive tariff plans. Discounts were also offered to customers who linked their SIM card to a BancoPosta account or a credit card, which reduced the price of the flat-rate plan from nine to seven euros per month. Special price-plans were made available to the immigrant community, offering attractive call prices to foreign countries. Korea Post has attributed the success of its Internet shopping mall to the affordable prices of its products (about 20 USD on average) making them attractive to consumers. Its policy of charging low commissions also attracted a large number of suppliers. Compared with Korea Post's 4% fee, TV home shopping charges commissions of between 15 and 25%, department stores and large supermarkets between 15 and 30% and e-commerce sites between 10 and 30%.

Challenges encountered during project implementation

The factors that contributed to the success of these different projects have been identified. It is important to understand these factors to know what needs to be done to successfully carry out similar projects. It is also important to know what can go wrong or what sorts of problems can be encountered in order to either avoid them or be prepared to resolve them. These problems are discussed below.

Resistance to change

It has already been stated that a determined leadership is required to drive the projects concerned, because of the sheer scale of the change involved and the resistance to that change. Saudi Post took on this challenge after experiencing initial resistance from municipalities to the introduction of its new address system. Municipalities resisted either because "they had their own system in which they believed", or because "they thought that it was their role to implement such a system for their cities". Saudi Post convinced some large municipalities "that conducting the project at the municipality level would lead to a lack of interoperability between the different municipalities' address systems, and that a national address system for the whole country was hence required". The other municipalities later realized that the Post was the only agency that could devise a nationwide address system beneficial to the whole country.

Other Arab countries attempting to introduce their own address system are facing similar challenges. It is a difficult issue since addressing is usually the responsibility of the local or national government. However, the benefits of a national address system are enormous. The problem can be resolved either through negotiations with the parties concerned (as in the case of Saudi Post) or by a policy directive. The latter seems to be the easier option.

Saudi Post has also faced resistance to the new address system from customers. Despite its attempts to introduce the new Wasel system through communication via different media such as television, brochures and conferences, the system has so far had only limited success. This reluctance to migrate to the new system is rooted in people's basic fear of the unknown. One way to allay this fear is to make people aware of what is going on. Saudi Post is doing just that by carrying on its campaign to inform people about what this change means and the benefits it will bring.

In the Bhutan Post study, reference has been made to resistance of another kind: the unwillingness of postal employees to use ICT-based applications in their work because of their scepticism about the benefits. As the project was implemented, however, that attitude changed and staff now consider access to ICTs indispensable in their work.

Problems relating to human resources

As shown in these case studies, the postal enterprises understood that the skills and capabilities of employees add value to the enterprise. Because their projects were based on ICTs, these Posts either recruited employees with IT skills or focused on improving the IT skills of their employees. In the case of Bhutan, the training needs of employees were understood and funds were made available for this purpose. However, the need for more training was felt not only by Bhutan Post staff, but also by Bhutan Telecom employees who maintained the VSAT hub at Thimphu and the five VSAT terminals. Bhutan Telecom felt that the one week of training given in 2005 on operation of the VSAT hub and the interface between the VSAT terminals and India's INSAT communication satellite needed to be augmented and wanted its qualified staff to be sent to India to train on the INSAT system. Most of the VSAT

station staff also felt that they needed more training in the new technologies. The important lesson here is the need for additional training on projects with a relatively higher degree of technical content.

Bhutan Telecom also experienced shortage of skilled personnel as a result of some of its trained staff leaving the organization. Because of the rapid deployment of ICTs, skilled personnel are in high demand. Organizations need to keep attrition levels to a minimum by devising attractive retention packages.

The Russian Post also faced challenges with human resources, but of a different type. It encountered problems "due to the issue of divergence of backgrounds, training and experience in the ICT experts, both within Russian Post and those at the telecom operators and in other organizations." According to the case study on the Russian Post, while "differences continue to exist, the level of convergence has significantly improved both within Russian Post and with its counterpart thus creating the basis for accelerated progress."

Problems relating to infrastructure

Other problems faced by the Bhutan project were the slow speed of the Internet connectivity and the power breakdowns at some VSAT stations owing to poor weather conditions (affecting the recharging and life of batteries). While budget constraints did not permit the option of faster connectivity, the speed of connectivity is one of the critical requirements of successful ICT-based projects. Similarly, although power problems in Bhutan were caused by extreme weather conditions, reliable power is another basic necessity.

BotswanaPost also faced a number of similar problems. Power cuts are frequent and disrupt service in the Kitsong centres, a major problem since these cuts "close down the whole centre until power can be restored". Internet service in rural locations is also not reliable, with sometimes no connectivity at all, though usually the problem is the slow speed of the connection. It is also difficult and expensive to maintain Kitsong centres because of their remote location. BotswanaPost feels that maintenance of Kitsong centres by its IT department is a "major challenge". IT experts at headquarters need to "travel long distances over, sometimes, poor terrain, which can result in longer than desired delays in making centres operational". Connectivity-related problems "can result in the whole Kitsong centre being non-operational until the IT specialist has arrived".

Korea Post's post office shopping mall (ePOST) encountered many difficulties at the start. Since most of the first-line post offices had no Internet connection, the web could not be used to provide some services. The information on an order normally sent via the Internet had to be communicated by fax to the supplying post office. This problem was finally resolved by ensuring Internet connectivity first for those post offices that handled postal money orders.

The Russian Post faces the problem of "high dependency" on external ICT infrastructure which is not very consistent, reliable or secure. It has not as yet been able to build its own ICT infrastructure, for "regulatory, technical and financial reasons". These problems have now largely been resolved. In 2009, the Russian Post drew up "the requirements and specifications for its own internal corporate ICT network" and "invited telecom operators to bid for a partnership". This process was concluded in early 2010, and the operator now plans to build on this partnership to develop "the internal corporate ICT network across the Federation, as a strategic component for further expansion of ICTs".

Problems relating to implementation

In the case of Brazil, ECT's technical implementation team had no previous experience in developing and deploying an integrated financial services system. The operator took on the challenge by setting up technical teams in each region to ensure successful deployment of the system. It also set firm deadlines for the critical project phases and made the players concerned accountable for these deadlines.

For Korea Post, the problem of timely payments to suppliers arose when it switched from manual to electronic processes. Earlier, for orders placed at the counter, the supplier was paid for the product on the same day. For products sold from the Internet shopping mall and paid for by credit card, payment to suppliers was delayed because the credit card companies had their own monthly cycle of payment. Korea Post asked these companies to make payments twice a month (fifth and twentieth days of each month) making it possible to expedite the payments owed to the suppliers.

In any project, problems relating to implementation will arise. Careful planning is one way to reduce the likelihood of these problems. When these problems do occur, it is important not to stray from the initial strategy. The plan may require adaptation, but all changes need to be evaluated and controlled, as described later in this chapter.

Organizational problems

Korea Post believes that for post office shopping to remain successful, substantial investments are needed to strengthen its capability. Because Korea Post is a governmental entity, it does not have the autonomy needed to allocate the necessary funds or hire additional staff to strengthen its operations, or to provide its customers or suppliers with incentives. This situation limits the growth of post office shopping. Moreover, not only is the organization smaller than its competitors, it has comparatively fewer subscribing members because it cannot offer them enough incentives or customized services, and the offer of incentives would have enabled it to attract more suppliers. Other organizational issues also exist, such as having the planning and operating functions of post office shopping divided between Korea Post, the Korea Post Information Center and KOVIX, which slows down the decision-making process, a serious disadvantage in a competitive market. The lesson here is that organizations with more autonomy have greater scope for consolidating gains, expanding the business and operating more efficiently.

In the case of the Kitsong centres, BotswanaPost's main problem is that the opening hours of post offices are not compatible with the needs of centre users, many of whom, particularly students, want to use the centres after normal post office hours. BotswanaPost is considering keeping post offices open till 18.00 to meet this need.

Lack of coherent action and preparedness

The majority of the projects have been implemented in partnership with other public and private partners. A lack of coherent action and preparations on the part of partners can impede implementation of such projects. In the case of the Russian Post, there was a "lack of coherent action and preparedness within the different divisions of the Russian Post and with the different public administrative entities". The introduction of Cyber Money "required intensive coordination with other authorities, including the Bank of Russia and the Tax Inspectorate". For the same reason, the implementation of e-government services in cooperation with municipalities and regional administrations has taken a long time to implement.

The above analysis reveals that devising business models to derive profits from using ICTs can be challenging. The potential is enormous but success depends on a host of factors. The most important are the availability of a supportive policy and regulatory framework, a full understanding of ICTs, sound ICT infrastructure and capability, effective project planning, committed leadership, a clear business strategy for correctly positioning the service or product and perseverance to overcome the barriers to change. The guidelines for implementation of ICT-based projects have been drawn around these key considerations. The guidelines mainly focus on the macro- rather than the micro- factors that need to be considered.

Guidelines

Policy instruments

One key finding of the analysis carried out earlier in this chapter is that the success of any project depends a great deal on an enabling policy and regulatory framework. The projects of Bhutan Post, BotswanaPost, Korea Post, Russia Post and Saudi Post have shown that the government's policy directly contributed to their success. In the case of ECT, its project was linked to the "wider development goal of social and economic inclusion being pursued by the Government of Brazil". Moreover, it was only the regulatory changes allowing non-banking commercial businesses to offer financial services that enabled post offices to act as "banking correspondents". It is also clear that the government encouraged ECT to assume this responsibility. For Poste Italiane, it was the lack of any policy or regulatory constraints that contributed to the success of its project.

Development of the postal sector is an important engine for growth. In turn, government policy, particularly in developing countries, shapes the institutional environment in which the postal sector develops. Governments in developing countries typically play an active and essential role in the country's economic and social affairs and do not rely primarily on market forces for solutions to national problems and challenges. Even in countries where there is more reliance on market forces, frameworks are usually in place to regulate development of the various sectors. The existence of such a framework increases the chances of success; conversely its absence can hinder success. A case in point is the Mongol Post Company, which had been providing money order services for years and was planning to expand its offerings in the financial services field. A change in the financial sector's regulations requiring banking and non-banking companies to acquire licences in order to provide banking and other financial services halted those plans.

Since a project can be accepted only if it falls within the scope of the country's policy and regulatory framework, the first step should be to examine that framework to determine the projects which can be accommodated. If any elements of the policy or regulatory framework are missing, the postal enterprise needs to lobby the civil society for their inclusion. Though an appropriate policy is one that is adapted to local realities, a study of the policy and regulatory frameworks in other countries would help to show policymakers the benefits resulting from the desired changes.

ICT infrastructure, IT capability and organizational change

As mentioned earlier in this chapter, the postal enterprises covered by this study spent considerable time and resources building a strong IT infrastructure. Some of them already had a robust ICT infrastructure by the time they launched their projects. The strategic origins of Italy's PosteMobile, introduced in November 2007, go back to early 2006 when Poste Italiane began to increase the use of ICTs in its operations and across all areas of business. When Korea Post launched its ePOST office shopping in 1999, it had already spent seven years building an ICT infrastructure as a part of its project aimed at government "development of a national information infrastructure". Before announcing its Postal Banco project in 2002, ECT had already begun building its ICT infrastructure in 2001, when it decided to create a corporate network. While many of these postal enterprises have not put a figure to the amount they invested to develop their ICT infrastructure, we can get some idea from the amount spent by ECT and Poste Italiane. The Brazilian operator spent some 177 million USD on its ICT projects, including the Banco Postal project, while Poste Italiane's investments in infrastructure networks and ICT systems reached 712 million euros in 2008, up from 608 million euros the previous year.

To build an ICT infrastructure, more than large investments in technology are needed to make the best use of ICTs. "It is not IT per se, but IT capability which confers sustainable competitive advantage to organizations",[6] and increasing IT capability requires, among other things, changes in the organization's structure and culture, business processes and human resources development policy.

An organization's structure can take many forms, ranging from "highly mechanistic to highly organic". Mechanistic structures are "typically highly formalized, non-participative, hierarchical, tightly controlled and inflexible, while organic structures are characterized by informality, a decentralized authority, open channels of communication and flexibility".[7] Mechanistic organizations are "reluctant to adapt and emphasize formally established procedures". To make the best use of IT resources, a firm "needs to develop a flexible operation style … which requires an open communication system and strong cooperation between departments". It also needs to be "innovative and willing to accept adaptation. Organic structure provides such an environment for developing superior IT capability."[8]

The above conclusion is supported by the case studies. In the case of Saudi Post, since the "historical organizational structure" was considered to be a "barrier to innovation and not compatible with the ICTs' fast development cycle", Saudi Post transformed itself into an entrepreneurial organization. The Saudi government restructured Saudi Post as a private holding company with eight independent business units, including an IT unit. The IT unit was created "to make sure that the organization was keeping pace with the latest technology". Saudi Post also endeavoured to encourage creativity among its employees and promote a culture of teamwork within the IT unit. It developed a new vision for the organization in order to "master the use of new technologies and to develop new business models" and created "the right dynamics between the different business units which ultimately lead to the creation of new business models".

ECT created a management structure for Banco Postal that was less hierarchical and had "fewer intermediate management levels than a traditional postal structure". Its ICT-based management style is considered "a model for the rest of ECT's corporate departments". The management structure adopted by Banco Postal has enabled it to have a flexible operational style with an open communication system and close cooperation between its departments.

PosteMobile was set up as a separate entity fully owned by the Poste Italiane Group, alongside other sister companies. By the end of December 2008, it employed 90 people. It comprises 10 divisions, each reporting directly to the CEO, resulting in a less hierarchical structure that gives it a flexible operational style and ensures effective coordination between the departments.

The Korean government had granted Korea Post greater autonomy in 2002, only after which time the government agency launched a series of IT projects to systematically bolster its ICT infrastructure and capability. The Computer Management Centre was established within Korea Post to support the IT services used in the ePOST shopping project. It has now grown into an independent department, the Korea Post Information Centre, capable of developing and managing Korea Post's information systems.

Bhutan Post has a compact organizational structure characterized by flexibility and openness. Before the launch of its project, Bhutan Post had a rudimentary ICT infrastructure in terms of human resources and equipment. During implementation of the project, Bhutan Post established a separate IT unit at its headquarters in Thimphu to train staff, maintain hardware and develop software. The IT unit has already succeeded in developing an online system for tracking domestic express and registered items and parcels.

In the case of business processes, the focus should not be on using information technology for automating existing processes, but rather on improving those processes to increase efficiency and reduce costs. Korea Post began building its ICT infrastructure with its "Business Process Reengineering and Information Strategy Planning" project, carried out from August to December 2001. During that phase, business processes were examined and reengineered, setting the stage for selection of an appropriate platform and the development and installation of IT solutions. After most of its IT system had become operational, Korea Post introduced an Enterprise Resource Management (ERP) approach across all areas of its business. ECT had used this ERP approach from the outset to integrate all administrative, operational and business activities based on the "optimization of resource utilization, increased network efficiency and increased commercial competitiveness". The integration of its systems allowed ECT to "share corporate information throughout the company, increasing management control while simultaneously allowing the increased decentralization of decision-making".

Since business processes and information systems have become so interconnected, the review of business processes as a starting point for information system planning has become a widely accepted approach. Two of the more important approaches for redesigning the way work is done are the ERP approach and the Business Process Reengineering (BPR) approach. With BPR, current processes are analyzed to "identify non value-adding activities, redesign the process to

[6] Bharadwaj, 2000; Ross et al., 1996 cited in Man Zhang, James McCullough, Ren Ying Wei, "Effects of organizational structure and information technology capability on organizational effectiveness in emerging markets". Journal of the Academy of Business and Economics, January 2004.

[7] Khandwalla, P.N., cited in Man Zhang et al, "Effects of organizational structure and information technology capability on organizational effectiveness in emerging markets".

[8] Man Zhang et al., "Effects of organizational structure and information technology capability on organizational effectiveness in emerging markets".

create value for the customer" and reduce cost for the organization. The reengineered process is then automated. While this provides a "customized solution", it may not be "the best in class". With ERP, "all the processes in an organization should conform to the ERP model", with minimum deviation, and the organization needs to adapt its existing business processes to what the ERP model offers. This option "offers a world-class efficient and effective process[9] and integration of the information system covering different functional areas of the organization". The ERP system can be used to improve existing business processes, but in cases where these processes are primarily manual, it may be preferable to reengineer the processes first.

Human resource development, particularly the training of staff to improve IT skills, is another important factor in efforts to make optimum use of ICTs. It has been argued that "firms with strong human IT resources are able to integrate the IT and business planning processes more effectively; conceive of and develop reliable and cost-effective applications that support the business needs of the firm faster than the competition; and communicate and work with business units more efficiently, while anticipating the future needs of the firm and innovating valuable new product features before their competitors".[10]

In addition to a policy and regulatory framework, ICT infrastructure and IT capability are considered equally important pre-requisites for taking on an ICT-based project. Postal enterprises need to move towards an organizational structure which is as close to the "organic structure" described above, pay due attention to improving their business processes and focus on the IT training of their staff.

To ensure its success, the project being considered also needs to be based on the type of ICT infrastructure and IT capability available. Bhutan Post and BotswanaPost, which had only a rudimentary ICT infrastructure and IT capability, kept their projects simple. Bhutan Post also chose a clever strategy for implementing in three phases. Each phase consisted of a self-contained module independent of the other two phases, which enabled the operator to consolidate the gains made from one phase before initiating the next. It also gave Bhutan Post enough time to absorb the new technologies and enable its staff to hone their technical skills. What is more, the lessons learned during the first phase were used for the next two phases. BotswanaPost followed a somewhat similar strategy, implementing its project in phases. It was on the basis of lessons taken from the first phase that it was decided to use bigger portable cabins in the following phase, in order to "provide space for waiting" and redesign the layout "to make the customer experience more comfortable". It is important to start with small projects that achieve what they set out to do, before moving on to bigger projects.

Feasibility study

Once a suitable project has been formulated in the context of a policy and regulatory framework and ICT infrastructure and IT capability, its feasibility needs to be evaluated. Given the estimate that "only one in fifty business ideas are actually commercially viable",[11] it is important to assess the project's financial and technical viability so as to avoid wasteful expenditure. One of the more effective analytical tools used for this purpose is the feasibility study. Many reasons can be given for not doing a feasibility study, but conducting one "is a good business practice". It is a "critical step in the business assessment process … and if properly conducted, it may be the best investment you ever made".[12]

A feasibility study analyzes the viability of an idea for a project and focuses on helping to answer the essential question of whether or not to proceed with that idea. All of the study's activities are directed towards answering that question. These activities consist in identifying problems and opportunities, examining different business scenarios and alternatives, investigating different ways of organizing the business, positioning the product/service in the marketplace, determining objectives and defining successful outcomes and finally proposing a business model.[13] Not all feasibility studies are alike and differ according to the type of business venture planned and the particular market opportunities identified. A feasibility study typically encompasses market feasibility, technical feasibility, financial/economic feasibility and organizational/managerial feasibility.[14]

Market feasibility is a critical component of any feasibility study. Market research does not need to be highly sophisticated, expensive or complicated. It need not be outsourced, but can be done in-house. It is important to ensure that it provides reliable information to be used to help build the business proposed. It may be valid to rely on one's own assessment of the market, as did Poste Italiane's CEO, Mr Sarmi, given his thorough understanding of the market. It may otherwise be preferable to rely on market research conducted the way it was by ECT in the case of Banco Postal. Market research provides information about market potential which, in turn, provides the basis for accurate sales forecasting and marketing strategy. Its basic components include an estimate of the size of the market for the product/service, projected market share and analysis of the competition.[15] In the business and market analysis, due consideration "should

[9] How BPR plays a critical role in ERP implementation? www.eresourceerp.com
[10] Bharadwaj, A.S., cited in Man Zhang et al., "Effects of organizational structure and information technology capability on organizational effectiveness in emerging markets".
[11] Alan Thompson, "Entrepreneurship and Business Innovation", Vineyard Publishing, Guildford, 2006.
[12] Don Hofstrand and Mary Holz-Clause, "What is a feasibility study", Iowa State University, 2009.
[13] Alan Thompson, op.cit, Hofstrand and Mary Holz-Clause, op.cit.
[14] Don Hofstrand and Mary Holz-Clause, "Feasibility Study Outline", Iowa State University, 2006.
[15] Mary Holz-Clause, "Conducting Market Research", Iowa State University, 2006.

be given to using traditional business analysis techniques, such as SWOT, Porter's Five Forces and PEST".[16]

In the case of Bhutan Post, a proper feasibility study had been carried out. In the case of Banco Postal, previous research had established that the proposed bank was a potentially profitable offering. The preparations made by ECT to ensure due diligence helped to make it an attractive partner to bidders and thereby increased interest in and the value of the bidding process itself. In the case of Poste Italiane, its CEO, Mr Sarmi, knew that a business opportunity existed. He was former Director General of Telecom Italia Mobile, Italy's leading mobile telecommunications operator, with formidable experience in mobile communications and a thorough understanding of the market.

In the case of Korea Post, perhaps no feasibility study was required because the history of ePOST shopping went back to 1986 when it was introduced as a service for the public good. Moreover, it was modelled on Japan Post's "hometown parcel" service, which had already proved successful. Moreover, the service would start small with only eight items, which did not involve much risk. Once the service was launched, however, Korea Post regularly carried out market research and customer surveys to determine the positioning of the service, the attributes of the product and the segments of the population to be targeted. When carried out carefully and with appropriate follow-up, customer surveys can be a very effective tool for growing sales and turning prospects and one-time buyers into loyal, repeat customers.

Project planning and implementation

Once a project's viability has been confirmed, the project needs to be implemented very carefully to ensure its success. The management of IT projects has become a crucial issue for organizations today because such projects are particularly difficult to implement owing to the complexity of the technology involved and the reluctance of employees to use technology in their work. Many IT projects end as failures. Surveys have been carried out from time to time to determine the success or failure rate of IT projects. The Standish Group[17] has been conducting such surveys since 1994 and releasing its CHAOS report on IT project success and failure. According to the 1994 CHAOS report, 16.2% of IT projects were considered successful, "having been completed on time, on budget with required features and functions". As many as 31.1% of IT projects were considered to be failures, "having been cancelled before they were completed or delivered but never used". The remaining 52.7% were considered challenged ("finished late, over budget or with fewer than required features and functions"). These figures have improved considerably since then. According to the 2009 CHAOS report, 32% of the projects were considered to be successful, 24% failures and 44% challenged. Though the success rate of IT projects in the last 15 years has doubled to 32%, every one in four projects still ends in failure.

Three most common reasons for a project's failure have been identified: weak business case, poor project planning and a lack of top management involvement and support. It is therefore important to examine the viability of the idea for a project, carefully plan the project's implementation and secure the commitment and support of top management. As discussed above, the viability of the project's idea can be evaluated by conducting a feasibility study. Project planning and management's commitment are discussed below.

Project planning

According to the Project Management Body of Knowledge[18], a project plan is "a formal, approved document used to guide both project execution and project control". The main uses of the project plan are to "document planning assumptions and decisions, facilitate communication among stakeholders, and document approved scope, cost, and schedule baselines". PRINCE2[19] defines project plan as "a statement of how and when a project's objectives are to be achieved, by showing the major products, milestones, activities and resources required on the project".

According to these two important industry standards, the crucial steps in a project's life cycle are the determination of its scope and its planning, implementation, control and evaluation. The scope states what the project's objectives are and what work will be done to complete the project. The scope describes the boundaries of the project (what is included in a project and what is not). The scope may become more refined as a project develops, but it should remain within the initial parameters defined. It also includes project deliverables and acceptance criteria, project assumptions and constraints. The project's scope needs to be developed in consultation with key stakeholders during the project start-up phase.

BotswanaPost encountered a problem in managing stakeholder expectations. Different stakeholders had "different expectations of what the final Kitsong centre product would look like and this affected inspections during the implemen-

[16] Alan Thompson, op.cit. "Five forces" is a framework for industry analysis developed by Michael E. Porter of the Harvard Business School. The five forces include three forces from "horizontal" competition (threat of substitute products, threat of established rivals and threat of new entrants) and two forces from "vertical" competition (bargaining power of suppliers and bargaining power of customers). PEST is a technique for structuring an environmental analysis (a routine early process in a planning exercise) by analyzing the political, economic, social and technological factors.

[17] The Standish Group is a globally known source of independent primary research and analysis of IT project performance.

[18] A Guide to the Project Management Body of Knowledge (PMBOK Guide) is a project management guide which provides the fundamentals of project management and contains best practices for managing projects. While it is an internationally recognized standard, it is the leading approach in North America.

[19] PRINCE2 (PRojects IN Controlled Environments) is a process-based methodology for effective project management. It is more of an implementation methodology and does not concern itself with the conception and feasibility of the project. It is a de facto standard used extensively by the British government and is widely recognized and used in the private sector, both in Great Britain and elsewhere.

tation process". BotswanaPost plans to resolve this problem "by making each stakeholder aware of what the final product will be".

Projects are no longer defined only by the three constraints of time, budget and quality. It has now become equally important to develop a close relationship with stakeholders (customers, clients, communities, etc.) to understand their needs and expectations. It is important to identify the primary stakeholders and to have a dialogue with them in order to arrive at a consensus on those needs and expectations. Such a dialogue also prevents unrealistic expectations on the part of shareholders. As the stakeholders eventually judge the result, they should also have a role in formulating the criteria for the project's success.

Planning of the project includes identifying the work to be performed, who will perform it, what their responsibilities will be and how they will be organized. It also includes determining the project cost and the timeline, prioritizing the deliverables to achieve the goals, setting the milestones and identifying key performance indicators. Lastly, it includes identifying the risks present in the project and planning for their management.

Realistic milestones need to be set. In the case of the Banco Postal project, it was ensured that "project milestones were achievable and sustainable over time". For the BotswanaPost's project, however, the time earmarked for achieving the milestones in some cases was "too tight". Stringent schedules for implementing the Kitsong centres "led in some cases to poor quality work, in other cases to missed deadlines and in a few rare cases to contractors abandoning the work altogether".

Implementation of the project includes identifying the equipment required, its procurement and installation, the development, designing and deployment of applications and systems software, and training.

Project control includes change control, regular inspections, and the monitoring and auditing of progress. For most projects, there are some changes to the project's scope which may have a bearing on the cost and timeline. It is therefore necessary to put in place a change management process. A chain of command should be established for approving any change to the project's scope, and no approval given without evaluating risk in terms of cost and time.

Project evaluation includes a post-implementation review and audit. While evaluation is necessary for all projects, it is particularly important for projects that have predominantly societal objectives since their impacts are often based on "hype and uncorroborated self-interest studies".[20] Impacts should be evaluated objectively, as was done in the case of Bhutan Post's project and is planned for BotswanaPost's project.

It is not necessary to follow all the stages of project planning because every project is unique. The projects included in this book did not follow each of the project planning stages, but used variations of all or some of the project stages. In selecting a project management methodology, an approach needs to be selected that is appropriate to the project objectives and the development environment. Regardless of the methodology used, careful consideration needs to be given to the overall project objectives, timeline and cost, and to the roles and responsibilities of all participants and stakeholders.

Management and institutional support

It is generally recognized that a strong and committed leadership is necessary for the successful implementation of ICT-based projects. These projects are usually so complex and face so many obstacles (including resistance to change) that they require a continuous push from the highest level. It was mentioned earlier in this chapter that Poste Italiane's CEO himself was behind the idea of launching PosteMobile and was actively involved in the execution of the project. Similarly, in the case of Saudi Post, it was the vision of its President that drove the Wasel and related projects. The Managing Director of Bhutan Post was the driving force behind the proposal to establish telekiosks in post offices. The project also received the continuous support of the country's top political and administrative officials.

For the other projects, while no particular individual can be identified with their success, they have had steadfast institutional support at all levels, including the highest decision-making level. Institutions are important to the successful outcome of projects in as much as they collectively shape the motivation of individuals to innovate, cooperate and take risks. In the Banco Postal project, ECT had the support of the Ministry of Communications and the Central Bank of Brazil. In the case of Korea Post, the project received the support of the highest policy-making level. The post office shopping service had been introduced in 1986 at the behest of the Ministry of Post Office (now the Ministry of Knowledge Economy). Towards the end of 1990s, when the service took on the attributes of an e-commerce service, it was designated as "a strategic project within the Korean government's policy on the promotion of IT industry". For BotswanaPost's Kitsong project, it was the government's decision to roll out the centres through the intermediary of BotswanaPost.

Business strategy

In projects aimed at offering a new service or product, a critical question is how to successfully grow that service or product. In today's challenging environment, the use of numerous business strategies is required to create and sustain a competitive advantage.

[20] "The Development Dimension, ICTs for Development, Improving Policy Coherence", OECD, 2009.

Many strategies have been developed over the years to help businesses compete effectively; these include benchmarking the competition, generic strategies, value disciplines and the blue ocean strategy. In benchmarking the competition, performance and processes are compared with the "best in class" and the best practices identified and adopted. Three "generic strategies" commonly used by businesses to acquire a competitive edge were defined by Michael Porter.[21] They are the cost leadership strategy, the differentiation (market segmentation) strategy and the focus strategy. The cost leadership strategy calls for being a low-cost producer for a given level of quality. The product or service is sold either at the average industry price to earn higher profit than the competitors or below the average industry price to gain market share. The differentiation strategy is aimed at creating a product or service that is considered to have unique attributes. Customers regard the service or product as better than or different from the other services or products available in the market. In the market segmentation, the focus is on one or two market segments and within that narrow segment to achieve either a cost advantage or differentiation. Initially, Porter believed that from these three generic business strategies, only one strategy should be adopted. Later on, he conceded that a combination of these strategies or a hybrid business strategy could exist.

Michael Treacy and Fred Wiersema modified Porter's three generic strategies to describe three basic "value disciplines" that can provide a competitive advantage. According to them, "companies that have taken leadership positions in their industries in the last decade ... have focused on delivering superior customer value in line with one of three value disciplines – operational excellence, customer intimacy or product leadership". Operational excellence means "providing customers with reliable products or services at competitive prices and delivered with minimal difficulty or inconvenience. Customer intimacy ... means segmenting and targeting markets precisely and then tailoring offerings to match exactly the demands of those niches … and product leadership …means offering customers leading-edge products and services that consistently enhance the customer's use or application of the product."[22]

In the blue ocean strategy developed by W. Chan Kim and Renée Mauborgne, "value innovation is the cornerstone". Blue oceans denote the "unknown market space" compared with red oceans which "represent the industries in existence today". Most blue oceans "are created from within red oceans by expanding existing industry boundaries". It is believed that "in any industry, no matter how competitive it is, a company can create a blue ocean of uncontested market space". In the blue ocean strategy, instead of focusing on beating the competition, companies must look outside their present paradigms to find new value propositions. "The creation of blue oceans is about driving costs down, while simultaneously driving value up for buyers."[23]

It is evident from the experience of the postal enterprises included in this book that they followed one or more elements of the above strategies. The differentiation and market segmentation strategies defined by Porter were followed by ECT, Poste Italiane and Korea Post and played a critical role in the success of their ventures. They also followed two of the three "value disciplines" described by Treacy and Wiersema, by providing customers with reliable products or services at competitive prices. They, as well as Saudi Post, Bhutan Post and BotswanaPost, also created "blue oceans" in the sense that they found "unknown market space" and also expanded "existing industry boundaries" and looked beyond their existing customers to non-customers to increase demand for their products/services. It is therefore important to devise a suitable business strategy for introducing new products/services.

Choice of partnership

Strategic alliances or partnerships are an important element of business strategy. Bhutan Post, BotswanaPost, ECT, Poste Italiane, Korea Post, Russia Post and Saudi Post all made good use of partnerships. A partnership today is considered not only a means to an end but also a desirable goal in its own right because of their enormous potential for creating and sustaining a competitive advantage. The benefit of entering into a partnership may have to be carefully assessed. If partnerships can provide an understanding of each others' strengths, they can increase the substance of a product or service by adding brand value and expertise and reducing its cost through the sharing of infrastructure and the inherent risk involved in any new project. Nevertheless, partnerships are not without challenges (differences in work culture, commitment, resources and priorities). While self-interest is an essential element, partnerships should be seen as a means of ensuring benefits for each party that could be achieved independently.

Technology issues

Integration of technologies

Many postal enterprises have adopted ICTs in a piecemeal manner over many years. This may have led to each department in an organization having its own computer system, data and database, which may not be able to communicate with each other. Within the same department, there may

[21] Michael E. Porter, Competitive Strategy: Techniques for Analyzing Industries and Competitors, The Free Press, New York, 1980. Porter has an almost "living legend" status in the world of management thinking and in 2005 was ranked first on the Thinkers 50, a list of the most influential business thinkers of our time, published every two years since 2003. He has made the list (www.thinkers50.com) each time.

[22] Michael Treacy and Fred Wiersema, "Customer Intimacy and Other Value Disciplines", Harvard Business Review, January–February 1993.

[23] W. Chan Kim and Renée Mauborgne, "Blue Ocean Strategy", Harvard Business School Publishing Corporation, 2005; "Meet the MasterMinds", an interview with Kim and Mauborgne (www.managementconsultingnews.com). Professors Kim and Mauborgne featured on the Thinkers 50 list from 2003 to 2009.

be layers upon layers of technology with different platforms and different generations of hardware and software that are sometimes incompatible. In all such cases, there is need to integrate these disparate systems. Enterprise Resource Planning (ERP) is one way to integrate an organization's data and processes into one single system. Once an ERP system is in place, all aspects of an organization can usually work in harmony, without every single system needing to be compatible with another. Increased productivity and fewer types of software are a result. ECT followed the ERP approach and concluded a contract with IBM to integrate all its technical systems into a single coherent system. Korea Post also implemented the ERP approach with the help of Korea Post Information Center.

Security

Security is a major concern with online and mobile financial services. The security of financial transactions and mobile payments needs to be ensured, as PosteMobile did by developing what it considered to be "one of the most advanced systems in the market in terms of security and technical capabilities". Korea Post also introduced secure systems for making online payments.

User-friendly software

Another important consideration is the design of user-friendly software for both customers and employees. Users would rather not have to click through a plethora of menus to find what they want. PosteMobile accepted this challenge by developing a "simple and intuitive" system for the customer with direct access from the SIM menu. Korea Post's ePOST has a user-friendly website where customers can easily find the image of the product (as well as purchasers' opinions), place and pay for the order, and track its movement up to delivery.

Type of technology

The selection of a suitable technology is another important factor. A technology should not be chosen just because it the latest or has the most features. It is important to choose the one most appropriate for the project. While some organizations like to use state-of-the-art technology, most prefer to use mature and proven technology that has a larger customer base, ensuring that advice about troubleshooting or making improvements is readily available. As observed in the Saudi Post case study, "choosing the most recent and costly technology may be risky…The technology may not be mature enough and the cost of replacing it shortly by a new version can be high." The Saudi operator therefore decided "not to provide each letter with an RFID tag, but only the post boxes". Other factors to be considered when selecting a technology are the reliability of the vendor, the availability of effective support within the country for the chosen technology and easy integration with existing technologies (to capitalize on earlier investments in IT systems).

Fast connectivity

It has been long recognized that the greatest boost to e-commerce will come not from savvy marketing or websites, but rather from "the proliferation of broadband Internet connections to the home … which are much faster than the dial-up modems in use today".[24] Korea Post's experience shows that fast connectivity is critical to the growth of e-commerce. Slow connectivity posed a number of problems for Bhutan Post in its competition with private Internet service providers. In the case of BotswanaPost, slow connectivity also led to customer dissatisfaction.

Sustainability of projects

Sustainability is an important consideration in project planning. It should also be remembered that, unlike other projects, ICT-based projects require continued investment in technology because of the higher rate of obsolescence with ICTs, compared with conventional technology. This needs to be taken into account for projections of return on investment.

Korea Post's ePOST shopping is profitable. The Banco Postal project, which also has a societal objective, was designed to be profitable from the outset and has already achieved profitability. As mentioned earlier in the chapter, Banco Postal revenues in some post offices now exceed postal revenues. And although Italy's PosteMobile is currently operating at a loss, it is expected to reach break-even in the near future.

Some post offices participating in the Bhutan and Botswana projects have some financial viability concerns. In the case of BotswanaPost, while the Kitsong centres were jointly financed by the government and BotswanaPost, it is up to BotswanaPost to make these centres viable once they are operational. They will not receive any government subsidies. Because of the "social importance of the centres in rural communities, the government and BotswanaPost are monitoring closely the operational viability of the centres to establish whether a subsidy is required or not". The long-term aim, however, is still to ensure "that the centres cover both their operational costs and the costs of replacing equipment when the current equipment reaches the end of its useful life".

Bhutan Post has similar problems with a number of its telekiosks, particularly the VSAT-connected telekiosks, because of the high cost of satellite connectivity. The Bhutan government is considering the possibility of providing a subsidy to cover the high cost of maintaining these telekiosks.

In the cases of Bhutan Post and BotswanaPost, success should be measured not only in financial terms, but also in terms of the social capital that has been accumulated. These projects have contributed to greater interaction between people and between people and their government. According to a World Bank study, there is growing empirical evidence that social capital contributes significantly to economic growth

[24] "E-Trends", Profile Books Ltd, London 2002.

and development. Natural, physical or produced capital and human capital "determine only partially the process of economic growth because they overlook the way in which the economic actors interact and organize themselves to generate growth and development". The missing link is social capital, which has been defined as the "internal social and cultural coherence of society, the norms and values that govern interactions among people and the institutions in which they are embedded".[25]

Projects which have higher societal objectives, such the Bhutan Post and BotswanaPost projects, may take more time to become profitable and may need longer nurturing, but in the end, no project can survive unless it is financially sustainable. Ensuring the longevity of such projects is critical, given that many telecentre projects which began between the mid- to late 1990s and the middle to latter part of the last decade have failed to deliver or to survive. This is mainly because they focused only on a programme-related deliverable, such as a telecentre. There is a need to look beyond the issues of readiness and availability to whether and how people use the facilities established and ensuring that there are enough users.[26] In the case of BotswanaPost, it is considering keeping the Kitsong centres open past the post office's normal working hours to allow students to make greater use of them.

The two telecentre projects in this collection have used the PC-based route to provide Internet connectivity and have been successful by and large. However, recent questions have been raised about the route providing Internet connectivity (should it remain PC-based, when less than 0.5% of villages in Africa have such a link, or should mobile telephony be used, which has already reached two thirds of the African population?). Even though it is most likely that both routes would be pursued[27], it should be kept in mind that mobile telephony is growing very rapidly in those areas of the world that have been let down by other kinds of infrastructure (bad roads, slow postal services and inadequate landline services). In such places, mobile phones are making a huge difference in the way people live and work. For those people without an available Internet infrastructure, the mobile phone will be the primary means of connecting themselves to the world. The option of providing public services and financial services through mobile phones alone or in combination with PC-based connectivity needs to be explored.

Resistance to change

Saudi Post encountered resistance from municipalities when introducing its new address system. Once it overcame that problem and completed the project, it noted some reluctance on the part of customers to adopt the new address system. In Bhutan Post's case study, a different type of resistance was noted – the unwillingness of postal employees to use new technologies. While this resistance to change was not mentioned in the other case studies, reluctance to adopt anything new is fairly common and is not confined to postal employees, but extends to other sectors as well. The use of new technology represents a major change from the way in which employees are accustomed to work. As Peter Drucker said, while "everybody has accepted by now that change is unavoidable", it is still considered that "like death and taxes, change should be postponed as long as possible and that no change would be vastly preferable".[28] Since "change is unavoidable", however, it is imperative to devise a well-thought-out strategy to overcome this resistance to change.

A significant amount of literature is now available on how to overcome this reluctance to new technologies in the workplace. Some of the most important work has been done by John P. Kotter, who has a well-earned reputation as the guru of change.[29] Although his book Leading Change deals with change as a way to transform organizations, his valuable insights apply equally to the problem of employees' resistance to new technologies and how to overcome it. Kotter has outlined eight steps towards successful change. The first four steps in the transformation process "help defrost a hardened status quo", the next three steps "introduce new practices" and the last step "grounds the changes in the corporate culture".

The first step is to establish a "sense of urgency", which is "crucial to gaining needed cooperation". As long as there is a high level of complacency, transformations "will go nowhere because few people are even interested in working on the change problem". The second step is to form a powerful guiding coalition for change with a large enough initial core of believers. This group, in turn, helps to bring others on board with new ideas.

The third step is to create a vision that helps to clarify the direction in which an organization needs to move and provides a rationale for the changes it will have to make. This vision "plays a key role … by helping to direct, align and inspire actions on the part of large numbers of people".
The fourth step is to communicate this vision to as many employees as possible. "Without credible communication, and a lot of it, employees' hearts and minds are never captured." This vision can be communicated in both words and deeds, though the latter "is generally the most powerful form".

The fifth step is to empower others to act on this vision, requiring the removal of obstacles that block the way of change. "New initiatives fail far too often when employees, even though they embrace a new vision, feel disempowered by huge obstacles in their path." The obstacles to acquiring ICT skills can be the lack of training facilities or appropriate

[25] Christiaan Grootaert, "Social Capital: the Missing Link? Social Capital Initiative", Working Paper No. 3, World Bank, 1998.
[26] The Development Dimension, ICTs for Development, Improving Policy Coherence, OECD, 2009.
[27] Ibid.
[28] Peter F. Drucker, Management Challenges for the 21st Century, Harper Business, 1999.
[29] Kotter appeared on the Thinkers 50 list in 2007 and 2009.

equipment or the lack of time to take part in a training programme.

The sixth step is to plan for and create short-term wins. Short-term wins help to maintain the level of urgency and motivation. "Most people won't go on a long march unless they see compelling evidence within six to eighteen months that the journey is producing expected results. Without short-term wins, too many employees give up or join the resistance." It is perhaps the short-term wins which helped the employees of Bhutan Post and Saudi Post to remain on course. Bhutan Post created a short-term win when it introduced its project in 17 post offices during the first phase and then went on to include the remaining post offices. Saudi Post created a short-term win when it first developed its innovative address system and followed it up with its other initiatives.

The seventh step is to consolidate improvements and to maintain the momentum for change. Kotter warns that victory should not be declared prematurely. New approaches are fragile and subject to regression. The feeling of victory should be used as a motivational tool to make the required changes in the organization's basic culture and systems relationships. As mentioned earlier in this chapter, organizations need more than good technology to make the most of ICTs. Changes in the organizational structure, culture and business processes, among other things, are also needed.

The eighth and final step is to institutionalize the new approaches. Change sticks when it becomes "the way we do things around here". Kotter concludes that each step is equally important and making mistakes in any step "can have a devastating impact, slowing momentum and negating hard-won gains".[30]

Moving up the value chain

It is also important to make plans for moving up the value chain. PosteMobile plans to move further into the B2B market by offering SMEs price-competitive solutions. There are more than four million enterprises in Italy. PosteMobile feels that "these types of companies are likely to find PosteMobile appealing, due not only to competitive prices, but also to the unique services offered". After Saudi Post developed its new postal address system, it introduced many new services, one of which was the Postal Mobile service, which allows customers to track their consignments by phone text messages or request pick-up of their outgoing mail from their mail boxes. The operator also started its e-mall service and postal e-mail service, both of which have resulted in a significant increase in the Saudi Post customer base.

Conclusion

One of the many useful points to emerge from the case studies in this collection is the need for a policy and regulatory framework that encourages postal enterprises to diversify and leverage ICTs so as to offer better and more diversified services. Another point is that success is not achieved overnight, but must be built upon the strong foundation of an ICT infrastructure and capability developed over years. When these postal enterprises saw a promising opportunity, a feasibility study was done to determine whether or not to act on that opportunity. The projects carried out to transform that opportunity into a service or product were carefully planned and implemented with the support and commitment of the top management. Due attention was also paid to selection of the technology to ensure that the service or product was appropriate and secure. The strategy for growing the service or product introduced was carefully crafted and focused on differentiation from the competition. It also included the creation of strategic partnerships and the offer of competitive tariffs and incentives.

These guidelines were prepared mainly on the basis of the postal enterprises featured in this collection and their experiences. They describe how things could be done most of the time. They are not binding, but represent a map showing how to get from the start to the finish along many possible routes. They cannot be applied mechanically in every case. Since projects operate in an environment that is broader than their scope, these guidelines need to be adapted to suit local environments, as was done by the postal enterprises included in this collection.

[30] John P. Kotter, Leading Change, Harvard Business School Press, 1996.