

# Journal of Business Systems, Governance & Ethics

Special Issue



# **Journal of Business Systems, Governance & Ethics**

## **Special Issue**

**ICTs for Developing Countries:  
Are There Realistic Answers  
to the Difficult Problems?**

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# Journal of Business Systems, Governance and Ethics

Vol 2, No 3, 2007

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# Guest Editorial

## ICTs for Developing Countries – Are There Realistic Answers to the Difficult Problems?

Andrew Wenn  
Victoria University, Australia

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Welcome, to this, the first special edition of the *Journal for Business Systems, Governance and Ethics*. This issue is devoted entirely to the problems of deploying, using and maintaining information and communications technology (ICT) in lesser-developed countries (LDCs). When the call for submissions for this special issue went out in late 2006, this journal was less than 12 months old, although, of course, it had been in the planning stages for longer than this. It is gratifying then to report that readers of this issue will find papers from Australia, Greece, Jordan, and the USA and that the studies contained therein encompass Vietnam, Ecuador and Romania whilst the paper by Imran and Gregor (this issue) presents a multi-country analysis of ICT in lesser developed countries.

Likewise, the reviewers, who kindly provided timely and constructive comments, were spread across the globe. If this only seems to underscore the power of ICT to, as Friedman (2005) has written, “flatten” the world, then I urge the reader to read and consider carefully the implications of the papers presented here.

As stated in the call for articles, the idea for this special issue arose out of personal experience. Having just returned from a three month sojourn in Timór-Leste, where I was able to experience at first hand the multitude of complex problems that arise out of the desire and the need to use ICTs within government, the education and corporate sectors I was left wondering if the rhetoric of the digital divide and ICT deployment really matched the practice (Wenn 2007). It was the desire to collect together actual accounts of success and failure that prompted this issue.

*A ‘digital divide’ threatens to exacerbate already-wide gaps between rich and poor, within and among countries. ... Timely access to news and information can promote trade, education, employment, health and wealth. One of the hallmarks of the information society – openness – is a crucial ingredient of democracy and good governance. Information and knowledge are also at the heart of efforts to strengthen tolerance, mutual understanding and respect for diversity. (Annan, 2003 as cited by Livingstone and Helsper 2007, p. 672).*

The digital divide (DD) has been discussed and theorised for years, it is seen to exist both within enclaves of developed nations and in the poor nations of this world (Ess and Sudweeks 2001; Kaimila-Kanjo 1992; Livingstone and Helsper 2007; Sy 2001). Now, whilst Annan (2003 as cited by Livingstone and Helsper 2007, p. 672) stresses the importance, indeed one could conclude the life-providing significance of information and knowledge, Afele highlights many issues besides the DD when he says:

*What is needed is a poor person’s connectivity system that would enable an entire community to utilise a few units of the convergence of television, radio, telephone, Internet, CD-ROM and print media, to offer new prospects in the delivery of sophisticated information to predominantly oral cultures that are currently considered as ‘uneconomic’ regions of the world. However, this poor person’s connectivity system should not imply deployment of the lower end of communications or inefficient tools. **Without appropriate tools, the notion that IT and knowledge flows can lead to sustainable development everywhere may not be realized.** (Afele 2003, p. 86 my emphasis)*

It is much more than this as well. “Technological innovation requires a recurrent rather than a one-off investment of money, time and effort on the part of the general public” (Livingstone and Helsper 2007, p. 673) Whilst Livingstone and Helsper are more concerned with internal islands of disadvantage when they say that “there is a risk that increasing internet penetration will exacerbate rather than reduce inequalities” (2007, p. 673) the same thing applies for LDCs whether they are island nations or share a boundary with a better developed neighbour. One only needs to consider the cases of Greece (Markellos, Markellou, Panayiotaki and Stergianieli this issue), Romania (Gudea this issue) or Timór-Leste (T-L) (Wenn 2007). Let us, for instance, consider the case of T-L which whilst I cannot claim that it is typical, at least enables me to raise one or two issues which I haven’t seen discussed elsewhere, but are so basic I cannot believe that they haven’t raised before.

Timór-Leste is one of the world’s newest nations, having gained independence from Indonesia in 2002; before that it was a Portuguese colony from ~1509 to 1975. It has a long history of neglect, and like many other colonized nations engaged in a long violent struggle for independence which resulted in 100,000s of deaths and eventually much destruction (Wheeler 2004). It is one of the world’s poorest nations, with an unemployment rate of 30% in urban areas (much higher elsewhere) (República Democrática de Timór-Leste 2005) and at the time I was there (early 2006) was experiencing increasing levels of civic unrest.

I travelled to T-L as a volunteer working as an IT mentor at one of the privately funded institutes of technology. Everywhere I went within the country there was a demand for IT skills and just as an aside accountants were also in high demand. It is not that, that struck me the most though. The computers that were operating there, were on the whole, cast-offs from wealthy nations, but more importantly riddled with viruses and other debilitating software.

Now, you, the reader, sitting at your desktop or maybe in a comfy armchair reading this on your Internet enabled laptop (this is after all an electronic publication) will probably be thinking so what? Why not install anti-virus software? To which I will say just one thing: ‘How do you keep anti-virus software up-to-date without an Internet connection?’

In case you are tempted to ask how the malicious software came to be on the computers in the first place, it should be pointed out that T-L shares a national border with a much more developed Indonesia, and there is a significant movement of people and the software across this border. The generally accepted belief is that viruses are unwittingly brought into T-L through the sharing of computers and USB memory sticks. It is also pertinent to add that an Internet connection was available at the place where I was working but it was dial-up line whose maximum transfer speed was less than 1.4kbs – obviously a very slow way of downloading a multi-megabyte virus update. Costly also, as telephone calls are charged at a timed-based rate.

There were some Internet Cafés in the capital Dili but the cost of US\$6 per hour for Internet access was far beyond the reach of the average employed citizen who would have been earning less than US\$100 per month. Just by way of comparison, a hand of bananas cost US\$1 or lunch for six children US\$6. So really Internet access was available for the privileged few (read those volunteers from first world countries).

All of this serves to highlight that “[b]eyond the simple issue of access/no access to ICT come more complex questions of levels of connectivity in terms of capability and distribution of the access concerned. For example, on a practical level, access to a personal computer does not guarantee a connection to the internet.” Similarly, “**material access to the technology is useless without the requisite skills, knowledge and support to use it effectively.**” (Selwyn 2004, p. 348 my emphasis) Several decades ago, Carpenter (1989) raised questions about the nature of technology transfer, whilst Wade (2002) questions whether the efforts to bridge the digital divide introduce another form of dependence on the West. (As we see from the T-L example, where the westerners were the only people who could afford to use the Internet). Kaimila-Kanjo (1992) highlights issues of culture and gender. However, there appear to be few studies that look at long-term viability and sustainability of ICT deployments.



Steyaert (2003) reinforces the idea that access is not everything in his review of *Technology and Social Inclusion, Rethinking the Digital Divide* (Warschauer 2003) when he comments “The book ceases analysis at access. Despite this concept gaining considerable depth here, there remains a gap between access and social inclusion. ... There is a world of difference between getting someone connected and providing them with enriched educational settings, with full labour market opportunities or enlarged civic engagement.” (Steyaert 2003, p. 576) When writing about research into experiences with ICT in rural areas of the Philippines Sy concluded: “[w]iring of public libraries and the civil society, establishment of affordable network access and community telecentres in rural areas, coupled with **education and technical training** for the digitally disadvantaged Filipinos” are amongst the necessary interventions (Sy 2001, p. 304 my emphasis). This is also mirrored by my experiences in T-L where there are, what can only be described as, great holes in the skills of the Timorese population. A particularly sad state of affairs when we consider that even if the virus-eradication program is successful there would be a shortage of skilled personnel to maintain it.

We see that it is not just a question of what technologies are appropriate for developing nations, but what are the cultural issues involved, what levels of connectivity are needed and are practical and furthermore does the introduction of technology into these countries necessarily ensure knowledge flows? Add to this the need for appropriate training and support, issues of “dominance of certain languages (especially English)” (Looker 2007, p. 711) funding availability and just as importantly questions of the setting of funding priorities, who does it and how (Looker 2007). It is almost enough to make one question, as Looker (2007) does, whether the introduction of ICT is counterproductive.

Leaving that question aside for the time being, one only has to read Gudea’s (this issue) contribution to see that grass-roots level demand for ICT will propel its use in some cases just as the cross-fertilisation of ideas combined with trial and error enable a small tourist lodge to install and configure a satellite dish to connect them to the Internet (Karanasios this issue). Rather than co-operative networks as developed in some communities in Romania (Gudea this issue), Fife and Hosman conclude that there is potential for private/public partnerships and outline some of the factors by which such implementations can be regarded as a success (Fife and Hosman this issue).

Steyaert (2003) talks of the potential ICT has to increase civic engagement and a number of the contributions examine issues surrounding the implementation e-government solutions in several countries (Abu-Samaha and Samad this issue; Imran and Gregor this issue; Markellos et al. this issue; Nguyen and Schauder this issue) with Imran and Gregor, in their multi-country study, concluding a multi-level approach that includes efforts by governments, organizations and individuals to provide access “to ICT tools and IT-related education” and furthermore that this should be incremental and sensitive “to local and cultural needs” (Imran and Gregor this issue).

There is no doubt that considerable differences exist between groups of users or potential users but I wanted papers for this issue to extend way beyond discussions of the nature of the DD and I am pleased to say that they do. I hope that everyone who reads the articles that follow finds them as interesting and instructive as I have and that maybe you can find some way of contributing your expertise to make the world a more tolerant, equitable place, one where diversity is treasured and mutual understanding flourishes.

As one of the emphases was on finding solutions to problems, I should perhaps add that after discussion with the T-L people I was working with, we decided to use a free version of an anti-virus program (in this case AVGFree <http://free.grisoft.com/> (accessed 19 Sept. 2007)) and implement a system whereby one of the volunteer aid workers who visited an Internet Café regularly would download the update, on a weekly basis and bring it back to the main campus. This would then be copied to a folder on one computer in the main office; those staff members whose computers were networked (four machines in total) could then perform the update over the network (after some training). For the remaining computers, one staff member from each campus or building where computers were installed was made responsible for obtaining the updated files on a visit to the main campus and then to take a walking-tour of each machine on their home campus installing the update. The idea being that the staff would take

ownership of both the problem and solution. Unfortunately before this could be subjected to more than one round of updates the civil unrest became so dire that the institute temporarily closed its doors. Not long after that, I along with several thousands of others were evacuated from T-L. Once again we see this echoed in the findings of Imran and Gregor.

Finally, I would like to thank all those who contributed articles to this special edition, it was reassuring to see that at least some of the problems of using ICTs in less well off countries can be solved. To the anonymous reviewers who contributed their time and effort and provided constructive feedback to the authors thank you for your efforts, without which this issue would have been much worse off.

## References

- Abu-Samaha, A. M. and Samad, Y. A. this issue, 'Challenges to the Jordanian Electronic Government Initiative', *Journal of Business Systems Governance and Ethics*.
- Afele, J. S. C. 2003, *Digital Bridges: Developing Countries in the Knowledge Economy*, Idea Group, Hershey, PA.
- Carpenter, S. R. 1989, 'What Technologies Transfer: The Contingent Nature of Cultural Responses', in *Technological Transformations: Contextual and Conceptual Implications*, eds Byrne, E. F. and Pitt, J. C., Kluwer, Dordrecht, pp. 163-177.
- Ess, C. and Sudweeks, F. 2001, 'On the Edge: Cultural Barriers and Catalysts to IT Diffusion among Remote and Marginalized Communities', *New Media and Society*, vol. 3, no. 3, pp. 259-269.
- Fife, E. and Hosman, L. this issue, 'Public Private Partnerships and the Prospects for Sustainable ICT Projects in the Developing World', *Journal of Business Systems Governance and Ethics*.
- Friedman, T. L. 2005, *The World Is Flat: A Brief History of the Globalized World in the Twenty-First Century*, Allen Lane, London.
- Gudea, S. this issue, 'Internet Access on the Cheap: The Power of the Co-Op', *Journal of Business Systems Governance and Ethics*.
- Imran, A. and Gregor, S. this issue, 'A Comparative Analysis of Strategies for E-government in Developing Countries', *Journal of Business Systems Governance and Ethics*.
- Kaimila-Kanjo, G. 1992, *Communication, Technology, Gender and Development in Malawi*. Masters, Concordia University.
- Karanasios, S. this issue, 'Ecuador, the Digital Divide & Small Tourism Enterprises', *Journal of Business Systems Governance and Ethics*.
- Livingstone, S. and Helsper, E. 2007, 'Gradations in Digital Inclusion: Children, Young People and the Digital Divide', *New Media & Society*, vol. 9, no. 4, pp. 671-696.
- Looker, E. D. 2007, 'Review of Heather E. Hudson, *from Rural Village to Global Village: Telecommunications for Development in the Information Age*. London and Mahwah, NJ: Lawrence Erlbaum Associates', *New Media & Society*, vol. 9, no. 4, pp. 707-711.
- Markellos, K., Markellou, P., Panayiotaki, A. and Stergiani, E. this issue, 'Current State of Greek e-Government Initiatives', *Journal of Business Systems Governance and Ethics*.
- Nguyen, T. T. and Schauder, D. this issue, 'Grounding e-Government in Vietnam: Bringing Responsive Government Services to Citizens', *Journal of Business Systems Governance and Ethics*.
- República Democrática de Timór-Leste 2005, *Implementation of the Brussels Programme of Action National Mid-Term Review*, Dili. Accessed June 2007.
- Selwyn, N. 2004, 'Reconsidering Political and Popular Understandings of the 'Digital Divide'', *New Media & Society*, vol. 6, no. 3, pp. 341-362.
- Steyaert, J. 2003, 'Review of Mark Warschauer, *Technology and Social Inclusion, Rethinking the Digital Divide*', *New Media and Society*, vol. 4, no. 5, pp. 575-7.
- Sy, P. 2001, 'Barangays of IT', *New Media and Society*, vol. 3, no. 3, pp. 296-312.
- Wade, J. H. 2002, 'Bridging the Digital Divide: New Route to Development or New Form of Dependency?' *Global Governance*, no. 8, pp. 443-466.
- Wenn, A. 2007, 'Flat Worlds/Local Crevasses', presented at *SPT 2007*, 8-11 July 2007, Charleston, SC, USA.
- Wheeler, T. 2004, *East Timor*, Lonely Planet, Footscray.

# Internet Access on the Cheap: The Power of the Co-Op

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## Abstract

*Internet access in the former socialist block continues to lag behind more developed countries. Unequal access to Information Technology has produced uneven levels of participation in the networked economy and society. Internet access, which is important to maintaining a technologically competent labour force, is a staple in the developed countries. However, it continues to be limited in Romania. Would-be users are devising inventive solutions to the relatively costly access solutions in order to get on the Information Highway. A country case study of Internet access in Romania reveals the advent of self-established, co-operative networks providing shared Internet access - seemingly a unique and innovative approach. Several of the Internet access plans on the market are presented in this paper together with a discussion of cyber cafés and the home-grown, co-operative networks that seem to be popping up all over the country. Understanding the context within which these home-grown networks arise and prosper offers valuable lessons and ideas for transferring these approaches to other developing countries that, like Romania, are struggling to bridge the infamous digital divide.*

## Keywords

*Shared Internet access, Internet café, home-grown networks, digital divide*

## Introduction

The Internet is at the core of the information technology revolution and the global economy. It allows everyone with a personal computer to communicate with all other computers connected to it, worldwide. Significant differences exist in terms of ability to access the Internet as economic factors bear heavily on the issue. The cost of the personal computer and the recurring costs related to Internet access can be a major burden for some end users. That being said, the Internet is slowly taking off in the countries of the former socialist block. Yet, connecting to the Internet remains a costly endeavour for the majority of the population. As the world economy continues its push toward globalization, those countries that are slow to embrace the Internet face the unpleasant prospects of being left behind.

Romania is located in South-eastern Europe, bordering the Black Sea. Its largest neighbours are Bulgaria in the South and Ukraine in the North. Romania began its transition from Communism in 1989, but a largely obsolete industrial base and communications infrastructure have complicated its

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efforts toward a market economy. In 2000 the country emerged from a three-year recession. There are palpable gains in privatization, deficit reduction, and inflation control. The Gross Domestic Product (GDP) per capita was \$6,900 in 2003, with a growth rate of 4.5%. The inflation rate in 2003 was 15%. The International Monetary Fund predicts GDP changes of 4.4% for 2006 and 5.5% in 2007, with consumer

prices changing at rates of 7.8% and 5.7% respectively (IMF 2006).

The currency exchange rate reported for 2003 is 33,200 Lei (ROL) per US dollar (USD) (CIA 2004).

## **Literature Review**

There is a notable lack of studies in academic journals regarding Internet access in Romania. The researcher was able to find only a few articles in practitioner magazines on this very topic. Goodman (1991) referred to the economic wasteland and old technology, remnants of the communist regime that ruled the country for forty-four years. Yet, there is a wealth of information available about Internet in Europe (Rocks 1998). However, the more detailed reports are only available from market research groups, and the associated fees were out of the reach of this study (Budd 2003).

Early references to Internet use in Romania go back to the early 1990s (Woodard 1995). Romania, like other Eastern European countries, lags behind in the number of broadband subscribers when compared to other more developed countries such as France, Germany, or the UK (Business Wire 2004). Yet, the countries of Eastern Europe have been surprisingly aggressive in adopting new technology. Eastern Europe had about 50 million mobile phone connections by the end of 2001, and a predicted annual growth rate of 16 percent (Ignatius 2002).

The new technologies installed in Eastern Europe are noteworthy. As early as 1998, Romania contracted with Cisco and BreezeCOM the upgrade of the Higher Education Network (RoEduNet), a national networking backbone with major nodes in six cities and links to all the country's universities as well as the non-profit scientific and cultural institutions (Business Wire 1998).

Internet usage in Romania continues to increase. The growth rate went from 10% in 2000 to 51% in 2004 (BBC Monitoring Media 2000; Tarifica Alert 2005). Yet progress is slow, especially when considering the relatively low GDP, low broadband DSL and cable TV penetration, and market liberalization and competition. The majority of Internet users are the staff of the companies that have access to the Internet at the office and the owners of personal computers, whose numbers are on the rise (BBC Monitoring Media 2000)

By 2007, when it is conditionally scheduled to join the European Union (EU), Romania was forecast to have an online population of around 3 million people, yet achieve the lowest online penetration rate in the EU, at just over 12%. Online spending will grow at a much faster rate, as users become more mature and therefore spend more online. Offline spending power will likely increase with accession to the EU, and as more online retail opportunities open up, with more companies operating Web sites in these countries (MacAonghus 2004).

## **Communications Infrastructure**

Economic improvements in Romania have lead to a gradual increase in wages. Yet, in relative terms, Internet access is anything but affordable. Affordability is an important factor that can hinder Internet use. Given the relatively low GDP in Romania, individuals, educational establishments and small business cannot afford significant Information and Communication Technology (ICT) expenditures. It is only natural then to find that broadband Internet access, Internet services and e-commerce are in their infancy in this geographic area (M2 PressWire 2003).

Internet access requires an adequate communications infrastructure. In Romania, the communications infrastructure includes 4.3 million telephones, and 6.9 million cellular phones (CIA 2004). The telephone system is assessed as rather poor, yet improving. Ninety percent of the domestic telephone network is automatic. Trunk network is mostly microwave radio relay, with some fibre-optic cable. About one third of the exchange capacity is digital. Reports show that in 2004 there were 201 mobile radio communications providers, 142 local telephony providers and 163 international calling service providers (Tarifica Alert 2004).

The internet country code is “.ro” and approximately 51,000 Internet hosts were online in 2004 - up from only 20 in October 1993 (RomaniaBusiness.com 1997). Things are changing rapidly with the majority of educational institutions, government, and non-government organizations (NGOs) establishing an Internet presence. There are more than 40 newspapers and 4 TV stations offering Internet programs (Jalobeanu 2003).

During the socialist era, Romania, like the rest of the socialist countries, fell behind in terms of data and telecommunications technology. Since 1989, when Romania turned toward a market economy, significant progress has been made. The telecommunication infrastructure continues to modernize, with most of the exchanges (Central Offices or COs) now being digital. Yet, there is a significant number of analog COs still in operation. This impacts the availability and quality of dial-up service and of digital data transmission.

Published figures for 2000 show that Romania had 7.5 million households and approximately 400,000 personal computers (a penetration rate of 7%). Approximately 15 to 20% of these PCs are connected to networks and 3 to 4% are connected to the Internet. There were approximately 250 Internet Service Providers (ISP) and some 70,000 Internet users. Romanian ISPs, independent companies from RomTelecom, are trying to gain national coverage. Due to competition the tariff for Internet access decreased by half in 1999. A typical dial-up Internet users (20 hours per month) pays an average of US\$35 a month, of which as much as US\$24 may account for telephone service.

In 2002, Romania had only twenty one secure servers, as compared to Croatia (25), Bulgaria (10) and Yugoslavia (7). Romania benefits from the deployment of two public networks: The Romanian Education Network and the Romanian National Computer Network. In terms of international connectivity, Romania has direct fiber optic links with European backbones and operates the only Internet Exchange in the region, based in Bucharest (Gurau 2002).

In Eastern Europe low per-capita-income levels and less spending on computers in general are responsible for a low Internet penetration rate: around 10% in 2003, compared to 35% in the EU. For comparison, the Internet penetration rate in U.S. households was 64% (Ladika 2004). To the average Romanian Internet user mentioned earlier, the US\$35 he spend to access the Internet can easily account for 30 to 35% of his wages (Oaca 2000).

## **Market**

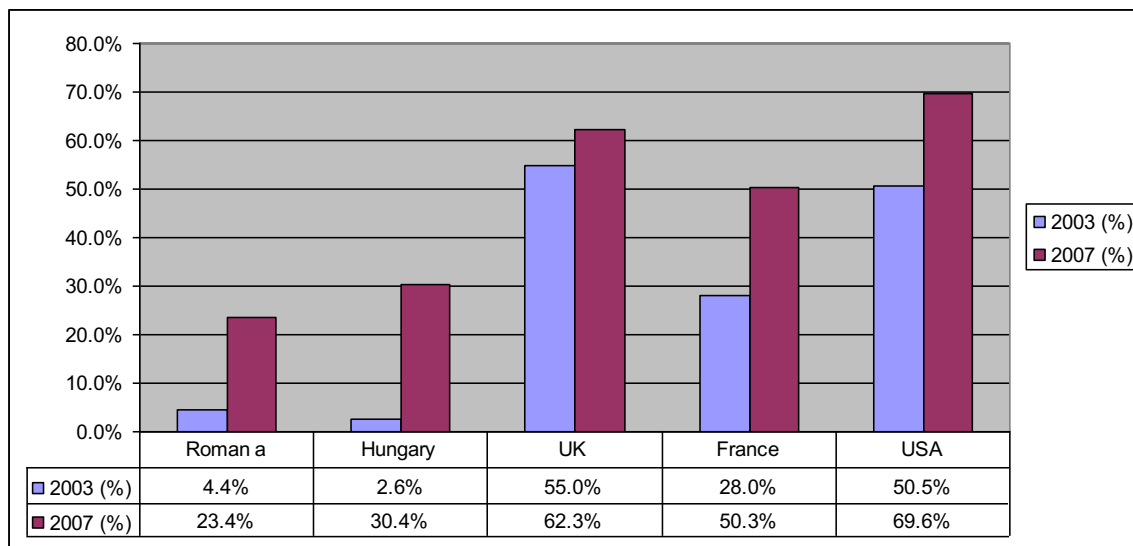
The market for Internet services in Romania is estimated at \$6 million per year, in 2004. This is a relatively small number in comparison to neighbouring countries such as Hungary (\$800 million/year) or the Czech Republic (\$1.6 billion/ year) (Telelucru 2004).

For Romania, estimates of the number of personal computers in existence vary. One source reported ten personal computers per thousand and Internet access penetration of 9.01 per 10,000 (LearnLink 2002). Another source reported 880,000 PCs overall and Internet access penetration of 4.4% for the same year - 2002 (Noua Economie 2002). While these reports differ, even the lowest figures show a marked improvement over 2000 when, according to Norris, less than .5% of the population was online (Norris 2000).

The average monthly wage is about €150, which is approximately \$190 at the current (September 2006) exchange rate. With the cost of a typical personal computer of \$600-700, it should come as no surprise that those who use computers mainly at the office outnumber those who use computers at home by a 2:1 margin (Noua Economie 2002).

A comparison of Internet access penetration rates among Romania, Hungary, and three developed countries (UK, France, USA) show significant differences. Namely, Internet access penetration in Romania is much lower. In 2001 Romania had a 4.4% Internet penetration rate, while U.K. had 55%, France 28%, and USA 51% (Eurostat 2004). Mainly due to the low-income levels in all East European countries, fixed-line, Internet and mobile penetration rates are all low. Broadband Internet access is

available in several countries but subscriber numbers are minimal (Business Wire 2004). The situation has improved significantly over the past few years (Figure 1). Recent (2007) statistics show significant increase in Internet penetration in Romania, as high as 517% during 2000-2007 (Internet World Stats 2007; Internet World Stats 2007).



**Figure 1.** Internet access penetration – 2007 v. 2003 (%)

Consumers have the choice of either dial-up or broadband Internet access plans. For tasks such as online chat or email, a dial-up connection would be sufficient for most users. Users that require access to multimedia and online games may consider a broadband connection as it would offer better performance. In addition to contracted Internet access, there are numerous cyber cafés that offer a convenient, affordable path to the Internet. Furthermore, innovative solutions involving shared Internet access over a home-made local area network are cropping up, in particular in the cities, where apartment buildings are common.

## Digital Divide

In the information society, knowledge and information constitute fundamental sources of access to information that leads to well-being and progress. Highly-developed ICT networks, equitable access to information, appropriate content in accessible formats and effective communication can help people achieve their potential, promote sustainable economic and social development, and improve the quality of life for all (M2 PressWire 2003).

ICTs enable societies to promote sustainable growth, advance social justice and strengthen democratic governance (Johnson 1999). The widening digital gap between rich and poor and unequal access to ICTs had produced uneven levels of participation in the networked economy and society.

The expansion of Internet usage in Romania makes e-governance possible and necessary. The Government was committed to ICT and e-initiatives, in order to better fulfil its obligations, particularly in areas of education, social protection, the promotion of economic growth and ensuring free access to competitive markets. Providing such services on-line would encourage better integration of ICT in and among local communities and boost infrastructure development as well. Two such projects under way were on-line tax payment and e-procurement, to ensure transparency and efficiency in the public procurement process (M2 PressWire 2002).

Internet access, which is important to maintaining a technologically competent labour force, is still very limited in Romania (OxResearch 2002). There is a digital divide between Eastern and Western Europe. Many potential customers are thought to be deterred by the high costs currently associated with dial-up internet access, in turn reflecting the monopolies which national telecommunication firms retain over

fixed-line networks (Chandler 2002). It is no surprise that the United Nations is trying to help by sending consultants into Romania to expand access to the Internet (Chronicle 2001). In fact, the Bill and Melinda Gates Foundation announced a project to install computers and provide free Internet access in Romania's public libraries (The Age 2006).

Governmental agencies are hard at work: in 2001 the Romanian government was investing in ICT, school computerization and schools' access to the internet (BBC Monitoring European - Political 2001). In addition, The Romanian Group for Promoting Information Technology was to launch 24 e-projects in 2001 including developing "Romanian Gateway" to promote industry and raise the country's profile, providing computer and Internet access in over 17,000 schools, a site for filling in customs documents online and provisions for allowing people to express their opinions online in an Electronic Referendum service (The Electronic Library 2001).

The use of the Internet has also increased. In 2004 in Romania there were approximately 40 large ISPs with one million Internet subscribers, most of whom use dial-up modems that provide low rates of data transfer. Although many academic sites have higher-capacity ISDN connections to the Internet, the data rates are still limited to 128 or 256 kbit/s (Panait, Doarn, Saftoiu, Popovici, Valeanu and Merrell 2004).

Notably, there are business initiatives in place geared toward providing telemedicine and banking services. Although telemedicine is currently practiced in Romania, there are barriers to its further development and widespread implementation. These include the outdated infrastructure for telecommunications and for Internet access, and the limited availability of modern PCs and digital medical equipment. However, the medical equipment is slowly being upgraded, especially in the large university centres, and this is creating the opportunity to establish centers of telemedicine expertise. The key to fulfilling such a vision is to obtain funding. To be effective at the national level, a coherent effort in telemedicine must be made. This requires government awareness and support (Panait, Doarn et al. 2004).

The successful implementation and development of online banking are influenced by many inter-related factors and institutions, including the quality and security of Internet network, the level of Internet knowledge of the population, the government support, as well as the Internet strategy of the bank and the quality/reliability of online banking services (Gurau 2002). Furthermore, most users have only limited online experience and therefore will be less likely to shop, since shoppers tend to be mature users. And with income levels far below those of many EU members, online spending is set to remain low (EuropeMedia 2003).

## **Research Questions**

Participation in the digital economy is no longer a luxury in the developed world. As the literature review shows, there are economic forces at play which prevents wide-spread access to the Internet. Given the low per capita income and the relatively high Internet access fees, the low market penetration of the Internet in Romania should come as no surprise. This study sought to investigate the connectivity options available to the Romanian would-be Internet surfer. A second research question was to find out whether the economic and technological hindrances - characteristics of a developing country - can be circumvented, and if so, in what manner.

## **Research Framework**

Innovation and entrepreneurship are characteristics of the human species. In order to be able to reap the advantages offered by the Internet, one must first find a way to connect to it. Novel, cost-effective access solutions are evidence of innovation; that is, in Rogers' words "... an idea, practice, or object that is perceived as new by an individual" (Rogers, 1995, p.11). The Diffusion of Innovations theory asserts there are four factors recognized to influence the adoption of innovation: the innovation itself, the channels used to spread information about the innovation, time, and the nature of the society where the innovation is introduced (Rogers 1995).

Within the framework of the Diffusion of Innovations theory, the co-operative Internet access solution unveiled by this study is a technological innovation because it is considered to be a new idea by potential adopters. The merits of the innovation - lower Internet access fees, better bandwidth, or even access at all - are appealing to Internet users. The communication channels supporting its diffusion are more often than not interpersonal communication, which Rogers (1995) qualifies as most effective in persuading potential adopters. The potential for adoption is further increased with face-to-face communication among individuals that share the same social and economic status, and level of education (Rogers 1995).

A second theory relevant to this study is Rogers' Innovation Decision Process Theory (Rogers 1995). The theory defines diffusion as the process by which members of a certain community embrace and adopt innovation. Rogers (1995) asserts that five different stages are involved. First, the potential adopters must learn about the innovation. Second, they must be persuaded and become convinced of the merits of the particular innovation. Third, they must decide to adopt the innovation. Fourth, they must actually implement the innovation. And last, they must confirm their decision to adopt the innovation was correct. Once all these stages are achieved, then diffusion results (Rogers 1995).

In the context of this study, potential adopters learn about the co-operative Internet access devised and employed by other Internet users and are persuaded by the economic benefits offered by the innovation. They next adopt and implement the innovation, by either joining an existing co-op (home-grown network) or starting their own. As they begin to enjoy the lower costs and/or higher bandwidth, in agreement with Rogers, diffusion has taken place. Rogers (1995) states that an increased rate of adoption is predicated upon the innovation having a relative advantage, compatibility with existing values and past experiences, relatively low complexity, trial-ability, and observability. The co-operative Internet access solution described in the study meets these requirements as it offers superior economics (relative advantage), offers the same type of Internet experience (compatibility with existing experiences), has relatively low complexity, it can be tried hands-on (trial-ability), and is readily observable both in terms of costs and bandwidth available (i.e., benefits).

The theoretical framework offered above is relevant to the context of the study in that, as this study unveiled, innovative responses to the relatively high ISP fees are devised and adopted by some Internet users. As stated earlier, the study set out to explore the various means for Internet access available to would-be Internet surfers in Romania - a developing economy. The researcher found that the innovation - the co-operative, shared Internet access that centers on home-grown local area networks - offers a viable, economically appealing alternative to individual Internet access accounts.

The findings from the study suggest that innovation is hard at work in Romania. The analysis of the data available from the study and the brief interviews with several Internet users reveal the advent of the home-grown, co-operative networks with shared Internet access. The following sections of the paper discuss these findings in detail. The insights are relevant to other developing economies and to Internet users who are looking for ways to mitigate the economic impact of relatively high Internet access fees.

## **Methodology**

The researcher chose a case study approach to investigate the phenomenon of interest (Yin 1994). Given the scope of the investigation in a national setting and the exploratory orientation of the study, the researcher resorted to analysing public documents available over the Internet. The data collection was augmented by personal communications and interviews with several Internet users in Romania, who shared their experiences connecting to the Internet. The respondent sample is small; it consisted of 11 participants (five females and six males) from two different co-ops. The youngest person interviewed was seventeen years old, and the oldest one thirty-four. The in-person interviews were conducted over a period of two weeks, and involved unstructured, open-ended questions. When online, the majority of the respondents spent their time in chat rooms and playing online games, taking advantage of the greater bandwidth available through the co-op. While hardly a representative sample, the respondents help validate the findings of the study.



In order to improve the validity and reliability of the study, the researcher followed a triangulation strategy. Multiple sources of evidence were used, involving mainly analysis of existing documentation in both print and electronic form. This combined approach to data collection supports the internal validity of the study. In general, external validity is more difficult to attain in single-case study. Yet, the study informs on Internet access solutions in Romania and it discovered an innovative approach to reducing the Internet access fees to a more affordable level. The findings are relevant to researchers and practitioners interested in the social and economical aspects related to Internet penetration in Eastern Europe. In addition, important lessons can be learned and are applicable to other developing countries that share the same type of economical issues. Namely, the low per capita income and relatively high Internet access fees.

## Findings

The results of the study offer a glimmer of hope for those who, while economically disadvantaged, wish to be able to surf the Web. A review of the ISPs that operate in Romania, complete with pricing structure, bandwidth and level of service is presented in the following section. In conjunction with the economic environment discussed in the previous sections, this study offers an understanding of the costs associated with Internet access and informs on what Romanian Internet users are facing. The advent of the Internet cafés and of the co-operative approach to Internet access is discussed. The former offers affordable Internet access to those who either lack a personal computer, or may be away from their home or office. The latter represents an innovative solution to what otherwise may be an economically intractable problem for the less affluent user who owns a personal computer: making Internet access more affordable.

## Internet Service Providers

Romania started connecting to the Internet in 1992 (Jalobeanu 2003). In 1993 there were only three ISPs: EUNET (KPNQWest), Starnets (Euroweb), and PCNET, yet Romania kept pace with the explosion of the World Wide Web. In 1999, the most important players were: Global One Communications Romania; Logic Telecom, which in 1996 established a subsidiary in Moldova; StarNet (with 8,500 subscribers), Dynamic Network Technologies (8,500 users), PC-Net (18,000 users), RNC (10,000 users), FX (8,500 users), and RoEduNet – the network of the Romanian educational system and ICI which operates the network of Romanian research institutes (Oaca 2000).

In 2002 Internet access was offered by 38 Internet Service Providers (Noua Economie 2002). By 2004, there were 498 service providers in Romania that offered data services and 570 Internet service providers (Tarifica Alert 2004). Today, Internet access is offered via dial-up (ISDN, 33.6 kbps, 28.8 kbps, 56 kbps), leased lines (nx64K, E1, T1, T3, Frame Relay, DSL, ATM), and broadband (DSL, ADSL, Cable, Fixed Wireless, Satellite) (ANISP Romania 2003).

## Dial-up Service

The most common Internet access modality is dial-up. Yet, unlike in more developed countries such as USA, Canada, etc., where local calls are generally billed at a fixed rate (included in the monthly fees paid to the local phone company), in Romania, just as in the majority of the European countries, all calls incur charges by the minute. This adds to the cost of the Internet access.

In Western Europe (e.g., Germany, UK) data transmission can be contracted for a fixed monthly fee, from the local phone carrier. Yet this type of change is slow to take place in Romania despite the liberalization of the phone services in 2003. For a long time, all phone services was provided exclusively by ROMTELECOM. Aside from cellular carriers that provide mobile telephony service, the situation continues. None of the new entrants into the market has managed to secure a significant share of the fixed telephony market. Any company offering phone service over existing cabling that belongs to RomTelecom would have to pay access fees, making potential profits less appealing and more difficult

to achieve. It is more lucrative for these companies to focus on offering long distance and international telephone service. Any company that tries to enter the market will face existing competition from established companies.

Telephone service fees vary during the day, and season. While customers in western European countries enjoy reduced telephone service tariffs during evening hours, this is not quite the case in Romania. Where and when such reduced tariffs are offered, the terms and conditions can vary significantly among providers.

In general, the rates for telephone service include a Value-Added Tax (VAT) of 19%. These monies are submitted to the tax collector and benefit the government. The most common type of telephone service costs \$7.00 a month and includes \$2.00 worth of traffic. Some other types of service are available for lower rates, yet they have additional restrictions. As of June 1st, 2004, telephone service rates are subject to two-tiers, with lower rates being charged during evening hours - \$0.041/min during business hours (workdays from 8:00am to 8:00pm) and \$0.014/min for non-peak hours. Through ROMTELECOM, since 2001 it is possible to take advantage of a reduced rate applicable to data communications. However, this requires that telephone services be provided by a digital CO, or that more sophisticated service monitoring options are to the subscriber. This is not always the case.

The access fees charged by Internet Service Providers vary. For example, customer located in the capital city, Bucharest, can choose from several plans that offer a limited number of hours (e.g., 5 hours for \$1.19, 20 hours for \$5.95, or 100 hours for \$16.66). Subscription plans that offer unlimited service are somewhat more expensive, and range from \$5.95/month for non-peak access to \$11.90/month anytime. Billing and payment for the monthly service is done in advance (Table 1).

**Table 1.** Internet Service Providers – monthly access fees for limited dial-up access

	5 Hrs.	6.Hrs.	10Hrs.	15Hrs.	20Hrs.	25Hrs	30Hrs	50Hrs	60Hrs	100Hrs
RDS			\$3.57			\$4.76		\$7.14		
PCNET	\$1.19		\$2.38		\$4.76			\$9.52		\$16.66
FX										
ARTELECOM										
DIGICOM					\$5.95					
IDILIS*							\$4.50		\$6.00	
DIALPLUS**		\$1.19			\$3.57					

\* Requires purchase of an access card. \*\* Ordering through SMS; fees charged to a mobile phone account.

Certain subscription plans offer unlimited Internet access. A cost comparison of existing Internet access plans that offer unlimited access is presented in Table 2.

**Table 2.** Internet Service Providers – monthly access fees for unlimited dial-up access

	<b>Non-peak hours</b> (7:00pm – 7:00am)	<b>Any time</b>	<b>e-Mail only</b>
RDS	\$5.95	\$11.90	
PCNET	\$8.35	\$10.71	
FX		\$10.71	\$21.42/year
ARTELECOM	\$5.95	\$8.33	
DIGICOM		\$11.90	
IDILIS*			\$9.00

\* Requires purchase of an access card.

Billing and payment for the monthly service is done in advance. A few Internet Service Providers offer access to the Internet without requiring a long-term commitment, or subscription – as shown in Table 3. In such case, fees for the Internet access are billed on the phone invoice.

**Table 3.** Internet Service Providers - access fees without a subscription plan

	<b>Daytime access (peak hours)</b>	<b>Night time access (non-peak hours)</b>
IDILIS	8:00am – 8:00pm: \$0.27/min.	\$0.17/min.
WEBLINE	8:00am – 8:00pm: \$0.29/min.	\$0.17/min.

ARTEL	8:00am – 8:00pm: \$0.25/min.	\$0.12/min.
EASYNET	8:00am – 10:00pm: \$0.27/min.	\$0.17/min.
ROMTELECOM	8:00am – 8:00pm: \$0.81/min	\$0.39/min (including weekends)

ISPs in general offer a fixed number of hours of access that typically expire within 30 days from purchase. They resort to innovative marketing campaigns and access packages to target in particular the younger customers. Unlimited monthly access plans are very common. Alternatively, access cards that offer one month of unlimited access can be purchased for approximately \$9.00. Other plans offer a limited number of hours (usually in multiples of five: 5, 10, 15, 20, etc.) of Internet access, or, limited access to email only (Munteanu 2004).

## Broadband Service

A relatively small number of companies control the market. In September of 1999, an investment fund backed by EBRD paid \$1.5 million for a 40% stake in PC-Net, the first investment in a Romanian ISP (Oaca 2000). Over time, numerous mergers and acquisitions have taken place, leading to the current situation. Service areas do not overlap, and customers do not have a choice of cable providers.

Cable access to the Internet was, until 2002 a very expensive proposition. Prices began to drop after 2002 (EuropeMedia 2002). The abolition of the RomTelecom monopoly in the telephone services market, in 2003, should have helped the cable providers (The Electronic Library 2001). Yet, there was no significant effort on their behalf to modernize their cable plants, a requirement for offering phone and Internet services (Business Wire 1998; Munteanu 2004).

Broadband Internet access plans typically include a limited amount of traffic for a monthly fee (e.g., \$10.71/month with 1GB traffic included – additional traffic is charges at \$0.04/MB). The broadband speed is between 128 kbps and 256 kbps. Additional fees are incurred for installation, and for the modem (Business Eastern Europe 2002). Table 4 details some of the broadband Internet access offer.

In the second half of 2004, Internet access service bundles continued to evolve (e.g., the \$10.71/month agreement now allows 1GB of traffic, up from 500MB). Likewise, \$17.85 will allow 2.5GB/month (up from 1.5 GB). The connection speed increased from 128 kbps to a maximum of 256 kbps.

**Table 4.** Internet access plans - broadband

ISP	Plan	Cost	Speed	Traffic Included	Additional Traffic	Installation	Modem cost	Notes
RDS	CableLink+	\$10.71	256 kbps	1GB	\$0.04/MB	\$17.85	0	Requires cable TV subscription
		\$17.85		2.5 GB	\$0.02/MB			
		\$23.80		4GB	\$0.015/MB			
		\$34.51		12 GB	\$0.01/MB			
		\$17.25		1.1 GB	\$0.04/MB			
	Cable Link	\$24.39		2.6 GB	\$0.02/MB			
		\$30.34		4.2 GB	\$0.015/MB			
		\$41.05		12.5 GB	\$0.01/MB			
		\$22.61		600 MB	\$0.01/MB	\$11.90	\$101.15	Cable
		\$28.56		unlimited*				Unlimited traffic during non-peak hours (7:00pm -7:00am and weekends)
		\$34.51	128 kbps	unlimited				
FX		\$34.51	64 – 256 kbps	1 GB	\$17.85/500 MB	\$28.95		Dial-up; cable; radio
ESS		\$23.80		200 Mb	\$0.95/MB	\$35.70	\$142.80	Cable
		\$59.50		600 MB	\$0.83/MB			
		\$148.75		1.8 GB	\$0.53/MB			
		\$297.50		3.6 GB	\$0.30/MB			
		\$416.50		5 GB	\$0.24/MB			
		\$226.10	64 kbps	unlimited				
		\$386.75	128 kbps	unlimited				
		\$714.00	256 kbps	unlimited				
		\$14.28		1 GB	\$0.12/MB			Cable
OPEN SYSTEMS		\$20.23		unlimited*			Non-peak hours	

		\$41.64		unlimited			
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\* - during non-peak hours (workday evenings and the weekend)

## Internet Cafés

A very popular and affordable means to the Internet is offered by Internet cafés. Typically these are set up in two or three-bedroom apartments, almost always on the ground floor with easy access from the street. In general, there is no coffee served at these establishments. A typical Internet café has between ten and twenty networked computers sharing an Internet connection – usually broadband. The computers are of various vintage, often built using salvaged components. Additional services that may be available to customers are internet telephony, email, chat, software and media downloads, print and fax services.

The Internet Café is a resource that provides support for, and serves the entertainment, business and communication needs of individual consumers – those who cannot afford Internet access from their own homes, and the occasional tourist. Internet cafés are attractive in that they represent economic opportunity for the owner. Thus, they are “for profit” enterprises and must sustain a profit. Would-be Internet surfers pay an hourly rate and can use a PC to access the Internet. The fees are between \$0.50-\$1.00 per hour. One source put the number of Internet cafés (cyber-cafés) in Romania at 18 in 2004. At the beginning of 2007 there were approximately 58 such cyber cafés advertised online (Afla.ro 2007; Cybercafes.com 2007; Romania-On-Line 2007; World66.com 2007). While indicating growth, none of these numbers would appear to adequately reflect the popularity of these establishments. Anecdotal evidence indicates the real number is much higher, perhaps by as much as a factor of 10 across the entire country.

## Home-grown Shared Internet Access

A notable trend is the development of private, neighbourhood-, peer access networks. As it seems, this novel, innovative approach is unique and has not been encountered or reported elsewhere. Typically, one or more ISP accounts are set up and shared among a number of participants that share the costs equally. This results in a decent quality connection at an excellent price - clearly, a better value. These private networks may cache popular sites (e.g., games, movies, shareware software). Aside from providing Internet access, these networks take advantage of the higher speed available on the ISP’s internal network (the term metropolitan access is used) and offer online gaming, chat and email services to their members.

The high cost associated with Internet access has motivated would-be users to organize and build their own local networks, connecting to the Internet through a shared account. The end users interviewed reveal two basic approaches to establishing a home-grown network. Frequently it starts with one user who purchases Internet access from a local ISP and pays the necessary fees. This person would next enrol other users and build a local area network using whatever parts and components can be procured (Figure 2). Consequently, the home-grown network could be either wired (Ethernet – with different connection rates) or wireless. As the number of users connected to the network grows, more money become available and would go towards higher bandwidth from the ISP as well as network wiring and equipment upgrades.

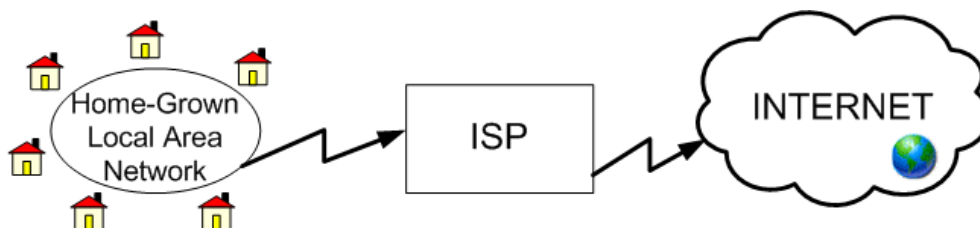


Figure 2. Home-Grown Local Area Network

Alternatively, it could be a group of neighbours who decide to pool their resources and share the cost of the Internet service. They will then build the local area network and share the benefits it yields: lower Internet access fees per user, a local online community in which they are members, and as more monies become available, higher bandwidth from the ISP and network upgrades.

While mainly in the cities, these home-grown networks have become quite popular lately. Table 5 shows where some of these home-grown networks are located. Aside from offering Internet access, these networks also allow shared games, chat, file downloads, etc. This type of setup offers access to a superior Internet connection (in terms of connection speed and amount of traffic allowed) for a reasonable price. Reportedly there were 116 such networks with approximately 12,000 users at the end of 2004 (DAP 2004; Home.ro 2004).

**Table 5.** Home-grown networks

	# of networks			# of networks	
Location	2004	2007	Location	2004	2007
Arad	1	8	Iasi	1	20
Bucuresti	74	383	Oradea	3	5
Brasov	4	15	Pitesti	6	15
Buzau	2	14	Ploiesti	3	24
Cluj	1	18	Sibiu	3	6
Constanta	2	17	Targu-Jiu	1	5
Craiova	1	1	Timisoara	5	24
Focsani	1	3	Vaslui	1	7
Galati	4	38	Zalau	1	5

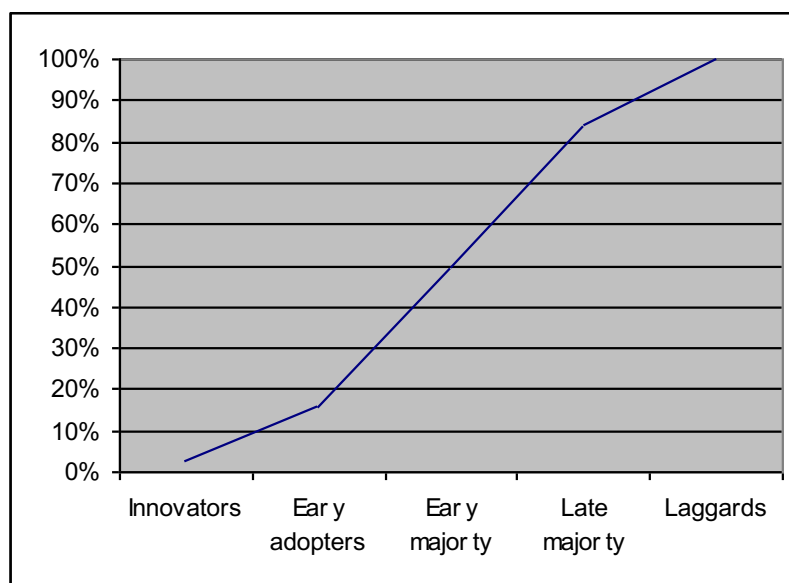
The situation evolved overtime. As more people became interested in becoming part of the home-grown network phenomenon, the numbers went up. In January 2007 Romania had 699 such home-grown networks, totalling over 1.6 million users. While the number of home-grown networks grew from 116 to 699 (a 600% increase), the number of members/subscribers grew from 12,000 to 1,637,814 (a 13,648% increase) over two years. In addition, these home grown networks can be found in 40 cities in 2007, up from only 18 cities in 2004. This is a significant development that is indicative of the popularity of these home-grown networks. As noted earlier, the tiered level of access affords different network privileges in connection with different user fees. In 2007, over 721,000 of the 1.6 million home-grown network members were enjoying full network privileges including Internet access while the rest were content to enjoy the other network resources (e.g., chat, file downloads, games) and refrain from Internet access in return for lower network access fees (retele.net 2007).



**Figure 3.** Home-grown networks in several major cities: 2004 vs. 2007.

The map in Figure 3 shows the rapid expansion of the home grown networks from 2004 to 2007. The un-even spread of these home-grown networks is evident and, as expected, they are concentrated in cities. Bucharest, the capital city, has the largest number of these networks. In contrast, the other cities have only a few networks each.

A basic tenet of Diffusion of Innovation theory is that in the early stages of the diffusion process, ideas are adopted very slowly; the rate of adoption increases quickly as adopters share their favourable experiences with potential adopters. Graphically, this translates into an “S”-shaped adoption curve: the adoption rate is relatively low initially, then it increases significantly, only to level off later on as less adopters embrace the innovation (Backer and Rogers 1998). Given the 600% increase in the number of home-grown networks from 2004 to 2007 reported earlier, it is conceivable that the phenomenon has reached critical mass. Hence, its dramatic increase in adoption rate. The most recent reports place Romania’s population at 22 million (CIA 2007) and the Internet penetration rate at 23.4% (Internet World Stats 2007). These figures compute to approximately 5.2 million users, of which as many as 1.6 million are members of a home grown network (retele.net 2007). This data, viewed in conjunction with the categories of adopters posited by Rogers and Scott (1997) would suggest the adoption rate has reached 31%, indicative of an early majority (Figure 4). However, the precise position on the S-curve can only be determined in a subsequent study and would require additional data.



**Figure 4.** Home grown network adoption rate.

In terms of technology, the home grown networks discussed above offer Internet access via fast connections (from kbps to Mbps) over fibre or dedicated circuits. Yet, some of them simply share broadband accounts over cable. While the costs may be placed in the vicinity of dial-up service (the average cost seems to be around 300,000 lei, which is equivalent to approximately \$10.00), users certainly receive more value: they can have access to a high-speed Internet connection now, and to additional services such as chat, online games, and downloads. It is notable that network connectivity is provided via either wired Ethernet at 100 Mbps, or wireless – employing 802.11a, 802.11b, and 802.11g IEEE standards. While for many years a technology laggard in terms of networking technologies, Romania is now seeing the latest technologies being put to good use.

A home-grown network will typically provide information regarding Internet access performance as a set of three numbers (Appendix A). First, the Internet connection speed varies across these networks from 16 Kbps for the slowest one, to 10 MBps for the fastest one. A second number indicates the connection speed on the metropolitan network – that is the ISP’s internal network. This typically is higher, around 512 Kbps on average. Yet, one of the networks states 200 MBps on the metropolitan network, using two different ISPs. The third number indicates the speed of the home-grown network. Network connectivity is overwhelmingly 100 MBps. Some networks also allow wireless access over 802.11 standards a, b, and g (54 MBps). As at the time of the study the 802.11g wireless equipment was just beginning to take off in the USA, this was a surprising finding. Furthermore, given the economic conditions in Romania, the researcher was expecting the home grown networks to consist of

mainly used or refurbished equipment. While this was true in some cases, for the most part, as it can be seen in Appendix A, network speeds of 100 MBps were quite common. This deployment and use of current technologies (by Western standards) is quite interesting. It appears that as funds in excess of the ISP monthly fees become available, the monies would be spent on upgrading the network. Consequently, it becomes easier to attract new members/users and the higher bandwidth offers better levels of service to all network users. The interview data supports this assertion.

A two-tier pricing scheme is prevalent among the existing home grown networks, with one fee for network and Internet access and a lower fee for network-only access. The typical home-grown network has 30-50 subscribers. Yet, membership ranges from two subscribers in the case of new, un-established networks to some 1,200 for the largest one. It is very common to see the number of Internet access subscribing member being lower than the total number of members in the particular network/co-op. Once again, the laws of economics seem to prevail over one's desire to surf the Internet.

### Comparison to other European countries

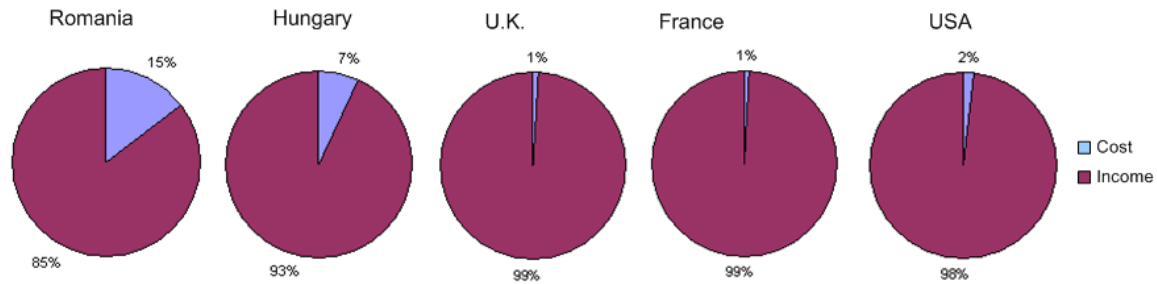
Overall, in comparison to what is available in other European countries, accessing the Internet from Romania continues to cost more, and offer less value. Furthermore, given the relatively low per capita income, accessing the Internet is not an affordable proposition for everyone. As it stands today, not everyone can afford to surf the Internet in Romania. This may be one of the main reasons behind the occurrence of the home-grown networks described in the previous section, and it may explain the popularity of the Internet cafés. Table 6 offers a cursory view of the fees and types of Internet access plans available in other European countries, and for comparison, in the USA (Munteanu 2004).

Given the average monthly wage of around €150 (approximately \$190), it is fairly easy to see why Internet access continues to be a challenge for the average Romanian citizen (The Malta Financial and Business Times 2003; Database Central Europe 2004; Sofia News Agency 2004).

**Table 6.** Internet Access in Other European Countries

Country	ISP	Plans	Download	Upload	Traffic	Cost	Installation	Notes
Hungary	Matav	Kabelnet Hobbi	384 kbps	64 kbps	unlimited	\$47.15	\$114.00	Two-year contract
						\$58.80	\$114.00	No long-term contract
		Kabelnet Otthon	512 kbps	128 kbps	Unlimited	\$54.60	\$114.00	Two-year contract
						\$70.60	\$80.00	No long-term contract
U.K.	Telewest		512 kbps		Unlimited	\$50.83	\$85.00	
			1 Mbps			\$68.00	\$85.00	
			2 Mbps			\$93.48	\$85.00	
France	Numericable		128 kbps			\$23.90		
			512 kbps			\$29.90		
			1 Mbps			\$53.90		
	FT	Cable Wanadoo	64 kbps	64 kbps	unlimited	\$30.00		
						\$23.90		Cable TV subscriber
			512 kbps			\$54.00		
						\$41.40		Cable TV subscriber
	Chello		512 kbps	128 kbps		\$53.50	\$108.00	
USA	RoadRunner				Unlimited	\$44.95		
	AOL				Unlimited	\$44.95		
	Earthlink				Unlimited	\$41.95		

The pie-charts in Figure 5 show the cost of broadband Internet access plans as a percentage of the average gross income for Romania, Hungary, U.K., France, and USA.



**Figure 5.** Comparative cost of Internet access relative to gross income

The term income as used in Figure 5 refers to average gross wages per month. After accounting for taxes and living expenses there is significantly less disposable income left for discretionary expenditures, Internet access included (Eurostat 2003).

Romanian Internet surfers may choose among the dial-up or broadband plans available in the area where they live. It may be as simple as visiting a nearby cyber café periodically. Alternatively, they may be able to join a local home-grown network that offers shared Internet access. If the option to join an existing network is unavailable, they may decide to start one of their own – either alone, or with a group of other people who are interested in this co-operative approach to Internet access. Clearly the incentive is to save money by sharing the ISP fees (and bandwidth) with others. Yet in some cases, membership in a home-grown network affords higher bandwidth, with shared broadband access rather than dial-up. The choices available vary, as access plans differ from location to location.

Cyber cafés are almost a staple, at least in the urban areas. They offer convenient and affordable Internet access for those who either cannot afford to, or do not wish to set up individual ISP accounts at their homes. In addition, for those who are either without a computer, or away from their home or office, the cyber cafés offer access to office productivity (printing, scanning, and access to general PC software applications) and Internet access for very little money.

The number of home-grown networks in the country seems to be increasing. However, this phenomenon seems limited for now to cities, where apartment buildings offer a higher population density and the physical span of the network is more manageable. Table 7 summarizes, and offers a quick comparison of some of the choices available to the would-be Internet surfer in Romania.

**Table 7.** Internet access choices

	Dial-up	Broadband	Cyber café	Home-grown network
Cost	\$10.00/month	\$30.00/month	\$0.50/hr.	\$10.00/month
Speed	20 kbps	128 kbps	128 kbps	256 kbps
Pros	Relatively affordable; suitable for chat and email; convenient	Fast; suitable for multimedia; does not tie up the phone line; convenient	Affordable; suitable for chat and email	Relatively affordable; good value; convenient; local community
Cons	Low speed; ties-up the phone line while in use; additional per minute charges incurred for phone use	Expensive; must pay for the modem and installation services	Inconvenient – must leave home; privacy concerns	Not available in all areas

Lagging behind other developed countries, Romania is making progress in terms of Internet access. As indicated by the home-grown networks that offer shared Internet access, people are finding ingenious ways to overcome the relatively high costs of Internet access. A trait that was honed during the years of socialism, when spare parts were scarce and many times they had to be designed and manufactured in a craftsman-like manner, seems to have resurfaced. Is this mere entrepreneurship? Perhaps. However, the benefits for the Internet users participating in these shared home-grown networks are self-evident. While



this phenomenon may be construed as an exercise in entrepreneurship, it does appear to meet the needs of the would-be urban Internet surfer in a cost-effective manner. It is undoubtedly a phenomenon worth monitoring.

## **Lessons Learned**

It seems that under the right economic conditions, home-grown shared Internet access will eventually materialize. But, what are the “right” conditions? For one, there should be Internet service available. Once that Internet service is available in a market, it is only a matter of time until would-be users will establish co-ops. Of course, the underlying assumption is that they have personal computers available, and the desire to surf the Internet – cost being the single most important obstacle they face.

What can governments do to encourage Internet surfing? The single most important thing is to take care of the infrastructure. That means ensuring the power grid is functional, and that telecommunication resources are in place. It is hardly fathomable to expect people to use personal computers without access to electric power, and it is impossible to connect to the Internet without an ISP. The second most important element needed to facilitate this phenomenon is the existence of ISPs. This role can be fulfilled by either a for-profit, non-profit, non-governmental, or governmental organization. Governments can provide incentives to encourage ISP start-up companies.

The co-op phenomenon allows for building up an Internet user base much faster than otherwise possible. The ISPs should consider encouraging this phenomenon as it is likely to help rapidly add Internet users. One way ISPs can encourage this is by offering high speed modems or perhaps offer to handle the billing for co-ops.

While it is important for ISPs to allow this behaviour, it is not entirely clear whether they have efficient means from preventing this – other than legal provisions and service policies. As any account holder can resort to network address translation in order to connect a private LAN to the Internet, it is unlikely the ISP can do much to block and/or filter traffic.

One possible trend that can occur is that as time progresses and prices start to drop, some co-op users will seek to build their own co-ops. Another trend may be that they will choose to surf the web on their own, and sign up for personal ISP accounts. This would allow them to achieve even greater bandwidth than through the co-op and perhaps, access to a larger variety of services offered by the ISP. Therefore, a likely trend is from expensive to cheaper access and from lower to higher bandwidth, while continuing to increase the number of Internet users and of ISP customers in the same time.

In time, as the Internet users become more sophisticated, their economic wherewithal and personal interests may lead them down this path, or not.

## **Future Research**

A number of potential research opportunities are available to either confirm or expand the findings of this study. First, a longitudinal study along the same lines with the one presented here, would provide some interesting data on whether the findings reported here will continue to hold over time, and the evolution of these home-grown networks and co-operative Internet access. Second, the study could be extended to include the country-side, where the population density is inherently lower than in the urban areas to find out more about how non-urbanites connect to the Internet. Third, further research may be conducted to investigate other countries that face similar economical challenges, in order to learn more about the Internet access choices their populations have. A cross-countries study would be another possibility. Continuing in the direction of this study, a follow up study involving quantitative methodologies would help inform on the degree of penetration of various Internet access technologies and on the extent to which the home-grown networks identified by this study continue to evolve and grow. Such study may bring additional confirmatory evidence in support of, and furthering the importance of this study.

## Conclusion

The study presented here achieved its goals of exploring the connectivity options available to the Romanian would-be Internet surfer and to find out whether the economic and technological hindrances - characteristics of a developing country - can be circumvented, and if so, in what manner.

The findings of the study are of interest to academic researchers and practitioners alike. The analysis of the various Internet access choices available in the country is thorough and informative. The Internet cafés studied and the discussion of shared Internet access solutions are applicable to other developing countries. And last, this report would be of interest to those who want to get into the ISP business in Romania, or wish to relocate there and carry on an Internet-enabled business or want to approach the Romanian market via the Internet.

This study set to explore Internet access in a developing country. Among its findings, the co-operative approach to Internet access stands out as an innovative, affordable solution to mitigating the relatively high cost of connecting to the Internet. As this study indicates, this type of development appears to be unique to the setting of the study and has not been found or reported elsewhere. Understanding the context within which home-grown networks arise and prosper offers valuable information that can be transferred to other developing countries. The same can be said about the very approach, which is to allow would-be Internet users to pool their resources and split the cost of Internet access over a shared local area network they build.

Home-grown Internet access is a useful solution for the near term, yet one cannot expect the situation to stay the same forever. In Romania, like in any other country, the Internet access fees may eventually become more affordable. While this is by no means a certainty, it is conceivable that as technology costs continue to drop and incomes continue to rise, the home-grown networks will probably - but not certainly - be supplanted. However, at least for the time being, these home-grown networks appear to continue to spread.

Romania is making steady progress toward a fully functional market economy, and access to the Internet is becoming more and more affordable. Yet, it will take some time for this type of service to become truly affordable. As it stands, the ingenuity of the average citizen continues to find ways around this problem. Therefore, at least for the near future, this co-operative approach to Internet access can be expected to continue. After all, it does seem to offer better value to the consumer.

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## References

- Afla ro (2007). 'Internet Café.' (02/09/2007). <http://www.afla.ro/?d=internet&sd=internet+cafe>
- ANISP Romania (2003). 'ANISP presentation 10/21/2003.' (09/07/2004). <http://www.anisp.ro/?c=noutati-comunicate&...&PHPSESSID=a56f0da9e760f6eb06f3e3db872d8d5d>
- Backer, T. E. and E. M. Rogers (1998). 'Diffusion of Innovations Theory and Work-Site AIDS Programs.' *Journal of Health Communication* 3: 17-28.
- BBC Monitoring European - Political (2001). 'Romania: Communications minister announces steps toward "e-Romania".' BBC Monitoring European - Political, London, Jun 6, 2001, 1.
- BBC Monitoring Media (2000). 'Romania: Internet monthly growth averages 10 per cent.' BBC Monitoring Media, London, May 25, 2000, 1.
- Budd, J. (2003). 'IDC: Internet penetration in Central and Eastern Europe to reach 17% in 2003, says IDC.' M2 Presswire, Feb 18, 2003, 1.
- Business Eastern Europe (2002). 'Web watch.' Business Eastern Europe, London, UK, August 5th 2002,

- Business Wire (1998). 'Cisco and BreezeCOM Win Major Romanian Higher Education Network Contract.' Business Wire, New York, Jul 23, 1998, 1.
- Business Wire (2004). 'Research and Markets: 2004 Telecoms in Europe - The Balkans and the South East: Internet and Mobile Penetration Rates low.' Business Wire, New York: May 14, 2004, 1.
- Business Wire (2004). 'Research and Markets: An Examination of Past, Current and Future Demand for Broadband Equipment and Services in 29 Leading European Countries.' Business Wire, New York: Sep 23, 2004, 1.
- Chandler, R. (2002). 'Online: Second sight: Digital divide racism's new frontier.' The Guardian, Manchester (UK), Jan 17, 2002, 2.
- Chronicle, H. (2001). 'Geeks join geezers to cut nations' technology gap.' Houston Chronicle, Houston, Tex., Aug 14, 2001, 4.
- CIA (2004). 'The World Factbook - Romania.' <http://www.cia.gov/cia/publications/factbook/print/ro.html>
- CIA (2007). 'The World Factbook.' (June 6, 2007). <https://www.cia.gov/library/publications/the-world-factbook/index.html>
- Cybercafes.com (2007). 'Internet cyber cafes guide all over the world.' (02/09/2007). <http://www.cybercafes.com/continent.asp?continent=Europe>
- DAP (2004). 'Retele Locale de Calculatoare.' (11/08/2004). <http://retele.dap.ro>
- Database Central Europe (2004). 'Average Gross Monthly Wages.' (11/22/2004). <http://www.databasece.com/wagegross.htm>
- EuropeMedia (2002). 'Cheaper internet services expected in 2003.' Europemedia, Amsterdam: Dec 9, 2002, 1.
- EuropeMedia (2003). '50m internet users in the new EU countries by 2007.' Europemedia, Amsterdam: Jun 10, 2003, 1.
- Eurostat (2003). 'Minimum Wages - EU Member States and Candidate Countries, January 2003.' (11/22/2004). <http://europa.eu.int/comm/eurostat/newcronos/reference/>
- Eurostat (2004). 'Eurostat Yearbook 2004 - The Statistical Guide to Europe.' (11/22/2004). <http://epp.eurostat.cec.eu.int>
- Goodman, S. E. (1991). 'From Under the Rubble: Computing and the Resuscitation of Romania.' *Communications of the ACM* 34(9): 19-22.
- Gurau, C. (2002). 'Online banking in transition economies: The implementation and development of online banking systems in Romania.' *The International Journal of Bank Marketing* 20(6): 285.
- Home ro (2004). 'Site-uri Web.' (11/22/2004). <http://www.home.ro/dir/107>
- Ignatius, D. (2002). 'Europe's Real Modernizers.' The Washington Post, Washington, D.C.: Dec 13, 2002, A45.
- IMF (2006). 'World Economic Outlook. Financial Systems and Economic Cycles.' September 19, 2006, <http://www.imf.org/external/pubs/ft/weo/2006/02/index.htm>, 296.
- Internet World Stats (2007). 'Internet Usage in the European Union.' (01/25/2007). <http://www.internetworldstats.com/stats9.htm#eu>
- Internet World Stats (2007). 'Top 35 countries with the highest Internet penetration rate.' <http://www.internetworldstats.com/top25.htm>
- Jalobeanu, M. (2003). 'Romania pe Net.' (09/07/2004). [http://www.itim-cj.ro/~jalobean/Romania\\_pe\\_net.html](http://www.itim-cj.ro/~jalobean/Romania_pe_net.html)
- Johnson, A. K. (1999). 'Globalization from below: Using the Internet to internationalize social work education.' *Journal of Social Work Education* 35(5): 377.
- Ladika, T. (2004). 'EU Internet Access Lags Behind U.S.' Wall Street Journal, Brussels: Jul 14, 2004, A2.
- LearnLink (2002). 'Roumanie - Rattraper des decennies perdues.' (09/07/2004). [http://learnlink.aed.org/Publications/Country\\_Papers/cp\\_pdf/FR\\_CP\\_Romania.pdf](http://learnlink.aed.org/Publications/Country_Papers/cp_pdf/FR_CP_Romania.pdf)
- M2 PressWire (2002). 'UN: 'Digital divide' still yawns as widely as ever, says secretary general, as general assembly opens two-day session on information technologies; Senegal's President cites hopeful signs of 'digital revolution' for Africa; Speakers say new technologies must be used to reach millennium development goals; Part 2 of 3', M2 Presswire, Coventry, Jun 18, 2002, 1.
- M2 PressWire (2003). 'ITU: Path towards information society for all takes shape; Declaration and action plan outlined.' M2 Presswire, Coventry, Mar 3, 2003, 1.
- M2 PressWire (2003). 'Research and Markets: Recent Internet and mobile penetration rates decreasing in Balkan and South east European States.' M2 Presswire, Coventry: Nov 13, 2003, 1.
- MacAonghus, J. (2004). 'Online impact of a growing Europe.' New Media Age, London: Feb 12, 2004, 15.
- Munteanu, A. B. (2004). 'Conectare Cablu.' (09/07/2004). <http://www.geocities.com/muntealb/ConectareCablu-bn.htm>
- Munteanu, A. B. (2004). 'Costul Internet in Romania.' (09/07/2004). <http://www.geocities.com/muntealb/CostInternetRo-bn.htm>

- Norris, P. (2000). 'The Global Divide: Information Poverty and Internet Access Worldwide.' (11/22/2004). <http://www.ksg.harvard.edu/iip/governance/psa2000dig.pdf>
- Noua Economie (2002). 'Revolutia Internet - Situatia din Romania.' (09/07/2004). <http://www.crie.ro/nouaeconomie/sr1231-situatia-VD.html>
- Oaca, N. (2000). 'Romania: Wireless Spurs Telecoms Growth.' *Telecommunications* 34(4): 92.
- OxResearch (2002). 'BALKANS: Region offers home for knowledge industries.' OxResearch, Oxford, May 10, 2002, 1.
- Panait, L., C. R. Doarn, et al. (2004). 'A Review of Telemedicine in Romania.' *Journal of Telemedicine and Telecare* 10(1): 1.
- retele.net (2007). 'Retele de bloc si cartier.' (02/05/2007). [www.retele.net](http://www.retele.net)
- Rocks, D. (1998). 'There's no shortage of information about Central Europe on the Internet: The trick is spotting what's useful.' *The Wall Street Journal (Europe)*, Brussels, Apr. 27, 1998, 18.
- Rogers, E. M. (1995). *Diffusion of Innovations*. New York, The Free Press.
- Rogers, E. M. and K. L. Scott (1997). 'The Diffusion of Innovations Model and Outreach from the National Network of Libraries of Medicine to Native American Communities.' (June 11, 2007). <http://nnlm.gov/archive/pnr/eval/rogers.html>
- RomaniaBusiness.com (1997). 'Romania Business.' <http://www.romaniabusiness.com>
- Romania-On-Line (2007). 'Internet Café.' (02/09/2007). <http://romania-on-line.netr/general/internetcafe.htm>
- Sofia News Agency (2004). 'Bulgaria, Romania - Europe's Wage Laggards.' (11/22/2004). <http://www.novinite.com/newsletter/print.php?id=37581>
- Tarifica Alert (2004). 'Romania - Breakdown of telephony service providers in Romania.' Tarifica Alert, Potomac: Aug 24, 2004, 1.
- Tarifica Alert (2005). 'Romania - Internet penetration on the increase in Romania by 51.48 percent.' Tarifica Alert: Potomac, Jan 4, 2005, 1.
- Teleducru (2004). 'Tendinte.' (11/22/2004). <http://telework.bravepages.com/marketing/perspective-tendinte.htm>
- The Age (2006). 'Gates Foundation to provide free access to computers and Internet in Romania.' (02/05/2007). <http://www.theage.com.au/news/Technology/Gates-Foundation-to-provide-free-access-to-computers-and-Internetin-Romania/2006/11/24/1163871584295.html>
- The Electronic Library (2001). 'The Information Society.' The Electronic Library, 268.
- The Electronic Library (2001). 'The Information Society.' The Electronic Library, 57.
- The Malta Financial and Business Times (2003). 'FOI deems national wages policy a 'growing concern'.' The Business Times, June 11, 2003,
- Woodard, C. (1995). 'Transylvania Goes On-Line With Internet.' *Christian Science Monitor*, Boston, Mass., Apr 27, 1995, 1.
- World66.com (2007). 'The travel guide you write.' (02/09/2007). <http://www.world66.com/europe/romania/bucharest/internetcafes>
- Yin, R. K. (1994). *Case Study Research: Design and Methods*. Thousand Oaks, CA, Sage Publishing.

## Appendix A: Home-grown Networks (DAP, 2004)

Name	City	Cost Internet	Cost Retea	Viteza Internet	Viteza Metro	Viteza Retea	Abonati Internet	Abonati Retea	Fiber	Ethernet	Wireless Ethernet
1 PTM Network	Bucuresti	300,000	30,000	10240 kbps	102400 kbps	100 Mbps	50	250	x	x	
2 MyNet	Ploiesti	300,000	20,000	32 kbps	1000 kbps	100 Mbps	7	7	x	x	
3 Saturn Network	Bucuresti	300,000	200,000	256 kbps	256 kbps	100 Mbps	2	2	x	x	
4 Cernei/Racadau	Brasov	1	1	16 kbps	1 kbps	100 Mbps	2	2	x	x	
5 Racovita	Bucuresti	1	1	1 kbps	1 kbps	100 Mbps	1	1	x	x	802.11b
6 NicuNET	Bucuresti	220,000	1	256 kbps	256 kbps	100 Mbps	8	8	x	x	
7 Rahova99	Bucuresti	350,000	10	512 kbps	10000 kbps	100 Mbps	150	500	x	x	802.11b
8 Intencity LAN Tineretului	Bucuresti	350,000	1	2048 kbps	100000 kbps	100 Mbps	100	110	x	x	
9 A3Net - Anatiel	Bucuresti	400,000	1	512 kbps	100000 kbps	100 Mbps	100	110	x	x	802.11b, a, g
10 HomeNetwork	Bucuresti	600	50	150 kbps	8000 kbps	10 Mbps	100	250	x	x	
11 IZAZONENETWORK	Focsani	1,000,000	1	2500 kbps	2500 kbps	100 Mbps	50	50	x	x	
12 NET 13 Septembrie	Bucuresti	320,000	320,000	2048 kbps	100000 kbps	100 Mbps	200	200	x	x	
13 Dark.NET	Bucuresti	200,000	1	128 kbps	1000 kbps	100 Mbps	40	97	x	x	
14 FreeLan/POG	Bucuresti	330,000	50	800 kbps	4000 kbps	100 Mbps	55	80	x	x	
15 Discovery-NET	Bucuresti	350,000	1	512 kbps	10000 kbps	100 Mbps	29	30	x	x	
16 Chitilla Network	Bucuresti	300,000	1	256 kbps	1024 kbps	100 Mbps	5	20	x	x	
17 Berceci	Bucuresti	450,000	1	16 kbps	16 kbps	100 Mbps	10	64	x	x	802.11b
18 U-NITE	Bucuresti	350,000	1	2560 kbps	102400 kbps	100 Mbps	680	700	x	x	
19 WildRaven	Oradea	500,000	123	288 kbps	288 kbps	100 Mbps	18	18	x	x	
20 Altinet1	Bucuresti	300,000	1	256 kbps	5000 kbps	100 Mbps	40	42	x	x	802.11b
21 Underground	Pitesti	350,000	1	256 kbps	11264 kbps	100 Mbps	1	12	x	x	802.11b, g
22 WORLDNET DATA COMUNICATI	Bucuresti	10	1	2000 kbps	100000 kbps	100 Mbps	600	600	x	x	
23 PrUnDu	Pitesti	350,000	1	512 kbps	1024 kbps	100 Mbps	90	195	x	x	
24 Tu-Net	Bucuresti	500,000	1	5120 kbps	21504 kbps	100 Mbps	400	600	x	x	802.11b
25 DCN	Bucuresti	400,000	400,000	128 kbps	8000 kbps	100 Mbps	30	30	x	x	802.11b
26 Socului Network	Bucuresti	370	25	32 kbps	10000 kbps	100 Mbps	20	60	x	x	
27 ExpressIRC Network	Bucuresti	300,000	300,000	33 kbps	33 kbps	100 Mbps	6	6	x	x	
28 Netlink	Vaslui	340	120	280 kbps	24 kbps	100 Mbps	50	50	x	x	802.11b
29 Spee NET	Bucuresti	350,000	1	2048 kbps	100000 kbps	100 Mbps	400	400	x	x	802.11b
30 Worldnet	Bucuresti	1,000,000	1	500 kbps	10000000 kbps	100 Mbps	80	80	x	x	802.11b
31 CICEU	Bucuresti	1	1	1 kbps	1 kbps	100 Mbps	1	70	x	x	
32 Devit	Arad	200,000	2	256 kbps	256 kbps	100 Mbps	33	50	x	x	
33 CEAIR	Pitesti	400,000	1	256 kbps	1 kbps	100 Mbps	15	20	x	x	
34 Profs	Bucuresti	350	10	16 kbps	30 kbps	100 Mbps	100	100	x	x	
35 Apollo	Timisoara	4,000,000	100,000	256 kbps	256 kbps	100 Mbps	10	17	x	x	
36 RadicalNet	Bucuresti	450,000	10,000	128 kbps	128 kbps	100 Mbps	6	6	x	x	
37 Moldo-Net	Bucuresti	350,000	30,000	128 kbps	128 kbps	100 Mbps	15	16	x	x	
38 Baltiza LAN	Bucuresti	300,000	1	256 kbps	256 kbps	100 Mbps	8	18	x	x	
39 R12	Bucuresti	240,000	10,000	256 kbps	1024 kbps	100 Mbps	22	22	x	x	
40 vlnx	Bucuresti	400,000	1	1024 kbps	2048 kbps	100 Mbps	123	123	x	x	802.11b
41 GNN	Bucuresti	300,000	1	32 kbps	64 kbps	100 Mbps	30	30	x	x	
42 I12 LAN	Bucuresti	300	100	32 kbps	768 kbps	100 Mbps	23	23	x	x	
43 ANI43	Bucuresti	350	100	128 kbps	1024 kbps	100 Mbps	100	80	x	x	
44 Space Networks	Bucuresti	410,000	1	512 kbps	102400 kbps	100 Mbps	130	150	x	x	802.11b
45 CScub	Bucuresti	500,000	100,000	256 kbps	1024 kbps	100 Mbps	12	12	x	x	
46 LaBloc	Bucuresti	400	1	16 kbps	520 kbps	100 Mbps	10	10	x	x	
47 Alex.Net	Iasi	350,000	1	256 kbps	2048 kbps	100 Mbps	50	150	x	x	
48 Citynetwork	Bacau	500,000	500,000	256 kbps	256 kbps	100 Mbps	25	25	x	x	
49 NRG - Valea Ialomitei - Dr. Tabere	Bucuresti	350,000	20	128 kbps	128 kbps	100 Mbps	11	15	x	x	
50 FalezalNord LAN	Constanta	250,000	1	512 kbps	8096 kbps	100 Mbps	120	120	x	x	802.11b
51 Stargab	Pitesti	250,000	1	256 kbps	512 kbps	100 Mbps	25	25	x	x	
52 Retea Stadion-Centru-Simion b-Di	Zalau	150,000	1	128 kbps	12000 kbps	100 Mbps	300	350	x	x	
53 BLOCNET (SmartSolutions)	Bucuresti	500	300	1024 kbps	100000 kbps	100 Mbps	180	180	x	x	802.11b
54 Anatiel Data Network	Bucuresti	410,000	1	2048 kbps	204800 kbps	100 Mbps	100	100	x	x	802.11b, g
55 Reteausa.org.ro	Ploiesti	300,000	50,000	32 kbps	1000 kbps	100 Mbps	40	95	x	x	802.11b
56 P-ta Romana	Bucuresti	500,000	500,000	512 kbps	10000 kbps	100 Mbps	61	62	x	x	
57 NRG-Homeboyz	Bucuresti	350,000	20	256 kbps	10,000 kbps	100 Mbps	32	46	x	x	
58 Cnetwork Galati	Galati	300,000	99	256 kbps	256 kbps	100 Mbps	6	6	x	x	
59 Sibiu Network	Sibiu	290,000	30,000	50 kbps	256 kbps	100 Mbps	5	5	x	x	802.11b
60 House Lan	Bucuresti	300	1	128 kbps	512 kbps	100 Mbps	30	70	x	x	
61 Zeus	Bucuresti	300,000	1	64 kbps	96 kbps	100 Mbps	50	50	x	x	
62 Salajan Network Connection	Bucuresti	230	250	32 kbps	10000 kbps	100 Mbps	30	30	x	x	
63 Xlan	Bucuresti	250,000	50,000	512 kbps	10 kbps	100 Mbps	100	100	x	x	
64 ?	Bucuresti	300,000	300,000	256 kbps	768 kbps	100 Mbps	50	50	x	x	
65 Retea ro-IntraNET	Bucuresti	350,000	1	128 kbps	10 kbps	100 Mbps	100	500	x	x	
66 Net in Ilfov	Bucuresti	490,000	490,000	512 kbps	512 kbps	100 Mbps	2	2	x	x	802.11b
67 Crismis Media Net	Timisoara	600	500	512 kbps	512 kbps	100 Mbps	80	80	x	x	802.11b
68 Rovme	Craiova	200,000	1	64 kbps	2000 kbps	100 Mbps	75	100	x	x	
69 Nova-Net	Bucuresti	325,000	1	1024 kbps	8192 kbps	100 Mbps	100	150	x	x	802.11b
70 Baicului	Bucuresti	400	1	32 kbps	768 kbps	100 Mbps	12	12	x	x	
71 M19	Galati	150,000	1,000	6 kbps	6 kbps	100 Mbps	14	18	x	x	
72 HOME69	Bucuresti	200,000	-	50 kbps	512 kbps	100 Mbps	20	70	x	x	
73 Apollo	Timisoara	100,000	10,000	32 kbps	128 kbps	100 Mbps	10	16	x	x	
74 DigitalAngels	Bucuresti	80,000	25,000	256 kbps	1000 kbps	100 Mbps	25	25	x	x	
75 PoianaNet	Bucuresti	600,000	300,000	300 kbps	4000 kbps	100 Mbps	20	30	x	x	802.11b
76 MetroNetwork	Buzau	500	100	512 kbps	10240 kbps	100 Mbps	50	100	x	x	
77 NET	Bucuresti	200,000	1	480 kbps	480 kbps	100 Mbps	50	250	x	x	
78 Panduri	Bucuresti	250,000	10,000	256 kbps	512 kbps	100 Mbps	30	30	x	x	
79 Raulnet	Timisoara	600,000	1	384 kbps	512 kbps	100 Mbps	25	30	x	x	802.11b
80 LifeSeeker/SpeedNet Network	Bucuresti	300,000	1	2048 kbps	10000 kbps	100 Mbps	100	100	x	x	
81 Network	Galati	3,000,000	250	256 kbps	0 kbps	100 Mbps	12	130	x	x	
82 BiK Lan Project	Bucuresti	300,000	1	2000 kbps	0 kbps	100 Mbps	500	1200	x	x	
83 e7gavana	Pitesti	400,000	500,000	128 kbps	0 kbps	100 Mbps	8	15	x	x	
84 SunNET Wireless Connection	Timisoara	500,000	1	128 kbps	0 kbps	100 Mbps	100	100	x	x	802.11b
85 galaxynet	Bucuresti	1	1	256 kbps	0 kbps	100 Mbps	80	100	x	x	
86 Xlogic Network	Brasov	2,100,000	50,000	16 kbps	0 kbps	100 Mbps	2	5	x	x	
87 Craiovei	Pitesti	430,000	1	512 kbps	0 kbps	100 Mbps	15	20	x	x	
88 p20	Bucuresti	430,000	1	128 kbps	0 kbps	100 Mbps	4	4	x	x	
89 INTRA@METRO	Buzau	350,000	350,000	256 kbps	0 kbps	100 Mbps	50	50	x	x	802.11b
90 WireNET	Bucuresti	400,000	1	2000 kbps	0 kbps	100 Mbps	200	200	x	x	802.11b
91 HAWKS	Targu-Jiu	300,000	10,000	128 kbps	0 kbps	100 Mbps	12	12	x	x	
92 OnLine	Cluj-Napoca	380,000	1	256 kbps	0 kbps	100 Mbps	20	35	x	x	
93 House LAN	Bucuresti	100,000	2	64 kbps	0 kbps	100 Mbps	16	70	x	x	
94 VITAN NET	Bucuresti	380,000	10,000	300 kbps	0 kbps	100 Mbps	30	40	x	x	
95 Hatisului	Bucuresti	330,000	1	128 kbps	0 kbps	100 Mbps	23	50	x	x	
96 Jewell Network	Oradea	300,000	1,000	128 kbps	0 kbps	100 Mbps	8	10	x	x	
97 Ghetto Network	Brasov	500,000	1	32 kbps	0 kbps	100 Mbps	8	4	x	x	
98 Home	Galati	600,000	100,000	128 kbps	0 kbps	100 Mbps	3	6	x	x	802.11b
99 Retea 9my	Ploiesti	350,000	1	56 kbps	0 kbps	100 Mbps	62	126	x	x	
100 Home	Sibiu	220,000	30,000	128 kbps	0 kbps	100 Mbps	25	32	x	x	
101 Rogerius 0744434448	Oradea	400,000	100,000	64 kbps	0 kbps	100 Mbps	5	14	x	x	
102 LanFX	Constanta	2	270	128 kbps	0 kbps	100 Mbps	22	20	x	x	
103 Blue Wave Net	Bucuresti	350,000	10,000	128 kbps	0 kbps	100 Mbps	6	6	x	x	
104 Nebula & Sunrise	Bucuresti	300,000	3	512 kbps	0 kbps	100 Mbps	35	40	x	x	
105 Lan143	Bucuresti	250,000	100,000	100 kbps	0 kbps	100 Mbps	105	153	x	x	
106 SNET	Bucuresti	4	500	1500 kbps	0 kbps	100 Mbps	8	8	x	x	
107 ReVealer's NetWork	Bucuresti	300,000	100,000	16 kbps	0 kbps	100 Mbps	4	4	x	x	
108 DCN Salajan	Bucuresti	400,000	-	4 kbps	0 kbps	100 Mbps	60	120	x	x	
109 Berceci Network	Bucuresti	300,000	-	128 kbps	0 kbps	100 Mbps	70	300	x	x	
110 Freelan si Home	Bucuresti	350,000	5	32 kbps	0 kbps	100 Mbps	45	110	x	x	
111 strand	Sibiu	180,000	1	100 kbps	0 kbps	100 Mbps	50	60	x	x	802.11b
112 Militari-Pacii	Bucuresti	350,000	1	2048 kbps	0 kbps	100 Mbps	55	112	x	x	
113 Macarale	Bucuresti	260,000	1	25 kbps	0 kbps	100 Mbps	15	58	x	x	
114 Scornilo	Bucuresti	1,200,000	1	128 kbps	128 kbps	100 Mbps	2	2	x	x	802.11b



# Ecuador, the Digital Divide and Small Tourism Enterprises

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## Abstract

*This article explores the digital divide from the perspective of Ecuadorian small tourism enterprises. Ecuador's ICT environment has been described as underdeveloped, obsolete, and expensive to use. There is also a serious shortage of ICT related human capital. Given these stumbling blocks, this article seeks to identify how small tourism operators have managed to adopt the Internet. Adopting a qualitative approach, field interviews were conducted with tourism enterprises across rural, semi-rural, and metropolitan areas of Ecuador. This article adds to our understanding of the digital divide, especially from the point of view of small tourism enterprises, and serves as an example to other small tourism enterprises in developing countries seeking to adopt the Internet.*

## Keywords

*Digital divide, tourism, small enterprises, Ecuador, Internet*

## Introduction

There is a growing body of literature that contributes to our understanding of the challenges faced by small enterprises in developing countries when adopting the Internet. Some of the most commonly cited obstacles are the inadequate and unreliable telecommunications infrastructure (Hawk 2004; Jennex, Amoroso and Adalakun 2004), the cost associated with adopting and using the technology (Cloete, Courtney and Fintz 2002; Rizk 2006), a lack of knowledge and skills, and often businesses are unaware of the full potential of the Internet (Moodley and Morris 2004; Rizk 2006). Referring to Internet adoption in the context of small businesses in developing countries Eduardo da Costa (2001 p.129) commented '*it is difficult, and yes, it is possible*'. However, faced with so many organisational and environmental limitations, and often-turbulent political and macroeconomic circumstances, how are small enterprises in developing countries adopting the Internet? Overall, the literature suggests that little Internet adoption is taking place amongst small enterprises (Moodley and Morris 2004; Rizk 2006). For instance, evidence from an investigation by Croes and Tesone (2004) in Nicaragua and Costa Rica showed that less than thirteen percent of Costa Rican, and less than two percent of Nicaraguan small and medium sized enterprises (SMTEs) advertised on the Internet. Email was the most widely used online activity, although SMTEs indicated a preference for interaction through low-tech means such as

cell phones. While the least common uses were advertising and selling or buying goods on the Internet. Similarly, a large study carried out by the Asia Foundation on SMEs in Philippines, Thailand, Sri Lanka, and Indonesia revealed that very basic uses of the Internet were taking place. This included email communication between suppliers and customers, research

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and information gathering, and to a lesser extent the development of basic websites (Asia Foundation. 2005). In Morocco, Mann (2002) found that most small tourism operators did not have informative websites and could not even receive reservations by email because of the high telecommunications cost involved. Mann also established that business lacked familiarity with the Internet and the ability to design a website. In Peru, a study by Gartner (2004) on small tourism operators found that they were all dependant on Lima based intermediaries who dealt directly with international agents that controlled prices. Even though the Internet emerged as a vehicle to bypass intermediaries, little adoption was taking place. Small local operators explained that such a move would be viewed as hostile by the Lima based agents who had threatened before to stop providing services to any operator that had the audacity to act in such a manner.

While the challenges faced by small enterprises and their use of the Internet is well explored, there is a paucity of research focusing on how they actually contend with these underlying constraints. In other words, how are small businesses overcoming the inherent obstacles in their environments and adopting the Internet? To answer this question, this article shares the experiences of Ecuadorian small tourism operators and provides a new perspective of the realities faced by small businesses in the developing world.

This article is organised as follows. The following section discusses the relationship between the Internet and tourism. A description of how the study was conducted is then presented. The subsequent section is dedicated to a discussion of the Information and Communication Technology (ICT) and small business environment in Ecuador. The experiences of the Ecuadorian tourism enterprises are then discussed. Finally, the article concludes with some discussion and lessons for small tourism enterprises.

## **The Internet and Tourism**

For sometime tourism has been recognised as an information-based and information-intensive industry that is well suited to the Internet (Poon 1993; Inkpen 1994; Sheldon 1997). Of little surprise, the numbers of people that use the Internet to plan trips are increasing. Over 84 million Internet users around the world visited travel sites in June 2001 (WTO 2002). In fact, the Internet *'has become one of the most successful channels used by consumers to research travel options, compare prices and make reservations'* (Collins, Buhalis & Peters 2003 p.484). From the business perspective it has emerged as the most relevant technology for marketing and communication, receiving bookings, information gathering, and internal operations (Gammack, Asia Pacific Economic Cooperation (Organization). Tourism Working Group., Griffith University School of Management. and APEC International Centre for Sustainable Tourism. 2004). Now, most large hotels have extensively adopted the Internet, developing websites, using the Internet to improve communications and creating new distribution channels (Collins, Buhalis and Peters 2003).

Although traditionally, smaller tourism operators have lagged behind their larger counterparts in terms of technology adoption, the Internet has been described as empowering even tiny tourism enterprises (Buhalis 1999). In the context of developing countries, Purcell et al., (2004) identified a number of benefits that have been linked with small tourism enterprise Internet use in developing countries. The benefits included, reduced advertising and communication costs, more efficient access to information, and exposure to a wider audience. This suggests that small tourism enterprises that do not adopt the Internet are placing themselves at a considerable disadvantage. Furthermore, it suggests that identifying strategies that can assist small tourism operators to mitigate Internet adoption barriers is imperative to facilitate its widespread adoption. In this article a number of specific examples are drawn from the field research to offer insight into the challenges faced and the solutions applied by small tourism enterprises in Ecuador. By doing so, transferable lessons for other small tourism businesses considering Internet adoption are identified.



## The Study

The overarching aim of the study was to investigate small tourism enterprise 'e-readiness' and Internet use in developing countries. As a result of the study an e-readiness framework was developed to assist small tourism enterprises in developing countries to make decisions about e-commerce. Field research was conducted in Malaysia and Ecuador. However, this article concentrates solely on the Ecuadorian component of the study and specifically the ways that small tourism enterprises contended with Internet adoption obstacles.

This study is classified as a multiple-case study. Field interviews were selected over other data collection techniques such as questionnaires, because interviews are valuable for developing an understanding of a phenomenon at the 'grass-roots' level (Neuman 1997). Enterprises had to fulfil three conditions to be eligible for the study. The first was that they must have less than twenty employees. The number of employees was considered as the principal criteria because of the difficulty obtaining information such as sales turnover or capital. The second condition was that they must be either an accommodation provider and/or a tour operator. The reason for this was because these two categories of tourism enterprises operate by attracting customers based on information provided. Focusing on a particular type of small business overcomes industry differences and strengthens validity (Cragg and King (1993) cited in Faggiani (2005)). It also means that the lessons learnt may be applicable to other small tourism enterprises. The final condition was that enterprises should use the Internet (as per Purcell et al., 2004). To avoid any language problems participants were informed that all interviews would be carried out in English. This posed only a minor issue, as most participants were fluent in English. To gather a holistic picture of the situation in Ecuador, rural, semi-rural, and metropolitan enterprises were targeted to participate.

Because personal introductions are often an integral part of the culture in developing countries, it was expected that the level of response to the initial email invitation would be low. Therefore, a large number of small tourism enterprises were emailed to participate. To achieve this multiple sources were used to collect the details of small tourism enterprises. This involved obtaining email addresses from commercial tourism websites (as per Davidson et al., (2006)), and traditional media such as travel guidebooks. During the course of the field research twelve in-depth field interviews were performed. The field research began on April the 19<sup>th</sup> 2006, and concluded on the 25<sup>th</sup> of May 2006. Although this study is classified as a multiple-case study, there are many similarities with ethnography as the field research involved interacting with small business owners in their social contexts. A reason for using ethnography to study actual real world situations (such as a small business) is because it enables a researcher to observe and study businesses as the complex social, cultural, and political systems that they are (Harvey and Myers 2002). In this case, the researcher spent days with participants in their lodge and surrounding areas, and was able to gain in-depth insight into their environments. The investigation also involved examining the online presences and activities of participants. Hine (2000) labels this as 'virtual ethnography'.

Table 1 lists the location and the types of services offered by each participant. Figure 1 geographically illustrates the location of each participant. There is some difficulty in classifying enterprises as exclusively rural, semi-rural, or metropolitan. For example, two enterprises ran lodges in a remote area, but performed most of the business operations from a home office in Quito. In one case, the home office was simply a computer connected to the Internet. Similarly one enterprise ran most of the tour/lodge operations (the Internet side) from a home office in a semi-rural area (where the tour operations were based) even though the lodge was actually located in a rural area. Customers rarely visited the home offices of these businesses, and in one case the owner spent a considerable amount of time at the actual business (the lodge). In another instance, a participant ran a tour business out of a shop front in Quito, even though its main source of Internet access was from home in a semi-rural area. Classifying businesses like these is a particular conundrum in a study such as this one where the area of interest is the Internet. However, such issues are typical when researching small businesses because they are managed in a personalised way (Kuwayama 2001) and not amenable to clear categorisation.

**Table 1:** Profile of the small tourism operators

Location	Services
Otavalo	Lodge
Puerto Ayora	Tour operator
Quito	Tour operator
Quito	Tour operator
Quito – Baeza*	Tour operator
Cotopaxi	Cabañas
Quito	Tour operator
Quijos Valley	Hacienda
Sangolqui	Hacienda
Quito	Small hotel
Chugchilán	Eco-lodge
Tumbabiro - Conocoto	Lodge & tour operator

**Figure 1:** Map of Ecuador

Adapted from: CIA (2007)

**Note:** ‘Hacienda’ is a Spanish word referring to a large countryside ranch, estate, or farm.

‘Cabañas’ is a Spanish word referring to a small hut type of dwelling.

\* This tour operator used the Internet from home in a semi-rural area.

Before entering into the field, a background analysis was performed on the state of affairs in Ecuador. This formed an important part of the analysis process, and helped to explain emerging themes (Dawson 2002). Despite the contemporary nature of the subject extensive documentation was not available. Along these lines, Angelelli et al., (2003) in a report for the Inter-American Development Bank posited that limited information is generally available in terms of information on small enterprises in Latin America. The background investigation involved a reconstruction of the ICT environment. It also involved becoming familiar with the geography, history, politics, and culture of the people to be studied (Peil 1983). This approach has been used in other ICT studies in the context of developing countries (Montealegre 1998; Madon 2005), and entails a thorough review of journal articles, government and institution reports, and other relevant literature.

## Ecuador: ICTs and small enterprises

The Republic of Ecuador is located in the Andean region of South America. It is a resource rich country with a population made up of a variety of cultures and ethnic groups. Ecuador is the world’s largest producer of bananas and significant producer of oil. In fact, oil contributes around one third of government revenue, comprises 20 percent of the economy, and 45 percent of exports (Economist 2005; CountryWatch 2006). Nevertheless, despite its resource affluence, a wide income gap places most of the population in the condition of extreme poverty (Talamanca, Furlani and Alves 2006). Before discussing Ecuador’s ICT environment, it is useful to begin by presenting a brief overview of the country in recent years. Nazmi (2001 p. 727) summed up the 1990’s by suggesting that while other Latin American countries were implementing meaningful economic reforms ‘Ecuador found itself in political chaos, social rift, regional infightings, and economic uncertainty’. It is no surprise then that the new millennium began poorly for Ecuador. Political instability and coups d’État resulted in four presidents

in five years - at one point in 2005 there were two contenders claiming to be president (Economist 2005).

Furthermore, high inflation and resulting 'dollarization', unemployment and low growth affected macroeconomic stability (Nazmi 2001; Economist 2006; Talamanca, Furlani et al. 2006). However, very recently there has been some economic and political stabilisation (Talamanca, Furlani et al. 2006).

There exists little reported information concerning ICTs in Ecuador, as is the case with other Latin American countries (Guasch and Ugas 2007). ICT development has not been a priority of policy makers. This is reflected in the country's e-readiness ranking, which decreased from 2002 to 2007 (Kirkman, Cornelius, Sachs and Schwab 2002; EIU. 2004; Dutta and Lopez-Claros 2005; EIU. 2007). As a result, the country suffers from an underdeveloped, obsolete, and expensive to use ICT infrastructure (Talamanca, Furlani et al. 2006). Furthermore, there is a limited supply of ICT related human capital, such as engineers, programmers, and website designers (Coppock, Maclay and Calero 2002; Talamanca, Furlani et al. 2006).

Teledensity remains low in Ecuador. Over 60 percent of the telephones lines are located in the capital Quito and the two other largest cities Guayaquil and Cuenca, which account for less than one third of the population. In terms of Internet users, as at 2005 there were seven Internet users per 100 people (ITU 2005). (Table 2 displays some basic demographic and ICT indicators for Ecuador).

**Table 2:** Ecuador Internet & ICT Indicators

Population	Rural % of population	Hosts per 10'000 inhabitants	Internet users per 100 inhabitants	PCs per 100 inhabitants	Average monthly cost per 20hrs Internet access
13.2 million	35.5%	6.67	7.32	5.49	\$US 20.61

Compiled from: (Kirkman, Cornelius et al. 2002; ITU 2005; WorldBank 2006)

### Small Enterprises in Ecuador

Ecuador is a market economy characterised by small-scale service and farming enterprises and high levels of self employment (Acs 2006; CountryWatch 2006). It is not surprising then that small businesses are the most important source of job creation (Talamanca, Furlani et al. 2006). In fact, 99 percent of all private enterprises have no more than 50 employees (World Bank. 2000). However, the country lacks significant policies geared towards small businesses, and resources to address capacity building and ICT diffusion (Talamanca, Furlani et al. 2006).

In addition to the inherent characteristics of small enterprises, such as being resource poor, having basic technology needs, being informally run, and relying on family labour (Mead and Liedholm 1998; Turner 2003; Bannock 2005; Oyelaran-Oyeyinka and Lal 2006), there is a prevailing organisational culture in Ecuador that does not see ICT implementation as a driver of change (Talamanca, Furlani et al. 2006). Busch (1989) also identified some characteristics of the small business environment in Ecuador:

- There is a lack of educated and trained personnel.
- Many small business owners believe that non-family members cannot be trusted and employees cannot be relied upon to follow directions.
- Although the city of Quito has an association of small businesses, the concept of trade associations does not appear to be well understood or fully accepted.
- Business owners and managers tend to be rather secretive and unwilling to share information.

The foregoing discussion suggests that factors such as an inadequate and expensive to use telecommunications infrastructure, lack of supportive government policies geared towards small business for ICT diffusion, and a lack of skilled human resources act as Internet adoption barriers in Ecuador. The subsequent section will discuss how these factors affected the small tourism enterprises in this study. It will also identify the ways that participants contended with these challenges.

## Discussion of the Field Research

### Small Tourism Enterprise Uses of the Internet

Before discussing the experience of the participants in this study, it is useful to identify how they were making use of the Internet. All participants had a website. The websites were relatively basic, although there was some use of moving images and content in multiple languages. Despite the simplicity of the websites, they appeared easy to use and navigate, although this was the impression of the author and not verified through any performance analysis. There was widespread use of tourism and travel portals for promotion. Email was the main use of the Internet. In fact, eight of the participants received over 50 percent of bookings through email. Only two enterprises actually offered online payments. However, both participants indicated that the volume was quite low. The most complicated internal infrastructure was a handful of networked computers. The use of the Internet by participants is consistent with development authors that suggest that small enterprises in developing countries concentrate on basic online activities (Tanburn and Singh 2001; Duncombe, Heeks, Kintu and Nakangu 2004). The next section will discuss how participants contended with the Internet adoption obstacles they faced. Four key areas are discussed, the cost of adoption, the ICT infrastructure, government support, and a lack of ICT skills. These are four of the major Internet adoption obstacles in Ecuador as revealed by the literature review and content analysis of the qualitative data gathered in the field.

### Cost of Adoption

The experience of the data collection suggested that the financial burden associated with Internet adoption was an issue for the participants, although not necessarily an inhibiting factor (however, this study only targeted online tourism operators). The cost of adoption did influence the types of activities that were performed online, and may help to explain why participants have not progressed beyond the entry-level stage of Internet use.

In Ecuador the cost of ICTs are quite high. In fact, three participants even went so far to suggest that the cost of ICTs in Ecuador was higher than in much more affluent countries such as the USA. As an example, participants in this study paid around \$US 75 a month for broadband (Ecuador GNI per capita is \$US 2210). Whereas a study by the authors in 2005/06 in Malaysia found the average cost was \$US 21 a month (Malaysian GNI per capita is \$US 4520). A hotel paid \$US 250 per month for a cable Internet access, which was used to provide wireless access to guests. This could be a strategy that other small tourism operators adopt to pass on the cost of Internet adoption.

There was some uncertainty amongst participants concerning the reason for the high cost of ICTs. A tour operator explained that even though the telecommunications industry is privatised the government still plays a role and elicits money from this industry. One participant commented *'cost is not an issue, but everything is expensive!'* referring to the high inflation experienced by the country. There was the indication that prices were decreasing - one participant gave the example of how previously an ADSL connection attracted *'an outrageous price of something like 200 [\$US] dollars a month'*.

Participants used a number of different means to attenuate the financial burden associated with Internet adoption and use. These are instructive examples for other small tourism enterprises:

- Using friends and family for IT support and advice (rather than pay for professional assistance). It also involved using these informal sources for website development, or developing the website internally, as opposed to paying for the development of one.
- Using simple, low cost online activities such as email and basic web publishing that are inexpensive and require very little maintenance. Again, this may help to explain why participants have not progressed beyond simple entry-level activities.
- Hosting a website in the USA, as opposed to hosting it in Ecuador. This has been found to be the case in other studies (Wresch 2003; Jennex, Amoroso et al. 2004). One enterprise hosted its

website in the USA at the cost of \$US 9, whereas another enterprise paid as high as \$120 to host its website locally. Along these lines, UNCTAD's (2004) guide for SMEs suggests that businesses in developing countries host their website in the country of its customer base. An international host can also raise the credibility of a business, and reduces fears that customers may have about purchasing from a business in a developing country (Lake 2000).

- Hosting a website with a free hosting service. One enterprise first hosted its website with a free hosting service. Then, once there appeared to be some benefit from having a website, the enterprise moved onto paid hosting. In support of this strategy, Costa (2001) suggests that a small business that has an idea to go online, should do it immediately, and correct it later.
- Using the brand of third-party tourism websites (such as online intermediaries and travel portals). These websites offer resources (such as marketing power and booking engines) that small tourism enterprises would not otherwise have access to. Along these lines, Payne (2002) suggests that small businesses consider 'piggybacking' on someone else's brand. This is important for small tourism enterprises in developing countries, because trust is an important issue, particularly for international customers (UNCTAD 2004).
- Collaborating with other tourism enterprises to develop a greater web presence as opposed to only having an individual website. For instance, one enterprise collaborated with other similar tourism operators. Together they developed a superior website promoting eco-lodges in Ecuador. By pooling their resources they were able to compete more aggressively. In particular they were able to promote themselves on a US based tourism portal that charged approximately \$1500 per year for promotion. Individually the tourism operators could not afford this level of promotion through their individual websites. In support of this approach, Payne (2002) suggests that small businesses come together to share an electronic commerce innovation.

## Government Support

Echoing the earlier discussion of the ICT environment in Ecuador participants indicated that the government was doing very little to support Internet diffusion amongst small tourism enterprises. In fact, amongst participants there was a negative view of the government. A tour operator remarked *'I ask for nothing and receive nothing'* referring to a lack of government support. While another put forth that *'they [the government] do little to help the people or business or tourism'*, and lamented that the *'government infrastructure is poor, medical, welfare, everything!'*

A reply from a small tourism operator to the initial email invitation to participate in the study provides useful insight into the situation in Ecuador:

*'Now please be aware that our company might be ready for having full access to internet in any way but the legislation of our country in order to prevent fraud has many stupid rules to say the less. The cost of the service here is 3 or 4 times more expensive than in your country like if Ecuadorians have all the money in the world and worst, here we do not know yet DSL connections. Most of the population still use dial up modems and extremely slow connection. It will be an interesting research what you are doing. It will be like a voyage in time'.*

Following a similar train of thought one participant suggested that the government acts as a barrier, *'government is not up-to-date, they have old systems and lines, very bureaucracy [bureaucratic] which makes it difficult to go on Internet on-line'* and continued to say *'government is not helping at all. All you have to do private'* (meaning that everything has to be done by the business without any support from the government). Unlike the strategies that were employed to attenuate the financial burden of Internet adoption, there was very little that could be done to overcome a lack of government support. As a consequence participants were forced to 'go at it alone'. On the positive side, some participants believed that things were improving.

Another area where the government was not perceived to be providing assistance was in terms of its online tourism marketing strategy. Other studies have highlighted the importance of government online tourism marketing or e-tourism websites (Purcell, Toland and Huff 2004; Karanasios and Burgess 2006). Consumers generally regard these websites as a source of unbiased and high quality information and they provide resource poor tourism operators with the opportunity to promote themselves online to a large audience. However, in Ecuador, tourism operators explained that there was no successful online marketing strategy by the government (the official website <http://www.vivecuador.com/> provided little opportunity for small tourism enterprises to be promoted worldwide). One participant commented that *'their [Ecuadorian government] marketing campaign is extremely poor'* and *'government is doing a poor job of marketing tourism'*. Along these lines, Talamanca et al., (2006) reported that most government portals in Ecuador are not updated. To combat this, participants made use of other tourism portals for promotion.

## ICT Infrastructure

As observed earlier, Ecuador's ICTs infrastructure is described as underdeveloped, obsolete, and expensive to use (the previous section looked at how participants contended with the cost of using the Internet). Participants shared a number of experiences concerning problems with the infrastructure and described some instructive strategies they used to overcome them.

A tour operator located on a small island in the Galapagos remarked that connectivity was a real issue. This participant was unsure of the type of Internet connection, but labelled it *'the slowest broadband ever'*. The business also suffered from regular power outages. To overcome this, the participant resorted to using the Internet at a nearby public Internet access point. Another participant reported that gaining access to dial-up was not problematic, however, *'Banda Ancha' [Broadband] is extremely difficult'*. In the months leading up to the interview the business experienced many problems. E-mails were not received and the business experienced poor service and incapable technicians on the part of the ISP *'since 5 days I try to change Internet provider and I am exhausted because the old provider is bothering and is not passing information new provider need. It really is a headache and hopefully new provider can make us on-line within ten days'*. The impact of this was that the owners wasted time and resources fixing problems rather than operating the business. This participant also provided some insight into using ICTs in a semi-rural area *'one month ago, they just cut the electricity without warning and computer got broken. Probably people from the electricity are not informed or ignorant that we use computers in Conocoto'*. The suggestion from this enterprise was that these types of problems were simply a limitation of operating in a semi-rural area, and one that a business needs to become accustomed to.

In one case, a Quito based bicycle tour operator (that used the Internet from home in a semi-rural area) lamented *'I can ride faster than my connection'*. The problem was that the connection was slow and disconnected often. To work around this the owner needed to download emails and then write the response offline. The owner would then return online and send the reply. When the Internet was needed whilst at work (in Quito), the owner made use of *cabinas públicas* (Internet cafés). However, the owner only used them sparingly because of the cost involved (usually around one to two \$US per hour).

An example set in the Andes of Ecuador, provides an excellent working case of how small tourism enterprises can work around problems with the infrastructure. In this example, the owners of a lodge explained that when they first settled in a remote part of the Andes to setup a lodge there was no telephone line. To rectify this, when the owners used to drive to the nearest large town (roughly four hours drive away) they would stop by the local telephone company, and request in person for a telephone line to be setup in the village. A first line was installed a few years later, and more lines were added in 1999. At that point, the owners began to use the Internet via a dial-up connection, which was extremely expensive (over one hundred US\$ per month including telephone calls), and unreliable. The owners explained that due to a lack of maintenance the quality and reliability of the local telecommunications infrastructure deteriorated rapidly over the last few years *'it was old technology*

*and now it is ancient*'. In fact, at the time of the interview, they could only connect via a telephone call about 60 percent of the time, and even then the line was extremely crackly. As a result, it was extremely difficult to hold a conversation. The owners then told the story of how they acquired the idea of using a satellite-dish to access the Internet from a tourist who visited the lodge with one in his van. This gave the lodge owners the idea of using a satellite-dish to access the Internet. After performing a basic cost-benefit analysis the owners decided that in the long-term using a satellite-dish would provide a more efficacious means of accessing the Internet. They then embarked on purchasing a second-hand satellite-dish from the USA, and had it transported to the nearest town. It is worth pointing out that even without any prior experience in this area, the owners managed to work it out using trial and error. This innovative solution resulted in stable Internet access and decreased telecommunications expenses, and generally as a result of the Internet and their online presence they were able to attract more customers. In fact, because of the deterioration of the existing infrastructure, the Internet became the only reliable means to receive a reservation, and communicate with customers.

Two participants made use of public Internet access points on an occasional basis. Although this represents a small number of the overall participants, it is inline with the attention that public Internet access points have received in the context of developing countries (Romero 2000; Colle and Roman 2005; Harris 2005). This is encouraging for other small tourism enterprises because it suggests that an internal Internet connection is not always necessary. In Ecuador, there has been a focus on the use of public internet access points (Galperin 2005), motivated by factors such as the high price of telecommunications and low PC penetration (Coppock, Maclay et al. 2002).

The preceding discussion suggests that the inadequate and poor infrastructure continues to be an issue in Ecuador. This goes against the argument put forth by some that in a relatively short time infrastructure will cease to be a very significant impediment to ICT development in some countries (Efendioglu and Yip 2004). Having said that, there was the indication that the situation was improving. In this study it appears that participants learnt to work within the confines of their environments. Participants also demonstrated the ability to mitigate certain challenges (using solutions such as working offline, using public Internet access points, and even the installation of a satellite-dish). In support of this, Molla and Licker (2005) assert that while some enterprises may accept organisational and external limitations others will take steps to counteract them, or are able to work in the confines of such constraints.

Some lessons for small tourism enterprises are:

- Learning to work within the confines of their environments. This means becoming accustomed to telecommunications and power outages, slow Internet connections, and other infrastructural limitations. The indication was that despite these shortcomings there are benefits to be absorbed.
- Working offline.
- Using innovative solutions such as purchasing a satellite-dish.
- Making use of public Internet access points.

## **Skilled Human Resources**

The literature suggests that there is a lack of ICT related human capital in Ecuador. In the context of this study most participants themselves (the owner/managers) were quite Internet savvy. This was a result of self-capacity or previous education. For instance, one participant simply purchased a computer and learnt how to use it. However, there was a problem with the level of ICT skills of the existing employees. Another layer of complexity was added because participants suggested that the problem extended to working knowledge of English to manage the communication component of the job (Spanish is the official language in Ecuador). This is particularly problematic in Ecuador where there are a small number of English speakers (Gordon 2005). The issue was not isolated to rural enterprises where traditionally this problem is more acute. A Quito-based participant even went so far as to check emails that were sent out by employees to make sure that they were correct. This echoes an earlier description of the business environment in Ecuador by Busch (1989). There was also the suggestion that it was too

expensive to hire an employee that has Internet skills and can communicate well in English. This is another example of how the cost of adopting the Internet can impact the business. Typically where this was not an issue it was because the owner/manager took care of the Internet side of business operations.

This problem referred not only to the existing employees but also to the local human resource base. To combat this issue one participant provided training. However, the owner maintained a cautious approach to training, because of concerns that the employee may leave for a job elsewhere. On the other hand, another participant commented *'we always stimulate employees to improve their skills and we help them also with this in time and economically'*.

In the case of a remote enterprise it was difficult to employ locals who could take care of the Internet side of the business. One of the owners explained that they employ *'four reliable young teenage girls that can cook and look after the rooms'*, however, *'if I train them up on the Internet side of things there is no point because as soon as they hit 19-20 they get married and have children'*. For this reason, they hired foreigners (usually travellers who want to stay in one location for an extended period of time) to help manage the lodge.

Participants often turned to informal networks such as family and friends for advice, IT support, website design, and so forth. The indication was that outside of rural areas these types of services existed in abundance, although at a high price. One participant used a teacher at his son's school to develop the first business website. The second website was developed by a paid consultant. Therefore the use of informal networks was not only a method of overcoming a lack of knowledge and skills, but also avoiding expensive professional assistance. It may also be a way of satisfying cultural obligations (Gartner 2004). In fact, other than for website development no outside professional assistance was employed. This echoes the characteristics of small businesses in developed (Burgess, Johanson, Schauder, Karanasios, Stillman and Sellitto 2006) and developing countries (Karanasios and Burgess 2006).

## Discussion

Along with the opportunities that Internet adoption offers small tourism enterprises, it presents significant challenges. The foregoing discussion captured the experience of a small number of tourism operators in Ecuador, and provided insight into the reality of Internet adoption in the context of developing countries. In particular, it examined how tourism operators mitigate the underlying barriers to Internet adoption in Ecuador. Participants used a number of different strategies to attenuate the cost involved with Internet adoption. They also were able to work around or find solutions for the inadequate and unreliable telecommunications infrastructure. In support of this, authors contend that enterprises in developing nations are able to find ways of keeping costs down and circumventing infrastructure shortcomings (Wresch 2003; Karanasios and Burgess 2006). To a lesser extent participants were able to contend with a lack of government support by doing everything themselves, and built self-capacity or made use of informal networks because of a lack of internal skills. However, it appears as though these factors will continue to restrain and be obstacles to further development of the Internet amongst small tourism enterprises.

A number of transferable strategies emerged from the qualitative data that can be applied to other small tourism enterprises. Table 2 summarises the strategies employed by participants in this study. Armed with such knowledge small tourism enterprises are in a better position to contend with the obstacles they face.



**Table 2:** Strategies used by participants to overcome Internet adoption obstacles

Overcoming the financial burden of Internet adoption	<ul style="list-style-type: none"> <li>• Using friends or family for IT support, website design, and advice</li> <li>• Developing a website internally, as opposed to paying for the development of one</li> <li>• Using simple, low cost online activities such as email and basic web publishing that are inexpensive and require very little maintenance</li> <li>• Hosting a website in the USA (where the cost is less than in Ecuador)</li> <li>• Hosting a website with a free hosting service</li> <li>• Using the brand and resources of third-party tourism websites</li> <li>• Sharing resources with other tourism enterprises</li> </ul>
Overcoming a lack of government support	<ul style="list-style-type: none"> <li>• Using commercial tourism portals for promotion where no effective government tourism portal exists</li> </ul>
Overcoming the inadequate and unreliable telecommunications infrastructure	<ul style="list-style-type: none"> <li>• Learning to work within the confines of their environments. This means becoming accustomed to telecommunications and power outages, slow Internet connections and other infrastructural limitations</li> <li>• Working offline</li> <li>• Using innovative solutions such as purchasing a satellite-dish</li> <li>• Making use of public Internet access points, such as telecentres and Internet cafés</li> </ul>
Overcoming a lack of skills	<ul style="list-style-type: none"> <li>• Building self-capacity</li> <li>• Training employees</li> <li>• Turning to informal networks for IT support, website design, and advice</li> </ul>

The experiences of the tourism operators in this article demonstrate that different paths have been traversed in the journey to Internet adoption, and a range of conditions encountered. This means that there is no one-size fits all solution for enterprises in developing countries, and that a flexible approach to adoption is required that takes into consideration the business environment and organisational resources. Along these lines, Austin (1990) suggests that the key to effective management in developing countries is the capacity to analyse and understand the forces enveloping the business and translate them into strategic decisions.

This article also highlighted many areas that need to be address in order to facilitate the expansion of the Internet amongst small tourism enterprises in Ecuador. Reducing the price of ICTs and designing specific support programmes for small tourism enterprises such as soft-loans for ICT adoption and capacity building purposes would go someway to assisting small tourism enterprises with Internet adoption. Steps should also be made to strengthen the telecommunication infrastructure to allow for more efficacious Internet use, and strategies employed to address the shortage of ICT related human capital. Furthermore, resources should be allocated to develop an official online tourism portal that provides small tourism operators a platform to promote to a worldwide market. Addressing these issues may also assist small tourism enterprises to progress beyond the entry-level stage of Internet adoption.

Whilst this article focused on a small selection of enterprises, the intention was to gain an understanding of how small tourism enterprises overcame obstacles using a small number of cases. The results from this study are suggestive of the problems faced (to a large extent), and the solutions applied (to a lesser extent) by small tourism enterprises in Ecuador, and many other developing countries. One limitation in this discussion is the point of view of offline tourism operators, or ones that may have tried, but failed, to surmount obstacles. A complementary approach would be to focus on both adopters as well as non-adopters. Nevertheless, this investigation does add to the growing body of literature in the domain of small tourism enterprises and the Internet in developing nations. It is also provides practical lessons for

small tourism enterprises, development consultants, and researchers as it is one of few articles that examine how small tourism enterprises actually contend with Internet adoption obstacles.

## References

- Acs, Z. 2006, 'How is entrepreneurship good for economic growth?' *innovations*, vol. Winter 2006, pp. 97-107.
- Angelelli, P., Guaipatin, C., Almeyda, G. & Llisterra, J.J. 2003, IDB Group support to the small and medium enterprise sector (1990-2002) achievements, lessons, and challenges, The Inter-American Development Bank Sustainable Development Department Micro, Small, and Medium Enterprise Division, Washington.
- Asia Foundation. 2005, Regional survey of SME's use of ecommerce in Indonesia, the Philippines, Sri Lanka and Thailand, viewed December 12 2005, <[www.asiafoundation.org](http://www.asiafoundation.org)>.
- Austin, J.E. 1990, *Managing in developing countries : strategic analysis and operating techniques*, New York : Free Press ; London : Collier Macmillan.
- Bannock, G. 2005, *The economics and management of small business : an international perspective*, Routledge, New York.
- Buhalis, D. 1999, 'Information technology as a strategic tool for sustainable tourism development', *The Courier*, vol. no. 175, no. May-June, pp. 55-7.
- Burgess, S., Johanson, G., Schauder, D., Karanasios, S., Stillman, L. & Sellitto, C. 2006, 'Building capacity in small businesses for the use of the Internet: A study of 'outer' suburbs in Australia', paper presented to SME Entrepreneurship Global Conference 2006, Selangor, Malaysia.
- Busch, E.T. 1989, 'Small business hurdles in Ecuador', *Journal of Small Business Management*, vol. 27, no. 1, pp. 70-4.
- Central Intelligence Agency. 2007, *The World Fact Book*, Central Intelligence Agency, viewed June 22 2007, <<https://www.cia.gov/library/publications/the-world-factbook/geos/ec.html>>.
- Cloete, E., Courtney, S. & Fintz, J. 2002, 'Small businesses' acceptance and adoption of e-commerce in the Western-Cape Province of South-Africa', *The Electronic Journal on Information Systems in Developing Countries*, vol. 10, no. 4, pp. 1-13.
- Colle, R.D. & Roman, R. 2005, 'Towards demand-driven community telecentres', in R.M. Davison (ed.), *Information systems in developing countries : theory and practice*, City University of Hong Kong Press, Hong Kong, pp. 114-29.
- Collins, Buhalis, D. & Peters, M. 2003, 'Enhancing SMTEs' business performance through the Internet and e-learning platforms', *Education Training*, vol. 45, no. 8, pp. 483-94.
- Coppock, K., Maclay, C. & Calero, L.A. 2002, 'Ecuador Country Profile', in G.S. Kirkman, P.K. Cornelius, J.D. Sachs & K. Schwab (eds), *The Global Information Technology Report 2001-2002 Readiness for the Networked World*, Oxford, New York, pp. 194-5.
- Costa, E.d. 2001, *Global E-commerce Strategies for Small Businesses*, MIT Press, Cambridge, Mass. ; London.
- CountryWatch 2006, Ecuador 2006 Country Review, CountryWatch, viewed December 9 2006, <[www.countrywatch.com](http://www.countrywatch.com)>.
- Croes, R.R. & Tesone, D.V. 2004, 'Small firms embracing technology and tourism development: evidence from two nations in Central America', *International Journal of Hospitality Management*, vol. 23, pp. 557-64.
- Davidson, A., Burgess, S. & Sellitto, C. 2006, 'An investigation of SMTE Web Site usage in Australia: Implications for E-commerce adoption and planning processes', in N. Al-Qirim (ed.), *Global Electronic Business Research: Opportunities and Directions*, Idea Group Publishing, Hershey, PA, pp. 88-113.
- Dawson, C. 2002, *Practical research methods : a user-friendly guide to mastering research techniques and projects*, How To Books, Oxford.
- Duncombe, R., Heeks, R., Kintu, M.J.R. & Nakangu, B. 2004, *eCommerce for small enterprise development a handbook for enterprise support agencies in Uganda*, Institute for Development Policy and Management, viewed August 2005, <<http://www.ecomm4dev.org/>>.
- Dutta & Lopez-Claros, A. 2005, *The Global Information Technology Report, 2004-2005 : Efficiency in an increasingly connected world*, Palgrave MacMillan, New York.
- Economist 2005a, 'Confused in the Andes.' *Economist J1 - Economist*, vol. 377, no. 8449, p. 40.
- Economist 2005b, 'Free-for-oil.' *Economist J1 - Economist*, vol. 376, no. 8441, p. 33.
- Economist 2006, 'Banana republic.' *Economist J1 - Economist*, vol. 381, no. 8500, p. 48.
- Efendioglu, A.M. & Yip, V.F. 2004, 'Chinese culture and e-commerce: an exploratory study', *Interacting with Computers*, vol. 16, no. 1, pp. 45-62.
- EIU. 2004, *Economist Intelligence Unit E-readiness Rankings 2004*, viewed June 2006, <[http://graphics.eiu.com/files/ad\\_pdfs/ERR2004.pdf](http://graphics.eiu.com/files/ad_pdfs/ERR2004.pdf)>.

- EIU. 2007, The 2007 e-readiness rankings: Raising the bar, Economist Intelligence Unit - Written in co-operation with The IBM Institute for Business Value.
- Faggiani, K.S. 2005, 'Identifying and overcoming barriers to the use of information technology by small business', in M.G. Hunter, S. Burgess & A. Wenn (eds), *Small business and information technology - research techniques and international case studies*, Heidelberg Press, Heidelberg, Victoria Australia, pp. 37-53.
- Galperin, H. 2005, 'Wireless networks and rural development: Opportunities for Latin America', *Information Technologies and International Development*, vol. 2, no. 3, pp. 47-56.
- Gammack, J., Asia Pacific Economic Cooperation (Organization). Tourism Working Group., Griffith University School of Management. & APEC International Centre for Sustainable Tourism. 2004, *Development needs of small to medium size tourism businesses : a report prepared for APEC Tourism Working Group*, School of Management Griffith Business School Griffith University, [Nathan] Qld.
- Gartner, W.C. 2004, 'Factors affecting small firms in tourism: a Ghanaian perspective', in R. Thomas (ed.), *Small firms in tourism : international perspectives*, Elsevier Ltd, Oxford, pp. 35-52.
- Gordon, R.G., Jr 2005, *Ethnologue: Languages of the World*, Fifteenth edn, SIL International, Dallas, Tex.
- Guasch, J.C. & Ugas, L. 2007, 'The digital gap in Maracaibo city in Venezuela', *Telematics and Informatics*, vol. 24, no. 1, pp. 41-7.
- Harris, R.W. 2005, 'Explaining the success of rural Asian telecentres', in R.M. Davison (ed.), *Information systems in developing countries : theory and practice*, City University of Hong Kong Press, Hong Kong, pp. 83-100.
- Harvey, L.J. & Myers, M.D. 2002, 'Scholarship and practice: the contribution of ethnographic research methods to bridging the gap', in M.D. Myers & D.E. Avison (eds), *Qualitative research in information systems: a reader*, Sage Publications, pp. 169-80.
- Hawk, S. 2004, 'A comparison of B2C e-commerce in developing countries', *Electronic Commerce Research*, vol. 4, no. 3, pp. 181-99.
- Hine, C. 2000, *Virtual ethnography*, Sage, London ; Thousand Oaks, Calif.
- Inkpen, G. 1994, *Information Technology For Travel and Tourism*, Pitman, London.
- ITU 2005, *ICT Statistics 2004*, International Telecommunication Union, viewed December 2005, <<http://www.itu.int/ITU-D/ict/statistics/>>.
- Jennex, M.E., Amoroso, D. & Adalakun, O. 2004, 'E-commerce infrastructure success factors for small companies in developing economies', *Electronic Commerce Research*, vol. 4, no. 3, pp. 263-86.
- Karanasios, S. & Burgess, S. 2006, 'Exploring the Internet use of small tourism enterprises in developing countries: evidence from a developing country', *Electronic Journal of Information Systems in Developing Countries*, vol. 27, no. 3, pp. 1-21.
- Kirkman, G.S., Cornelius, P.K., Sachs, J.D. & Schwab, K. 2002, *The Global Information Technology Report, 2001-2002 : Readiness for the Networked World*, Oxford University Press, New York.
- Kuwayama, M. 2001, *E-Commerce and export promotion policies for Small and Medium-Sized Enterprises: East Asian and Latin American Experiences*, International Trade and Integration Division, United Nations Publications, Santiago, Chile.
- Lake, S. 2000, *E-Commerce and LDCs: Challenges for enterprises and governments* paper presented at the E-Commerce and LDCs Roundtable, Kathmandu, Nepal., United Nations Conference on Trade and Development (UNCTAD).
- Madon, S. 2005, 'Evaluating e-governance projects in India: a focus on micro-level implementation', in D. Howcroft & E.M. Trauth (eds), *Handbook of critical information systems research : theory and application*, E. Elgar Pub., Northampton, Mass., pp. 325-49.
- Mann, C.L. 2002, 'Electronic Commerce, Networked Readiness and Trade Competitiveness', in G.S. Kirkman, P.K. Cornelius, J.D. Sachs & K. Schwab (eds), *The Global Information Technology Report: Readiness for the networked world*, Oxford University Press, New York, pp. 90-103.
- Mead, D.C. & Liedholm, C. 1998, 'The dynamics of micro and small enterprises in developing countries', *World Development*, vol. 26, no. 1, pp. 61-74.
- Molla, A. & Licker, P.S. 2005, 'eCommerce adoption in developing countries: a model and instrument', *Information & Management*, vol. 42, no. 6, pp. 877-99.
- Montealegre, R. 1998, 'Waves of change in adopting the Internet: Lessons from four Latin American countries', *Information Technology and People*, vol. 11, no. 3, pp. 235-60.
- Moodley, S. & Morris, M. 2004, 'Does e-commerce fulfill its promise for developing country (South African) garment export producers?' *Oxford Development Studies*, vol. 32, no. 2, pp. 155-78.
- Nazmi, N. 2001, 'Failed reforms and economic collapse in Ecuador', *The Quarterly Review of Economics and Finance*, vol. 41, no. 5, pp. 727-35.

- Neuman, W.L. 1997, *Social research methods : qualitative and quantitative approaches*, 3rd edn, Allyn and Bacon, Boston.
- Oyelaran-Oyeyinka, B. & Lal, K. 2006, 'Learning new technologies by small and medium enterprises in developing countries', *Technovation*, vol. 26, no. 2, pp. 220-31.
- Payne, J.E. 2002, *E-Commerce Readiness for SMEs in Developing Countries: A Guide for Development Professionals*, Academy for Educational Development/LearnLink.
- Peil, M. 1983, 'Situational Variables', in M. Bulmer & D.P. Warwick (eds), *Social research in developing countries : surveys and censuses in the Third World*, UCL Press, London, pp. 71-88.
- Poon, A. 1993, *Tourism, Technology and Competitive Strategies*, CAB International, Wallingford.
- Purcell, F., Toland, J. & Huff, S.L. 2004, 'The potential of e-commerce for remotely located SMEs: Case studies from Samoa', in N.A.Y. Al-Qirim (ed.), *Electronic commerce in Small to Medium-Sized Enterprises: Frameworks, Issues and Implications*, Idea Group, Hershey, PA, USA, pp. 86-105.
- Rizk, N. 2006, 'Venturing the unexplored : e-readiness assessment of small and medium enterprises in Egypt', in S. Kamel (ed.), *Electronic business in developing countries : opportunities and challenges*, Idea Group Publishing, Hershey, PA, USA, pp. 246-64.
- Romero, S. 2000, 'How a byte of knowledge can be dangerous, too', *New York Times*, vol. 149, no. 51367, p. 4.
- Sheldon, J.P. 1997, *Tourism Information Technology*, CAB International, New York.
- Talamanca, C.F., Furlani, A. & Alves, A. 2006, *ICT cluster priority assessment. ICT and SMEs: a strategy framework for the development of the Latin American and Caribbean Region*, Multilateral Investment Fund, Inter-American Development Bank, Italian Trust Fund for MIF Project Preparation.
- Tanburn, J. & Singh, A.D. 2001, *Innovation and Sustainability in Business Support Services (FIT) - ICTs and Enterprises in Developing Countries: Hype or Opportunity?*, International Labour Office, Geneva.
- Turner, S. 2003, *Indonesia's Small Entrepreneurs : Trading on the Margins*, Routledge, London ; New York.
- UNCTAD 2004, 'Use of the Internet for efficient international trade: guide for SME managers', paper presented to United Nations Conference on Trade and Development, New York and Geneva.
- World Bank. 2000, 'News about World Bank Group Small and Medium Enterprise Initiatives', *SME FACTS* . vol. 1, no. 1, July.
- WorldBank 2006, *World Development Indicators*, The World Bank Group, <<http://www.worldbank.org/>>.
- Wresch, W. 2003, 'Initial e-commerce efforts in nine least developed countries: a review of national infrastructure business approaches and product selection', *Journal of Global Information Management*, vol. 11, no. 2, pp. 667-78.
- WTO 2002, *Tourism and Poverty Alleviation*, World Tourism Organisation, Madrid.

# Grounding E-Government in Vietnam: From Antecedents to Responsive Government Services

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## Abstract

*The paper concerns the antecedents or preconditions for the successful development of e-government in Vietnam. The main antecedent issue under consideration is the readiness of the population to access and use networked ICTs, the prime communication medium of e-government. The paper reports the results of in-depth interviews with 38 citizens in various regions of the country. Its purpose is primarily to examine the capacity of citizens to become effective users of e-government services in terms of their access to, and capacity to use, ICTs. Its subsidiary purpose, in the light of these user-centric considerations, is to offer some thoughts on how government in Vietnam might position itself better to provide effective e-government services. In essence the paper attempts to shed light on the following questions: How ready is the population to make use of e-government services if these were provided? How ready is government to provide a full range of e-government services to this population? At present only 16 million out of Vietnam's more than 85 million people are ICT/Internet users. If e-government service delivery is to be effective, clearly a much greater proportion of the population needs to become users. The paper looks at case studies of users and non-users, as well as background data from a variety of Vietnamese and international sources, in order to frame initial suggestions about how barriers to wider internet use can be overcome, and how services to current and future users could be made more effective.*

## Key words

*E-government, electronic government, ICT users, ICT non-users, Vietnam, Internet*

## Introduction and Aims

This paper was developed from a presentation to the 'Vietnam E-Government Symposium 2006 – The Bridge for Government, Business and Citizens'. That presentation and this paper form part of a greater project on the role of ICTs in the development of Vietnam as a sustainable knowledge economy.

The paper concerns the antecedents or preconditions for the successful development of e-government in Vietnam. The main antecedent issue under consideration is the readiness of the population to access and use networked ICTs, the prime communication medium of e-government.

The paper reports the results of in-depth interviews with 38 citizens in various regions of the country. Its purpose is primarily to examine the readiness of citizens to become effective users of e-government

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services in terms of their access to, and capacity to use, ICTs. Its subsidiary purpose, in the light of these user-centric considerations, is to offer some thoughts on how government in Vietnam might position itself better to provide effective e-government services. In essence the paper attempts to shed light on the following questions: How ready is the population to

make use of e-government services if these were provided? How ready is government to provide a full range of e-government services to this population?

The assumption is made in this study that the aim of e-government is to improve the responsiveness of government to the needs of people, or in other words (to borrow from Abraham Lincoln) contribute to the reality of *government of, by and for* the Vietnamese people, and that e-government can play a role in this by improving communication between government and people (Nguyen 2001). At present only 16 million out of Vietnam's more than 85 million people are internet users. If e-government service delivery is to be effective, clearly a much greater proportion of the population needs to become Internet users. This paper looks at case studies of users and non-users in order to frame initial suggestions about how barriers to wider internet use can be overcome, and how services to current and future users could be made more effective.

## The Concept of E-government and Factors Contributing to its Success

The term 'electronic government' or 'e-government' appeared about a decade ago and there is no commonly accepted definition (Bhatnagar 2004). Oliver and Sanders saw e-government as "the migration of government information and services to an on-line delivery mode" (Oliver and Sanders 2004). As with the concept of 'e-commerce', the scope of e-government covers the interaction between government and citizens (G2C), government and business enterprises (G2B), and inter-agency dealing (G2G).

In this article we shall use the broad definition of e-government provided by Marche and McNiven: "the provision of routine government information and transactions using electronic means, most notably those using Internet technology, whether delivery at home, at work, or through public kiosks" (Marche and McNiven 2003).

It is an underlying assumption in this paper that Internet technologies and specifically e-government should have as their main purpose the improvement of the ways in which government serves its citizens and the ways in which citizens interact with public institutions.

Martin and Byrne stated their philosophy of e-government in even stronger terms:

*It seems clear that for e-government to be anything more than automated service provision it needs to reach far beyond the conduct of routine government business to embrace social, economic and political change (Martin and Byrne 2003).*

Marche and McNiven (2003) stressed that successful e-government programs should not only be based on the perceived efficiency gains for government itself, but rather on the satisfaction of consumers. Kolsaker and Lee-Kelley (2006) criticised the UK's 'techno-centric model' which they argued 'fails to engage citizens as anticipated, underplays the importance of Knowledge Management (KM) and clashes with the traditional values of public service'.

Dada (2006) mentioned factors which would be important from the perspective of the suppliers of e-government: the capacity for significant organisational change, the development of leadership skills, a grasp of the distinction between 'hard' (technological factors) versus 'soft' (human factors), and understanding of the differences in catering for the private and public sectors, and for citizens in developed and developing countries.

From the perspective of citizens' needs (the 'demand side' in e-commerce terms), Margetts and Dunleavy (2002) stressed the vital role of factors such as the impact on citizens of transaction costs, an understanding of cultural barriers, for example social exclusion caused by the problem of unequal access to the Internet, citizens' expectations of government services and their degrees of acceptance of technological innovations, and possible mismatches between governmental and social uses of the Internet'.

Recently, Intel joined with the Government for the Third Millennium Foundation (Gov3) to publish a white paper on global best practice in delivering public services. This paper expressed similar ideas in stressing the need for a 'citizen-centric' service model, which:

*treats citizens and businesses like customers. Citizen-centricity is about turning the focus of government around – looking at the world through the other end of the telescope, so that the needs of the citizen and businesses come first, rather than operational or other imperatives inside the government (Intel and Gov3 2006).*

## The Context of ICT in Vietnam

At the national level, government in Vietnam consists of the dual structures of the Communist Party and the National Government. The country is organized at local government level into 64 provinces. The provinces are divided into 588 districts, which are further subdivided into 9069 communes (General Statistics Office of Vietnam 2006).

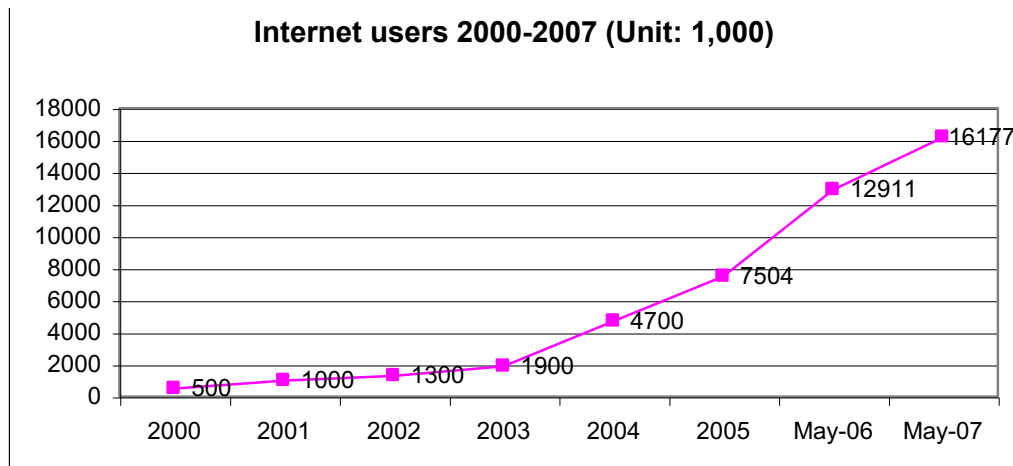
According to the CIA World Factbook (2007) the area of Vietnam is 329,560 sq km. Total population is 85.26 million (July 2007 est.) with a median age of 26.4 years, comprising 26.3% of 0-14 years, 67.9% of 15-64 years, and only 5.8% of 65 years and over (Central Intelligence Agency 2007).

Approximately 60 million live in a rural setting with farming as the main occupation (General Statistics Office of Vietnam 2006).

Vietnam has undertaken a far-reaching process of economic reform known as 'Doimoi' since 1986. The Government of Vietnam committed to increased economic liberalization and enacted structural reforms needed to modernize the economy and to produce more competitive, export-driven industries. Achievements of Doimoi have been spectacular. According to a World Bank (2003) report, the progress made in Vietnam in alleviating poverty has been one of the greatest success stories in world economic development in recent years. Poverty rates measured at international levels have halved from 58% in 1992 to 37% in 1997 and 29% in 2002 (World Bank 2003) and further down to 24.1% in 2004 (ADB 2005). Together with poverty reduction, the country had very successful economic growth since 1990 with around 8% annual GDP growth from 1990 to 1997, 5.5% from 1998 to 2000, over 7% from 2002 to 2005 and 8.4% in 2006, making it the world's second-fastest growing economy. The country also achieved a high rate of increase in exports, from US\$9.1 billion in 2001 to US\$16.5 billion in 2002 or over 12% a year (Dapice and Fellow 2003). In 2005, nominal GDP and per capita GDP were US\$52.8 billion and US\$636, respectively (Baker, Tumbarello and Ahmed 2006).

At present (June 2007) about sixteen million people are users of the Internet, while just under 70 million others conduct their lives without the use of computers (Vietnam Internet Center 2007). The growth of Internet usage in Vietnam over the 5 year period to 2005 is shown in Figure 1. The leap from 7.5 million users in 2005 to 16 million in 2007 underlines a trend of rapid growth.

**Figure 1** – Internet Development in Vietnam



Source of data 2000-2004: Hochiminh Computer Association (2006); and 2005-2007 from Vietnam Internet Center (2007)

Further insight regarding ICT/Internet usage is provided by the statistics assembled in Table 1 below. This Table shows that despite the vigorous growth in the absolute number of users, the percentage of ICT usership – including telephony – in the population as a whole is still very low.

**Table 1 – Vietnam ICT use statistics**

Telephone subscribers per 100 inhabitants	Internet users per 100 inhabitants	PCs per 100 inhabitants	Global e-readiness rankings	
29.42*	12.72*	1.26*	61/65**	68/104***
Sources:				
* International Telecommunications Union (2005) (ITU 2006)				
** Economist Intelligence Unit (2005). Ranked form 65 countries (EIU 2006)				
*** Global Information Technology Report (2005). Ranked out of 104 countries (Dutta and Jain 2004)				

Amongst small enterprises in Vietnam the diffusion of ICTs and the Internet in particular has been slow. In a case study in 2005 of nine traditional villages focusing on small enterprises and e-commerce, Tran identified the following difficulties: unreliable technological infrastructure, lack of legal infrastructure, blocking of Internet access due to security concerns, and high cost of Internet connectivity (Tran 2005). However, despite the infrastructural constraints and difficult conditions, a number of small enterprises are engaging in e-business.

E-government cannot be achieved without the availability of telecommunications infrastructure. With the increase in use shown in Figure 1 and Table 1 has come an ‘explosion’ in the development of the Vietnamese ICT sector since the turn of the millennium. According to statistics presented by the World Bank (World Bank and WITSA 2004), Vietnam’s investment in ICT infrastructure as a percentage of GDP was of a similar order to that of larger economies in the region: Vietnam spent 7.3% of GDP, while South Korea spent 6.7%; Japan 7.4%; and Hong Kong 8.4%. Clearly the absolute figure spent in Vietnam was much lower than that of these countries, given the differentials in GDP terms. The 2006 estimated per capita GDP (PPP – purchasing power parity, per capita) comparison expressed in U.S. dollars is Vietnam: 3,100; South Korea: 24,500; Japan: 33,100; Hong Kong: 37,300 (CIA World Factbook 2007). Nevertheless the level of commitment being made in percentage terms sets a good base for long term development.

Chowdbury and Cuong et al (2002) reported that the Vietnamese government was enthusiastic in encouraging e-commerce and e-government projects, introducing ICT strategies and ICT parks to attract foreign companies. Policy makers have also been keen to foster B2B e-commerce to promote



export industries, however both B2B and B2C e-commerce have been described as negligible. These authors identified some challenges to ICT expansion in Vietnam, namely: lack of sufficient competition in the ICT sector; high piracy rates; and a shortage of ICT skilled labor.

The first attempt to build e-government in Vietnam was the '112 Project' on computerization of state administration in the framework of the Public Administration Reform (PAR), starting in 1999. In parallel with the 112 Project which focused more on internal administration, almost all ministries and national departments and all 64 provincial governments developed their websites which were linked to the government portal [www.chinhphu.vn/portal](http://www.chinhphu.vn/portal) to provide information and limited services to business and individuals. In 2007, the government discontinued the 112 project to prepare a more comprehensive e-government program (Nguyen 2007).

Furthermore, several initiatives are underway to improve the national environment for 'e-facilitated' trade and to provide support and encouragement to businesses taking advantage of this (Gammack et al, 2004).

Kaufmann, Kraay et al (2006) summarized and interpreted the findings of a World Bank report "Governance Matters V: Governance Indicators for 1996–2005" which covered 213 countries and territories. The report assessed six dimensions of governance: voice and accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law; and control of corruption in the political regime. In this report, the political regime in Vietnam was seen as stable, but the other five elements received very low scores compared with other countries. Moreover little improvement was discerned in the ten year period. The analysis suggested that improvement was needed in the capacity of government to manage its resources effectively and to formulate and implement sound policies. Such improvements are required for greater responsiveness to the needs of citizens, both in the community and business sectors, especially at a time when Vietnam is integrating into the global economy and joining the World Trade Organisation (WTO) in January 2007.

The benefits of Vietnamese online services were still very limited. According to Pham, less than 50% of the provincial websites provided information related to investment, licensing, land permits, customer and taxation. Only two out of 49 websites provided on-line services about the matters (Pham 2005). For instance, NBIN, an automation of the business registration process, did not allow any registration to be carried out online. That static website simply provided information and application forms and people still had to meet government staff to register their business (Vu and Jones 2006). Furthermore, little attention had been given to identify the needs and obstacles of the people in relation to e-government. E-government projects basically focused on internal administration - G2G affairs rather than G2C and G2B relationships. Vu and Jones (2006) argued that:

*E-Government initiatives have been far too focused on modernization and the purchase of hardware for government agencies... All initiatives (Project 112 and PAR initiatives) are supply side focused with little thought to the actual needs of users, business and citizens, and how these needs can best be met...*

They thus commented that 'the service needs of citizens and businesses be addressed and e-government initiatives and PAR meet these needs rather than taking a supply side approach to projects' (Vu and Jones 2006). Understanding of information on customers' needs together with technological and social obstacles and weaknesses in relation to online acceptance could help to reduce failures, extensive wastage of investment, and damage to credibility and reputation for future e-government projects.

## **Methodology: a Case Based Approach**

The style of the research reported in this paper is mainly ethnographic and qualitative. In-depth insight, rather than statistical generalization, is the key outcome sought. The methodology seeks to triangulate case data with large data sets (where available) in order to establish strong inputs to policy development.

The first author conducted 38 interviews in the Vietnamese language from January to April 2006. The interviewees were both ICT users (people who currently use computers) and ICT non-users, in order to identify and explore factors associated with adoption and non-adoption of ICTs. The study's sampling approach is described later. For the non-users, the following open-ended issues (among others) were investigated. What are major problems they encountered? What are major channels of information through which they acquire new information and knowledge to solve problems? What are barriers that prevent them from using ICTs? For the users, the key open-ended questions were as follows. For what purposes do they use ICTs? What are difficulties that they are experiencing and how do they deal with these? Does the usage of ICTs help them in their work and life?

An explanatory statement and a letter of consent were provided to let the interviewees know about the purpose and the method of the interview, and its compliance with ethical protocols, and to elicit their agreement to participate. If they agreed, the conversation started and was recorded. If any interviewee requested to be anonymous a code was used on their interview documentation. Otherwise, their names with the date of interview and a brief description were recorded. In this paper interviewees are referenced by their code number and their date of interview (e.g. I22, Feb 20, 2006).

As the Vietnamese language was used in the study to facilitate smooth conversation it was difficult to use automated qualitative analysis tools such as NVivo on the transcripts. Instead manual grouping of content was undertaken, and Excel spreadsheets were used to summarize data and discern patterns.

The sampling technique used for selecting the cases was *purposive sampling*, a non-probability sampling approach "used when the investigator is interested only in obtaining a sufficient number of elements to satisfy research objectives. The resulting sample is ... 'balanced' on a range of variables, for example sex, age, education, income, location (or place of abode) ..." (Williamson 2002). In other words, the sample is representative, but representativeness is not achieved through random selection as in a probability sample, but through criteria-based selection of the individuals to be included in the sample. Representativeness means that the subset under study should manifest, in an unbiased way, selected characteristics of the superset, that are seen to be important to the research. The practical success of such an approach to sampling is daily demonstrated in the business world, for example in focus group work undertaken by marketing professionals for product and service development.

A knowledgeable local guide was identified to help identify 16 non-users to interview. Agriculture still accounts for 20% of GDP (despite its recent decline in proportion to the national economy). Rural villages and hamlets house 74.1% of the whole population (Khổng 2002). Therefore care was taken to include rural, farm based interviewees who were interviewed at their homes.

For the users, 20 interviewees were chosen in Internet cafes or in their working places from North to South of Vietnam. In Internet cafes, the interviewer and his assistant walked in and selected one or two persons at each site. In addition, they also selected interviewees from a private shop, a university, a research unit and two governmental agencies. About 10% of people who were approached refused to be interviewed either because they were busy, or were anxious about disclosure. These were replaced with similar cases from the same categories.

## Characteristics of the Sample

The cases included in the sample were 22 users and 16 non-users. For non-users an equal number of males and females were selected, but for users males predominated, reflecting the macro picture presented in the large statistical reports available. Among the users, 17 lived in cities and five in communes. Of the 16 non-users, five were in suburbs, four in agricultural villages, four in villages that were changing into towns and three were in the process of moving from the countryside to cities. By region, 28 lived in the North, one in the Centre and seven in the South of Vietnam. The composition of the sample is summarized in Table 2 below.

**Table 2** – Composition of Purposive Sample

	ICT/Internet Users	ICT/Internet Non-users	Totals
Gender			
<i>Male</i>	14	8	22
<i>Female</i>	8	8	16
Location			
<i>Rural</i>	5	8	13
<i>Urban</i>	17	8	25
Age group of non-users			
20-29			
30-39		3	
40-49		3	
50-59		3	
60+		4	
Age group of users		3	
10-14			
15-19			
20-24	1		
25-29	6		
30-34	7		
35+	6		
	2		
	0		
<b>Totals</b>	<b>22</b>	<b>16</b>	<b>38</b>

## Age

Although no large scale statistical survey evidence was available regarding the relative ages of users and non-users, the purposive sample for users included more younger people than older to reflect both the overall youthful demographic of Vietnam and an assumption that usage is higher in the younger age groups. For non-users the interviewees were spread more or less evenly across age groups. It should be noted, however, that no non-users below the age of 20 were included, and it would be desirable to undertake follow-up study of non-users in this age bracket.

## Income

Monthly income of non-users in the sample varied widely from VND 100,000 to 4,000,000. The average income of a northern/central farmer and a student was much lower than that of other jobs (VND400,000 and 1,237,500, respectively). Other non-users had an income comparable to that of a user. It would be necessary to remark that 1) farmers were more economically self-reliant and their incomes, such as rice or maize, were often not accounted in monetary terms; 2) in 2006, US\$1 was VND 15,983 at the official exchange rate, yet was about 2,826VND in purchasing power parity (Central Intelligence Agency 2007) . Thus, a farmer's actual income, if exchanged into money, could be higher. For the reader's reference, 1kg of rice costs about VND 5,000 and a student's lunch costs from VND 5,000.

Users in the sample, excluding students, had an income varying from VND 600,000 to 3 million per month with a mean of VND 1,216,000. A student got a monthly allowance of about VND 544,000 on average. Rural users spent much less in total, but a relatively high proportion of their income. For instance, I22 (Feb 20, 2006) a rural high school student, paid VND 100,000 monthly, one third of his allowance, for the Internet - a considerable amount equivalent to his monthly rice budget.

## Education

Categories commonly used to describe formal educational levels in Vietnam are primary, secondary, high school, vocational and higher training and 'other' – and these categories were used in the study. Among the non-user group in the sample, farmers had lower education (from primary to secondary

levels) than the other occupations (from vocational training to higher education). Six users were university students and seven hold bachelor's degrees or above.

There were non-users who attained only primary education but there existed also ICT illiterates among high literates. Several non-users had attained high school graduation or bachelor degrees, or were university students.

## Occupation

Among non-users, farmers were the biggest group consisting of three in the North and three in the South. Their main jobs were cultivating rice, corn, vegetables or aquaculture. Other non-users were three folk-artists in Bacninh province, one owner of a large seafood restaurant in Hochiminh city, one director of a *Quanho* culture business center in Bacninh province and one student in Hochiminh city who came from the poor province of Quangtri in the Center.

Users' professions were more diversified, including student, government officer, university staff, researcher, public relations, medical doctor, guard keeper, hairdresser and a sales manager of *Dongho* folk printing.

## How ICT/Internet Non-users Obtained Information

Almost all non-user interviewees were aware of the importance of information and knowledge to compete in the demanding contexts of work and life. However few people knew much about the actual use of ICTs, or e-government service delivery. Instead, they were using other channels to get information though not all of them were effective and useful.

In a study some years ago, the loudspeaker was identified as the major channel of information to farmers (World Bank. 2002; Smith, Toulmin and Qiang 2003). Our study suggests that the loudspeaker might lose its leading position. As depicted in Figure 2, the major channels were:

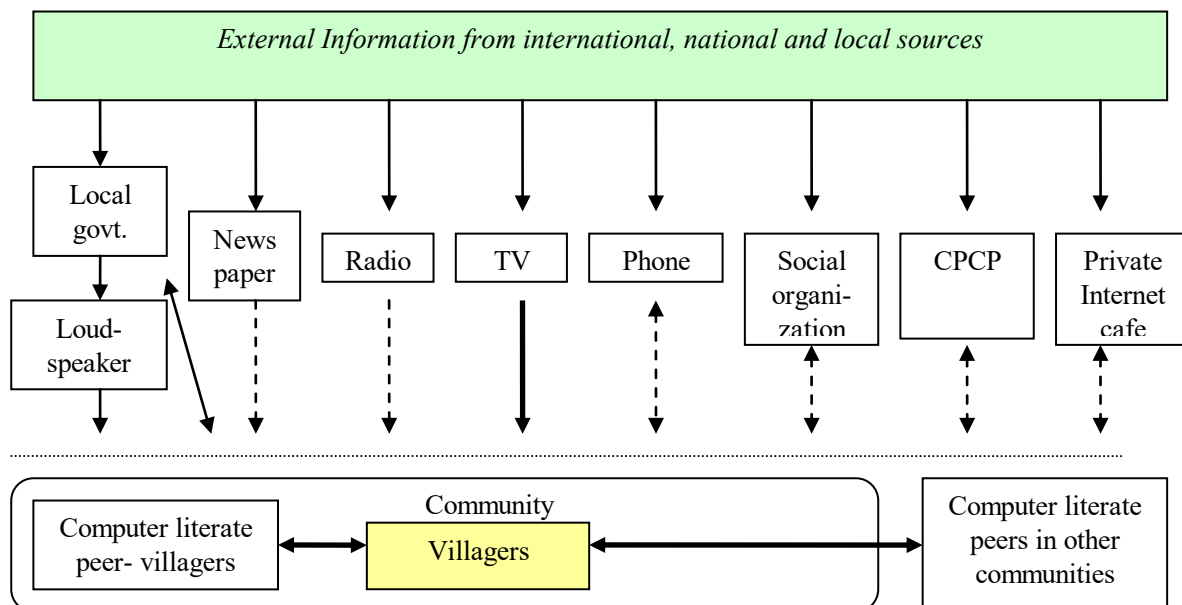
- **Television and peers** (people who lived, worked or studied near by) overtook loudspeakers to be the top sources of information. Nine of the 16 interviewees regarded TV and peers the main source of information. While TV provided various kinds of general information, peers supplied specific knowledge, such as job availability, working know-how or learning-related information;
- **Loudspeaker systems** were a channel through which the local authority announced local guidelines or government regulations to the people e.g. hygiene cleaning, farming schedule, health or vaccination time table. Three interviewees recognized the existence of loudspeakers in communes but revealed that they were not important to them. Information from loudspeaker was often deemed to be less attractive and very narrow (I28, Feb 25, 2006). Furthermore, the transmission time was very limited and often conflicted with the availability of villagers who were usually too busy, often working at a second job (I37, Mar 7, 2006);
- **Newspapers and books** were not read by rural non-ICT users in contrast to residents in urban areas (I27, Feb 25, 2006; I26, Feb 24, 2006; I53 Apr 7, 2006);
- **Telephone**: Thanks to the expansion of the public telecommunications infrastructure recently, more households possessed telephone set, mainly fixed phone. Seven interviewees reported that they could use telephone to exchange information about market or job with their peers;
- **Radio**: Four interviewees claimed radio as a source of information but two of them (I27, Feb 25, 2006 and I37, Mar 7, 2006) added that they spent very little time to listening to radio;
- **Communal government and social organizations** (e.g. Farmer's Associations, Women's Associations or Veterans' Associations): Social organizations sometimes organized meetings to provide villagers with information, such as know-how to raise cows or goats, or to obtain loans. Only three out of 16 persons regarded communal government or social organizations meetings as sources of information them but said they did not attend because either they did not have time (I37,

Mar 7, 2006 and I51, Apr 7, 2006) or the information provided was not relevant or beneficial (I51, Apr 7, 2006);

- **Computer and the Internet:** To all non-users those technologies were something far away. One interviewee did not have any idea of what benefit the new technologies offer (I37, Mar 7, 2006).
- **Communal Post and Cultural Points (CPCPs):** According to Vietnam Posts (Vienampost 2006), as a joint initiative between the Ministry of Posts and Telematics and the Ministry of Culture and Information, about 8,000 CPCPs with Internet and telephone connection were set up by Vietnam Posts and Telecommunication Group in a total of 9,069 communes. That initiative was an effort to enable villagers in poor and remote areas to access to ICTs. We had a small study about this channel in late 2006 and plan to discuss about it in future. It was not identified as an information source in the interviews reported here.

An important insight gained in the non-user interviews was that computer literate peers or neighbors of non-users played an important role in providing new knowledge because of geographic proximity and relevance of content for non-users. With peers, non-users can seek the most necessary information conveniently and informally; and they can check if the knowledge they receive is usable or not. From another perspective, that trend can be interpreted as a process of displacement or substitution. Some years before, general information from TV or loudspeakers might have been adequate, but now villagers need more specific and practical knowledge for working or living, and traditional one-way media such as loudspeaker systems or even broadcast television cannot keep pace.

**Figure 2-** Main Sources of External Information for ICT/Internet Non-Users



## Obstacles for E-government Service Delivery to ICT/Internet Non-Users

Among the cases included in the sample, there were few rural residents who had access to the Internet, the major channel of e-government services. Even villagers who lived very close to cable networks for the Internet, TV and telephone in Bacninh or Haiphong did not use these services. Major obstacles for non-users were not identical for everyone but varied by profession, residential locality, age and economic status.

Firstly, the cost of ICTs was a forbidding barrier to farmers. In the North, the income from farming was too low, about VND 100,000 a month (US\$ 6) compared with Internet installation fee from VND 80,000 to 470,000 (I27 and I28, Feb 25, 2006, I35, Mar 7, 2006) or cable TV subscription fee at VND55,000 a month (I37, Mar 7, 2006). In the South, I51 (Apr 7, 2006) claimed that “only a rich family can afford to buy a computer at 3.5-5 million VND... Many households are very poor or live in slums.”

Secondly, the gap in infrastructure availability between urban and rural areas became larger. The telecommunication infrastructure, including Internet, telephone, cable TV, quickly developed and became more available in urban areas. However in communes like Dongho in Bacninh province or Nhanbinh in Longan province, Internet service was not available. The nearest cybercafe to Nhanbinh, for example, was 7km away. Students at secondary or high schools were not taught IT because there was no computer lab there (I51 Apr 7, 2006).

In regard to subjective difficulties, time constraints were often mentioned. Farmers claimed they were very busy doing a second job to get more income (I26, Feb 24, 2006, I35, Mar 7, 2006). They also stated that their educational limitations, in areas such as English and business skills, precluded them from using the Internet (I24, Feb 24, 2006). Consequently, villagers were reluctant to try using the Internet because they believed they lacked necessary skills and knowledge (I51, Apr 7, 2006). Also, farmers did not see potential benefits from the new technology. “Work at communes is often simple, do not require technology. The Internet is something far away. We do not know what benefits ICTs can bring about for us”, said I35 (Mar 7, 2006).

While most older non-users would say no to ICTs, younger persons appeared more enthusiastic in approaching the Internet. Many children were observed surfing the web in Internet cafes in communes.

Though being more enthusiastic for the new technology than their elders, psychological reluctance was apparently more difficult for juniors to overcome. Shyness and timidity stopped many interviewees for the first trial of a new technology like the Internet, as I26 revealed:

*The feeling of a person who never uses the Internet is very shy...Although I already know the Internet is a new channel rich of diversified information and there is an Internet cafe next door, I dare not try (I26, Feb 24, 2006).*

Surprisingly, if asked to try the Internet by a peer, people could overcome that adverse feeling, as I53 recalled: “I used a computer for the first time thanks to some friends who often went to Internet cafes [who] asked me to go with them” (I53, Apr 6, 2006).

While almost all farming interviewees had no intention to use the Internet or a computer, some revealed that they might encourage their children to use ICTs in the expectation that their children could learn the emerging technology. Along these lines, I27 (Feb 25, 2006) bought a computer set for his son who studied in Hanoi. Similarly, the old artisan I21 asked his children to set up a website to market his *Dongho* prints via the Internet.

In summary, non-users (and especially farmers in the countryside) were visibly more disadvantaged than users in receiving e-government services. Main obstacles to them were limited education, low awareness and literacy of ICTs, low income, old age, timidity as well as lesser availability of e-government services and telecommunication network access.

## Obstacles for E-government Service Delivery to Current ICT/Internet Users

This section presents major features of and obstacles to interviewees who were currently Internet users in Vietnam, including frequency, experience, place of access, education and purpose of online activities.

### Online Time

There was a clear difference in the years of experience with computers and the Internet and the usage time between rural and urban users. Users in cities had longer experience with computer and the Internet than counterparts in the countryside (8.9 years and 5.7 years vs. 2.0 years and 2.0 years, respectively). In terms of usage hours per week, the former also used at least three times more than the latter (23.6 hours vs. 6.8 hours, respectively). Some users were computer game players who spent much more time with the Internet than general users, with a mean of 47.4 hours per week (about 7 hours per day). I08, a player in grade 12, even claimed that sometimes he played 20-22 hours a day (Jan 24, 2006). Youth may be exposed to computers and the Internet from an early age. For example, the 12-year-old I33 (Mar 6, 2006) disclosed that he had exposure to a computer for three years. Some even used computers before going to primary school, as revealed by I07, a gamer in Hanoi (Jan 24, 2006). Data about the sample's Internet experience and usage time is summarised in Table 3.

**Table 3** – Computer Experience and Usage Time

Indicator	Urban user	Rural user
Average years of using a computer	8.9	2.0
Average years of using the Internet	5.7	2.0
Average weekly usage hours	23.6	6.8
Maximal weekly usage hours	56	8

N=20 interviewees

### Access Points

Five main locations of Internet access identified in descending order of using frequency are: Internet cafes, home, office, school and peer's home. Internet cafes (other names in Vietnam: Internet shops, Internet dealer or Internet Service Center) were the most popular places where users could come to play games, chat, surf the Internet or make international VoIP calls at very low rates, about VND 2-3,000 per hour. Those places were usually full of students from nearby schools. Ninety percent of interviewees answered that they used computers in such places.

More than half of the ICT/Internet user interviewees (55%) used home computers. This was a new phenomenon if we recall that computers had been a luxury to families just a few years before. A quarter of people (25%) used office computers. Two teenagers (10%) claimed that they retrieved the web from their friend's house. It was surprising and sad to realize that schools did not play much role in providing computer and Internet service to the people (only 10%). Some schools even prohibited students from using the Internet. I22, a high school student in Ho town (Feb 20, 2006) revealed:

*Many students dare not go to Internet cafes because either they don't know about IT or their teachers forbid it. My school also prohibits students from the use of the Internet because using the Internet means playing games or accessing to bad websites. My school expelled several students who went to Internet cafes.*

Nobody claimed that they had accessed the Internet from CPCPs.

## Usage Purposes

To answer the question “*What are the primary purposes for which you use the Internet/ ICTs?*” 10 top activities were identified and none of them related to e-government services. Ninety percent of the users had at least a Yahoo email account though they did not spend much time using it. The uses of ICT listed in the most-mentioned order were: chatting, online multiplayer games, news or information, online music, downloading educational materials, solo games, work, other entertainment, creating online content, making friends and relaxing.

## Usage and Education

The usage purposes were different between those who had higher education and those who had not. University students were the most diversified online users who exploited many functions of computers and the Internet such as email, chat, and multiplayer games, as well as study, online music and high rates of searching for news and information. One university student created online content as a super moderator of an online forum. High school students used less sophisticated applications such as emailing and chatting, followed by multiplayer or solo games, news and information and other activities. Many male high school students played truant from school to play games at Internet cafes. Bachelor’s degree holders who were older than other groups spent less time on chat and computer games than others but more for work, study, news and information. The data for secondary school students was too sparse as only one student (165 Dec 18, 2006) was interviewed. However, her data suggested that people with low levels of formal education used computers for entertainment or study, but in a relatively unsophisticated way.

## Usage and Other Factors

Besides education, the online behaviour of users was also affected by other dimensions such as gender, experience, hobbies and living location.

Firstly, male users spent more time on chat and multiplayer games than female who most likely spent more time on searching for news and information, playing solitary games, entertainment, study and work. In searching news or information, male users looked for political, sport or lottery information while female users spent more time on social, business and IT topics, or on topics of special relevance to women or children. However, both genders were similar in regard to emailing and listening to online music. The majority of users did not chat with strangers but rather with old friends. Several male users made friends with unknowns. This finding is somewhat similar to the features of American online male and female users in 2001 (Howard, Rainie and Hones 2001).

Secondly, experience influenced the way people used ICTs. Similar to American users (Lebo, Cole, Suman, Schramm, Bel, Lunn, Maguire, Hanson, Singh and Aquino 2004), very experienced Internet users (with 5 years or more experience) spent the largest amount of time on email, instant messages, multiplayer games, more specific news, information and professional work, while new users (with 2 years or less) spent most time in emailing and chatting, followed by surfing information, offline or solo games and music.

Thirdly, people with different ages used computers differently. Elder people spent less time in chatting than younger. Social duties such as family responsibility or childcare may limit people being online. I34, a medical doctor, explained in his interview (Mar 6, 2006) why he seldom chatted: “Before marriage I chatted a lot. Now I seldom enter a chat room except when I chat with my sister overseas”.

Lastly, there was a clear distinction in the complexity of usage between rural users compared with urban users. While urban residents explored diversified online activities, rural users generally used relatively simple functionalities such as email or chat. They also spent much of their time on offline games owing to the low quality of connection. This difference was a visible evidence of the social divide in the Internet age in Vietnam.



## External Challenges

Despite the increasing development of local e-newspapers and e-publications in Vietnam recently, interviewees still complained about the quality of the Vietnamese content. One interviewee remarked: “the Internet does not change much of my working practice because if I need a professional document, I have to search in foreign websites” (I34, Mar 3, 2006). Another (I07, Jan 24, 2006) pointed out: “Information in Vietnamese websites is poor and not always most updated”.

In relation to infrastructure, most users (other than those in Hanoi and Hochiminh cities) complained about the poor telecommunications infrastructure. Even in a big city like Haiphong, a major harbor 100 km east to Hanoi, users were dissatisfied with the service. “The connection is often disrupted”, said I34 (Mar 3, 2006). In rural areas, the infrastructure was even worse both in coverage and quality. A user in a rural Internet cafe in Bacninh province, 30 km north east to Hanoi, exclaimed “the connection in rural Internet cafe is very slow. Many times I wanted to send a message but had to cease it since it took so long” (I22, Feb 20, 2006).

The over-regulation of the Internet was a topic of criticism by many interviewees. One person (I07, Jan 24, 2006), for example, explained: “The requirement of the government for security purposes, such as showing identification card when entering an Internet shop, is neither relevant nor manageable”. An owner of an Internet cafe in Haiphong shared this idea (I32, Mar 6, 2006). An article in Vietnamnet, a popular Vietnamese online newspaper made the point that no Internet café could avoid violating the Circulation No. 02/2005/TTLT-BCVT-HHTT-CA-KHDT on management of Internet dealerships. Such a regulation was not only cumbersome and unrealistic, but also restricted children under 14 from using Internet cafes (Vietnamnet 19/07/2006).

In comparison with users in developed countries, the complexity level of online applications used by Vietnamese people was clearly lower. The users interviewed spent most of their time on simple applications like email, chat and gaming. Fallows’ data suggested that American users exploited the web with more sophisticated activities such as shopping and buying online, searching for health or travel information, tracking credit cards, banking or paying bills (Fallows 2004). Overcoming users’ real or perceived shortfalls in skill or confidence is an important factor for achieving full effectiveness of e-government services.

## Users’ Obstacles

Obstacles identified in the interviews of users may be grouped into five areas: namely the English language, technological skills, personality development, economic affordability and rural disadvantage. These are discussed in turn below.

### The English Language

English, the dominant Internet language, was found to be a barrier to the majority of the users. For example, an academic said “I do not know much English, especially technical terms” (I05, Jan 24, 2006). A doctor gave his reason for only reading Vietnamese websites: “It is essential to know English to read professional documents on the Net. Therefore, I only enter Vietnamese websites” (I34, Mar 3, 2006).

With the Internet, literacy takes on greater importance, as it is mostly text based (Tigre and O’Connor 2002). Language is a big factor in Internet usage (De Boer and Walbeek 1999; Palmer 2000). Salman (2004) viewed language as a key Internet content issue. Cullen (2001) noted that China and Russia only experienced significant growth in Internet usership once content was provided in Chinese and Cyrillic.

## Technological Skills

Most users had difficulty in searching for information because they did not have technical skills - especially searching techniques. One user complained: "It takes much time to find necessary information if the connection is not speedy and we don't know appropriate keywords." Four users expressed concerns about Internet security, such as viruses and spam (I12, Jan 25, 2006; I05, Jan 24, 2006; I34, Mar 3, 2006; and I06, Jan 24, 2006) and one user was worried about being hacked (I48, Apr 5, 2006).

## Personality Development

Three users expressed concern about possible bad effects of unhealthy Internet content on adolescents, the major users of the Internet in Vietnam. As one user explained, unhealthy content of the net, such as erotic websites or the like, may badly spoil the personality of adolescents, who:

*often have limited social knowledge and experience become bewildered accessing the enormous information in the Internet, and may not adjust themselves to bad information. That can have negative impact on their personality development (I48, Apr 5, 2006)*

## Economic Affordability

Unlike the situation for rural users, economic affordability was seen not to be a major obstacle for urban users. The appearance of many private Internet cafes in all cities and big towns in recent years made the Internet both accessible and affordable to almost all urban users. As one interviewee put it, (I03, Jan 20, 2006) "the cost of using the Internet at cyber cafes is not a problem". However, if used too long for gaming, the cost would not be small. With the availability and affordability of Internet cafes, they could become ideal e-government service points.

## Rural Disadvantage

As was expected, rural users were disadvantaged compared to their urban counterparts in many aspects of ICT usage. Rural students have more difficulty accessing the Internet than their counterparts in the city. As one user explained (I22, Feb 20, 2006) "In the Internet cafe, many [rural] students only use applications like chat or email which have already been installed by the Internet cafe manager. They don't know how to access a website or how to search for information". Rural villagers, especially farmers, lacked IT literacy simply because there was no IT training available in their region. One interviewee summed up some of the main issues:

*Our IT literacy is limited. In the countryside, even if we want to learn IT, we do not have much chance. There is no IT training centre in my district but only in Hanoi and Bacninh. How can I arrange my time to study there and to work here as well as to look after my children? (I23, Feb 20, 2006).*

## Discussion and Recommendations

As ICT/Internet users and non-users are not identical in their needs and capacities, e-government approaches should not be the same for everyone but rather be customized to take account of the special needs of at least these two large categories of citizens. The first strategy should take into account of the 16 million online users who are mostly young, well-educated, and technically adept and agile; and the second for the 70 million non-users who are digitally marginalized. By approaching each group appropriately government can help citizens overcome the obstacles to receiving public services.

Non-users face many more difficulties than users in the possibility of receiving electronic services from the government. As identified above, social exclusion, low income, limited education, unfamiliarity and timidity, low expectations of government services, unavailability of technology, telecommunication

costs and time constraints were serious obstacles to the adoption of e-government by these people. Thus besides considerations to assist current users suggested below, special measures could be taken to make non-users, bit by bit, familiar with electronic transactions and administration. Non-users could also be indirectly assisted from e-government services through intermediary channels additional to the Internet. As shown in Figure 2, non-users can benefit from public services or information from peers, family relatives or communal authorities who may have more opportunity or capacity to access to e-government websites.

As a prerequisite to being a direct beneficiary of e-government services, a non-user must become a user. They need to become aware of the possible advantages of ICTs and the Internet in offering them more effective and convenient government services. In the interviews for the study, TV was identified as the most accessible and effective channel of information. Television can therefore become a prime medium for government to raise awareness about the Internet and e-government among non-users.

Timidity about the first trial of ICTs is a psychological barrier that should be seriously kept in mind by e-government implementers. Special attention is needed to young non-users who are more likely to want access to new technology. Young people should be encouraged to become familiar with the Internet and online public services. An example of this approach is a project that Vietnam Data Company (VDC) piloted using WiMax technology in Vanhoa Secondary School in Laocai in October 2006 by which ethnic minority students had the first chance to approach computers and the Internet in the mountainous region (Hung 2006). Similar activities, that help the youngsters to overcome the psychological timidity for their first attempt to use ICTs, should be encouraged in other places.

On the national scale, opportunities to gain ICT literacy could be offered in schools, ICT training centres and via TV programs so that students and as many other people as possible could gain familiarity with the technology. And most importantly, e-government projects should identify non-user needs to provide relevantly customized information and services to them. These services should meet the very concrete, practical requirements of people in each locality. Land/house registration and disputes, and reporting of governmental corruption are examples of current hot topics among that the Vietnamese public in relation to the authorities.

In the worldwide context, e-government projects such as Online Dispute Resolution, the emerging set of tools and techniques for resolving disputes online, have the potential to successfully resolve half a million disputes per year (Tyler and Bretherton 2004) – this is but one example of an area where e-government facilitation could materially assist Vietnamese participation in global business. Unless e-government continuously addresses new developments such as this, it could easily lose relevance in much the same way as the loud-speaker system discussed earlier.

Internet users are the direct potential customers of e-government projects. Given that the majority of them are young and well-educated, initiatives of e-government should be highly targeted towards users' interests, demands and benefits. Online public services, unless specifically satisfying young people's needs, would not make much sense to them. Looking back to the pattern of online usage discerned through the interviews, the main purposes of the online activities can be regrouped into communication, entertainment, education and job related themes. Potential e-government projects should carefully take into consideration these factors, and seek to integrate services with existing and emerging use patterns.

For instance, the government can legalize the validity of electronic application forms and allow the youth to download them from government websites rather than buying paper forms from authorities. That simple activity could save much logistical workload for government agencies as well as relieve the frustrations of red tape that such organizations impose upon the people. Vu and Jones (2006) suggested that "Before investing resources and time in new online services or initiatives provinces should ensure they have done all they can do with their current infrastructure, such as ensuring forms are available for download". Two governmental portals on education and labor are examples that illustrate this argument.

At the moment <http://moet.gov.vn>, the website of the Ministry of Education and Training provides information to students, from news and legal documents to examination plans and students' scores. If students and their parents could also download training and education-related application forms such as enrolment, resume pro formas for university exam applications, and the education text books from grade 1 to 12 that are needed by all 20 million Vietnamese students, it would save much time, money and paper for all parties.

Similarly, <http://www.molisa.gov.vn/>, the website of the Ministry of Labor, Invalids and Social Affairs, presently provides no online job-related application forms or online forums about job opportunities and required skills. At the provincial level, departments of education and training, and departments of labor, injured war veterans and social affairs should establish or upgrade websites to provide more customized content on education, training and jobs to meet the specific demands of each locality. If these kinds of relevant, specific services were provided, the benefit - and thus the attractiveness - of sites to users would be much higher than sites providing merely general introductions or news releases quoted from other news media. E-government can start from this simple one-way provision of information before contemplating more advanced but higher cost projects.

It was a striking feature of the interviews for the study that none of the interviewees – even those with well-developed ICT skills and ready access to the Internet – had undertaken an online transaction with a government website. This suggests that more effort should be made to inform citizens about the existence of e-government websites, especially at the point when these websites are upgraded to provide relevant interactive services. Such awareness raising programs could be delivered to citizens through popular channels such as television. It is important to equip users with ICT skills such as searching e-government services on the Internet. It is also necessary to develop a Vietnamese-language searching tool to help the users who, as shown above, have trouble in finding needed information: content in the Vietnamese language is best interrogated by a search engine customized to that language and cultural context. Jaeger and Thomson (2003) claimed that an e-government system would fail if the government did not take an active role in educating citizens about the value of e-government.

To provide e-government services to users in rural and poor areas, much more work is needed. The government may need to consider the social exclusion barrier to e-government imposed by a shortage or absence of Internet availability in rural areas – a classic manifestation of the digital divide. Farmers, especially those in the north, centre, highland and mountainous area, have very low incomes. As telecommunication and Internet connection fees are still expensive to most rural residents, policies to reduce or subsidize telecom tariffs as well as other relevant measures to encourage rural people to use the Internet are recommended. Margetts and Dunleavy (2002) suggested that incentives to encourage citizen uptake of electronic services, such as lowering the cost of transaction to a feasible level for farmers, are important to increase the adoptability of e-government. The importance of two-way channels of information, including telephony, professional associations and especially peers are extremely important to villagers and should be consistently encouraged. Local governments play a critical role in promoting those channels as well as potential Internet access points, such as CPCPs or private internet cafes. Cecchini and Raina asserted that e-government projects imperatively need the collaboration of the local staff in reducing the gap between technology and the reality of social context, and creating a sense of local ownership. “The local administrative and political actors need to be involved in the implementation of the project. Otherwise, the likelihood of failure increases dramatically” (Cecchini and Raina 2004).

Finally, to enhance the availability of technology including the presence of telecommunication networks in communes, the existence of Internet access points is essential to make information accessible to the people. For that purpose, the role of Internet cafes with their widespread presence and cheap pricing should be taken into consideration in e-government strategy and programs. Clusters of e-government projects + governmental authorities + CPCPs + Internet cafes are prominent potential channels in providing government services to citizens. Within such an approach, Internet cafes with their wide market coverage in the country, may feature locally relevant government websites, with some simple guidelines for users.

## **Conclusion**

Vietnam is transforming into a networked society where more people are becoming connected and more advanced applications, such as e-government, are becoming available. Compared to young, dynamic and well educated ICT/Internet users, non-users are significantly disadvantaged in accessing e-government services. ICT/Internet non-users still vastly outnumber users in Vietnam. This paper has argued that in order to provide effective e-government to all citizens, the great majority of people need to become ICT users. People need to become acquainted with computers and build their IT literacy. It has also been suggested that for poor and disadvantaged areas and for farmers, special measures beyond the present simple CPCPs should be taken. People should be given a better chance to use the Internet by clustering private Internet cafes and public CPCPs as access nodes where government websites with relevant content, and e-government services that hopefully will become increasing interactive, can be accessed.

To become direct beneficiaries of e-government, people must first have a basic level of ICT access and literacy. The data from the interviews shed light on current barriers to attaining this level of e-government readiness from the demand side. It was found that the computer experience, education level, age, gender and the availability of ICTs infrastructure all influence the likelihood of ICTs, and thus e-government, adoption by citizens. Further obstacles to non-users are financial affordability, infrastructure unavailability, educational and psychological constraints. As antecedents to e-government, all these obstacles need to be overcome.

Inevitably the aspiration to deliver excellent, responsive e-government services to the great majority of citizens has extensive antecedent implications for the workings of government as a whole. E-government services, if they are to succeed, cannot simply be “wallpapered” on to systems and structures of public administration that are inefficient, slow and inward looking. The drive towards effective e-government service delivery needs to be accompanied by a re-examination of government processes, especially in terms of their responsiveness to citizens’ needs. A key factor is the capacity of each government officer to deal creatively with the new electronic administration environment. The transformation towards a citizen-centric, ICT enabled, government service regime is a complex challenge, requiring extensive practical action, as well as ongoing research and evaluation. However the potential economic and cultural payoffs for individuals and the nation could be immense as improved communication between citizens and government results in a more informed and empowered society.

## References

- ADB (2005, December 1). "ADB Loan to Boost Viet Nam's Poverty Reduction Program." Retrieved April 17, 2007, from [http://www.adb.org/media/Articles/2005/8914\\_Viet\\_Nam\\_poverty\\_reduction/](http://www.adb.org/media/Articles/2005/8914_Viet_Nam_poverty_reduction/).
- Baker, C., P. Tumbarello, et al (2006). Vietnam: Statistical Appendix. Washington, D.C., International Monetary Fund: 51.
- Bhatnagar, S. C. (2004). E-government : from vision to implementation : a practical guide with case studies. New Delhi, Sage Publications.
- Cecchini, S. and M. Raina (2004). "Electronic Government and the Rural Poor: the Case of Gyandoot." *Information Technology and International Development* 2(2): 65-75.
- Central Intelligence Agency (2007). World Fact Book. Washington D.C., Potomac Books.
- Dapice, D. O. and S. Fellow (2003). "Vietnam's Economy: Success Story or Weird Dualism? A SWOT Analysis." Retrieved April 17, 2007, from <http://ase.tufts.edu/econ/papers/200315.pdf>.
- De Boer, S. J. and M. M. Walbeek (1999). "Information technology in developing countries: a study to guide policy formulation." *International Journal of Information Management* 19(3): 207-218.
- Dutta, S. and A. Jain. (2004). "The Networked Readiness Index 2003-2004." Retrieved September 27, 2004, from [http://www.weforum.org/pdf/Gcr/GITR\\_2003\\_2004/Framework\\_Chapter.pdf](http://www.weforum.org/pdf/Gcr/GITR_2003_2004/Framework_Chapter.pdf).
- EIU (2006). "The 2006 e-readiness rankings." Retrieved July 1, 2006, from [www.eiu.com/2006eReadinessRankings](http://www.eiu.com/2006eReadinessRankings).
- Fallows, D. (2004). "The Internet and Daily Life: Many Americans use the Internet in everyday activities, but traditional offline habits still dominate." Retrieved July 1, 2006, from [http://www.pewinternet.org/pdfs/PIP\\_Internet\\_and\\_Daily\\_Life.pdf](http://www.pewinternet.org/pdfs/PIP_Internet_and_Daily_Life.pdf).
- General Statistics Office of Vietnam (2006). "Average population by sex and by residence." November 15, 2006, from [http://www.gso.gov.vn/default\\_en.aspx?tabid=467&idmid=3&ItemID=4704](http://www.gso.gov.vn/default_en.aspx?tabid=467&idmid=3&ItemID=4704).
- General Statistics Office of Vietnam (2006). "Number of administrative units as of 31 December 2005 by province." November 15, 2006, from [http://www.gso.gov.vn/default\\_en.aspx?tabid=466&idmid=3&ItemID=4653](http://www.gso.gov.vn/default_en.aspx?tabid=466&idmid=3&ItemID=4653).
- Hochiminh Computer Association (2006). "Toan Canh CNTT Vietnam 2006 [Vietnam ICT Outlook 2006]." Retrieved July 28, 2006, from [www.hca.org.vn/tin\\_tuc/hd\\_hoi/nam2006/thang7/vio2006/baocaotoancanh\\_2006.pdf](http://www.hca.org.vn/tin_tuc/hd_hoi/nam2006/thang7/vio2006/baocaotoancanh_2006.pdf)
- Howard, P., L. Rainie, et al (2001). Days and nights on the Internet: The impact of a diffusing technology. The Internet in everyday life. B. Wellman and C. Haythorhwaite. Oxford, Blackwell: 45-73.
- Hung, H. (2006, October 31). "Thử nghiệm WiMax không đơn thuần là công nghệ [WiMax test is not simply technology]." *VnExpress* Retrieved March 1, 2007, from <http://vnexpress.net/Vietnam/Vi-tinh/2006/10/3B9EFDD4/>.
- Intel and Gov3 (2006). "Solutions White Paper: Citizen centric government - Global Best Practice in Delivering Agile Public Services to Citizens and Businesses." Retrieved January 15, 2007, from [http://www.intel.com/business/bss/industry/government/citizen\\_wp.pdf](http://www.intel.com/business/bss/industry/government/citizen_wp.pdf).
- ITU (2006). "ICT Statistics." Retrieved August 29, 2006, from <http://www.itu.int/ITU-D/ict/statistics/>.
- Khổng, D. (2002). Một số vấn đề dân số với phát triển các dân tộc thiểu số và miền núi Việt Nam [Some issues on population and development of ethnic minorities in mountains of Vietnam]. Phát triển bền vững miền núi Việt Nam, 10 năm nhìn lại và những vấn đề đặt ra [Sustainable development in mountainous areas of Vietnam: 10 years review and considerations]. Hanoi, Agricultural Publishing.
- Lebo, H., J. I. Cole, et al (2004). "The UCLA Internet Report: Surveying the digital future, year four: Ten years, ten trends." Retrieved July 4, 2006, from <http://www.digitalcenter.org/downloads/DigitalFutureReport-Year4-2004.pdf>.
- Marche, S. and J. D. McNiven (2003). "E-government and E-governance: the future isn't what it used to be." *Canadian Journal of Administrative Science* 20(1): 74-86.
- Margetts, H. and P. Dunleavy. (2002). "Cultural barriers to e-government." Retrieved May 22, 2007, from [http://www.governmentontheweb.org/downloads/papers/Cultural\\_Barriers.pdf](http://www.governmentontheweb.org/downloads/papers/Cultural_Barriers.pdf).
- Martin, B. and J. Byrne (2003). "Implementing e-Government: widening the lens." *Electronic Journal of e-Government* 1(1).
- Nguyen, H. (2007). "Sẽ kế thừa những kết quả của Đề án 112 [Inherit the 112 Project]." Retrieved May 23, 2007, from <http://vnexpress.net/Vietnam/Vi-tinh/2007/05/3B9F5E20/>.
- Nguyen, T. T. (2001). Tổng quan về chính phủ điện tử [Overview of electronic government]. Tin học hoá quản lý nhà nước ở Việt Nam và mô hình chính phủ điện tử [Computerization of state administration in Vietnam and the electronic government model]. M. G. Doan and C. H. Nguyen. Hanoi Office of Government, Defense Publishing House: 1-19.

- Oliver, E. L. and L. Sanders, Eds. (2004). E-government reconsidered : renewal of governance for the knowledge age. Sipp/Ipips ; 3. Regina, Sask., University of Regina Saskatchewan Institute of Public Policy.
- Palmer, J. J. (2000). "Internet access in Bahrain: business patterns and problems." *Technovation* 20(8): 451-458.
- Pham, T. B. H. (2005). Vietnam E-Government Overview: A Survey of Government Websites. Vietnam IT Overview 2005. H. C. Association. Hochiminh, Hochiminh City Computer Association.
- Smith, P., L. Toulmin, et al (2003). "In-Focus: ICT in Vietnam - Accelerating ICT Development in Vietnam." I-Ways, Digest of Electronic Commerce Policy and Regulation 26 31-40.
- Tigre, P. B. and D. O'Connor. (2002). "Policies and Institutions for E-Commerce Readiness: What Can Developing Countries Learn from OECD Experience?" Technical Papers No. 189 Retrieved January, 2005, from <http://www.oecd.org/pdf/M00028000/M00028358.pdf>.
- Tran, C. N. (2005). Impact of Policy on Development of E-Commerce in Vietnam E-commerce in the Asian context: selected case studies. R. Lafond and C. Sinha. Singapore, Institute of Southeast Asian Studies & International Development Research Centre: 70-94.
- Tyler, M. C. and D. Bretherton (2004). Lessons for eGovernment: Online Dispute Resolution. the Australian Electronic Governance Conference 2004, Melbourne, University of Melbourne - Department of Political Science.
- Vienampost (2006). "Điểm bưu điện văn hoá xã: một điểm sáng ở nông thôn [Communal Post and Cultural Center- A bright spot in countryside]." Vietnam Posts Retrieved June 11, 2006, from <http://vietnamgateway.org/vanhoaxa/dbdvhx.php?action=thongtin&chuyenmuc=0901&id=060103160035>.
- Vietnam Internet Center (2007). "Thống báo số liệu phát triển Internet Vietnam 5/2007 [Statistic data of Internet growth in Vietnam by April 2007]." Retrieved May 31, 2007, from <http://www.thongkeinternet.vn/jsp/trangchu/index.jsp>.
- Vietnamnet (2006, July 19). "Đại lý Internet công cộng: không vì phạm mới lạ [Public Internet dealer: how can not violate]." Vietnamnet Retrieved May 1, 2007, from <http://www.vietnamnet.vn/cntt/206/07/592721>.
- Vu, K. M. and R. Jones. (2006). "VNCI Policy paper #7: E-Government and Business Competitiveness: a Policy Review." Retrieved November 1, 2006, from <http://www.vnci.org/default.asp?act=Download&downloadID=57>.
- Williamson, K. (2002). Research techniques: sampling. Research methods for students, academics and professionals: information management and systems. K. Williamson and A. Bow. Wagga Wagga, NSW, Centre for Information Studies, Charles Sturt University: 225-234.
- World Bank (2003). Vietnam Development Report 2004: Poverty. Hanoi, Poverty Reduction and Economic Management Unit, East Asia and Pacific Region, the World Bank: 194.
- World Bank (2002). Accelerating Information & Communication Technologies Development in Vietnam.





# Public-Private Partnerships and the Prospects for Sustainable ICT Projects in the Developing World

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## Abstract

*This paper analyses the recent phenomenon of private/public partnerships (PPPs) in the ICT sector of the developing world. The partners may come to these projects with divergent motivations: profit on the one hand and the provision of public services on the other, but at the end of the day, the interests of the partners that are symbiotic can – and indeed should – be aligned to ensure successful long-term projects. To investigate what can be done to promote successful and sustainable PPPs, this paper extends the traditional two-actor analysis to include both a third-party non-profit-oriented facilitating organization and the technology recipients that are the targets of these projects. Following an overview of the current state of PPPs in the developing world, the paper provides two case studies, based in Vietnam, where all four of the above-mentioned stakeholders were involved. The cases reveal important success factors that can be applied to future PPPs in the ICT sector.*

## Keywords

*Private/public partnerships, developing world, ICT sector, Vietnam*

## Introduction

The recent upsurge in Public-Private Partnerships (PPPs) between developing country governments and private firms is especially prominent in the information and communications technology (ICT) sector. These joint projects are undertaken in an attempt to bring the benefits of technological efficiencies to the developing world, taking advantage of the strengths and interests of each partner. However, the underlying motivations for the individual partners can be widely divergent: one is driven by a profit motive; the other by the desire to deliver social services to constituents. Even so, it is possible, and vital, to attempt to align these partners' interests, to promote the important task of bridging the digital divide.

This paper addresses the following questions: How can these divergent motivations be aligned symbiotically to ensure a win-win scenario, not just for the parties mentioned, but for the recipients as well? Along the same lines, what are the prospects for long-term sustainability of these projects, and what can be done to promote this? One method brought forth in this paper involves bringing two important actors into the analysis: both the recipients of the technology, and a third-party organization

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– one with no profit motive – that can initiate and cultivate relationships between the public and private partners and function as an intermediary in the contract-forming process. This is the role that a governmental, non-governmental, or inter-governmental organization such as the World Bank, the United States Agency for International Development (USAID), the Australian Agency for International Development (AusAID), or the Catholic Fund for Overseas Development (CAFOD), often plays.

Involving an intermediary most directly addresses the initial stages of the PPP's formation, but if contracts are well-formulated and roles made clear from the outset, it can go a long way toward addressing the longer term prospects of the venture. Additionally, it is often people working for such organizations that prioritize involving the recipients of the technology in the process, by asking the opinions of local residents, instead of assuming that they know what is best. To our knowledge, these topics have not yet been addressed within the still-nascent scholarly literature on PPPs in the ICT sector.

Our paper proceeds as follows: after an overview of the emerging public-private partnership trend in the information and communications technology sector and a discussion of the diverse motivations facing the public and private actors, a brief theoretical discussion appears. Next, we provide a more specific and comprehensive look at current projects and initiatives underway involving Western technology corporations and the developing world, followed by a section presenting the major challenges facing such projects. The following section introduces the concept of a role for a third party intermediary in the PPP scenario. We follow this section with two timely case studies, which involve bringing telecommunications and broadband technology to remote, rural villages in Vietnam. These cases involved a public private partnership as well as the presence of a facilitator. Following the case studies, we conclude with an overview of success factors, and a call for future research.

## **Overview of Global Public-Private Partnerships in the ICT Sector**

Over the past few years, the growth of private investment for development has been remarkable in magnitude, as has private enthusiasm for public partnerships. The proportion of funding from the U.S. government relative to that from private enterprise has shifted in recent years, with 85 percent of resources now coming from fixed capital investment, remittances, and other forms of non-governmental giving. Some 15 percent of resources transferred from the U.S. to the developing world come from Official Development Assistance (ODA). In the 1970s the breakdown was nearly the opposite (Runde 2006). In the next few years, the annual investment into the ICT sector in the developing economies could reach \$100 billion.

Ideally, public-private partnerships are thought to create synergistic results by combining the expertise and resources of the private partner with the administrative and political power of the governmental partner. They can take several forms, but are usually viewed as a business relationship, or agreement, between two or more parties that combine private sector capital (and sometimes public sector capital) to improve public services and the management of public sector assets (Gerrard 2001).

Current ICT sector PPPs seek to define and address a development challenge. These partnerships enjoy broad support and are promoted by governments, international organizations (such as the World Bank, the United Nations Development Program, the UNCTAD and others), non-governmental organizations (NGOs), and private firms alike. Because there are numerous potential benefits – increased efficiency and scalability of projects, financial resources, human capital, technology and intellectual property, market access, cutting-edge business practices, and other expertise – when both public and private actors join forces, these partnerships are coming to be seen as the most efficient method for bridging the digital divide. In fact, the United Nations Millennium Declaration specifically recommends the creation of public private partnerships to “ensure that the benefits of new technologies, especially information and communications technologies...are available to all,” (Weigel & Waldburger 2004, p. XV).

From a corporate point of view, what could be more ideal than doing good while doing business – contributing to ICT connectivity around the globe while simultaneously contributing to the bottom line?

From a developing country point of view, what could be better than to have infrastructure, hardware, software, and expertise all provided by a world leader in technology, with the implicit promise of bridging the digital divide and increasing efficiency and economic growth? Herein lies the attractiveness and appeal behind the recent surge in public private partnerships (PPPs) undertaken between Western technology MNCs and developing country authorities. And there is good reason for this appeal: When these projects are successful, they can bring about many desirable benefits.

Yet, the academic community reports mixed results for such undertakings. One major concern regarding PPPs in the developing world – particularly in rural communities – is that they do not address the larger issues of socio-economic development and poverty eradication. Kanungo (2004) reports that private sector participation in such projects has not demonstrated better results than previous public sector initiatives. A further concern is the sustainability of such projects: if they do not prove to be profitable for the private partners, will they abandon the projects? Alternately, do the projects provide for sufficient local training to make them sustainable once the technical experts who installed and programmed the equipment return to their homes?

Some critics question the value of the Internet and telecommunications technologies to address the needs of the developing world – why not focus on a nutritional divide, an educational divide, an opportunities divide, or a health care divide? This is the essence of the “bread vs. broadband” debate: Given the more basic needs not being met in poor countries, how much of a developing country government’s monies (or any aid efforts, for that matter) should be devoted to technology issues?

While acknowledging the salience of the above argument, we believe the bread vs. broadband dichotomy to be a false one: this paper asserts that when PPPs are well-thought out and designed with the empowerment of localities in mind, they can bring about long-term economic benefit in nearly all of the basic needs areas mentioned above. Broadband connectivity can enable local small business entrepreneurship, tele-education and tele-health capabilities, knowledge of market prices for crops before they are brought to market, and increased knowledge of successful farming techniques. These are some of the value-adding benefits communications connectivity can bring about; but their potential is more likely to be realized if a project is designed with local needs and desires in mind.

The paper also asserts that this subject is worthy of academic analysis because the phenomenon is *already taking place*: numerous Western-based technology multinationals have already formed public-private partnerships to bring telecommunications-based projects to the developing world. And it is a cause for concern that, to date, there has been a lack of systematic, unbiased research guiding and/or assessing the significant and growing amount of activity in this area.

Little is known about the operation of the public-private model; systematic evaluation is difficult. This may be due to the uncoordinated dynamic of public-private partnerships; there is no central organizing body, projects may be non-comparable on a global scale, and there are no standard metrics for assessment – perhaps due to resistance to evaluation processes in general (Rosenau 1999). Further, benchmarking is seldom done prior to the commencement of a project, and long-term evaluation is most often not a part of the overall budget.

However, if this phenomenon is not studied, the academic community is implicitly accepting that the corporate social responsibility implied in such partnerships – “making a profit and making the world a better place do not have to be mutually exclusive goals” (from AMD’s website) – has undergone a change in its very nature, and as such, can proceed, unmonitored and blindly trusted. Yet, history has demonstrated that corporate self-regulation does not always produce ideal outcomes: community- and opportunity-building, empowerment, and increased human well-being in investment-targeted communities may not be at the root of corporate initiatives.

It is important to remember that the venture partners come to the project with different expectations, goals, backgrounds, mindsets, and ways of “doing business;” all of these need to be made clear, as does the plan of action. After all, private firms are businesses run for profit. In this case, the profit from their endeavours often comes later, as current investments help to create future markets. Though private

enterprises view financial viability as the primary legitimacy in a PPP, the public partner may view local appropriateness and public (electoral) support as overriding in importance (Angerer & Hammerschmid 2005).

Despite these differences, one commonly cited best practice for firms, within the context of developing country PPPs, may bode well for localities targeted by the project: taking into consideration the needs and desires of the local communities and involving local citizens in all stages of the PPP undertaking – a bottom-up rather than a top-down approach – will lead to more successful outcomes for both parties. In other words, only if the technology catches on and people see a benefit in their lives because of it – if the project is truly a success as the community defines it – will a market for future goods have been created.

## Diverse Motivations and Theoretical Discussion

Many rationales exist to explain the recent upsurge in public private partnerships. This section outlines the wide range of motivations of the public and private sector partners.

For the public partner, PPPs offer attractive advantages, such as increased private finance and investment, technological experience and expertise, risk-sharing, the public legitimacy that results from being associated with a successful global corporation, and a potential downsizing of the public sector or a decrease in governmentally subsidized programs. A further argument for PPPs on economic grounds concerns the benefits associated with a liberalizing of regulations and markets (at least in the telecom sector), increased exposure to technology and more efficient ways of doing business, and a stronger incentive to adhere to the policies of fiscal discipline required to do business with global companies. An additional motivation for governments, and certainly for the recipients of the technology, is the value-adding potential of ICT, not just in terms of economic growth, but also through improvement of social and political capital.

Possible negative outcomes for governments include asymmetries of power and information, and political and financial risks in the event of failed projects. Even so, citizens' increase in demands for governmental services, paired with stagnant government revenues, points to the likelihood of more PPPs being created in the future, particularly in developing countries.

For the private partner, advantages include access to new markets, risk-sharing and uncertainty-reduction, and an improved image as a result of their "philanthropic" work. As stated above, ICT firms are looking to the developing world for new markets. Though activities are directed toward future profits, enterprises are experiencing immediate tangible benefits that are not necessarily related to profit margins. Among these are improved morale among their workforce and the creation of a positive company image both at home and abroad.

Company executives accept low margins in developing markets and acknowledge the long-term nature of current investments in emerging economies. Although these markets will not change the companies' balance sheets for 10-15 years, it appears incontrovertible that this is where the future markets will be and they must get an early foothold in the market to avoid the possibility of being shut out. The search for new markets underscores a point raised by Bruno Lanvin (2005) of the World Bank, who states that:

*The arithmetic of telecommunications and that of poverty do not necessarily seem to agree. For a poverty fighter, the 'next billion' would refer to those who need to be taken out of absolute poverty; for an IT executive, the 'next billion' would more spontaneously refer to the next wave of customers that could emerge from developing countries, particularly in the mobile market (p.15).*

He finds, nonetheless, that the one billion for whom ICTs are not a priority (those at the bottom of the ladder) and the one billion that the industry is looking to as their next consumers, are not one and the same. Helping both groups to gain access to ICTs is not an impossibility, as long as there is a shared sense of responsibility among the public and private sectors (Lanvin 2005).

In fact, it is not only private firms that are making the push for ICTs. Governments are also soliciting foreign direct investment to improve the level of and economic growth and competitiveness, and to foster greater inclusion in the global economy. Accordingly, one area in which there has been a global trend towards market liberalization is the telecom sector; the mobile telephone industry has experienced meteoric growth in developing countries. Levels of Internet connectivity and adoption have not grown as rapidly as those of mobile telephony, but have been substantial nonetheless.

While de-monopolization of the telecom sector may be seen as a step in the right direction, it is only the first step: countries that have liberalized must subsequently promote real competition and transparent business practices, as well as shift their focus to regulation and tax reduction. In addition, governments must promote universal access, as well as connectivity in rural areas, e-learning and e-health initiatives: such provisions for the common good are seldom – if ever – provided by an unfettered market. Although the ITU (2006) reports that regulations governing the provision of universal services in basic telecommunications now exist in most countries, whether or not these services are being implemented is a separate issue with which many governments of developing countries struggle. The case studies in this paper provide an example of Vietnam's experience implementing its newly legislated universal service obligation and offer insight to countries facing similar situations.

Academic research on the subject of Public Private Partnerships has revealed cause for cautioned optimism: There are numerous cases of failed PPPs. Despite being touted as a panacea, PPPs are often misunderstood and work well only under certain conditions. Because of this, a good deal of organizational and instructional literature has appeared with the goal of enumerating and promoting best practices involving PPPs, to ensure successful joint ventures (See, e.g. United Nations Foundation 2003, Weigel & Waldburger 2004, World Bank 2003, 2006). Most of the recommendations put forth in this literature are based upon case study. There is value in such an approach. However, there is also need for a better reporting of failed cases, as these can be equally as instructional as successful ones.

A theoretical understanding of the nature of PPPs is also necessary, as this may lead to greater insight and more successful projects. This is a complicated undertaking, however, since the focus of ICT ventures are most often multifaceted, and the priorities enumerated may depend upon each participant's point of view. ICT projects comprise such diverse goals as infrastructure development, human capacity training, economic development, and information and communications provision. The multifarious nature of these projects, in fact, underscores the basic characteristic of ICT as an enabling tool, and not as an end unto itself.

Despite the complexity of such undertakings, one theoretical basis through which PPPs may be better understood involves a rational choice approach, and sees PPPs as contracts that may change or evolve over time. Accordingly, bargaining theory sees contractual negotiations as a series of games, performed over time, between two rational actors. The games are not zero-sum, since a contractual agreement offers the opportunity for both sides to realize a mutuality of interests, and can lead to a larger share of the final pie to be divided between the players. In other words, both sides can profit from the interaction.

If the above description of PPP contracts being a result of a bargaining game is apt, then two additional points are worth making. First, since the developing country comes to the bargaining table with markedly less experience in negotiating business ventures and less expertise in the telecom industry in general, the presence of a third party intermediary may help to level the playing field, particularly in the most critical initial stages of negotiations. Second, if one views the negotiations through a game theoretic lens, this exercise has the benefit of forcing each player to disclose all of its stated and unstated assumptions, beliefs, and intentions. It ultimately allows the players to see the situation more realistically – from all points of view and not just from their own. Once again, the presence of a third party intermediary in the role of “honest broker,” – one whose interest lies in putting together a sustainable project but not in profiting from it – may aid in this scenario as well.

## **Current Developing World Partnerships in the ICT Sector**

The emergence of public-private partnerships between ICT companies and the governments of developing nations are increasingly formed with the support of international organizations like the USAID, the World Bank, and the UN. For example, a recent World Bank report advocates that developing country governments work across departments and partner with private enterprise to extend the use of ICT (World Bank 2006).

In 2002, UN Secretary-General Kofi Annan challenged the technology corporations of Silicon Valley (California) to do more in the Public/Private partnership arena; to unleash their creative energies to bring wireless technologies to the developing world and narrow the gap between the technological “haves” and “have-nots” (Annan 2004). Accordingly, chipmakers Intel and Advanced Micro Devices, (AMD) among others – notably Cisco and Microsoft – have initiated programs to distribute low cost personal computers (PCs) to the world’s poor. These companies are investing billions of dollars in marketing and research to develop markets in Latin America, India, China, Southeast Asia, and Eastern Europe. Maturing markets in the U.S., Japan and Europe have spurred companies to look to future growth areas (Detar 2006).

Worldwide PC sales are estimated to grow 10.5 percent in 2006, as compared to the 6.8 percent estimate for the U.S. (Detar 2006). Since many technological advancements of the past few decades appear to have deepened the digital divide, ICT companies are taking a different approach this time; in addition to experimenting with pricing models and distribution tactics in the developing world, they are also piloting programs to meet basic social and economic challenges. Education, medicine, and work training initiatives have been established with an eye to future markets

This emphasis on addressing basic needs represents a paradigm shift: in the past, basic improvements in daily life – when they took place at all – were assumed to be a by-product of multinational involvement in an emerging market. The enthusiasm of governments and non-governmental organizations to support private enterprise-led projects also marks a significant change in perspective regarding corporate involvement in growth plans.

Some corporate ICT Chief Executive Officers (CEOs), like Andy Grove and Craig Barrett of Intel, are eager to participate in UN-sponsored conferences that focus on expanding access and more recently on Internet governance, such as the World Summit on the Information Society (WSIS). Ambitious plans such as MIT/Nicholas Negroponte’s “One Laptop Per Child” (OLPC) program are often announced at these venues.

Substantial private industry investments have been proposed and are already underway. Microprocessor manufacturer AMD, for example, is in the second year of its 50 x 15 initiative, which seeks to provide Internet access to half of the world’s population by 2015. About 15 percent of the world’s population presently has Internet access.

Intel is also in the midst of its largest emerging markets initiative. It recently announced its intent to invest over \$1 billion over the next five years to improve Internet connectivity, education, and overall computing accessibility in the developing world. Its 5-Year Objectives for the “World Ahead Program” include training 10 million teachers to use technology in education, and to provide schools with wireless broadband connectivity (Agence France Presse 2 May 2006). The company has built three computing platforms for developing markets; by employing local service providers and computer manufacturers, Intel is able to sell these systems for 20 percent below developed-world prices.

Intel’s program will be used in a deal financed in part by the Mexican government and the Mexican Teacher’s Union: 300,000 personal computers will be provided to teachers at a cost of \$300 each. Plans are also underway to promote PC use in Brazil and India. The “community PC” is a PC kiosk plan for providing shared computing in places like India, with the cost of each system estimated to be \$500-\$600 and electrical power provided by a solar-charged car battery. Other plans include providing students with small notebook computers and educational software (Dunn 2006).

## Challenges

Some of the challenges facing these well-intentioned projects include a lack of global coordination of efforts and the need for greater understanding of organizational cultures among the project partners. Another salient concern is whether the projects are designed with the local citizens' desires in mind, and therefore actually perceived to fill an existing need.

A number of large technology-related companies, such as AMD, Microsoft, and Intel have launched ambitious programs (50X15, Unlimited Potential, and World Ahead Program, respectively) aimed at bringing technology to developing countries. Even the United Nations recognizes that private sector companies are not philanthropic organizations and that public-private partnerships are formed out of self-interest. It is rational, therefore, that corporations tout the activities that bring about positive externalities, and utilize them as a marketing tool – their core objective remains profit.

Of concern, however, is that these large companies might pursue their market-expanding activities solely to bring their own products to underserved markets and to establish a conduit for future advertising revenues. Similar issues arise when ICT corporations bring a single invention to the developing world and tout it as a panacea, regardless of local needs. One example is AMD's current focus on its Personal Internet Communicator, a PC with a 56-Kbps modem, hard disk, and USB ports. AMD reports that their system, which is sold for under \$200 (without a monitor,) is being used in Brazil, India, Panama, Turkey, Russia and Uganda (Dunn 2006). Another example is the "One Laptop per Child" project spearheaded by the Massachusetts Institute of Technology. This initiative, which aims to provide 150 million of the world's poorest children with low-cost, durable laptops, has raised concerns that the technology may be inappropriate for the intended recipients, in terms of addressing development challenges.

The question remains whether these laptops will create the economic and social well-being that the companies desire. Giving a child a laptop to use in school may be an admirable goal, but equipping the machine with the capabilities to shoot digital video, create music, and chat with classmates may drive the children to think of them more as toys than as learning tools. Additionally, while children may quickly adapt to new technologies, adults may not: are the giant technology companies recruiting an army of instructors to accompany the distribution of their laptops, to oversee the training of educators to use the technology in a productive, meaningful way? There are case studies that suggest this is the case. This paper, however, questions whether sufficient resources exist to address the issues of training, upkeep, connectivity, or repair, that must accompany the 150 million laptops that the "One Laptop per Child" program plans to distribute all over the globe. Without a comprehensive, long-term plan for overall implementation, this project could achieve some measure of success, or "bright spots" in due time, but may not otherwise realize the totality of benefits possible or hoped for.

Another question is whether locally relevant content exists for all of these laptops, and whether the educators prefer to adopt technological teaching techniques. Still other issues include whether these laptops will be seen as handouts, and whether the parents of the children who receive the laptops will sell them on the black market in order to meet more immediate daily needs.

Perhaps there is a better argument to be made for the companies that plan to sell inexpensive PCs on an individual basis. In this case, those who buy them are self-selecting; both interested in and motivated to take advantage of the potential benefits ICT can offer. Indeed, AMD, Intel, and Microsoft are advertising to *targeted consumers* within China, India, Latin America and Russia (Dunn 2006). At issue here may be the infrastructural and hardware demands required to have a PC with internet capability – which includes having reliable source of electricity. This may serve to exacerbate existing inequalities within developing countries (Oyelaran-Oyeyinka & Lal 2005), or in other words, create a two-tiered or intra-state digital divide.

Still another challenge facing public private partnerships is created by the institutional and organizational differences brought to the table by each participant. In addition to the divergent motivations discussed above, private sector and public sector methods of doing business can differ

greatly as well. The public sector participants may be hesitant to relinquish control over projects or share information, while the private sector partner may chafe at the inefficiency built in to public sector methods of doing business. In addition, public organizations accustomed to subsidization may take their time making decisions. Simply put, a mutual lack of understanding of the organizational and procedural methods of doing business may affect the expectations and ultimately the outcome of the venture. The examples above serve to illustrate that it can be extremely difficult to bring even the most well-intentioned plans to fruition.

However, despite all of the Western-minded focus on PCs, laptops and Internet, strong – and growing – evidence suggests that the greatest demand for ICT in the developing world remains that for the simple mobile phone. There exists a universal desire to be able to communicate with others, in real-time, by voice. Hardware-oriented corporations may do well to consider this fact when planning their developing world strategies.

The rapid growth of worldwide mobile telephony has served as an encouraging example of the possibilities for technological expansion, even in areas where this service seemed unaffordable. Private enterprise, NGOs, and governments are looking at mobile technology as a means to circumvent resource, infrastructure, and policy constraints that have impeded access in developing markets. Future projects may be re-strategized with mobile telephony over Internet as one answer to the demand question.

Finally, there is a lack of global coordination. This can lead to outcomes that reflect the interests and concerns of the donors, not the recipients. Laurie Garrett (2007) reports precisely this problem in the field of global health. Western donors have focused their efforts so narrowly on AIDS that the top killers in most poor countries – maternal death from childbirth and paediatric death resulting from respiratory or intestinal infections – go unaddressed, even though these are much more basic, easily treated, and preventable problems than AIDS. In the case of global health, virtually no provisions exist to allow the world's poor to say what they want, decide which projects serve their needs, or determine how to adapt these projects to the local environment (Garrett 2007, p. 16). The dangers inherent in imposing a developed technology upon the developing world exist regardless of the nature of that technology.

## **The Role of a Third Party Facilitator**

This paper does not purport to solve the issues mentioned above regarding public-private partnerships. However, one key ingredient in successful projects notably absent from the existing literature is the concept of the third-party facilitator. This role may be played by an international, governmental, or inter-governmental organization that has no profit motive, such as the United States Agency for International Development (USAID), the World Bank, the US Trade and Development Agency, the Inter-American Development Bank, or various relevant branches of the United Nations. Based on the authors' interviews with USAID associates, this paper will focus on the role played by this organization.

The key factor in this new equation – which now involves multiple actors – is that such an organization plays the role of facilitator or honest broker, and does not carry out the project itself. Rather, it brings together the interested parties and proposes a plan of action for a sustainable project. It may then play a passive or active role in setting up the project, but the time line is finite; at some pre-defined point the facilitator departs, allowing the public and private partners to take over the project.

One salient benefit USAID offers is its contacts in the developing world; it has been active in development work for over 50 years, and in each country has established numerous contacts beneficial to American corporations wanting to do business there but unsure of where to start or whom to contact. In the field of ICT, USAID has played this matchmaking role to large corporations, such as Intel, Qualcomm, and Microsoft, as well as for smaller companies.



The typical project involves a two week planning stage. USAID assesses the feasibility and local interest for a project, identifies the potential partners, and creates a project proposal. It is at this stage that the agendas and interests of all parties must be identified; this can be helpful in addressing the theoretical issue of all players stating their assumptions and intentions. This organization's involvement also plays a valuable role in addressing local interests, allowing the project a higher likelihood of being a good fit for the locality's needs and desires.

Another role that USAID can play in the developing country is as an advocate for a welcoming business environment. In the case of the ICT sector, USAID has actively advocated for market reforms and liberalization of the telecom sector. It has also advocated for Universal Service legislation, which ensures governmental support for bringing telecom capabilities to underserved and rural areas.

There can, of course, be cases in which this third-party role does not lead to optimal outcomes, and it must not be taken for granted that because an organization is not-for-profit it has entirely altruistic intentions. USAID's motivations include furthering the interests of companies with headquarters in the United States: even if a local company would have been a better match in a private-public partnership, there is a good chance that it would be overlooked.

## Case Studies

This paper provides details of two PPP projects similar in all but the technology implemented. Both projects are being carried out in the Northern Vietnamese region of Lao Cai, and are partnerships between Intel and entities within the Vietnamese Ministry of Post and Telecom – the Vietnam Telecommunications Fund (VTF) and the Vietnam Data Communications Company (VDC). In both cases, USAID facilitated bringing the partners together, with the stated goals of leveraging complementary contributions and forming a partnership that would enhance sustainability and scalability. This section highlights USAID's role, but it is worth noting that AusAID has expressed interest in undertaking a similar project in the Quang Ngai province in South-Central Vietnam, as well as other projects in the future. This is a direct consequence of the success of the cases described below (Owen 2006).

Intel's aim within the Lao Cai project is to bring WiMAX (defined as Worldwide Interoperability for Microwave Access<sup>1</sup>) to Vietnam and to expand the potential market for its chip-utilizing products. Additional goals for Intel include fostering economic development by deploying broadband technologies in remote areas and cost-effectively delivering reliable broadband and Voice over Internet Protocol (VoIP) to these regions. Intel's development goals are reflected in the company's World Ahead Program, a five-year, \$1 billion investment in the provision of technologies to developing countries with intent to improve accessibility, connectivity, education, and content (Intel 2007). In these projects, Intel has provided both hardware and support.

The Vietnamese government's goal in these projects is to provide underserved rural areas with telecommunications access, and to ensure the future flow of public utility funds. The Vietnamese government had recently enacted a universal (telecommunications) service fund to this end, but had not yet disbursed any funds. The projects herein described will serve as models for the deployment of similar projects to be funded by Vietnam's universal service/access funds. The VTF also hopes to establish processes and procedures that will ensure the sustainability and scalability of future projects (Owen 2006). The Vietnam Data Communications (VDC) partner is playing the role of governmental lobbyist, as well as providing much of the hands-on support required for implementation and management; this ensures the projects' operability at the local level.

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<sup>1</sup> The difference between Wi-Fi and Wi-Max is that the WiMAX specification provides symmetrical bandwidth over many kilometres and range with stronger encryption and typically less interference. Wi-Fi has shorter range (approximately 10's of meters,) weaker encryption and suffers from interference, as in metropolitan areas where there are many users, or when there are obstacles to its line-of-sight.

USAID's role is to bring the public and private partners together, with the goal of extending telecommunications into rural areas of Vietnam. To this end, it provides critical funding and on-site management. USAID's *Last Mile Initiative* is its global program – launched in April, 2004 – to bring modern telecommunications infrastructure to farmers and small businesses in rural areas that have traditionally been underserved.

USAID is often able to play the role of matchmaker between public and private partners because it is already “on the ground” in developing countries, involved in various development-related projects, and has a presence – as well as contacts – on a local level. This organization also frequently plays the role of empowerer: it interviews and has dialogues with local residents, both asking people what they want the projects to do for them and educating them as to what the projects can accomplish.

USAID typically begins projects by performing an initial in-country overall assessment of a project's feasibility, defining potential partners and assessing the regulatory situation. Over the following months, the organization formulates a more specific plan for the program, choosing targets with features that make them good candidates for the technology. USAID's Vietnam Last Mile Initiative (LMI) commenced in the spring of 2005 with an initial country assessment, and subsequently embarked upon the project design that was completed in the fall of 2005. Implementation of the nationwide project began in December of 2005.

The first project was to bring WiMAX to the rural, agricultural village of Lao Cai, (the capital of the province of the same name), in the Northern, mountainous region of Vietnam. This village was specifically chosen because of the economic benefit the residents could realize if they were able to communicate inexpensively with their Chinese neighbours just across the border, in order to promote trade. Local people were consulted both prior to and during the project's implementation. In Vietnam there are strong provincial governments that operate within the state's regions, and the head of the Lao Cai People's committee was a local champion of the project; this lent the project considerable local credibility and support.

Technology installed included a base station, nearly 20 fixed-access WiMAX modems, wireless and wired VoIP phones, and related networking infrastructure. The modems were installed throughout the city and region: at the local post office, an internet café, a government office, in secondary schools, health care centres, hotels, and in a farm household outside the city (Intel 2007). At each location a VoIP-enabled phone was set up and linked to the modem, providing both broadband internet access and telephone service at minimal cost and with little complexity. (The VoIP service could also be used with existing analog phones.)

The project moved quickly: implementation-level planning began in January, 2006. By June of the same year, *Memorandums of Understanding* (MOUs) had been signed between all of the parties, and by the end of September, the first WiMAX deployment at Lao Cai was fully operational (Owen 2006).

Given the success of the first Lao Cai project, all three partners decided to move ahead with the second, which will similarly provide broadband internet access to a rural, mountainous area within the Lao Cai region – the city of Sapa – but in this case, the Internet service will be provided by satellite, using the IPStar satellite system. Deployment was financed by substantial investments already made by the Government of Vietnam (Owen 2006, p. 4).

The city of Sapa was deemed appropriate for this technology implementation because it is eligible for universal service funds from the Vietnam Telecommunications Fund (VTF). Moreover, the deployment in this city was seen as a test case, or demonstration project, to determine whether similar satellite-enabled ICT projects can be established in other rural areas within the country (Owen 2006).

The second project was carried out even more quickly than the first: planning took place in late September of 2006, the deployment was undertaken in November-December 2006, and the project was fully operational by January 2007. This project's hardware included a central antenna to receive satellite Internet, with approximately 10 modems distributed throughout the commune, while wired and wireless VoIP phones and a small number of rugged laptops were also distributed (Owen 2006).

One of the USAID goals for these projects was to design a program that could be self-sustainable in the longer term, so that further subsidization costs would not be required once the programs were up and running. In other words, if, after the initial investment and start-up costs are incurred, such projects can become profitably run by a local municipality or entrepreneur; ongoing governmental subsidies would no longer be necessary. This concept of long-term sustainability is central to the realization of this and similar projects in the future.

In both cases, Voice over Internet Protocol (VoIP) technology is the primary application provided for voice communications. As a result, both Internet connectivity and voice-related communications are enabled with a single technology deployment. This combined provision of Internet and voice in a single technology minimizes both short term and long term costs, as VoIP presently represents the least-expensive method of communicating over long – and even short – distances. It also addresses the provision of a service that is currently the most in-demand in the developing world – voice communications – while simultaneously providing Internet connectivity, for which demand may ultimately increase over time.

### **Successful Outcomes for the Cases**

It may be too soon to comment on the long-term economic and social benefits for the communities involved in the preceding cases; whether the technology has been adopted and used in the health centres and schools to which it was provided, and whether the communications technology has led to economic activity and growth. Even so, the projects have already been deemed successful on several fronts. As such, a number of critical success factors have been identified and can serve as valuable lessons-learned for future projects of a similar nature.

First, the project took advantage of the intersection of interests common to the parties involved. All partners had long-term goals motivating their participation. Next, the project benefited from reliable, committed public partners, at both the local and national level.

As to the hardware requirements of the project, the PPP contracts made clear that resources were not handouts, but were provided in a collaborative/supportive approach (Owen 2006). The project was structured to include a US-based manager as well as one based in Vietnam. Everyone working on the project took advantage of the telecommunications technology made available by the project – email and VoIP – to ensure a continual dialog between participants. Additionally, monthly status reports and thorough periodic project reviews and projections were provided on a regular basis (Owen 2006).

An uncompromising project management approach gave way to a more flexible one once the project got underway, which is often the case when diverse partners come together. However, the compromises that were made never overrode the core interests of any of the participants (Owen 2006). Finally, as mentioned above, all of the participants viewed the project through a long-term lens: USAID acknowledged that their role had an end date; Intel sought to create a long-term market, and the VDC used the project to enhance its position within the Vietnamese marketplace and gain legitimacy among constituents.

The cutting-edge technology utilized in the projects is also noteworthy; its unique and novel attributes show promise for deploying similar projects around the world. This is the case because these technologies have transformed what was once an expensive proposition – providing telecommunications capabilities to low-income, low-density populations – into a much more affordable one.

The Sapa project made use of three noteworthy technologies. Simply described, these are: satellite technology to provide the Internet backhaul (to transport the information back and forth), WiMAX technology to distribute the Internet access on the ground, and Voice over Internet Protocol (VoIP) to enable voice communications. These technologies are both revolutionary and enabling in a number of ways. The specific satellite technology employed in the Sapa project is already being used on a regional basis, serving a number of neighbouring Southeast Asian countries, but in a limited and inefficient

manner – to single subscribers at elevated rates. Utilizing the same satellite to provide internet backhaul for entire villages provides economy of scale, which results in a more affordable proposition.

The WiMAX technology enables the network to be available across a larger geographical area than was previously possible: a WiMAX omni-directional antenna and WiMAX access points distributed throughout a region enable the satellite-provided WiFi Internet to be available for distances greater than before. With solar-powered modems and WiFi towers now available and being used, a stable source of electricity need no longer be a prerequisite for bringing information and communications technology to underserved areas. Finally, VoIP is the least expensive method of voice communication known today. Enabling residents of rural villages to make both local and long-distance calls at minimal cost provides increased efficiency in planning and communication, leading to economic growth. If governments allow, local communities can become their own telecommunications providers, not reliant upon the central administration for handouts or subsidies.

In the foreword to the influential book *ICT4D – Connecting People for a Better World*, three areas are identified where immediate action is required: First, to integrate ICT systematically into poverty reduction strategies: Second, to move beyond small pilot projects to larger, nation-wide implementation of ICT programs: Third, to continue to create new types of partnerships involving all major stakeholders – government, civil society, and the private sector (Weigel & Waldberger 2004, p. 8). The paragraph below gives evidence that these case studies may also be viewed as successes based on their addressing of the enumerated criteria.

As a direct result of the success of the Lao Cai pilot program, a larger initiative has commenced to undertake a similar project in the Quang Ngai province in South-Central Vietnam. The partnership for this program comprises a local (Vietnamese) mobile phone company, the provincial government, AusAID, USAID, and the World Resources Institute. The program is designed with specific applications in order to improve agricultural performance, health care, micro-credit, educational access, and connectivity. Both the provincial government and the local mobile company have indicated their intent to scale the solution across the entire population of the province (one million people), and potentially, across the rest of rural Vietnam. Also stemming from the Lao Cai program's success, Intel approached USAID, proposing to work together to implement this same program in up to 30 different countries (Owen 2006).

## **The Nexus: Success Factors that Matter**

Re-shifting the focus to the bigger picture, we have identified several practices and/or characteristics common to the successful implementation of ICT projects. These are drawn from previous literature as well as the current case study.

The first is to start out small, even if the project is a partnership between top levels of government and a large multinational corporation. Modest efforts that are in line with local realities and appropriate to local socio-economic conditions are more likely to be adopted by the local residents. Smaller projects are more easily adapted to changing conditions. There can be large returns from low-cost projects, and even successful, scalable projects often begin as pilots, the successes of which may inspire the confidence in both investors and the government to “think bigger.”

The second practice is to identify the technology appropriate to the project. Oftentimes, simpler is better. In this case, some of the newest available technologies were utilized, but this had much to do with the local circumstances, including existing satellite availability and the region's mountainous terrain. Also, the technology was deemed appropriate because it brings telephony, at the lowest-cost rates available, while at the same time as providing Internet connectivity. In the end, the choice of technology must be determined by the project's characteristics.

A third characteristic necessary for success is the proper nature of a state's telecom sector: it must be liberalized, with the presence of real competition. Also essential is the government's desire to implement universal telecommunications service. Such was the case in Vietnam.

A fourth success factor involves finding appropriate partners for the public private partnership. They must all be interested in the long-term sustainability and scalability of the project. In this case, the presence of a third party intermediary proved, by identifying and bringing together the potential partners, to be extremely useful. This actor's focus – not on profits, but on crafting a sustainable project – was particularly fruitful during the contract-formulation stage, when each player involved had to make its intentions and motivations clear. Forming a solid contract tends to benefit all players throughout the life of a project.

The fifth success factor is the recognition that there are more than just two parties involved in a public-private partnership. Local communities must be involved from the outset in these projects, so that they will feel like stakeholders in what could otherwise seem top-down, paternalistic, foreign projects. Involving communities includes both inquiring of the residents what their needs and wants are, as well as educating them as to what ICT can do for them. The enthusiasm and commitment of decision-makers is a factor common to most successful cases, and the presence of a local project champion can help greatly with local acceptance, as was the case here. Services that are seen to be useful, and demonstrate their utility quickly, will be used in everyday life, which also encourages adoption. Buy-in by citizens is much more likely if services demonstrate an improvement over the status quo.

Some challenges that remain for the project described above include its ongoing monitoring, to determine whether the technology will be adopted by the local residents. Time will tell whether the people of these cities will take advantage of the technologies beyond their use for simple communications; whether the more advanced areas of information technology, education and health care will be served as well. It also remains to be seen whether, as initially anticipated, the local residents will adopt the ICT to benefit themselves economically. A further challenge exists regarding the financial sustainability of the project: although the government is financially committed to providing universal service, it is preferable that the project be self-sustaining, and the possibility exists for it to become so. Whether this will happen will be seen in time.

## Conclusion

The digital divide was, at one time, considered merely an issue of access. A more meaningful distinction now made is the disparity in *real* access, defined in terms of both physical access and usability (UN 2004, p.8). Developing a beneficial “culture of use” is most likely to take place when success factors are present – services are visible, frequently used, context specific, have a human face, and meet tangible needs. Systematic benchmarks for measuring progress do not exist, which highlights the need for more organized data collection efforts. ICT investments in the developing world will continue to grow in the coming years. Thus, there is great opportunity for careful investigation of how these resources can best be used to fight poverty.

Progress has been made in gathering information about ICT-related Public Private Partnerships in the developing world. We can identify benefits in the success stories, yet tracking the effects of programs throughout a project's lifecycle is still an important activity that is too often left undone. Additionally, our paper reports two successful cases – a more ideal scenario may have been to contrast a successful case with an unsuccessful one, with or without the presence of an intermediary party. Nonetheless, the multitude of related projects currently underway provides an unprecedented opportunity to learn how social and economic change can be furthered through advanced technologies. The lessons that we learn may be applicable to many contexts. Greater clarity about the underlying drivers of technology adoption throughout the world is an additional part of the fundamental understanding of how technology can best be applied to meet real needs.

Serving the needs of emerging markets offers many challenges and opportunities to the private sector. Developing country governments, and other organizations acting alone, have not been able to mount a comprehensive enough effort to eradicate poverty in the lowest tiers of the economic pyramid (Hart 2005). Public-Private Partnerships thus offer great opportunities for technological advancement in the

developing world. Still, there is a need for careful study of these initiatives, in order to ensure successful, sustainable projects and to encourage the use of ICT to further human development.

## References

- Angerer, D J & Hammerschmid, G 2005, 'Public private partnership between euphoria and disillusionment. Recent experiences from Austria and implications for countries in transformation,' *Romanian Journal of Political Science*, vol. 5, no.1, pp. 129-159.
- Annan, K 2002, 'Kofi Annan's challenge to Silicon Valley,' November 5, viewed 18 Feb 2007, <http://news.com.com/2010-1069-964507.html>
- Detar, J 2006, 'Intel Spurs PC Use in Developing World: "Discover the PC",' *Investor's Business Daily*, April 4, p.A06, quoting research from IDC.
- Dunn, D 2006, 'Tech giants, nonprofits make ambitious push with cheap PCs,' *Information Week*, May 29, 2006. viewed 18 Feb 2007, <http://www.informationweek.com/news/showArticle.jhtml?articleID=188500346>
- Garrett, L 2007, 'The challenge of global health,' *Foreign Affairs*, vol. 86, no. 1, pp. 14-40.
- Gerrard, M 2001, 'Public-Private Partnerships,' *Finance and Development*, Sep, pp. 48-51.
- Hart, S 2005, *Capitalism at the Crossroads: the unlimited business opportunities in solving the world's most difficult problems*, Wharton School Publishing, New Jersey.
- Indjikian, R & Siegel, D 2005, 'The Impact of Investment in IT on Economic Performance: Implications for Developing Countries,' *World Development*, vol.33, no. 5, pp.681-700.
- Intel 2006, 'Case Study: WiMAX gives rural community a new voice,' viewed 23 Feb 2007, [http://www.intel.com/intel/worldahead/casestudies\\_vietnam1.htm](http://www.intel.com/intel/worldahead/casestudies_vietnam1.htm)
- International Telecommunications Union (ITU) 2006, 'Annex A: Proposed Topics in the 2006-2007 ITU New Initiatives Questionnaire,' Geneva, viewed 17 June 2007, <http://www.itu.int/osg/spu/ni/ITUNewInitiativesQuestionnaireResults2006.pdf>
- Kanungo, S 2004, 'On the emancipatory role of rural information systems,' *Information Technology & People*, vol. 17, no. 4, pp. 407-422.
- Lanvin, B 2005, 'The next billion,' *Communications and Strategies*. No 58, 2<sup>nd</sup> Qtr, p.15.
- Owen, D 2006, 'Vietnam LMI: Associated Working Papers,' December 20.
- Owen, D 2007a, 'Expanding Rural Access: White Paper,' February 17, viewed 17 June 2007, [http://www.nextbillion.net/files/Expanding%20Rural%20Access-White%20Paper-20Feb07\\_0.pdf](http://www.nextbillion.net/files/Expanding%20Rural%20Access-White%20Paper-20Feb07_0.pdf)
- Owen, D 2007b, 'Expanding Rural Access: Associated Working Papers,' January 30.
- Oyelaran-Oyeyinka, B & Lal, K 2005, 'Internet diffusion in sub-Saharan Africa: a cross-country analysis,' *Telecommunications Policy*, no. 29, pp. 507-527.
- Prahalad, CK 2005, *The Fortune at the Bottom of the Pyramid*, Wharton School Publishing, New Jersey.
- Rosenau, PV 1999, 'The Strengths and Weaknesses of Public-Private Policy Partnerships,' *American Behavioral Scientist*, vol. 43, no.1, Sep, pp. 10-34.
- Runde, D 2006, 'How to make development partnerships work,' *OECD Observer*, no. 255, May, pp. 29-31.
- United Nations 2004, *UN Global E-Government Readiness Report, 2004: Towards Access for Opportunity*, Department of Economic and Social Affairs, Division for Public Administration and Development Management, New York.
- United Nations Foundation & World Economic Forum 2003, 'Public Private Partnerships: Meeting in the middle,' viewed 18 Feb 2007, [https://www.weforum.org/pdf/Initiatives/GHI\\_2003\\_Meeting\\_in\\_the\\_middle.pdf](https://www.weforum.org/pdf/Initiatives/GHI_2003_Meeting_in_the_middle.pdf)
- Weigel, G & Waldburger, D (eds.) 2004, *ICT4D: Connecting People for a Better World. Lessons, Innovations and Perspectives of Information and Communication Technologies in Development*, Swiss Agency for Development and Cooperation (SDC) and Global Knowledge Partnership (GKP), Berne, Switzerland.
- World Bank 2003, 'ICT for Development Contributing to the Millennium Development Goals: Lessons Learned from Seventeen InfoDev Projects,' Washington, D.C., The World Bank.
- World Bank 2006, 'Information and Communications for Development (IC4D) – Global Trends and Policies,' Washington, D.C., The World Bank.

# Current State of Greek E-Government Initiatives

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## Abstract

*This paper presents an overview of e-government efforts in Greece. Its aim is to point out the necessity of designing and implementing efficient e-government applications in order to improve public sector quality. In this framework, firstly we discuss e-government basic issues. Then we present the structure of public sector in Greece and try to categorise used information systems. We continue with a review of best Greek e-government practices and we compare the progress of Greece against EU countries. We examine the potentials and barriers of the area and finally we demonstrate the arising opportunities and the key challenges regarding e-government in Greece.*

## Keywords

*e-Government, public sector, Greek programmes*

## Introduction

In recent years, we have witnessed the rapid evolution of the Web, a development environment that allows easy access, sharing, interchanging and publishing of information. In this context, the significance of governing and administration have been considerably altered. Not only because intense pressures and expectations that the way of governing should reflect new methods of work, but also the

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necessity for more “open” governments to citizens and businesses. Governments have realized that their information resources are not only of value in themselves. They are valuable economic assets, the fuel of the knowledge economy. By making sure the information they hold can be readily located and passed between the public and private sectors, taking account of privacy

and security obligations, it will help to make the most of this asset, thereby driving and stimulating national and international economy. The governments take advantage of Information and Communication Technologies (ICTs) and the continuing expansion of the Web and started strategies to renew the Public Administration and eliminate existing bureaucracy and therefore reduce costs (Riedl, 2003; Tambouris et al., 2001).

Electronic government (e-government or EG) allows an economic approach of democratic processes. However, ICTs can achieve more than this. They redefine public administration processes by altering the relations between services’ providers and public, public and private sector, and government and citizens. New forms of governing make their appearance, reflecting the continuously altered organisational and economic structures, with important effects in the way that we “exist” as citizens. It is clear that e-government does not concern only online services and the better support of citizens and businesses, but comprises a new set of technologically advanced processes and tools, that promote the interaction between the public and the government.

In Greece, ICTs started being explored at first and then exploited in order to help e-government grow. The main boost towards e-government was initiated by European Union (EU) funding on respective actions. The Greek approach towards e-government and the Information Society (IS) has undergone, in terms of top-level planning, a radical change between the 2nd (1994-1999) and 3rd (2000-2006) Community Support Framework (CSF) periods. The efforts during the 2nd period concentrated mainly to informational e-government web portals and to supply Public Administration with technological infrastructure in order for the employees to get familiar with technology and quit the traditional paperwork. During the 3rd period some, but not much, transactional e-services are provided by the Public Administration (Hahamis et al., 2005). Moreover, many divergences are observed between public organisations and agencies mainly in the level of modernisation and provided services to the citizens. Even though the public services that “lead” the developments have a lot of way for improvement in order to reach the European mean values. Now, the Greek Digital Strategy for the period of 2006-2013 is in progress, aimed at enabling a “digital leap” to improve productivity and quality of life by 2013 (Greek Digital Strategy, 2005).

This paper deals with e-government efforts, funding activities and strategies took place so far in Greece. There are no systematic data on Greek e-government programmes. The causes are: (a) the field is relatively new, (b) e-government initiatives are considered on a project by project basis, and (c) many of them are implemented by different ministries, institution and organizations of public sector. In this framework, this paper examines national and international literature, relevant e-government funding issues, programmes and projects, in order to depict the current state of e-government in Greece and also to conclude some specific developing country considerations. Specifically, its aim is to point out the necessity of designing and implementing efficient e-government applications. We believe that the vision of an electronically modernized Greek Public Administration will be realized if a series of key strategic aspects will be considered, as well as international best practices and experiences. Within this context, firstly we discuss e-government basic issues. Then we present the structure of public sector in Greece and try to categorise used information systems. We continue with a review of best Greek e-government practices and we compare the progress of Greece against EU countries. Finally, we examine the potentials and barriers of the area and demonstrate the arising opportunities and the key challenges.

## E-government Definitions and Models

Although the literature relating to this area proliferates, the definition and the various models of e-government are still unclear among researchers and practitioners of Public Administration. According to E-governance Institute (2004) “*E-governance involves new channels for accessing government, new styles of leadership, new methods of transacting business, and new systems for organizing and delivering information and services. Its potential for enhancing the governing process is immeasurable*”. Another quite broad definition which incorporates its four key dimensions that reflects the functions of government i.e. e-services, e-democracy, e-commerce and e-management is the following “*E-government is the use of information technology to support government operations, engage citizens, and provide government services*” (Dawes, 2002).

*Digital government (DG) or e-government may be defined also as “The process of using information and communication technologies to enable the civil and political conduct of government”* (McIver & Elmagarmid, 2002). In addition, in September 2003, the European Commission defined e-government as “*The use of information and communication technology in public administrations combined with organisational change and new skills in order to improve services and democratic processes and strengthen support to public policies*” (Europa, 2003).

E-government can be distinguished into three basic categories: a) government-to-citizen (G2C) that relates to the relationships between governments and citizens, b) government-to-business (G2B) that relates to the relationships between governments and businesses and c) government-to-government (G2G) that relates to the activities that improve and upgrade governments’ services (Egov, 2003). Recently, a fourth category has been added, the one of government-to-employees (G2E) (Ndou, 2004).



E-ASEAN Task Force (2007) explains why e-government is important to developing economies: the democratic, business, and governmental aspects of governance are simplified and improved, cutting costs and providing better services to citizens and businesses. Transformation within the three (3) major authorities of government may be expected, namely: political, economic, and administrative.

- *Political*: government would be able to interact with all citizens in all levels, therefore promoting e-democracy. An informed citizenry would promote transparency and accountability within government.
- *Economic*: e-government delivers services to businesses as well. E-procurement, or an online supplier exchange, is among the services included in G2G and G2B services. This will allow transparency in the bidding process and give opportunities to smaller businesses, which otherwise are not able to bid on big government procurement projects.
- *Administrative*: G2G services are enhanced. Government processes and procedures are simplified to cut red tape, facilitate delivery of services, increase productivity of the bureaucracy, and increase savings.

E-government is not a one-step process or implemented as a single project. It is evolutionary in nature, involving multiple stages or phases of development. Hiller & Belanger (2001) suggested that “*E-government can be considered through two lenses: the type of relationship and the stages of integration*” and offered five stages of development for e-government. Layne & Lee (2001) regarded e-government as an evolutionary phenomenon and suggested a four-stage growth model: (1) cataloguing, (2) transaction, (3) vertical integration, and (4) horizontal integration. Reddick (2004) examined both of the above models and concentrated on two of the four stages proposed by Layne & Lee, cataloguing and transactions. Like Hiller & Belanger, he conceded that stages of growth are combined with major types of e-government relationships: “*E-government can involve electronic relationships between government and different levels of constituents.*” The first relationship identified is G2C; the second is G2G and the third, G2B (Table 1).

Type of Government Relationship	Stages of E-government Growth	
	Stage I: Cataloguing	Stage II: Transactions
<b>G2C</b>	Online presence of information about government and its activities for citizens. Example: council meeting minutes online.	Services and forms online and databases to support online transactions for citizens. Example: online payment of taxes.
<b>G2G</b>	Online presence of information for other levels of government and its employees. Example: intranet with benefit information.	Services and forms online and databases to support online transaction for other levels and government and employees. Example: provide online training.
<b>G2B</b>	Online presence of information for businesses about government. Example: online product review of office supplies.	Services and forms online and databases to support businesses transactions with government. Example: make purchases of office supplies online.

**Table 1.** Stages of e-government and type of government relationship (Reddick, 2004).

According to World Bank (AOEMA, 2007), the e-government is developed in 3 phases:

- *Publish*: governments generate huge volumes of information (rules, regulations, documents, and forms), much of it potentially useful to individuals and businesses.
- *Interact*: publish sites, however rich in content, are just a first step. Interactive e-government involves two-way communications, starting with basic functions like email contact information for government officials or feedback forms that allow users to submit comments on legislative or policy proposals.
- *Transact*: governments can go further, by creating web sites that allow users to conduct transactions online. A transact web site offers a direct link to government services, available at any time. In the past, government services such as land registration or the renewal of ID cards required long waits, confrontation with stifling bureaucracy and the occasional bribe. Innovations such as citizen service kiosks located in shopping centres in Brazil or portable government computers that can be carried into rural pockets of India bring e-government directly to the citizens of developing nations.

Finally, Gartner Group, an international consultancy firm (Baum & Di Maio, 2000), adds one more phase, so e-government mature according to the following four phases:

- *Stage 1, Presence*: the primary goal is to post information such as agency mission, addresses, opening hours and possibly some official documents of relevance to the public.
- *Stage 2, Interaction*: this phase is characterized by web sites that provide basic search capabilities, host forms to download, and linkages with other relevant sites, as well as e-mail addresses of offices or officials. This stage enables the public to access critical information online and receive forms that may have previously required a visit to a government office.
- *Stage 3, Transaction*: this phase is characterized by allowing constituents to conduct and complete entire tasks online. The focus of this stage is to build self-service applications for the public to access online, but also to use the Web as a complement to other delivery channels. Typical services that are migrated to this stage of development include tax filing and payment, driver's license renewal, and payment of fines, permits and licenses. Additionally, many governments put requests for proposals and bidding regulations online as a precursor to e-procurement.
- *Stage 4, Transformation*: this phase is characterized by redefining the delivery of government services by providing a single point of contact to constituents that makes government organization totally transparent to citizens. Examples of transformation include highly tailored web sites, or "virtual agencies," where government information is pushed to citizens, and where they can pay local property taxes, renew state driver's licenses and apply for federal passports all in one place, with seamless interfaces back to the respective agencies involved in the transactions.

From the above, it is clear that there are many definitions and models for e-government suggesting the existence of a wide spectrum of opinions, perspectives and background. However, meta analysis of relative bibliography seems to offer some insights that eventually would be synthesized into the following: "*E-government refers to the use of ICTs to improve the efficiency, effectiveness, transparency and accountability of government*".

## Structure of Greek Public Sector

The Greek public sector comprises of a significant number of services and institutions that have been categorized based on Services and Institutions Registry of Greek Public Administration (2005) (Table 2). For the rest of the paper, we will use the term "service" for any unit of Greek Administration. The

operation of each public service is conditioned by a presidential decree-law (which is called Organization of service) describing:

- the structure of the service (framework, managements, departments, etc.).
- the structure, the objectives and the competences of each management or department.
- the discrimination of the personnel positions in sectors, the posting in each sector, as well as the distribution of organic places inside the service.

Similar logic is followed for the organic ICT units of the organisations in the majority of public sector services. Thus, usually the existence of ICT units is provided with their level (management, department, office), their objectives and competences, the total number of organic places, the allocation of these places in personnel categories and the requisite qualifications for these places. However, divergences in the structure and the precise naming are observed among different services (EPE, 2006).

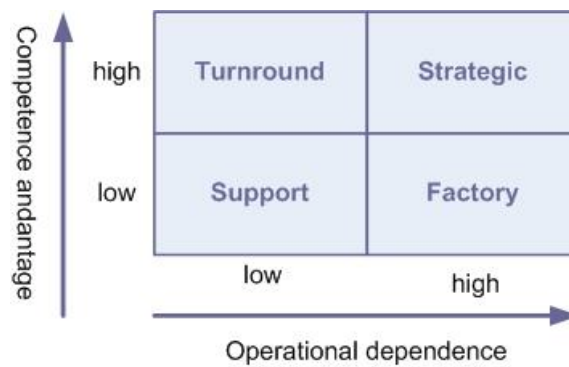
Structure of Public Sector	
Independent (Self Existent) Public Services of Constitutional Leadership of State	A' and B' Degree OTA (Local Administration Organisations)
Public Offices of Juridical Operation of State	Courthouses
Public Offices of Legislative Operation of State	Municipalities and Communities Unions
Independent Administrative Offices	Municipalities and Communities Confederations
Ministries	Municipal and Community Legal Persons
Regions	Protectoral Legal Persons

**Table 2.** Greek public sector administration structure.

The first ICT units were initially created in order to support certain functional needs e.g. automatic calculation of employees payroll. So, in many cases a small number of individuals were working in computerised offices or departments supervised by the Economic Management of the specific service. This structure is maintained even today in many services. In addition, the actually needs in ICT structures, systems and applications are different from service to service, depending on their scope, size and functionality. Consequently, the requirements for ICT personnel are also different. Only in 23% of services exist the structure *Institution -> ICT Management -> ICT Department*. In most services the structure *Institution -> Other Management -> ICT Department* is followed (32%), in few the structure *Institution -> ICT Department* (17%), while in the rest (28%) a different structure is followed (e.g. the service has 1-2 ICT employees that do not belong in any Department, or in other cases the employees belong in Departments that are not in the ICT area or in ICT self-existent offices or computer centres) (EPE, 2006).

If we attempt to categorize the Information Systems of Greek public sector using an analysis model like the *Strategic Grid Model* of McFarlan et al. (1983), we would lead to the following conclusions (Figure 1). Until now, the majority of Information Systems are classified in the *Factory Category*, including systems that try to cover the running functional needs of organizations giving low emphasis in the future needs. It's about systems and applications that fulfil specialised needs and in their majority are met in small institutions with limited resources, which do not have the ability to develop their information infrastructure and to make ambitious future plans.

On the contrary, on a large scale organizations and institutions, we observe the design (e.g. in the General Secretariat of Public Administration and Electronic Governing (2007)) and in a few already the existence (e.g. in the General Secretariat of Information Systems (2007)) of certain systems that are classified in the category of *Turnaround Information Systems*. These systems make the change (turnaround) from the orientation in the organization/institution's operation to the direction of development. They do not cover in full running needs, but future needs and give emphasis in the developmental character of the organization/institution.



**Figure 1.** Categorization of Public Administration Information Systems.

McFarlan model (1983) was initially used in the private sector, since high strategic importance characterizes those systems that give competitive advantage in an organization/institution. Respectively, in the public sector, we could say that of strategic importance are the systems that provide a very high level of e-government services. Unfortunately, there are not many systems of this type in the Greek Public Administration, as the need for pioneering services to the citizens and the enterprises is not of vital importance not only for the public but also for the private sector. An example of this type of systems could be considered the information system of Citizen Service Centres (KEP), which is susceptible to lots of improvements (EPE, 2006).

## Greek Programmes for E-government

The Greek endeavour for developing the IS began within the 2nd CSF, an effort to integrate scattered actions in homogenous sectoral Operational Programmes (OP) e.g. Telecommunications, Industry, Public Administration, Education and Initial Professional Training. The term CSF is referred to a document, established by the Commission in collaboration with the Member State, which constitutes the Commission's response to the Member State's requirements as set out in the Plan. It describes in general terms the joint action to be undertaken by the Member State and the Union and sets out priorities for action, funding and forms of assistance. Implementation of the 2nd CSF had laid the foundations for the modernization of the country's technical infrastructure, the productive environment and of the labour force skills (Greek E-government Factsheet, 2007). In the next paragraphs, we provide an overview of the general e-government situation in Greece, while Table 3 at the end of the section, gives a summary of major e-government programmes.

### KLEISTHENIS Programme

In 1994, KLEISTHENIS, an OP for the Modernisation of Public Administration over the period 1994-1999, was launched. This programme was funded by the 2nd CSF and the Greek State (IDABC e-Government Observatory, 2006). Its main objective was to create the conditions of a continuous modernisation of the public sector via interventions of a technical, organisational and educational order. The introduction of new technologies in public service delivery was among its main priorities.

The programme financed (Greece in the Information Society: Strategy and Actions, 2002):

- organizational and informatics projects in the fields of public finance, social and economic interest.
- introductory and continuing vocational training programmes for public administration personnel.
- studies and applications for the use of new technologies in the public services and for the creation of the necessary common infrastructure.

Among the most important projects included in KLEISTHENIS were the development of electronic tax services (TAXISnet) and the creation of a national public administration network (pilot phase of SYZEYXIS) which are described in sequence.

### **Actions by the Ministry of Economy and Finance**

The Ministry of Economy and Finance implemented a considerable number of Information Technology (IT) projects in the fields of taxation (TAXISnet program), customs offices, treasury-budget, etc., as part of the KLEISTHENIS program, financed by the 2nd CSF. Such projects contributed to the improvement of services provided to all parties carrying out transactions with the Ministry, the effective support of the decision-making procedure, the stamping out of tax and duty evasion, and the curtailment of public expenses (Greece in the Information Society: Strategy and Actions, 2002). Furthermore, the Ministry promoted the development of a pilot system for the electronic exchange of receipts and the electronic filing of Value Added Tax (VAT) statements. Currently, the Ministry is considering the possibility of supplying taxpayers with a smart card identifying its holder in order to allow economic transactions and issuance of standardised tax certificates at special points of service.

### **Greek Strategy for the Information Society**

In 1995, the publication of the white paper “*Greek Strategy for the Information Society: A Tool for Employment, Development and Quality of Life*” took place. The objectives of this strategy over a ten to fifteen year period were the following:

- to increase the use of advanced information technologies in order to reduce the digital gap between Greece and its partners and to reach international standards.
- to prepare Greek firms to adopt ICTs.
- to enable an increasing number of citizens to have access to information technologies.
- to encourage electronic transactions with public.

In addition, in 1997, the Greek Government adopted a “*Strategic Plan for Administrative Reform*”, which set four main fields of action: the structure of the administrative system, its activities, its human resources, and new ICT. The introduction and use of information systems went hand in hand with organisational changes and functional re-organisation (Greece in the Information Society: Strategy and Actions, 2002).

### **TAXISnet**

During the 2nd CSF period, the first serious attempt, which came to success, was the TAXISnet (Taxation Information System, <http://www.taxisnet.gr>). It is the e-government portal enabling tax-related transactions, issuing of electronic certificates, as well as document handling via the Internet. During the first years of operation, it offered Gartner’s 2nd stage services and now it has evolved and provides Gartner’s 4th stage services to citizens and businesses. TAXISnet operation has resulted in simplifying and improving servicing citizens and businesses across all taxation procedures. The response of the general public and businesses to the utilization of the online services provided by TAXISnet has been exceptionally positive. As a measure of this response, between its entry into productive operation May 2000 and January 2002, an average of about 500 new users per (working) day signed up. The electronic Proof of Tax Compliance issuing service has processed more than 144,000 applications, and the online information service for settlement of income tax obligations has handled more than 5 million calls (Greece in the Information Society: Strategy and Actions, 2002). Furthermore, operation of the portal has reduced the corresponding manual procedures and manpower, for the benefit of Hellenic Ministry of Economy and Finance. The TAXISnet service, provides G2C, G2B and G2G services, including electronic submission of income tax forms, personalised electronic

notification of the results of the tax return clearance process, electronic issuing of certificates by fax, electronic submission of VAT forms, payment via banking system services and validation of tax certifications e.g. Tax Clearance Certification (Gouscos et al., 2001). Some of these services, as well as some other general information services, are also available via the telephone Call Centre service and via the General Secretariat for Information Systems web site (<http://www.gsis.gov.gr>).

## Operational Programme for the Information Society

With the aim of implementing the IS strategy in a coherent and integrated way, an Operational Programme for the Information Society (OPIS) was adopted in 2000, which covered the period 2000-2006 and was supported by the EU as part of the CSF. OPIS was an innovative horizontal programme, cutting across government departments, which aimed at implementing the essential features of the Greek Government's IS white paper, as well as of the eEurope initiative and the conclusions of the Lisbon Summit of March 2000 (Infosociety, 2004).

The OPIS includes four lines of action: Education and Culture, Citizens and Quality of Life, Digital Economy and Employment, and Communications. The priorities for e-government, which forms part of the action line "*Citizens and Quality of Life*", are as follows:

- Improved quality of services to citizens and enterprises by public administrations at central, regional and local level.
- Development of online applications, as well as use of ICTs to streamline and re-engineer procedures and communication within and amongst government departments, covering all of public administration and especially the fiscal area and finance, social insurance, justice, public tendering and procurement procedures, regional development and emergency services areas.
- Support the creation of geographical and environmental mapping and management information systems, linking central to regional and local government.
- Use of IT in order to promote and support a broader strategy for providing higher quality health and welfare services to all citizens, and for the reform of the management of the health sector and its budget.
- Introduction of telematics applications in land, sea and air transport.

In 2001, the Greek Government created Information Society S.A., a state-owned company tasked with supporting the implementation of the OPIS. To this end, the company supports government departments and agencies in all stages of ICT project design, implementation and follow-up. It has economic and managerial autonomy.

## SYZEFXIS

During the 3rd CSF period more e-government projects were developed. In April 2001, the Government network SYZEFXIS (<http://www.syzefxis.gov.gr>) was launched as a pilot project, with the participation of 15 state organisations. SYZEFXIS has become a nationwide intranet for the Greek public sector, ultimately connecting more than 1.700 organisations nationwide and has been "*characterized by technical and functional completeness*" (Informatics Development Agency, 2004). It was a project of the Greek Ministry of the Interior, Public Administration and Decentralization that aimed to develop "*an effective public administration with a modern information and telecommunications infrastructure and the easier coordination of state processes through IT and Tele-networking*" (Informatics Development Agency, 2004). Phase A of the project was included in the OP KLEISTHENIS whilst phase B was included in the OPIS (Hahamis et al., 2005). It entered its full production stage in November 2005. The network comprised 1.766 nodes and relied on services by telecom providers under Service Level Agreements (SLAs) and not on purpose-built infrastructures. The network provided advanced telecommunication and information services, including telephony, data and video transmission

through 4 Virtual Private Networks (VPNs). Training on the use of the SYZEFXIS network started and implementation of the Training Gate of the network took place then. The state organizations, which would be finally connected with the Public Administration's network, were the central and regional administration, as well as the prefectural and local administration. A peer-to-peer connection between the National Network of Public Administration SYZEFXIS and the Hellenic Network for Research and Technology, GRNET, was activated in May 2006. Access to the s-TESTA (Secured Trans-European Services for Telematics between Administrations) network through SYZEFXIS became operational (IDABC e-Government Observatory, 2006). It was complemented by the development of Metropolitan Area Networks (MAN), optical rings infrastructures, in approximately 50 municipalities across Greece, aiming to interconnect "points" of public interest (such as public administration buildings, schools, tax offices, administrations) through a broadband network.

### **IKAnet**

As part of its modernization programme IKAnet (<http://www.ikanet.gr>), the Greek Social Insurance Institution, has developed two new services, which serve as a springboard for the provision of further quality services to employers and employees or pensioners. The new electronic services of IKA fall into two categories: Information Services and Transaction Services. The first transaction service was the electronic submission of the Analytical Periodical Statement, aiming at improving transactions with IKA, and eliminating the need for the physical presence of the employer in transactions with the Institution (Greece in the Information Society, Strategy and Actions, 2002).

### **Call Centres**

The Greek Government launched an innovative Call Centre enabling citizens to apply for a number of certificates and administrative documents by dialling a nationwide four-digit telephone number (1502), in February 1998. Citizen's requests were registered by operators who gave information regarding available services and procedures and filled a standardised computer form. The form was then immediately transmitted online and by fax to the competent administration, which issued the document and sent it to the citizens by registered mail to their postal address. The competent agencies were obliged to take action within a specific time limit (10 days). By the end of 2001, more than 870.000 applications for administrative forms and documents had been submitted, representing almost 608 applications per day (IDABC e-Government Observatory, 2005). This figure shows the success of the service, which increases the responsiveness of public administration, promotes equal and user-friendly access to public services, helps to reduce red tape and administrative costs, and contributes to a better quality of life for citizens. In June 2003, Greece's 1502 Telephone Application System received the first United Nations Public Service Award in the category "*Improvement of Public Service Results*" in the geographic area of Europe and North America.

### **Greece in the Information Society: Strategies and Actions**

The Greek Government's strategic approach to e-government was laid down in the white paper "*Greece in the Information Society: Strategies and Actions*", which was published in February 1999 and updated in 2002 and set out the new Greek policy for the development of the IS. It presented a comprehensive strategy, defined priorities and specific goals, as well as resources and mechanisms for achieving them and its basic objective was the development of an "*open and effective*" government. The white paper placed great emphasis on raising the quality of public services in order to ensure social cohesion and contribute to economic objectives in terms of living standards. So, they should be characterised by ubiquity, uniqueness of reference, de-materialisation, quality and cost-effectiveness (Greece in the Information Society: Strategy and Actions, 2002).

## ARIADNI Programme

The ARIADNI (Development and Operation of the Main Information, Support and Interconnection System of Citizens Service Centre – ARIADNI Offices) programme is adopted for the improvement of public administration services delivered by regional and local administrations, in particular through the use of Internet for most transactions and communication with central government and for most interactions with citizens and businesses. It signalled the collaboration between the central public administration and local government authorities, and was implemented through both central and decentralized actions. The programme, was financed by Public Investment Programme with a co-funding by national resources and the EU, through the CSF 2000-2006 and in particular the OP IS. It set the target of creating one-stop shops for administrative services in municipalities and prefectures, where citizens are able to complete administrative transactions using a minimum of his resources (money and time to travel). The programme also included an ambitious administrative procedures simplification project, aimed at reducing administrative burdens for citizens and businesses. A specific programme, ASTERIAS, as part of ARIADNI, was aimed at improving public services provided to the people of the Greek islands. The implementation of the Citizens' Service Centres was supported by the ARIADNI programme (Greek E-government Factsheet, 2007).

Today, the programme ARIADNI II (2007), that constitutes the continuation of ARAIDNI, provides services (SLAs) through the development and operation of the necessary ICT infrastructure for facilitation of the Citizens Service Centres (KEP). Specifically, it includes the following subprojects:

- Collection, digitisation, codification, organisation and process of the public information and entry thereof in the main Internet site, as well as the design and implementation of the data base of administrative information and forms.
- Internet portal for administrative information and electronic transactions.
- Provision of information and submission of applications for electronic transactions through telephone centre.
- Provision of services and information through the Citizens Service Centres.
- Development and support of the VPN interconnection of the Citizens Service Centres.
- Control, management and decision making (MIS).
- Provision of training services.
- Support services and Help Desk.

## Citizens Service Centres

In 2002, the first ten Citizens Service Centres (KEP in Greek) (<http://www.kep.gov.gr>) opened, one-stop administrative shops located in or near municipality and prefecture offices. These centres “were institutions, running under the supervision of Greek local municipalities, realising a flexible citizen-centric mechanism, which aims to increase the flexibility and efficiency of the way citizens interact with the public sector” (Tambouris et al, 2004). Through these shops, citizens can have access to public service information and to a number of standardised administrative procedures. There are currently more than 1.000 Citizen Service Centres spread around Greece and more than 850 administrative services covering virtually all the public sector that can be accessed through the Centres (Hahamis et al., 2005). The Citizens' Service Centres were meant to gradually integrate all administrative procedures through the use of ICT. The physical one-stop shops were complemented by an Internet portal and by a free of charge telephone helpline (IDABC e-Government Observatory, 2006). These centres are linked together by an IP network and use a platform, called e-KEP, to file citizens' requests, create a relevant e-directory, electronically register KEP mail, manage citizens' requests and monitor their progress all the way through settlement. Accessible through the one-stop



service centres across the country or through the Internet, the e-KEP platform supports the use of certified digital signature, enabling real time on-line transactions between citizens and Public Administration. The average service time usually does not exceed 7 days. The Citizen Service Centre Internet portal receives over 9 million visits each month. The Prime Minister announces in parliament in June 2006 that the Citizen Service Centres are to be upgraded and renamed into Integrated Transaction Centres.

### **POLITEIA Programme**

The Ministry of the Interior, Public Administration and Decentralisation implemented in May 2000 an OP called POLITEIA which “*was the main element of a co-ordinated effort to promote reform of the structure and activity of public administration, with the primary aim to improve services offered to the public*” (OECD, 2004). As part of this effort, Citizens’ Service Centres (CSCs) designed as one-stop shops for services to the citizen, were introduced under the ARIADNI Project, and operate using up-to-date ICT. Its main objectives were to adopt modern financial management models, to simplify administrative procedures, to recruit well-trained civil servants, to implement new technologies and adopt modern methods of administration and control, and to ensure transparency and eliminate corruption. The overall aim was to transform the Greek public administration into a modern, outward-looking administration focused on better serving citizens’ needs.

POLITEIA 2005-2007, a 3-year programme for the “*re-establishment of Public Administration*” was launched in March 2005. The objectives of the programme were to better serve all citizens by focusing on their real needs, increasing transparency in public administration, implementing e-government in all administrative levels (central and regional administration, municipalities), restructuring agencies and processes, protecting citizen’s privacy and consolidating the Rule of Law (IDABC eGovernment Observatory, 2005). The POLITEIA programme complemented the OPIS by supporting actions not originally covered by it. Its launch was accompanied by the creation of the “*Council for E-government*”, whose target was to draft a “*Strategic Plan for E-government*”. The plan set the targets and the coordination mechanisms among all relevant national and European Programmes. Following the deployment of the POLITEIA programme, an invitation for proposals was issued by the central government towards the prefectures in September 2005.

### **Central Procedure Simplification Committee**

In 2004, the Central Procedure Simplification Committee was created. Its main objectives were the planning, implementation, monitoring and assessment of administrative simplifications, reform of the appropriate organisational structures for supporting the simplification policy and preplanning of activities to inform government officials on simplification methods and techniques.

### **Greek Digital Strategy**

The draft Greek Digital Strategy for the period of 2006-2013 aimed at enabling a “*digital leap*” to improve productivity and quality of life by 2013. The proposed digital strategy includes more than 65 actions and is divided into two parts. The first part of the plan will be enacted by 2008, and the second one by 2013. By 2008, the government will promote the development of electronic procurement, broadband connections, digital public services for citizens and businesses, and the use of electronic signatures. After 2008, the proposed strategy includes creating one-stop e-points to serve companies, re-organising the public sector and incorporating new technologies into the education system (Greek E-government Factsheet, 2007).

## General Secretariat for Public Administration and E-government

The General Secretariat for Public Administration and E-government launched in April 2006, as a consultation process on the future OP entitled “*Improving the Management Capability of Public Administration*”. The programme, which belongs to the National Strategic Reference Framework 2007-2013, aims at transforming the functionality and organisation of public administration and the development of innovative services for citizens and businesses.

Programmes	Description
<b>KLEISTHENIS</b>	A project relating to the administrative modernization of the public administration, the development of integrated information systems in the public administration and the education and training of human resources.
<b>Actions by the Ministry of Economy and Finance</b>	The development of a pilot system for the electronic exchange of receipts and, in particular, the electronic filing of VAT statements.
<b>TAXISnet</b>	It provides services to individual and corporate tax-payers, including electronic submission of VAT forms and payment of VAT via banking system services, electronic submission of income tax forms, personalized electronic notification of the results of the tax return clearance process, and the electronic issuing of certificates by fax.
<b>SYZEFXIS</b>	It aims to develop “ <i>an effective public administration with a modern information and telecommunications infrastructure and the easier coordination of state processes through IT and Tele networking</i> ”.
<b>IKAnet</b>	The IKA web site makes it possible to completely treat the declaration of social contributions for employees online.
<b>Greek Strategy for the Information Society</b>	The objectives of this strategy were defined and the creation of a model that must be followed.
<b>Strategic Plan for Administrative Reform</b>	It sets four main fields of action: the structure of the administrative system, its activities, its human resources, and new ICT.
<b>The call centres</b>	They increase the responsiveness of public administration, promote equal and user-friendly access to public services, help to reduce red tape and administrative costs, and contribute to a better quality of life for citizens.
<b>White Paper “Greece in the Information Society: Strategies and Actions”</b>	It presents a comprehensive strategy, defines priorities and specific goals, as well as resources and mechanisms for achieving them and its basic objective is the development of an ‘open and effective’ government.
<b>ARAI DNI Programme</b>	It is adopted for the improvement of public administration services delivered by regional and local administrations and sets the target of creating one-stop shops for administrative services in municipalities and prefectures.
<b>Citizens Service Centres</b>	They are institutions, running under the supervision of Greek local municipalities, realising a flexible citizen-centric mechanism, which aims to increase the flexibility and efficiency of the way citizens interact with the public sector.
<b>POLITEIA Programme 2000</b>	The main element of a co-ordinated effort to promote reform of the structure and activity of public administration, with the primary aim to improve services offered to the public.

<b>POLITEIA Programme 2005-2007</b>	The objectives of the programme are to better serve all citizens by focusing on their real needs, increasing transparency in public administration, implementing e-government in all administrative levels, restructuring agencies an processes, protecting citizen's privacy and consolidating the Rule of Law.
<b>Council for E-government</b>	Its present target is to draft a Strategic Plan for E-government. The plan will set the targets and the coordination mechanisms among all relevant national and European programmes.
<b>Operational Programme for the Information Society (OPIS)</b>	OPIS is an innovative horizontal programme, cutting across government departments, which aims at implementing the essential features of the Greek Government's Information Society white paper as well as of the eEurope actions. The priorities for E-government are mentioned.
<b>Information Society S.A.</b>	A state-owned company tasked with supporting the implementation of the Operational Programme for the Information Society (OPIS).
<b>Central Procedure Simplification Committee 2003</b>	Its main objectives are the planning, implementation, monitoring and assessment of administrative simplifications, reform of the appropriate organisational structures for supporting the simplification policy and preplanning of activities to inform government officials on simplification methods and techniques.
<b>Greek Digital Strategy</b>	It aims at enabling a "digital leap" to improve productivity and quality of life by 2013.
<b>Improving the Management Capability of Public Administration</b>	The programme aims at transforming the functionality and organisation of public administration and the development of innovative services for citizens and businesses.

Table 3. Greek e-government programmes.

Before the 2000-2006 programming period, most Member States of EU were rather optimistic regarding the permanence of the positive trends that arose with the emergence of the "new economy" and the stock market boom. Same was the picture in Greece with CSFs. However, recent data shows that developments are not in step with these optimistic assessments. Already from the second quarter of 2001, the European economy found itself in a phase where development rates were dropping, deficits in the public sector were increasing, unemployment rates were rising, and the return on capital and investments was low (CSF, 2006).

According to i2010 (2006), Greece has only 30 services fully available online, posting the country at 23rd place of the 28 countries of EU measured. Unfortunately, the projects presented above, are the only remarkable e-government projects launched in Greece that have more than informational profile and actually provide electronic G2B, G2C and G2G services. The 3rd CSF and especially OPIS, has brought enough funding to reorganize the whole Greek Public Administration. The institutional and organisational obstacles of the Greek Public Administration, however, remain still insurmountable. The most crucial problem for the preparation of ICT projects are time delays caused by red tape and bureaucratic processing of the calls for interest and biddings, reducing dramatically time available for implementation and the use of the 3rd CSF funds. That is why it is essential that the call for interest and bidding processes are accelerated and the cooperation and the coordination between the related actors are enhanced, in order to realize a substantial and qualitative implementation (Boufeas et al, 2004).

The main characteristics of the Greek Public Administration could be summarized in the following features (Boufeas et al, 2004):

- Low efficiency.
- Difficulties in the introduction of organizational information architecture models.
- Fragmented efforts of computerization – lack of standardization.
- Insufficient technical infrastructure.
- Lack of training and experienced personnel on information technology.

## EU Programmes vs Greek Programmes

Most EU countries initiated their first OPs later than Greece did; France and Switzerland in 1998, Germany and Ireland in 1999, Italy and United Kingdom in 2000, while Scandinavian countries (Sweden, Norway, Finland and Denmark) activated in IS during the mid 90's, without taking advantage of a specific OP (Observatory for the Greek Information Society, 2006). EU countries in general are active in e-government projects. Table 4 summarizes the best e-government practices of EU countries (Observatory for the Greek Information Society, 2005).

Country	E-government	URL
Austria	HELP Portal SBA Online Citizen Card  Light Citizen Card  Official Email Service for the Public Sector FINANZonline	<a href="http://www.help.gv.at">http://www.help.gv.at</a> <a href="http://www.schulbuchaktion.at">http://www.schulbuchaktion.at</a> <a href="http://www.buergerkarte.at">http://www.buergerkarte.at</a> <a href="http://www.chipkarte.at">http://www.chipkarte.at</a> <a href="http://www.bdc.at/208.html">http://www.bdc.at/208.html</a> <a href="http://www.mobilkomaustria.com">http://www.mobilkomaustria.com</a> <a href="http://www.a1_net/signatur">http://www.a1_net/signatur</a> <a href="http://www.atrust.at">http://www.atrust.at</a> <a href="http://www.zustellung.gv.at">http://www.zustellung.gv.at</a> <a href="https://finanzonline.bmf.gv.at">https://finanzonline.bmf.gv.at</a>
Belgium	KAFKA Initiative, Simplification of Public Administration e-ID Card  Tax on Web Federal Portal for Citizens and Business	<a href="http://www.kafka.be">http://www.kafka.be</a> <a href="http://www.simplification.be">http://www.simplification.be</a> <a href="http://eid.belgium.be">http://eid.belgium.be</a> <a href="http://www.certipost.be/eid">http://www.certipost.be/eid</a> <a href="http://www.eid-shop.be">http://www.eid-shop.be</a> <a href="http://www.tax-on-web.be">http://www.tax-on-web.be</a> <a href="http://www.belgium.be">http://www.belgium.be</a>
France	Income Taxes Assessment, Declaration and Payment French eGovernment Portal eVoting  Online Declaration and Payment of VAT	<a href="http://www.ir.dgi.minefi.gouv.fr">http://www.ir.dgi.minefi.gouv.fr</a> <a href="http://www.service-public.fr">http://www.service-public.fr</a> <a href="http://www.interieur.gouv.fr/rubriques/b/b3_elections/b31_actualites">http://www.interieur.gouv.fr/rubriques/b/b3_elections/b31_actualites</a> <a href="http://www.tva.dgi.minefi.gouv.fr/index.jsp">http://www.tva.dgi.minefi.gouv.fr/index.jsp</a>

Germany	<p>BUND.DE  <a href="http://www.bund.de">http://www.bund.de</a>  Public Purch@sing Online  <a href="http://www.evergabe-online.de">http://www.evergabe-online.de</a>  Arbeitsamt Online (Employment Office)  <a href="http://www.arbeitsamt.de">http://www.arbeitsamt.de</a>  Bafög-Online (Student Loans Online)  <a href="http://www.bva.bund.de/aufgaben/bafog/index.html">http://www.bva.bund.de/aufgaben/bafog/index.html</a>  ELSTER, e-Tax Return  <a href="http://www.elster.de">http://www.elster.de</a>  DIGANT  <a href="http://www.bundesdruckerei.de">http://www.bundesdruckerei.de</a>  Customs Online 2005 &amp; ATLAS  <a href="http://www.zoll-d.de">http://www.zoll-d.de</a>  BRN, Das Bayerisches Realschulnetz  <a href="http://www.realschule.bayern.de">http://www.realschule.bayern.de</a>  WEB for ALL  <a href="http://www.webforall-heidelberg.de">http://www.webforall-heidelberg.de</a>  Bremen On-line Services  <a href="http://www.bremen.de">http://www.bremen.de</a></p>
Denmark	<p>Digital North Denmark  <a href="http://www.detdigitalenordjylland.dk">http://www.detdigitalenordjylland.dk</a>  Nordpol.dk, Democracy on the Web  <a href="http://www.nordpol.dk">http://www.nordpol.dk</a>  Public Procurement Portal  <a href="http://www.doip.dk">http://www.doip.dk</a>  Digital Signatures  <a href="http://www.digitalsignatur.dk">http://www.digitalsignatur.dk</a>  e-Boks  <a href="http://www.e-boks.dk">http://www.e-boks.dk</a>  NetCitizen, Portal for Digital Citizen Services  <a href="http://www.netborger.dk">http://www.netborger.dk</a>  Electronic Tendering (SKI): National Procurement  <a href="http://www.ski.dk">http://www.ski.dk</a></p>
United Kingdom	<p>Info4local  <a href="http://www.info4local.gov.uk">http://www.info4local.gov.uk</a>  E-government Unit  <a href="http://www.caimed.org">http://www.caimed.org</a>  E-economy Unit  <a href="http://www.caimed.org">http://www.caimed.org</a>  E-communications Unit  <a href="http://www.caimed.org">http://www.caimed.org</a>  E-voting  <a href="http://www.caimed.org">http://www.caimed.org</a>  E-participation  <a href="http://www.caimed.org">http://www.caimed.org</a>  National Planning Portal  <a href="http://www.planningportal.gov.uk">http://www.planningportal.gov.uk</a>  Customer Handling of Import and Export Freight (CHIEF)  <a href="http://www.hmce.gov.uk">http://www.hmce.gov.uk</a>  Directgov.uk  <a href="http://www.directgov.uk">http://www.directgov.uk</a>  Fife Direct  <a href="http://www.fifedirect.gov.uk">http://www.fifedirect.gov.uk</a></p>
Ireland	<p>Irish Public Procurement Portal  <a href="http://www.etenders.gov.ie">http://www.etenders.gov.ie</a>  OASIS &amp; BASIS Portals  <a href="http://www.oasis.gov.ie">http://www.oasis.gov.ie</a>  <a href="http://www.basis.gov.ie">http://www.basis.gov.ie</a>  <a href="http://www.eforms.ie">http://www.eforms.ie</a>  ROS (Revenue Online Services)  <a href="http://www.ros.ie">http://www.ros.ie</a>  REACH, Messaging Infrastructure for Intra-governmental Cooperation  <a href="http://www.reach.ie">http://www.reach.ie</a>  FAS &amp; PUBLIC JOBS Portals  <a href="http://www.fas.ie">http://www.fas.ie</a>  <a href="http://www.publicjobs.ie">http://www.publicjobs.ie</a>  Motor Tax Online  <a href="http://www.motortax.ie">http://www.motortax.ie</a>  Irish Tax Administration's SMS Service  <a href="http://www.revenue.ie/wnew">http://www.revenue.ie/wnew</a></p>
Iceland	<p>Government Offices  <a href="http://www.government.is">http://www.government.is</a>  GoPro, Electronic Records Management System  <a href="http://www.gopro.net">http://www.gopro.net</a>  eTax, Electronic Tax Returns  <a href="http://www.brussels.rsk.is">http://www.brussels.rsk.is</a>  Customs Declaration on the Web  <a href="http://www.tollur.is">http://www.tollur.is</a></p>
Spain	<p>INFO XXI  <a href="http://enis.eun.org">http://enis.eun.org</a>  CAT 365 Citizen's Portal  <a href="http://www.cat365.net">http://www.cat365.net</a>  Utenet, ICT Training for Disabled People and Welfare Workers  <a href="http://www.utenet.com.ar">http://www.utenet.com.ar</a></p>

Italy	Citizen Car Registration and Ownership Italia.gov.it Electronic ID Card and National Services Card eProcurement PolisWeb, Lawyer Access to Case Information TELEMACO, Signed Electronic Filling for Business Entities	<a href="http://www.aci.it">http://www.aci.it</a> <a href="http://www.italia.gov.it">http://www.italia.gov.it</a> <a href="http://www.cartaidentita.it">http://www.cartaidentita.it</a> <a href="http://www.acquistinretepa.it">http://www.acquistinretepa.it</a> <a href="http://www.tribunale.bologna.giustizia.it">http://www.tribunale.bologna.giustizia.it</a> <a href="http://web.telemaco.infocamere.it">http://web.telemaco.infocamere.it</a>
Luxembourg	Luxembourg E-government Strategy Public Web Sites Portal Online Declaration and Payment of VAT	<a href="http://www.eluxembourg.lu">http://www.eluxembourg.lu</a> <a href="http://www.etat.lu">http://www.etat.lu</a> <a href="http://saturn.etat.lu/etva/index.do">http://saturn.etat.lu/etva/index.do</a>
Netherlands	Public Key Infrastructure Electronic Government Counters  Electronic Vote  Biometric Passports and ID Cards	<a href="http://www.opengroup.org">http://www.opengroup.org</a> <a href="http://www.eurovision.net">http://www.eurovision.net</a> <a href="http://www.caimed.org">http://www.caimed.org</a> <a href="http://www.minbzk.nl">http://www.minbzk.nl</a> <a href="http://www.caimed.org">http://www.caimed.org</a> <a href="http://www.caimed.org">http://www.caimed.org</a>
Portugal	Citizens Portal Fiscal Electronic Declarations  Portugese Government Portal e-Voting	<a href="http://www.portaldocidadao.pt">http://www.portaldocidadao.pt</a> <a href="http://www.e-financas.gov.pt">http://www.e-financas.gov.pt</a> <a href="http://www.dgci.min-financas.pt">http://www.dgci.min-financas.pt</a> <a href="http://www.portugal.gov.pt">http://www.portugal.gov.pt</a> <a href="http://www.votoelectronico.pt">http://www.votoelectronico.pt</a>
Sweden	Ministry 24-7 Seniornet.se	<a href="http://www.24-timmarsmyndigheten.se">http://www.24-timmarsmyndigheten.se</a> <a href="http://www.seniornet.se">http://www.seniornet.se</a> <a href="http://www.sics.se">http://www.sics.se</a>
Finland	Finnish e-ID Card Oodi & Web-Oody Systems, Enrollment in the University of Helsinki Public Sector Portal  TYVI Tyoelake, Finnish Center for Pensions VERO Portal Citizen Certificate	<a href="http://www.fineid.fi">http://www.fineid.fi</a> <a href="http://www.oodi.fi">http://www.oodi.fi</a>  <a href="http://www.suomi.fi">http://www.suomi.fi</a> <a href="http://www.lomake.fi">http://www.lomake.fi</a> <a href="http://www.tyvi.fi">http://www.tyvi.fi</a> <a href="http://www.tyoelake.fi">http://www.tyoelake.fi</a> <a href="http://www.vero.fi">http://www.vero.fi</a> <a href="http://www.sonera.fi">http://www.sonera.fi</a> <a href="http://www.vaestorekisterikeskus.fi">http://www.vaestorekisterikeskus.fi</a>

Table 4. Best e-government practices of EU countries.

Many of the above best EU e-government practices could be applied in Greece. Indicatively, we mention the following:

- *Services for job searching.* These services are provided via Greek Manpower Employment Organization (OAED) web site (<http://www.oaed.gr>). For the time being, online services include only: unemployed searching and job searching in Greece and in Europe. So, there is a need for application more sophisticated services e.g. intelligent classification of professional categories. Characteristic practices from Ireland are Fas (<http://www.fas.ie>) and Public (<http://www.publicjobs.ie>) Jobs Portals.
- *Customs services.* An integrated customs information system (ICIS) is under development, but today its provided services are limited. Moreover, soon the computerization and inter-networking of all custom stations will be completed. Representative EU best practices are: from Germany, Customs Online 2005 & ATLAS (<http://www.zoll-d.de>), from United Kingdom, Customer Handling of Import/Export Freight (CHIEF) (<http://www.hmce.gov.uk>), and from Iceland, Customs Declaration on the Web (<http://www.tollur.is>).

- *Electronic procurements.* An integrated system of electronic procurements is under development. This system could be adopt best services of relative EU countries e.g. from Denmark, Public Procurement Portal (<http://www.doip.dk>) and Electronic Tendering (SKI): National Procurement (<http://www.ski.dk>), from Ireland Public Procurement Portal (<http://www.etenders.gov.ie>) and the Italy, eProcurement (<http://www.acquistinretepa.it>).
- *Portals.* The lack of basic portals (national, citizens, enterprises) implies Greek insufficiency in e-government field. Currently, this role is covered by Citizens Service Centres portal (<http://www.kep.gov.gr>), which despite its recent redesign, it is unable to correspond with high arisen requirements (e.g. content organisation that remains focused on Public Administration structure, interaction that does not reach the level of electronic forms completion and submission, etc.). In late 2008, ERMIS e-government portal is expected to be in full operation in order to fulfil this gap. A best EU practice that could be found application in this portal, constitutes Austria HELP Portal (<http://www.help.gv.at>). Another interesting practices are: Belgium, Federal Portal for Citizens and Business (<http://www.belgium.be>), France, eGovernment Portal (<http://www.service-public.fr>), Denmark, NetCitizen, Portal for Digital Citizen Services (<http://www.netborger.dk>), Luxembourg, Public Web Sites Portal (<http://www.etat.lu>) etc.

## Greek E-government Ranking

Many organisations and surveys attempt to measure e-government progress of several countries either on a EU level or an international level, according to different indicators and measurements. European Commission (2005), measures the e-government policy indicator of the eEurope Action Plan on 28 EU countries yearly. For these countries the European Commission and the Member States defined a list of twenty basic public services. For twelve of these services, the citizens are the target group while for eight of them businesses are the target group. European Commission (2005) resulted for online sophistication indicator in an overall average score of 65% for the 20 public services in the 28 countries (53 % for the 10 new member states and 72% for the other countries). This means that the online sophistication of public service delivery in the EU is situated between one-way interaction and two-way interaction. Even the EU 15+ countries are overall not yet on a level of two-way online service delivery. As far as the new fully available online indicator is concerned, the fifth measurement resulted in an overall average score of 40% for the 20 public services in the 28 countries (29% for the 10 new member states and 46% for the 18 other countries). These results are illustrated in Figure 2, while Figure 3 and Figure 4 depict each participating country's indicators measurement.

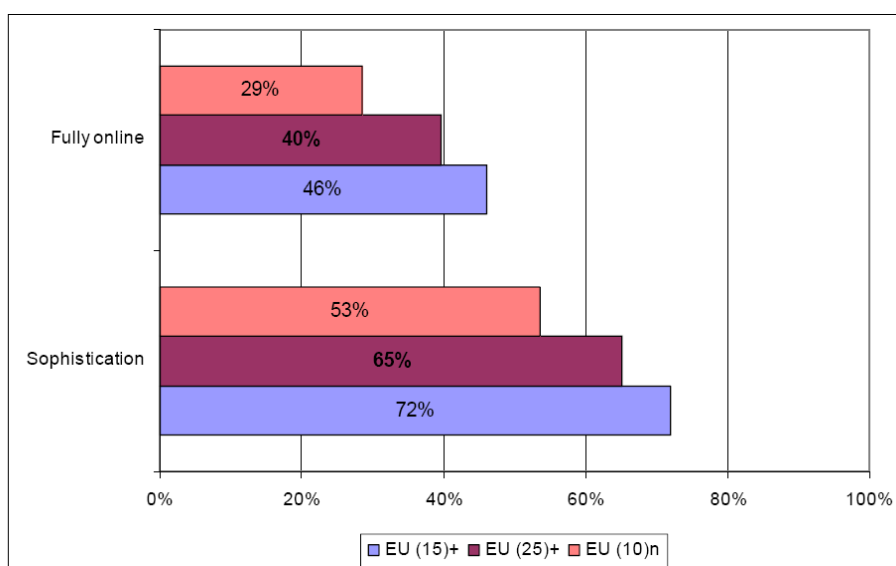


Figure 2 Overall Results (European Commission, 2005).

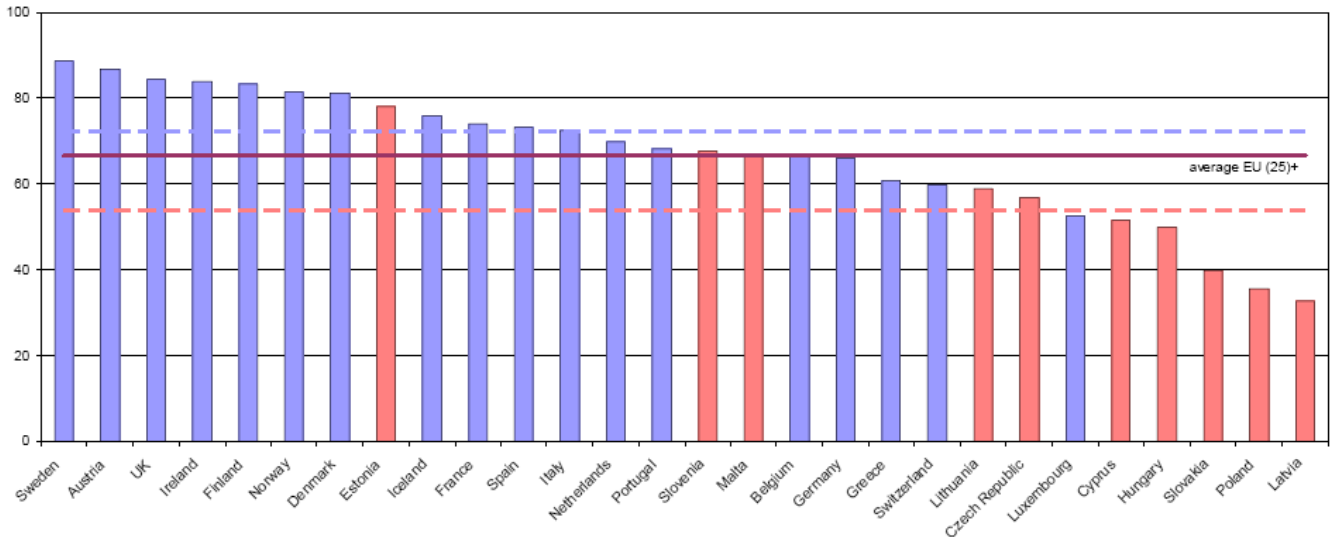


Figure 3. Country results – online sophistication (European Commission, 2005).

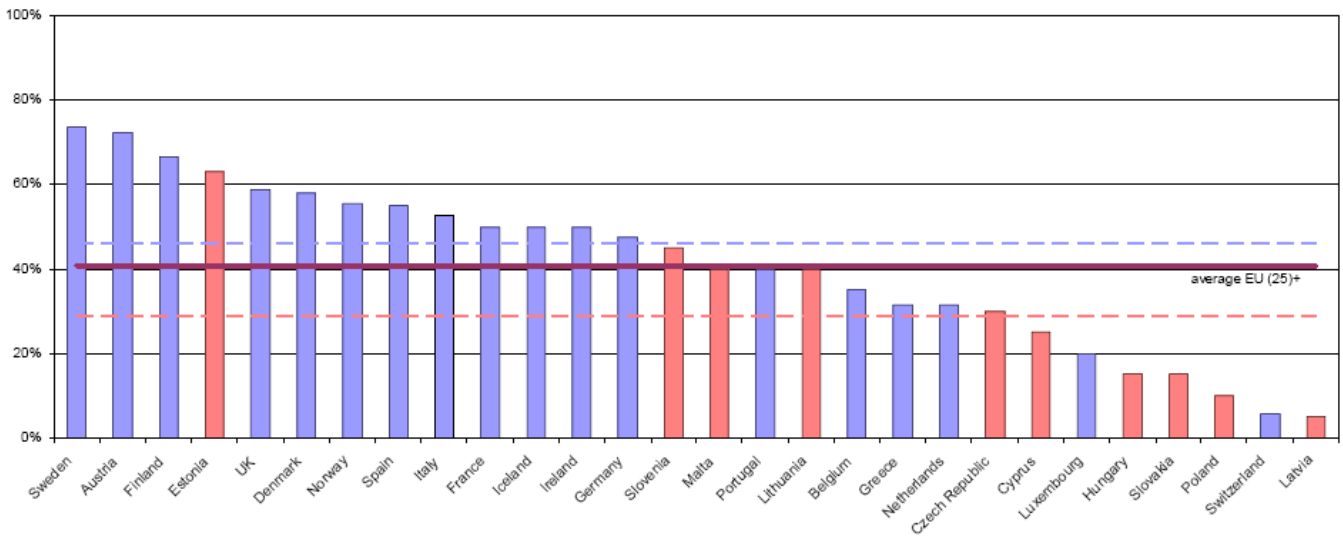


Figure 4. Country results – fully availability online (European Commission, 2005).

According to European Commission (2005), over the last 3 years, the online development of public services has improved by 27 percentage points as depicted in Figure 5 while the “fully available online” development of public services has improved by 26 percentage points, as depicted in Figure 6. Greece (EL) stands at 16th place as far as online sophistication progress is concerned and at 15<sup>th</sup> place as far as fully available online progress is concerned. Table 5 illustrates each participating country’s progress on these two indicators during 2001-2004.



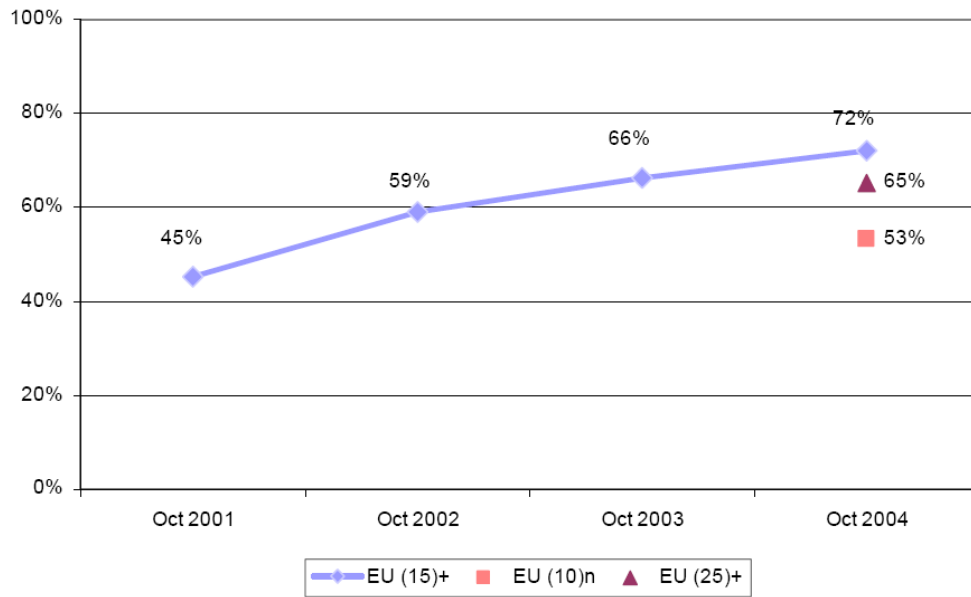


Figure 5. 2001-2004 overall progress – online sophistication (European Commission, 2005).

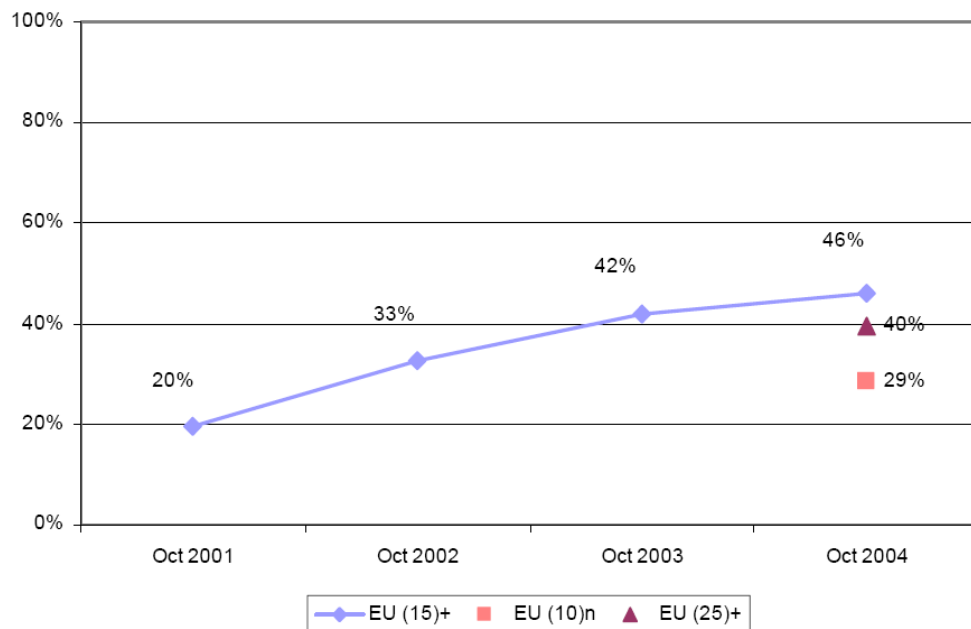


Figure 6. 2001-2004 overall progress – fully available online (European Commission, 2005).

Online Sophistication					Fully available online				
	Oct 2004	Oct 2003	Oct 2002	Oct 2001		Oct 2004	Oct 2003	Oct 2002	Oct 2001
S	89%	87%	87%	61%	S	74%	67%	67%	28%
A	87%	83%	56%	40%	A	72%	68%	20%	15%
UK	84%	71%	62%	50%	FIN	67%	61%	50%	33%
IRL	84%	86%	85%	68%	UK	59%	50%	33%	24%
FIN	83%	80%	76%	66%	DK	58%	72%	61%	32%
NOR	82%	75%	66%	63%	NOR	56%	47%	35%	35%
DK	81%	86%	82%	59%	E	55%	50%	40%	30%
ISL	76%	56%	53%	38%	I	53%	45%	35%	15%
F	74%	73%	63%	49%	F	50%	45%	35%	25%
E	73%	68%	64%	50%	ISL	50%	28%	28%	11%
I	72%	59%	57%	39%	IRL	50%	56%	50%	22%
NL	70%	65%	54%	37%	D	47%	40%	35%	20%
P	68%	65%	58%	51%	P	40%	37%	32%	32%
B	67%	58%	47%	23%	B	35%	35%	25%	0%
D	66%	52%	48%	40%	EL	32%	32%	32%	11%
EL	61%	54%	52%	39%	NL	32%	26%	21%	5%
CH	60%	55%	49%	-	L	20%	15%	5%	5%
L	53%	47%	32%	15%	CH	6%	0%	0%	-

Table 5. Country ranking (European Commission, 2005).

At international level, the World Economic Forum's Networked Readiness Index (NRI) measures the propensity for countries to exploit the opportunities offered by ICT and is published annually. Table 6 illustrates the NRI rankings for the past 4 years for most EU countries as well as other countries with high NRI rankings.

Country	2002-2003	2003-2004	2004-2005	2005-2006
Australia	15	9	11	15
Austria	16	21	19	18
Belgium	22	24	26	25
Canada	6	6	10	6
Denmark	8	5	4	3
Finland	1	3	3	5
France	19	19	20	22
Germany	10	11	14	17
<b>Greece</b>	<b>42</b>	<b>34</b>	<b>42</b>	<b>43</b>
Hong Kong	18	18	7	11
Iceland	5	10	2	4
Ireland	21	22	22	20
Israel	12	16	18	19
Italy	26	28	45	42
Japan	20	12	8	16
Korea	14	20	24	14
Luxembourg	27	14	17	26
Malaysia	32	26	27	24
Netherlands	11	13	16	12
New Zealand	23	23	21	21
Portugal	31	31	30	27
Singapore	3	2	1	2
Spain	25	29	29	31
Sweden	4	4	6	8
Taiwan	9	17	15	7
United Kingdom	7	15	12	10
United States	2	1	5	1
<b>Countries measured</b>	<b>82</b>	<b>102</b>	<b>104</b>	<b>115</b>

Table 6. Greece NRI Ranking (World Economic Forum, 2006).

The above international ranking implies that despite the undertaken e-government initiatives, public sector's management methods and procedures in Greece are still inefficient, full of inherent weaknesses that need to be solved further. In specific areas, the results were relatively successful (e.g. Citizens Service Centres), but at the same time, they have to face certain public administration problems, failures

and controversies to effectively manage and fully utilize the potentials that ICTs offer in order to improve public sector services.

## Conclusion and Future Directions

The operation of public sector and the procedures, services or information for covering citizens' and companies' transactions require an open, transparent, effective and responsible environment, as a basic precondition for economic growth and citizen service. This plays a significant role in the quality of life, as well as entrepreneurship and investments. In Greece the public sector's organization structure and operation is characterised by reduced efficiency. Complex regulatory frameworks, division of competencies among a large number of services and administration levels, unnecessary workload, costs and red tape, reduced incitement, inadequate mobility and formalism constitute the major administrative burdens that affect Greek public sector and economy activity growth.

Greek Public Administration modernization is a necessity imposed by the increase of the quality of service delivery and the reduction of the transaction costs (National Strategic Reference Framework 2007-1013, 2006). Greek transition to the IS, even if it is temporally delayed, it is in the stage of maturation, building on the previous experience and correcting the weaknesses within the framework of 2<sup>nd</sup> CSF. However, the undertaken reform initiatives are not yet complete and new actions need to be addressed in order to contribute to the attainment of high quality public services.

The OPs are based henceforth on the integrated planning of OPIS, eliminating the initial fragmentation of the individual actions. The public agencies are not anymore reserved towards outsourcing, and information technology companies have acquired adequate experience. The proposed interventions, finally, will be realized under the light of best practices and particular effort will be made for the training of human capital.

The vision of an electronically modernized Greek Public Administration, as reflected in the business plans, should not take the form of another list of good intentions which will fail to get actually implemented. It should be shaped within the body of Greek Public Administration. The only way to success, apart the effective operational coordination at an organizational level, is the strict implementation according to the time schedule and the budget, as well as the rational monitoring and evaluation of the process through clear quantitative and qualitative indicators.

The Hellenic E-government Strategy advocates that electronic services (e-services) should be characterized by ubiquity, uniqueness of reference (i.e. single point of service), de-materialisation, quality and cost-effectiveness. E-services are seen as essential business infrastructures that should only be planned and deployed as such. The Greek government set out essential methodological steps for developing and implementing e-services that included (State Services Commission, 2004):

- identifying critical areas of service.
- determining business priorities and critical success factors.
- identifying business partners and building consensus.
- determining the scope of a pilot application.

One step to solve the problems outcome above, is the formation of dedicated e-government legislation in Greece. Additionally, there is currently no legislation governing the use of electronic means in public procurement in Greece.

Moreover, the reengineering of the internal processes has, surely, to be achieved at a maximum degree, since it is the basic prerequisite for the modernization of the Public Administration according to the

basic principles of e-government. On the other hand, the effective dissemination of information, both within the framework of the organizational coordination, and towards the improvement of the electronically provided services to the end users, cannot be easily controlled from the very beginning. The general culture of the Greek society is the main factor which will set, on the one hand the level of inter-agency cooperation for the production of qualitative outputs and outcomes, and on the other hand, the e-government acceptance degree by the citizens-customers.

The planners in each agency should take into consideration the aforementioned critical factors for the maximization of the benefits resulting from the e-government projects and re-adjust the strategic goals, in accordance with the changes in the preferences of the end users and the speedy developments in the IT sector.

## References

- AOEMA (2007). Stages/Phases of E-government, [http://www.aoema.org/E-Government/Stages-Phases\\_of\\_e-government.htm](http://www.aoema.org/E-Government/Stages-Phases_of_e-government.htm) (accessed 31.08.2007).
- ARIADNI II (2007). Development and Operation of the Main Information, Support and Interconnection System of Citizens Service Centre. <http://www.kep.gov.gr/portal/page/portal/MyNewPortal/Tools/AriadniIII> (accessed 31.08.2007).
- Baum, C., & Di Maio, A. (2000). Gartner's Four Phases of E-government Model. GartnerGroup.
- Boufeas G., Halaris I., & Kokkinou A. (2004). Business Plans for the Development of E-government in Greece. An Appraisal, UNTC Occasional Papers Series No 5, <http://unpan1.un.org/intradoc/groups/public/documents/UNTC/UNPAN014633.pdf> (accessed 31.08.2007).
- CSF (2006). Hellas Community Support Framework 2007-2013 Programming Period. [http://www.hellaskps.gr/Index\\_en.htm](http://www.hellaskps.gr/Index_en.htm) (accessed 31.08.2007).
- Dawes, S. (2002). The Future of E-government. Center for Technology in Government, University at Albany/SUNY, [http://www.ctg.albany.edu/publications/reports/future\\_of\\_egov/future\\_of\\_egov.pdf](http://www.ctg.albany.edu/publications/reports/future_of_egov/future_of_egov.pdf) (accessed 31.08.2007).
- E-ASEAN Task Force (2007). <http://www.aseansec.org> (accessed 31.08.2007).
- Egov (2003). E-government Strategy, Implementing the President's Management Agenda for E-government, [http://www.whitehouse.gov/omb/egov/2003egov\\_strat.pdf](http://www.whitehouse.gov/omb/egov/2003egov_strat.pdf) (accessed 31.08.2007).
- E-governance Institute (2004). Concepts and Principles of E-governance. Rutgers University's National Center for Public Productivity, <http://www.andromeda.rutgers.edu/~egovinst/Website/institutepg.htm> (accessed 31.08.2007).
- EPE (2006). Informatics Review Survey in Greece. Hellenic Informatics Union, <http://www.epe.org.gr/meleth> (accessed 31.08.2007).
- Europa (2003). The Role of eGovernment for Europe's Future. Communication From the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, <http://europa.eu.int> (accessed 31.08.2007).
- European Commission (2005). Online Availability of Public Services: How is Europe Progressing?, European Commission Directorate General for Information Society and Media, [http://www.observatory.gr/files/meletes/egov\\_benchmarking\\_2005.pdf](http://www.observatory.gr/files/meletes/egov_benchmarking_2005.pdf) (accessed 31.08.2007).
- General Secretariat of Information Systems (2007). <http://www.gsis.gr> (accessed 31.08.2007).
- General Secretariat of Public Administration and Electronic Governing (2007). <http://www.gspa.gr> (accessed 31.08.2007).
- Gouscos, D., Mentzas, G., & Georgiadis, P. (2001). Planning and Implementing E-government Service Delivery: Achievements and Learnings from On-Line Taxation in Greece. Workshop on E-government at the 8th Pan-Hellenic Conference on Informatics, Nicosia, Cyprus, November 8-10.
- Greece in the Information Society: Strategy and Actions (2002). <http://ec.europa.eu/idabc/servlets/Doc?id=22349> (accessed 31.08.2007).
- Greek Digital Strategy (2005). [http://www.infosoc.gr/NR/rdonlyres/A13F889F-DE92-4DCF-B64A-37351BFC69B9/3053/ktp\\_all.pdf](http://www.infosoc.gr/NR/rdonlyres/A13F889F-DE92-4DCF-B64A-37351BFC69B9/3053/ktp_all.pdf) (accessed 31.08.2007).
- Greek E-government Factsheet (2007). European Communities. <http://www.epractice.eu/files/media/media732.pdf> (accessed 31.08.2007).
- Hahamis, P., Iles, J., & Healy, M. (2005). E-government in Greece: Bringing the Gap Between Need and Realty. The Electronic Journal of E-government, 3(4): 185-192, <http://www.ejeg.com> (accessed 31.08.2007).

- Hiller, J.S., & Belanger, F. (2001). Privacy Strategies for Electronic Government. Virginia: The Pricewaterhouse Endowment for the Business of Government.
- i2010 (2006). Online Availability of Public Services: How Is Europe Progressing? Web Based Survey on Electronic Public Services Report of the 6<sup>th</sup> Measurement, June 2006, [http://europa.eu.int/information\\_society/eeurope/i2010/docs/benchmarking/online\\_availability\\_2006.pdf](http://europa.eu.int/information_society/eeurope/i2010/docs/benchmarking/online_availability_2006.pdf) (accessed 31.08.2007).
- IDABC eGovernment Observatory (2006). eGovernment in Greece, November 2006, v.7.0, <http://ec.europa.eu/idabc/servlets/Doc?id=27201> (accessed 31.08.2007).
- Informatics Development Agency (2004). Network Syzefxis, <http://www.syzefxis.gov.gr> (accessed 31.08.2007).
- Layne, K., & Lee, J. (2001). Developing Fully Functional E-government: A Four Stage Model. *Government Information Quarterly*, 18: 122-136.
- McFarlan, F.W., McKenney, J.L., & Pyburn, P. (1983). The Information Archipelago - Plotting a Course. *Harvard Business Review*, 61(1): 145-156.
- McIver, W.J., & Elmagarmid, A. (2002). *Advances In Digital Government: Technology, Human Factors, and Policy*. Kluwer Academic Publishers.
- National Strategic Reference Framework 2007-1013 (2006). Ministry of Economy and Finance, General Secretariat on Investments and Development [http://www.mnec.gr/export/sites/mnec/en/economics/National\\_Strategic\\_Reference\\_Framework\\_for\\_2007-13/ESPA\\_eng.pdf](http://www.mnec.gr/export/sites/mnec/en/economics/National_Strategic_Reference_Framework_for_2007-13/ESPA_eng.pdf) (accessed 31.08.2007).
- Ndou, V. (2004). E-government for Developing Countries: Opportunities and Challenges. *Electronic Journal on Information Systems in Developing Countries (EJISDC)*, 18(1): 1-24.
- Observatory for the Greek Information Society (2005). Best Practices in the ICT Sector, European Countries, [http://www.observatory.gr/files/meletes/Best%20Practices%20in%20the%20ICT%20sector\\_GR\\_11.10.05.pdf](http://www.observatory.gr/files/meletes/Best%20Practices%20in%20the%20ICT%20sector_GR_11.10.05.pdf) (accessed 31.08.2007).
- Observatory for the Greek Information Society (2006). Study to Create Infrastructure to Observe Operational Programme for the Information Society and Programming Complement Indicators. Deliverable: Operational Programmes for the Information Society in other EU Countries, [http://www.observatory.gr/files/meletes/Π1b\\_final.pdf](http://www.observatory.gr/files/meletes/Π1b_final.pdf) (accessed 31.08.2007).
- Reddick, C.G. (2004). A Two Stage Model of E-government Growth: Theories and Empirical Evidence for U.S. Cities. *Government Information Quarterly*.
- Riedl, R. (2003). Design Principles for E-government Services. Proceedings of the eGov Day, Vienna, Austria, <http://www.ifi.unizh.ch/egov/Wien03.pdf> (accessed 31.08.2007).
- Services and Institutions Registry of Greek Public Administration (2005). <http://www.gspa.gr/%283011133085971299%29/documents/egkyklioι/δοα/μητρωο%20δημοσιω%20φορεω%20int.doc> (accessed 31.08.2007).
- State Services Commission (2004). Channel Strategy: Summary of International E-Service Initiatives Terms and Definitions. E-government Unit, [http://www.e.govt.nz/\\_NONarchive/policy/participation/participation-0305/participation-0305.pdf](http://www.e.govt.nz/_NONarchive/policy/participation/participation-0305/participation-0305.pdf) (accessed 31.08.2007).
- Tambouris, E., Gorilas, S., & Boukis, G. (2001). Investigation of Electronic Government. Proceedings of the 8<sup>th</sup> Pan-Hellenic Conference on Informatics, 2: 367-376, [http://www.egov-project.org/egovsite/tambouris\\_panhellenic.pdf](http://www.egov-project.org/egovsite/tambouris_panhellenic.pdf) (accessed 31.08.2007).
- World Economic Forum (2006). <http://www.weforum.org> (accessed 31.08.2007).



# A Comparative Analysis of Strategies for E-Government in Developing Countries

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## Abstract

*The adoption of e-government and effective use of Information and Communication Technologies (ICT) has the potential to yield significant benefits in the developing countries. This study investigates strategies to advance the use of ICT in the public sector in developing countries, with the aim of improving services and outcomes for government and citizens. A multi-level framework for analysis was developed. A meta-analysis of data gathered in a United Nations study of e-government readiness was performed, focussing on the developing countries that have greatly improved their relative positions recently. In general, the findings support the multi-level approach. At the national level, a low level of economic development, poor infrastructure and political unrest are inhibitors of public sector ICT progress. At a base level, access by individuals and organizations to ICT tools and IT-related education is necessary for e-government to be feasible. Some strategies were observed to be linked to progress with e-government across a number of developing countries, including leadership vision and willingness to initiate change within the government sector, an incremental, step-by-step approach to development, and sensitivity to local and cultural needs.*

## Keywords

*Least Developed Country (LDC), ICT adoption, Public Sector, e-government, ICT Strategy*

## Introduction

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The importance of Information and Communication Technologies (ICT) in developing countries is increasingly being recognized in academic literature although as yet no clear and comprehensive framework or theory has emerged for dealing with the very complex issues involved. Kelegai and Middleton (2004, p.114) concludes that *IS (Information*

<sup>2</sup> A previous version of this paper using only 2004 data appeared as Imran, A. and Gregor, S. (2005). Strategies for ICT use in the public sector in the least developed countries: A cross-country analysis. In B. Campbell, J. Underwood, D. Bunker (Eds.). *Proceedings of the 16<sup>th</sup> Australasian Conference on Information Systems*, University of Technology, Sydney, Australia, 30 Nov. – 2 Dec, p. 32.

*Systems*) research in this area has been non cumulative and fragmented, lacking an overarching framework regarding the context in which effectiveness criteria are applied'. Heeks (2002, p.102) states that 'until very recently, the entire literature on IS and developing countries would struggle to fill a single bookshelf'. Empirical research studies are few and scattered, although a number of international bodies and organizations including the United Nations Development Program (Accenture, Markle-Foundation and UNDP 2001; ASPA and UNDPEA 2001), International Telecommunication Union (ITU 2002) and the World Bank (2002, 2005) have carried out comprehensive investigations of ICT in developing countries.

The current study focuses on the use of ICT in the public sector in Least Developed Countries (LDCs). The public sector plays a leading role in ICT adoption and use in LDCs, being the largest user of computers and thus is able to exert considerable influence on the diffusion of ICT throughout the country through its policies and regulations (Flamm 1987; Nidumolu, Goodman, Vogel and Danowitz 1996). Adoption and implementation of ICT in public sector government agencies can pave the way for ICT diffusion in the country as a whole. The spheres of influence for public sector organizations using ICT include (i) improving government processes (*e-Administration*); (ii) connecting citizens (*e-Services*); and (iii) building external interactions (*e-Society*). Taken as a whole these activities can be referred to as *e-government* (Heeks 2004).

The lead author was personally motivated to undertake this research by his own experience working with ICT in the government sector in Bangladesh. It was observed that ministerial departments felt unable to take full advantage of ICT to increase efficiency or improve citizen access to government. The gap between government and citizen was increasing, allowing bureaucracy, lack of transparency and potentially corruption. The use of legacy systems meant that having to queue for hours to collect a government form was still a common occurrence. A need for further knowledge and strategic direction was strongly felt within the government sector.

Against this background, the aim of the current study was to investigate strategies to advance the use of ICT in the public sector in LDCs, with a view to constituting a framework and guidelines for other developing countries to improve services and outcomes for government and its citizens. The successful strategies and best practices followed by those countries could provide important lessons for other LDCs and also a focus for further research.

The paper proceeds as follows. Relevant prior research is reviewed to give a framework for the study. The meta-analysis of changes in e-government readiness across a number of LDCs is then described and conclusions drawn as to the strategies that are proving effective for use of ICT in the public sector.

## Conceptual Background

The theories drawn upon for studying globalization, the Digital Divide and e-government are diverse and no single theoretical approach has yet found favour (Walsham and Sahay 2006). Theories used include the Theory of Reasoned Actions (TRA) (Fishbein and Ajzen 1980), the Technology Acceptance Model (TAM) (Davis, Bagozzi and Warshaw 1989) and Diffusion of Innovations Theory (DOI) (Rogers 1995). Other theorists drawn upon include Castells (1996, 2000; Castells 2000) perspectives on globalization, theory relating to information infrastructure (Rolland and Monteiro 2002) and broad meta-theoretical perspectives such as structuration theory (Giddens 1984) and actor-network theory (Latour 1991).

Problems have been noted with a number of the theories used. One problem is that they have been developed and tested primarily in the context of developed or western countries and are possibly not relevant in the context of many developing countries and LDCs. The Diffusion of Innovations theory grew out of the diffusion of farm innovations in developing countries (Rogers 1995, p.59). Rose and Straub (1998, p.40) note that: 'Of the 70 IT-based studies which either confirmed or extended the DOI model surveyed, none were conducted within developing nations'. Straub and his associates carried out a series of investigation in Arab countries using TAM and initially found it was applicable (Rose and



Straub 1998). Further studies, however, pointed out that a culture-influence modelling approach was needed to understand the effect of cultural beliefs by examining them individually in their respective cultural contexts (Straub, Loch and Hill 2003). A second problem is that the unit of analysis in many studies is not clearly specified and the complexities of the interrelationships among differing units of analysis are not well understood. Studies have taken as their focal units the individuals in a country, particular projects or organizations, or the country as a whole.

In light of the paucity of theoretical guidance in the extant literature, this study adopts a grounded approach (Glaser and Strauss 1967) within a contextual framework derived from the literature. A framework is used that provides a means of handling the complexity of the interactions between citizens, organizations, the government and other industry sectors, and the national and international context. It also allows for the reflexivity of these interactions. Although our study focuses on government use of ICT, it is necessary to consider the government sector in interaction with entities and structures at other levels, which will both constrain and enable the actions a government can take. Figure.1 depicts the multi-layered approach to the problem, envisaged as something like the successive layers of an onion. At each level the actions of entities within that level are both constrained and enabled by the structures of the levels above them, and in turn, through their actions, affect the structures that are in their immediate environment through cycles of reciprocal change.

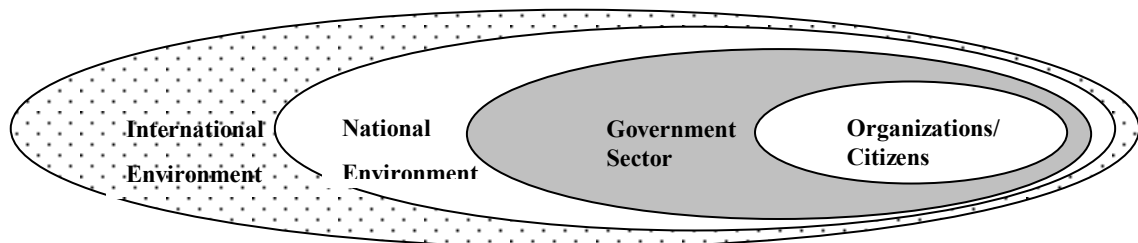


Figure 1: A multi-level approach to the use of ICT

Table.1 shows a summary of the influences at these different levels of analysis that have been implicated in ICT adoption and use in developing countries in prior studies.

Table 1: Multi-level influences on ICT adoption in developing countries

Level	Influences on ICT related activities	Countries studied	Influences and studies
International	International agencies	India	Promotion of Information Technology ( IT) through domestic and foreign investment should be the first area of policy (Nair and Prasad 2002)
National	Economy	World	Lack of an economic environment conducive to investment is a problem (Rodriguez and Wilson 2000)
		Nigeria	Political economy is the main differential between DCs and LDCs, not culture (Korpela 1996)
	World	Need a climate of civil liberties conducive to research and expansion of communication (Rodriguez and Wilson 2000)	
	Asia	Authoritarian regimes shape diffusion of ICTs to their political advantage by exerting control and censorship (Kalathil and Boas 2001)	
	Malaysia	Political stability is an important factor (Raman and Yap 1996)	
	Bangladesh	Political will from the top is very important (Sobhan, Shafiullah.M, Hossan and Chowdhury 2004)	

	Culture	5 Arab Countries	Socio conflicts occur because technologies are culturally biased in favour of developed countries (Hill, Loch, Straub and El-Sheshai 1998)	
		Arab	Culturally appropriate IT design can enhance transfer (Straub, Loch et al. 2003)	
		Jamaica and Tanzania	Socio-cultural aspects can be highly influential (Hagenaars 2003)	
	Infrastructure	Many countries	Lack of infrastructure is a primary problem. Asian countries lag non-Asian countries (Wong 2002; Wresch 2003; UN 2004)	
	ICT policy/ strategy	Nepal	Government needs to provide a lead (Pradhan 2002)	
		Pakistan	Development policy and economic aspirations have strong linkages between direct ICT interventions (Mujahid 2002)	
		Malaysia	Step-by-step approach could be a model for countries with agricultural and natural resources (Raman and Yap 1996)	
		World	Policies need to be: (i) long term; (ii) aimed at building capabilities; (iii) adaptive to changing context; and (iv) synergistic with other ongoing national programs (Checchi, Hsieh and Straub 2003)	
		LDCs	Avoid over ambitious top-down approaches and stress virtues of multi-stakeholder involvement (Accenture, Markle-Foundation et al. 2001)	
		Many	Need to facilitate local cultural content (UN 2004)	
	<b>Government sector</b>	Administrative practice/ reform	Sudan	Lack of systematic principle and procedures in the system is a hindrance, embodying working procedures, managerial style and HRM policy (Higgo 2003)
			Asia	There is a close relationship between e-government and administrative reform (Ahlert 2001)
World			The administrative reform process must be continuous (OECD 2003)	
Bureaucracy		Developing Country	Bureaucratic establishments pose insurmountable obstacles for introducing and sustained use of IT (Avgerou 1990)	
e-government strategy		World	Government needs to take the lead in establishing, reforming and regulating (UN 2004)	
Government regulation		LDCs	Necessary, since social counter pressures are unable to soften the impact (Filho, Padua and Luna 1982)	
Knowledge of ICT		Bangladesh	Need awareness and knowledge of ICT among government officials (Sobhan, Shafiullah.M et al. 2004; Taifur 2004)	
<b>Organizational</b>	Top management support	Indonesia	Most important factor for successful development of IS (Kandelin, Lin and Muntoro 1998)	
		Malaysia	Support from top management is a success factor (Zaitun, Mashkuri and Wood-Harper 2000)	
		Bangladesh	Initiative from top level officials is crucial (Taifur 2004)	
	Management knowledge of ICT	Papua New Guinea	Lack of understanding of ICT amongst top management is a drawback (Kelegai and Middleton 2004)	
	Organizational culture/ values	Kuwait	IS managers in different countries focus on different management areas based on local conditions (Alshawaf and Delone 2002)	
		Egypt	Understanding existing organizational culture has a direct and positive impact (Serour and Henderson-Sellers 2002)	
Institutional development / capacity	LDCs	Institutional development is more important than 'bridging the digital divide' (Daly 2004)		
<b>Individual citizens</b>	Penetration of IT Technology tools	All	A core set of basic tools (personal computers, mobile/handheld devices, hybrid devices) must be affordable to the majority of the population (UN 2004)	

		LDCs	Develop innovative behaviour in the societies to achieve pervasive ICT adoption (Corea 2000)
	Education	All	Education related to technology is needed (Rice 2003; UN 2004)

Of particular interest for this study are the strategies and approaches different developing countries are using to promote more effective use of ICT in the government sector (e-government). The strategies implicated in prior studies include reform of administrative procedures, lessening of bureaucracy and increased knowledge of ICT within government agencies. The government sector is also expected to take a leadership role in promoting ICT and in building a regulatory regime and organisational environment that allows ICT use to flourish. The public sector can promote ICT use indirectly through its influence over the enabling conditions at other levels in our analytical framework, including encouragement of foreign investment, multinational involvement and ICT educational programs. Network effects, however, mean that the citizens and organizations in a country must be in state of readiness to use ICT before they can take full advantage of public sector initiatives to provide government services electronically.

The ICT uptake by the government sector internally (G2G), which is our focus of study, is a precondition for the ultimate success of e-government, where connecting citizens to government system is the major objective. To reach that stage, governments need to develop their own structures and mature systems with intra- and inter-agency IS implementations.

## Methodology

Prior academic research studies of ICT use in LDCs have tended towards in-depth case studies of single countries (Walsham and Sahay, 2005). While this approach gives valuable insights into particular projects and initiatives, it does not give cross-country comparisons. In this study we have performed a meta-analysis of the data available in the *United Nations Global e-Government Readiness Report* (UN 2004; 2005), which gives data on the 191 member states for 2003, 2004 and 2005. In these yearly reports each member state is given an *e-Government readiness index* based on a weighted average composite figure calculated from (1) website assessment, (2) telecommunications infrastructure and (3) human resource endowment. The index is a 'measurement of the capacity and willingness of countries to use government for ICT-led development' (UN, 2004, p. 13) and incorporates accessibility issues like infrastructure and educational levels to judge the preparedness of a country in using ICT for national, economic, social and cultural empowerment of its people.

Our interest is in assessing what government strategies have been associated with a greater use of ICT for e-government in developing countries. One indication of the advance in e-government in a country can be found by comparing the rankings of a country from one year to the next (eg. from 2003 to 2004) and examining the strategies employed in those countries that have exhibited the largest jumps from one rank to a higher rank. Countries are ranked relative to each other, so a position of number 10, means that a country is the 10<sup>th</sup> ranked country of the 191 studied. The fact that a country drops in rankings from one year to the next, however, does not necessarily mean that its own e-government rating has decreased - rather other countries may have advanced comparatively more in the same time frame and overtaken them.

As prior work has shown that there are dramatic differences in ICT adoption between developed and developing countries, we have focussed our analysis on the developing countries, drawing data from 2003, 2004 and 2005 UN reports. We focussed on the developing countries which had the greatest relative change upwards ( $\Rightarrow 10$ ) in their readiness index from 2003-2004. Further analysis of qualitative data in this UN report allowed identification of trends and patterns across the more successful countries. An analysis of 2004-2005 changes was also performed, although the 2005 report had less detail on the strategies used by each country .

## Effective Strategies for the Public sector in Developing Countries

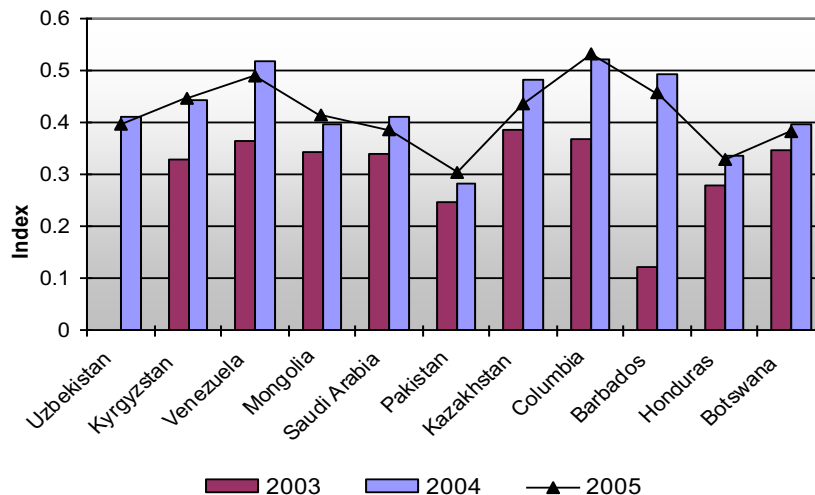
The UN global e-government readiness report gives data for all the 191 member states. The e-readiness index in 2005 shows the leading countries as the United States, Denmark, the United Kingdom and Sweden. Compared with 2004, the top 25 positions were occupied by the same set of developed countries with just a minor reshuffling of ranks among them. The top countries and their indexes were United States (.9062), Denmark (.9058) and Sweden (.8983). The average index across all 191 countries was (.4267). Widespread disparity among countries and regions was observed. The regions of Africa (.2642) and South and Central Asia (.3448) were far behind the rest of the world in almost all aspects of ICT development for e-government access.

### Strategies and Comments for the years 2003-2004

Table 2 shows those developing countries that rose most markedly between 2003 and 2004, with a change in ranking of +10 or greater and highlights the main strategies they used. The 10 countries that were ranked lowest in 2004 were Chad, Ethiopia, Afghanistan, Mali, Niger, Timor-Leste, Micronesia, Marshall Islands, Palau and Nauru. The index figures of 2005 for developing countries with greatest advance shows in absolute terms that the majority at least maintained the level they had reached in 2004. Figure 2 presents the readiness indices for these countries from 2003-2005 graphically.

**Table 2.** Developing countries with the greatest advance in e-government readiness rank 2003-2004

Country	Region	Index 2004	Rank 2004	Rank 2003	Change	Characteristics of strategies employed
Uzbekistan	S/Central Asia	.3965	81	Not ranked	>173	Effort to avoid language barriers with multi-language sites.
Kyrgyzstan	Central Asia	.4468	66	110	+44	Provision of e-services according to indigenous priorities development plans.
Venezuela	S America	.4898	56	93	+37	A strong commitment to education, online services, interactive features, poll and open discussion forums.
Mongolia	E Asia	.4152	75	103	+28	Priorities and political willingness allowed 'leapfrogging' to higher stages and bypassing of intermediate stages.
Saudi Arabia	W Asia	.3858	90	105	+15	Expansion and improvement of overall sectoral presence online.
Pakistan	S/Central Asia	.3042	122	137	+15	A simple and illustrative model of steady incremental development
Kazakhstan	S/Central Asia	.4813	69	83	+14	Heavy investment in designing e-strategies and programs with an outreach message.
Columbia	S/Central America	.5335	44	57	+13	A much improved one stop-shop e-government portal.
Barbados	Caribbean	.4563	65	76	+11	Commitment to e-services online even with limited resources.
Honduras	S/Central America	.3301	113	124	+11	Impressive education sector services and discussion forums.
Botswana	Africa	.3827	91	101	+10	Proves incremental implementation can be highly successful if done professionally and strategically.



**Figure 2:** eGovernment readiness indices for developing countries that improved their ranking from 2003-2004

The results of this survey overall support the multi-layered model presented in Figure 1. The obvious effects of factors at the national level that affect uptake of ICT in government include the political situation and the economic situation. Governments in high-income countries were well advanced in terms of their provision of public information, online services, and electronic access to government. The bottom 40 countries had made relatively little progress between 2003 and 2004. The UN report comments on the problems with the countries of South and Central Asia:

*Despite progress, the lack of infrastructure and education is the most serious barrier to further expansion of e-government. The enabling environment in many countries in the region is characterized by irregular or non-existent electricity supplies, especially outside large cities, telephones remain luxury items and internet access is available to only the privileged few in the upper income bracket. South and Central Asia is home to about 25 percent of the world's population but has a GDP (Gross Domestic Product) per capita equal to 10 percent of the world average and 1.6 percent of the United States (UN 2004, p. 43).*

The interrelationships among the levels is also obvious, with countries that make an advance in e-government also showing a rise in factors operating at the level of individuals and organizations, such as the degree of penetration of technology tools and ICT literacy.

### Factors associated with advancement from 2003-2004

It is instructive to consider some of the strategies employed in those developing countries with a significant improvement in more detail. Although these countries have the problem of using technologies that were designed in developed countries with differing cultures, yet they have managed some success.

Uzbekistan showed the greatest rise, going from no government online presence to 81<sup>st</sup> in the world. The progress made in Uzbekistan is a response to the growing number of Internet users in the country, which has doubled in the recent past. Approximately 73% of users are in the capital of Tashkent and rely on Internet cafes for access. The government has attempted to ameliorate language barriers by providing content in native Uzbek, Russian and English. Even though the government web site provides only limited information, it encourages feedback with a web content form and clear and accessible information. The UN report sees Uzbekistan as a good illustration of what a country can accomplish with e-government with even a modest level of resources and planning effort.

Kyrgyzstan, a relatively new independent state with low economic status, made a breakthrough within a year to rise 44 places in the global rankings. Kyrgyzstan provides an example of the provision of government services focussing on indigenous priorities and development plans.

Mongolia made the greatest advance among the countries in South and Eastern Asia, jumping 28 places from 103 to 75. It provides an interesting example:

*Mongolia's e-government efforts prove that stages of e-government need not be additive. Depending on their priorities and the political willingness, countries can 'leapfrog' to higher more mature stages of service delivery even bypassing transactional stages which require, among other things, sophistication of financial systems... Unlike most other countries, the Mongolian site has advanced into the networked presence without the typical incremental coverage of all the basics. The e-participation mechanism includes an online legislative and online policy forum. Both are frequently used and appear to be very popular (UN 2004, p. 33).*

However, although some Central and South East Asian countries demonstrated best practices and steady progress, other countries located in the same region were lagging and falling further behind: For example, Indonesia (-15), Philippines (-14), and Vietnam (-15). Some countries in this region showed no change, including Nepal, Bangladesh, Bhutan, Myanmar, and Laos.

### Strategies and Comments for the years 2004-2005

A similar analysis was also carried out with 2005 report taking the countries which had jumped 10 or more positions in 2005. Table 3 lists those developing countries that advanced their ranking in 2005. But this time a completely new set of countries was found, including many that were significantly lagging in 2003-2004. This finding is likely in part a function of the fact that ranking data is used, so that a country that is relatively low ranked in one year has a much greater chance of improving its relative position in the following year.

**Table 3.** Developing countries with the greatest advance in e-government readiness rank (2004-2005)

Country	Region	Index 2005	Rank 2005	Rank 2004	Rank 2003	Change 2003-04	Change 2004-05
Egypt	Africa	.3793	99	136	140	+4	+37
Bhutan	S Asia	.2941	130	165	161	-4	+35
Saint Vincent and the Grenadines	Caribbean	.4001	88	119	111	-8	+31
Timor-Leste	SE Asia	.2512	144	174	169	-5	+30
Kuwait	W Asia	.4431	75	100	90	-10	+25
UAE	W Asia	.5718	42	60	38	-22	+18
Qatar	W Asia	.4895	62	80	77	-3	+18
Islamic Republic of Iran	Asia	.3813	98	115	107	-8	+17
Oman	W Asia	.3405	112	127	98	-29	+15
Antigua and Barbuda	Caribbean	.4010	86	99	92	-7	+13
Cyprus	W Asia	.5872	37	49	51	+2	+12
Georgia	W Asia	.4034	83	94	99	+5	+11
Guatemala	S America	.3777	100	111	109	-2	+11
China	SE Asia	.5078	57	67	74	+7	+10
Saudi Arabia	W Asia	.4105	80	90	105	+15	+10
Zimbabwe	Africa	.3316	120	130	116	-14	+10
Ghana	Africa	.2866	133	143	-4	-4	+10

- Shaded ones progressed in consecutive years

Unfortunately, detailed characteristics and strategies behind each country's advance were not articulated clearly in the 2005 report. However, some strategies similar to those observed in the 2004 report were noted, including the development of national portals, an increase in online presence, new service delivery, steady improvement, more dedication and commitment, deregulation of telecommunications. In addition to political commitment, the 2005 UN report also identified 'a well thought out vision' and 'do-

able objectives' as important markers for a successful eGovernment development. There was good progress in Arab countries in 2005 tending to refute the previous notion of cultural barriers in technology adoption, especially in Arab countries (Hill, Loch et al. 1998; Straub, Loch et al. 2003).

## Trends

Overall, our analysis identified a number of themes that were common in a number of the LDCs showing improved rankings compared with others. These themes were:

- (1) *Leadership and political willingness to initiate change within the government sector* was evident in the majority of countries with improved positions. Malaysia for example, has a Malaysian Administrative Modernization and Management Planning Unit (MAMPU) that seeks to enhance the use of ICTs and has mandated that each government agency create an IT strategy to help facilitate greater communication between agencies and the public.
- (2) *An incremental step-by-step approach to development* was also common across the majority of the LDCs with a step up in ranking. Examples include Pakistan (+15, 2004), Saudi Arabia (+15, 2004), China (+7, 2004, +10, 2005), Thailand (+6, 2004) and Kuwait (+25, 2005). There was limited evidence of top down long-range planning approaches that had noticeable effects (possibly because of the generally low level of maturity in ICT planning and adoption).
- (3) *'Leap frogging' is possible*. It is not necessary to go through steps or stages in a fixed sequence. Mongolia is an illustration, advancing considerably although it bypassed a transactional stage.
- (4) *Sensitivity to local and cultural needs in the development of web sites* was evident in countries including Uzbekistan (>173, 2004) and Kyrgyzstan (+44, 2004), Egypt (+37, 2005).

Overall, the finding from this analysis are congruent with the framework established from prior studies, with all three of these themes having been identified in prior work (Table 1), the exception being the 'leapfrogging' effect. In contrast, administrative reform was identified by Higgs (2003) as a hindrance to advancement, but was not emphasized in the UN report. The analysis and trends in different years further reveals that success in eGovernment in LDCs does not necessarily involve a long term planning process. Rather, good intentions coupled with political will and effective drive can change a country's status. This observation reinforces the findings and recommendation in other literature concerning the importance of leaders with a clear vision who champion ICT in developing countries.

## Conclusion

The aim of this study was to investigate strategies to advance the use of ICT in the public sector in developing countries so as to improve the services and outcomes for government and citizens. A conceptual framework for the study was developed from prior literature with a multi-level analysis, depicting influences on the ability of the government sector to engage in e-government at the international and national levels and reciprocal relationships with the preparedness at the organizational and individual level in terms of the penetration of IT tools and appropriate education.

A meta-analysis of data gathered from a UN study of e-government readiness was performed, focussing on the developing countries that had exhibited the greatest change in their ranking from 2003 to 2004 and then 2004 to 2005. Patterns that typified the successful countries in comparison with their less successful counterparts were extracted by studying the qualitative data in the report. In general, the findings support the multi-level framework that was suggested by prior literature. At the national level, a low level of economic development, poor infrastructure and political unrest are inhibitors of public sector ICT progress. At the lowest level, individuals require access to ICT tools and IT-related education to set up the conditions under which e-government is feasible. The only level where there was no data to support expected relationships was at the international level, where none of the case studies mentioned international investment or multi-national firms. Possibly these factors are less evident when studying government sector advances, rather than the private sector.

However, even amongst the LDCs, which all suffer to some extent from an environment inimical to e-government growth, some strategies appear to lead to success: leadership and willingness to initiate change within the government sector, an incremental, step-by-step approach to development, and some sensitivity to local and cultural needs in the development of web sites. Our results suggest some strategies can be used with success in more than one country. These strategies provide a general direction that can guide actions to be adapted by respective governments. However, one has to be cautious, as some studies reinforce the idea that the environment of each LDC is unique (Montealegre 1999) and that there is no 'one size fits all' approach (Accenture, Markle-Foundation et al. 2001).

There are a number of limitations to this study. For empirical evidence it has relied on secondary sources, with a meta-analysis of data in a worldwide UN study. Although the UN study was comprehensive and rigorous, its purpose was not the same as ours and so the data we could glean is necessarily limited. The absence of evidence for relationships may be because relevant data was not collected, not because the relationship does not exist. Further, the use of the change in eReadiness ranking as a sign of progress is indicative rather than a firm measure. As the majority of the developing countries are at very low levels of eReadiness, even modest development in e-government can result in a dramatic change in ranking. However, the lack of prior academic research on a world-wide scale means that our approach has some justification.

The study is a preliminary one, and further work is anticipated using the framework developed here as a base, with on-the-ground case studies of LDCs. The study is significant in that it contrasts findings from a large scale study with a framework of influences derived from a scattered literature. It brings together literature from both academic resources and reports funded by international agencies to give a good base for understanding the complex phenomenon involved.

## References

- Accenture, Markle-Foundation and UNDP 2001, 'Creating a Development Dynamic', *Digital Opportunity Initiative*. URL: <http://www.opt-init.org/framework.html> Accessed 11 July 2005
- Ahlert, C. 2001, 'Conference Report, Digital Opportunity Forum – Asian Diversity and the Role of Japan', Center for Global Communications, Tokyo. [http://www.glocom.ac.jp/dof/dofreport/dof\\_report.pdf](http://www.glocom.ac.jp/dof/dofreport/dof_report.pdf). Accessed 20 July 2006
- Alshawaf, A. and Delone, W. 2002, 'IS Management Issues in Kuwait: Dimensions and Implications', *Journal of Global Information Management*, vol. 10, no. 3, pp. 72-80.
- ASPA and UNDP 2001, 'Benchmarking E-Government: a Global Perspective', URL: [http://pti.nw.dc.us/links/docs/ASPA\\_UN\\_egov\\_survey.pdf](http://pti.nw.dc.us/links/docs/ASPA_UN_egov_survey.pdf) Accessed 11 July 2006
- Avgerou, C. 1990, 'Computer-Based Information Systems and Modernization of Public Administration in Developing Countries', in Bjorn-Andersen, S. C. B. a. N. (Ed.) *Information Technology in Developing Countries*. The Netherlands, Elsevier Science Publishers.
- Castells, M. 1996, *The Rise of the Network Society*, Blackwell.
- Castells, M. 2000, 'Globalization in the Network', *Prometheus Journal*, vol. 4, no. pp. 109-123.
- Checchi, R. M., Hsieh, J. J. P.-A. and Straub, D. W. 2003, 'Public IT Policies in Less Developed Countries: A Critical Assessment of the Literature and a Reference Framework', *Journal of Global Information Technology Management*, vol. 6, no. 4, pp. 45.
- Corea, S. 2000, 'Cultivating Technological Innovation for Development', *The Electronic Journal of Information Systems in Developing Countries*, vol. 2, no. 2, pp. 1-15.
- Daly, J. 2004, 'The Institutional Divide: Is The Digital Divide a Symptom or a Cause?' *Information and Communication Technologies for Development*. URL: <http://topics.developmentgateway.org/ict/rc/ItemDetail.do~1026042> Accessed 15 Sep 2006
- Davis, F. D., Bagozzi, R. P. and Warshaw, P. R. 1989, 'User Acceptance of Computer Technology: A Comparison of Two Theoretical Models', *Management Science*, vol. 35, no. 8, pp. 982-1003.
- Filho, P., Padua, W. and Luna, H. 1982, 'Social Impact of Automation: Some Specific Problems of LDCs', *Human Systems Management*, vol. 3, no. 4, pp. 311.
- Fishbein, M. and Ajzen, I. 1980, *Understanding Attitudes and Predicting Social Behaviour*, Eaglewood Cliffs, NJ, Prentice-Hall.



- Flamm, K. 1987, *Targeting the Computer: Government Support and International Competition*, Washington D.C., Brookings Institution.
- Giddens, A. 1984, *The Constitution of Society*, Cambridge, Polity Press
- Glaser, B. and Strauss, A. 1967, *The Discovery of Grounded Theory: Strategies for Qualitative Research*, Weidenfeld & Nicholson
- Hagenaars, M. 2003, 'Socio-cultural Factors and ICT Adoption', The International Institute for Communication and Development. <http://www.iicd.org/articles/IICDnews.import2069>. Accessed 10 June 2006
- Heeks, R. 2002, 'Information Systems and Developing Countries: Failure, Success and Local Improvisations', *Development Informatics*. Institute for Development Policy and Management, University of Manchester.
- Heeks, R. 2004, 'Basic Definitions Page', *eGovernment for Development, IDPM, University of Manchester*. <http://www.egov4dev.org/egovdefn.htm> Accessed 16 July 2006
- Higgo, H. A. 2003, 'Implementing an Information System in a Large LDC Bureaucracy: The Case of the Sudanese Ministry of Finance', *The Electronic Journal on Information Systems in Developing Countries*, vol. 14, no. 3, pp. 1-13.
- Hill, C. E., Loch, K. D., Straub, D. W. and El-Sheshai, K. 1998, 'A Qualitative Assessment of Arab Culture and Information Technology Transfer', *Journal of Global Information Management*, vol. 6, no. 3, pp. 29.
- ITU 2002, 'Improve Connectivity, Increase Access, and Lower Costs, Improving IP Connectivity in LDCs', *DOT Workshop Working Group N.2*. Geneva, ITU Headquarters
- Kalathil, S. and Boas, T. C. 2001, 'The Internet and State Control in Authoritarian Regimes: China, Cuba, and the Counterrevolution', Washington, DC, Carnegie Endowment for International Peace, Global Policy Program.
- Kandelin, N. A., Lin, T. W. and Muntoro, K. R. 1998, 'A study of the Attitudes of Indonesian Managers Toward Key Factors in Information System Development and Implementation', *Journal of Global Information Management*, vol. 6, no. 3, pp. 17-26.
- Kelegai, L. and Middleton, M. 2004, 'Factors influencing information systems success in Papua New Guinea organisations: a case analysis', *Australasian Journal of Information Systems*, vol. 11, no. 2, pp. 57-69.
- Korpela, M. 1996, 'Traditional Culture or Political Economy? On the Root Causes of Organizational Obstacles of IT in Developing Countries', *Information Technology for Development*, vol. 7, no. 1, pp. 29.
- Latour, B. 1991, 'Technology is Society Made Durable,' in A Sociology of Monsters: Essays on Power', in Law, J. (Ed.) *Technology and Domination*. London.
- Montealegre, R. 1999, 'A Temporal Model of Institutional Interventions for Information Technology Adoption in Less-Developed Countries', *Journal of Management Information Systems*, vol. 16, no. 1, pp. 207.
- Mujahid, Y. 2002, 'Digital Opportunity Initiative for Pakistan', *The Electronic Journal on Information Systems in Developing Countries*, vol. 8, no. 6, pp. 1-14.
- Nair, K. G. and Prasad, P. N. 2002, 'Development through Information Technology in Developing Countries; Experiences from an Indian State', *The Electronic Journal on Information Systems in Developing Countries*, vol. 8, no. 2, pp. 1-13.
- Nidumolu, S. R., Goodman, S. E., Vogel, D. R. and Danowitz, A. K. 1996, 'Information technology for local administration support: The Governorates Project in Egypt', *MIS Quarterly*, vol. 20, no. 2, pp. 197.
- OECD 2003, 'The E-Government Imperative', Organisation for Economic Co-operation and Development URL: <http://www1.oecd.org/publications/e-book/4203071E.PDF> Accessed 11 July 2006
- Pradhan, J. 2002, 'Information Technology in Nepal: What Role for the Government?' *The Electronic Journal on Information Systems in Developing Countries*, vol. 8, no. 3, pp. 1-11.
- Raman, K. S. and Yap, C. S. 1996, 'From a Resource Rich Country to an Information Rich Society: An evaluation on Information Technology Policies in Malaysia', *Information Technology for Development*, vol. 7, no. 3, pp. 109.
- Rice, M. 2003, 'Information and Communication Technologies and the Global Digital Divide Technology Transfer, Development, and Least Developing Countries', *Comparative Technology Transfer and Society*, vol. 1, no. 1, pp. 72-88.
- Rodriguez, F. and Wilson, E. J. 2000, 'Are Poor Countries Losing the Information Revolution?' *InfoDev Working Paper* Global Information and Communication Technologies Department.
- Rogers, E. M. 1995, *Diffusion of Innovations*, New York, Free Press.
- Rolland, H. and Monteiro, E. 2002, 'Balancing the Local and the Global in Infrastructural Information Systems', *The Information Society*, vol. 18, no. 2, pp. 87-100.
- Rose, G. and Straub, D. 1998, 'Predicting General IT Use: Applying TAM to the Arabic World', *Journal of Global Information Management*, vol. 6, no. 3, pp. 39.

- Serour, M. K. and Henderson-Sellers, B. 2002, 'The Role of Organizational Culture on the Adoption and Diffusion of Software Engineering Process: An Empirical Study', *IFIP TG8.6 Working Conference*.
- Sobhan, F., Shafiullah, M., Hossan, Z. and Chowdhury, M. 2004, 'Study of e-Government in Bangladesh', *Bangladesh Enterprise Institute and Asia Foundation. Dhaka. pp. 1-56*
- Straub, D. W., Loch, K. D. and Hill, C. E. (Eds.) (2003) *Transfer of Information Technology to the Arab world: A Test of Cultural Influence Modelling.*, Hershey Idea Group Publishing.
- Taifur, S. 2004, 'Comprehensive Study of eGovernment Initiatives in Bangladesh', *Planning Division, Ministry of Planning, Government of Bangladesh. pp. 1-173*
- UN 2004, 'Global eGovernment Readiness Report 2004 - Towards Access for Opportunity', *UNPAN/11/2004 United Nations pp. 166*
- Walsham, G. and Sahay, S. 2006, 'Research on Information Systems in Developing Countries: Current Landscape and Future Prospects', *Information Technology for Development*, vol. 12, no. 1, pp. 7-24.
- Wong, P. K. 2002, 'ICT Production and Diffusion in Asia: Digital Dividends or Digital Divide?' *Information Economics and Policy*, vol. 14, no. 2, pp. 167.
- World-Bank 2002, 'The eGovernment Handbook for Developing Countries', *InfoDev. Center for Democracy and Technology pp.*
- Wresch, W. 2003, 'Initial E-Commerce Efforts in Nine Least Developed Countries: A Review of National Infrastructure, Business Approaches, and Product Selection', *Journal of Global Information Management*, vol. 11, no. 1, pp. 67-78.
- Zaitun, A. B., Mashkuri, Y. and Wood-Harper, A. T. 2000, 'Systems Integration for a Developing Country: Failure or Success? A Malaysian Case Study', *The Electronic Journal of Information Systems in Developing Countries*, vol. 3, no. 5, pp. 1-10.

# Challenges to the Jordanian E-Government Initiative

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## Abstract

*This paper aims to present a number of key challenges to the Jordanian Electronic Government Initiative as a precursor to embracing mobile government (the future electronic governmental service provision). The first wave of electronic governmental services was delivered through the web as the sole communication channel. Despite the limited success of a small number of governmental entities to utilise such a communication channel, the very limited penetration of the Internet in Jordan has dampened such cases of success and pushed key decision makers at the Electronic Government Initiative to consider more popular alternative communication media. This paper reflects on Jordan's past experience with electronic government to identify lessons learnt to be carried on to future mobile and second wave of electronic governmental service provisions.*

## Keywords

*e-Government, m-Government, Strategic IT initiative, e-Readiness, Infrastructure, Liberalisation, Channel Reach and Richness.*

## Introduction

The emergence of the Internet and Mobile/Cellular communication media has changed the landscape of governmental service provision and future communication between governments, citizens, organisations and other governments. The emergence of such communication media has opened up the space for unlimited number of key applications and Information Systems namely electronic governmental service provision. Electronic governmental service provision can be perceived as an implementation of electronic business within governmental domains from an operational point of view. Such electronically mediated content delivery and service provision is supposed to lead to a number of benefits for individuals, businesses and governments namely: global service delivery, higher visibility at lower operational costs, stronger business relationships, shorter time to market, better customer loyalty, real time training and conferencing; personalised goods, easier to promote products and/or services and faster to disseminate information (Amor 2002 P17, Lawrence et. al. 1998, Turban et. al. 1999 P15, Simpson and Swatman 1998, Abu-Samaha 2005).

The adopted definition of e-Government in the Jordanian initiative is “the ability to submit [governmental] transactions on-line and make payments electronically where they are required” (MoICT, 2000). The use of electronic services and channels to provide governmental transactions and content has been considered as a powerful tool to improve internal managerial efficiency, public service quality and public

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participation (Moon 2003, Lawrence et. al. 1998 P8). The eEurope 2002 Action Plan indicates that e-Government “could transform old public organisation and provide faster, more responsive services. It can increase efficiency, cut costs, increase transparency and speed up standard administrative processes for citizens and business” (eEurope, 2000). Hence, it is highly believed that Information and Communication Technologies (ICT) can provide a more proactive action to handle the causes of the chronic decline of public trust in governments as Moon (2003) indicates “IT [Information Technology] appears to offer a useful opportunity to government to enhance public trust and citizen satisfaction by improving procedural transparency, cost-efficiency, effectiveness and policy participation. IT provides positive opportunities as well as many challenges to governments and the public”. A conclusion emphasised by Vélez-Rivera et al (2005) who perceive electronic government systems to possess “an unprecedented potential to improve the responsiveness of governments to the needs of the people that they are designed to serve. To this day, this potential is barely beginning to be exploited”.

This paper will articulate the concerns and issues surrounding the limited success of Jordan’s e-Government initiative in terms of bandwidth and reach. The paper will reflect on a number of statistics and other qualitative reviews concerning previous experiences in the Jordanian electronic government initiative to establish why such a promising initiative have provided such a limited partial success. The paper is structured into a number of sections; each with its own domain of interest. The second section introduces a detailed description of the Jordanian e-Government initiative including its aims, vision and constituent ingredients. The third section provides a synopsis of the Jordanian telecommunication industry/market followed by an analysis of Jordan’s readiness for electronic service provision. The fifth section provides a number of quantitative and qualitative assessments of the first wave of Jordan’s electronic governmental services. While the final section provides an analysis of key issues and reasons contributing to the partial success of the Jordanian e-Government Initiative including conclusions and recommendations for the future waves of the e-Government initiative.

## Jordan’s E-Government Program

The electronic government of Jordan was conceived and established as a national program in the year 2000 aiming at coordinating information gathering from and dissemination to a variety of different governmental sources presented in an easily navigable format (Jordan e-Government Initiative 2003, MoICT 2000). The overall objectives of such initiative were: to improve the quality of governmental service delivery, to increase transparency, to improve responsiveness, to save time, money and other resources and to create positive spin offs (MoICT, 2000). While the initiative’s vision can be viewed as “delivering services to people across society irrespective of location, economic status, education or ICT ability” which will eventually transform the government and contribute to economic and social development through transforming the way citizens, businesses and other entities interact with the government (MoICT, 2006a).

The Jordanian Ministry of Information and Communication Technologies (MoICT) was assigned to take the lead role in implementing the e-Government Program. MoICT’s mission towards e-government is to provide support and capability to coordinate the management, implementation, interoperability and benefits of the national e-Government Initiative via:

- Supporting the e-Government strategy to be implemented across governmental entities
- Participating in planning and coordinating a national portfolio of e-Government initiatives
- Maintaining technological integration and interoperability of e- Government initiatives and encourage the re-usability of application components
- Planning and implementing security policies and a secure network environment
- Promoting and monitoring organizational transformation (change management) at the ministry, department and organizational level
- Educating the Government of Jordan employees and transferring knowledge
- Delivering successful e-Government initiatives and projects that are managed by dedicated project managers

- And providing analysis and information on the status of e-Government initiatives and projects to major stakeholders (Jordan eGovernment Initiative, 2003).

In terms of achievements, the e-Government program has been involved in developing and implementing major e-Government initiatives and service, these are:

- Income tax e-service was launched end of 2004,
- Drivers and vehicle licensing e-service was launched end of 2005
- Real estate registry and borders e-services were launched mid of 2006.
- A Secure Government Network (SGN) providing connectivity for web and email services to 18 governmental entities was implemented and hosted at an operation centre established by the e-Government program.
- An e-Government Contact Centre was established to provide business and technical support to SGN administrators and different categories of e-Government services' users.
- A comprehensive information security roadmap and e-Government Information Portal was launched in November 2006. The bilingual (Arabic / English) Information Portal provides a single official access point on the internet to government information required by different categories of users, including citizens, businesses, and governmental entities and employees (Jordan eGovernment Initiative 2003, MoICT 2006a).

## ICT Infrastructure Liberalization and the Establishment of TRC

National infrastructure in the form of computers and public and private networks plays a pivotal role in the realization of any strategic IT initiative. In terms of national infrastructure, Jordan has one telecommunication company, four mobile network operators and an extended number of Internet Service Providers (ISPs) all of which owned and operated by the private sector. Furthermore, the Jordanian government has issued twenty-one more ISP licenses to meet the increasing demand for high quality, high bandwidth Internet connectivity (Telecommunications Regulatory Commission, 2005; Arab Advisors Press Room, 2005).

The liberalization of the telecommunication market in Jordan started as early as 1992, which led to the establishment of the Telecommunications Regulatory Commission (TRC) in the year 1995 (Telecommunications Regulatory Commission, 2005c). The vision of TRC is "A telecommunications environment that is competitive, advanced, regulated and available to all" (Telecommunications Regulatory Commission, 2005b). While, the Mission Statement of TRC is "To ensure the availability of advanced and high quality Information and Communications Technology (ICT) services to all users at just, reasonable and affordable prices by working with all stakeholders in an independent, open and transparent manner to create a regulatory environment that promotes fairness, competition and investment, thus assuring fulfilment of the Kingdom's long-term ICT needs" (Telecommunications Regulatory Commission, 2005b). TRC's business scope includes the following services/products: Public Switched Telephony Network (PSTN), Public Mobile Telephony (Cellular), Public Mobile Telecommunications, Radio Trunking, Paging, Data Communications Services, Global Mobile Personal Communications by Satellite (GMPCS) and Pre-paid Cards Services (Telecommunications Regulatory Commission, 2005b).

Regarding Public Switched Telephony Network (PSTN), TRC regulates the service providers (Jordan Telecom (JT)) who operate and manage a fixed public telecommunication network that provides local, national and international fixed telephony services and leased lines and BATELCO Jordan who were granted a class license in may 2005 to provide PSTN services in the near future (Telecommunications Regulatory Commission, 2005b). Regarding Public Mobile Telephony (Cellular), Jordan Mobile Telephone Services (Fastlink), which is partly owned by Motorola Co., has been providing this service since 1995 through a countrywide GSM900 cellular network. Moreover, JT were granted a license to provide Public Mobile Telephony through an affiliate (MobileCom) to provide a more competitive cellular service since September 15th 2000. The two companies had dual exclusivity (duopoly) for providing GSM900 public mobile telephony service until the end of 2003 when a license to operate

public mobile telecommunications service was granted to (Umniah) on the 9th of August 2004 (Telecommunications Regulatory Commission, 2005b). In addition to Fastlink, Mobilecom and Umniah, Jordan has a fourth Public Mobile Telephony provider. The New Generation Telecommunication Company (Xpress) is the sole provider of Radio Trunking service granted by the Telecommunication Regulatory Commission (TRC) on April 6th 2003 and launched commercially in June 2004.

## **ICT eReadiness**

The Economist Intelligence Unit (2006) defines eReadiness as the “state of play of a country’s Information and Communications Technology (ICT) infrastructure and the ability of its consumers, businesses and governments to use ICT to their benefit”. On the other hand, the Jordanian Ministry of Information and Communication Technologies (2006) defines eReadiness as “the degree of preparation of a nation or community to participate in and benefit from ICT developments”. According to the 2006 eReadiness Ranking of the Economist, Jordan was ranked 54th worldwide (out of 68 entries) and 6th in the Middle East and Africa (out of 10 entries). The ranking is calculated based on a number of weighted quantitative and qualitative criteria (nearly 100) organised into six distinct categories measuring the various components of a country’s social, political, economic and technological development (Economist Intelligence Unit, 2006). On the other hand, McConnell International (2006) ranked Jordan’s eReadiness between medium and low by establishing the status and progress of five interrelated attributes: Connectivity, E-Leadership, Information Security, Human Capital and E-Business Climate. This indicates that many conditions are suitable to conduct e-government and e-business initiatives though improvements are needed to support a proper e-environment. The report emphasised Jordan’s leadership in terms of forward-thinking and extraordinary style and called upon capitalizing on Jordan’s small, young and well-educated population. On the other hand, Connectivity and Information Security eReadiness attributes were rated as low to medium and E-Business Climate was rated as low.

The Ministry of Information and Communication Technologies’ “The e-Readiness Assessment of The Hashemite Kingdom of Jordan 2006” report shows that Jordan has thrived in many aspects of eReadiness like: establishment of a regulatory framework in the ICT sector, enhancement of human capital and e-Leadership though there are still challenges that need to be overcome to complete the transition to an information society like affordability, quality and reliability of connectivity, the macroeconomic structure, business adoption, expansion of e-Government services and Research and Development (R&D) (Ministry of Information and Communication Technologies 2006).

According to REACH 3.0 the continued privatization and enhanced competitiveness of Jordan’s telecommunications sector/market along with rigorous lobbying on the part of Ministry of Information and Communication Technologies (MoICT), Telecommunications Regulatory Commission (TRC) and Information Technology Association of Jordan (INTAJ) have resulted in significant improvements in telecommunication services and pricing. REACH (Regulatory Framework, Enabling Environment (Infrastructure), Advancement Programs, Capital & Finance, and Human Resource Development) is Jordan’s strategic IT initiative that intends to lay out a clear plan of action to bolster the country’s nascent IT sector and maximize its ability to compete in local, regional and global markets. The REACH initiative has called for providing preferential access to high-speed lines, providing competitive pricing on high-speed lines, initiating private sector-led Information Technology park, providing infrastructure for connecting Jordanians initiative, training customs officials to facilitate Import/Export of ICT products, increasing Internet and Personal Computer (PC) penetration rates and building Infrastructure for e-Government Initiative (REACH 3.0, 2003). While the 2007-2009 Ministry of Information and Communication Technologies’ Strategic Plan has called for a competitive ICT industry and an increased awareness of using ICT to participate in sustainable economic development through providing support for various electronic initiatives in Jordan, attracting foreign investment in the local ICT industry, facilitating the establishment of offshore call centres, connecting schools, colleges and universities to a local fibre optic network for educational purposes and to introduce the concept of

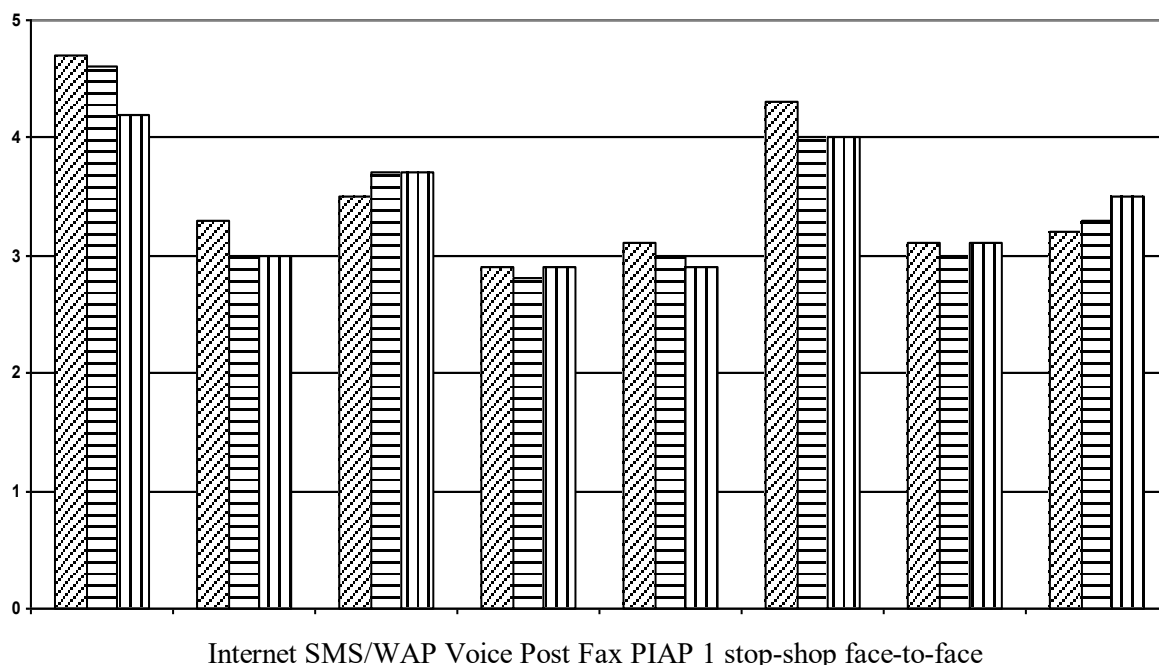
knowledge management to various public sectors (Ministry of Information and Communication Technologies, 2005d).

## Government Services Delivery Channels Assessment (2000-2005)

This section presents the findings of a number of surveys conducted by the MoICT to evaluate the e-Government initiative as a number of Jordanian governmental institutions and agencies invested in technology and personnel to provide electronic governmental services to both citizens and businesses. The survey included 21 Interviews with Key National Figures, 142 Focus groups with Government Employees, 53 Focus groups with Companies, 48 Focus groups with Citizens, 395 Questionnaire surveys of Government Employees, 254 Questionnaire surveys of Companies, and 409 Questionnaire surveys of Citizens. The assessment was carried out by Arthur Business Consulting under the supervision of the e-Government program team.

The assessment of the 21 Key National Figures interviews shows agreement on the importance of the e-Government initiative. In terms of communication channels, the interviewees were unanimous to select the Internet as the primary contact channel of both citizens and businesses in terms of governmental relationship/contact whether via Personal Computers, kiosks or local school computer centers. However the interviews stressed the need to maintain traditional methods (face-to-face) of contact with the government while fax and post communication channels were deemed obsolete and economically infeasible (MoICT, 2005b).

Regarding questionnaires, traditional face-to-face remains the most popular way to contacting the government where 82% of business representatives and 87% of citizens contacted the Government in a traditional face-to-face manner. Regarding the preferred way to contacting a governmental agency by business owners, 39% of respondents chose the Internet, 55% chose telephone or post while more than 60% sent documents via fax. In terms of Citizens, only 14% used the Internet to communicate with a governmental agency while 36% of respondents used voice (MoICT, 2005b).



**Figure 1** Preferred Information Distribution Channel (MoICT, 2005b)

Figure (1) presents a comparison of preferred information distribution channels where the first bar refers to governmental entities, the second bar refers to business entities and the third bar refers to citizens. Despite the fact that the Internet got the highest rating from all groups (Government

Employees, Companies and Citizens) in terms of the most preferred interactive channel, telephone got a high evaluation as an alternative or supplementary communication channel from all groups of respondents. Furthermore, Citizens strongly preferred traditional face-to-face contact for interactive communication with service providers whereas Internet and telephone were widely accepted channels for interactive communication between service providers and recipients.

More importantly, the interviewees, focus groups' participants and questionnaires' respondents have drawn attention to resistance to change, technical weaknesses and budgetary constraints as major obstacles to the implementation of new set of e-Services; effective project management, change management and communication as the most important success factors; while Internet and phone were perceived as primary contact channels for the implementation of new electronic governmental services (MoICT, 2005b).

Evans and Wurster (1997) identified reach and richness as major indicators to assess any communication channel effectiveness. Evans and Wurster (1997) defined reach in terms of the number of people whether at home or at work exchanging information and richness in terms of bandwidth, customisation and interactivity. Bandwidth refers to the "amount of information that can be moved from sender to receiver in a given time"; customisation refers to "degree to which information can be customised"; and interactivity refers to "dialogue" (Evans and Wurster, 1997). Evans and Wurster (1997) explain that this trade off between reach and richness shapes "how companies communicate, collaborate, and conduct transactions internally and with customers, suppliers and distributors". In terms of reach, whether at home or workplace, Internet penetration is very minimal in Jordan; estimated at 2% of the population in 2004 up from 0.7% in 2000 while the penetration of the mobile phones is currently estimated at 47.4% of the population (Department of Statistics, 2005) and expected to reach 57% of the population by the end of 2009 (Arab Advisors Press Room, 2005). In terms of richness, currently the Internet can provide far larger amount of information that is easily navigable in many formats while the current wireless infrastructure is incapable of competing with such advantage.

## **e-Government Challenges and Lessons Learnt**

Despite some successes, a number of operational challenges were encountered at the early stages of the e-Government program, which instigated the key decision makers to make important changes to the e-Government program. These can be summarised as:

- Low level of Internet penetration,
- Infrastructural constraints (high cost and inadequacy of bandwidth),
- The digital divide,
- Privacy and security concerns,
- Limited IT skills,
- Limited public sector reform efforts,
- Lack of an enabling legal framework
- Lack of awareness (MoICT, 2000).

In terms of accessibility of e-Services in Jordan, the figures of the Department of Statistics and MoICT show that Telephony penetration (fixed and mobile) in Jordan is high when compared to other communication channels like the Internet. INTAJ (Information Technology Association of Jordan) estimated that Jordan had 42,000 Internet users in the year 2000 despite limited affordability of personal computers and network accessibility (REACH 1.0, 2000). While Abu-Ghazaleh & Co. Consulting (2005) estimated the number of Internet users in Jordan in the year 2004 at 111,054 users up from 62,242 Internet users in 2002; a penetration rate of almost 2% of the population. 67% of whom used the Internet via pre-paid Internet cards while only 1% used the Internet via a leased line. This limited accessibility via the Internet was attributed to relatively expensive broadband connection coupled with limited time and low speed of connectivity (MoICT, 2005). On the other hand, the Ministry of Information and Communication Technologies (MoICT) figures indicate that 87.4% of households have



either a fixed or mobile phone (MoICT, 2005a). The number of mobile phone's subscribers has gone up to 1,624,000 in 2004 from 1,219,000 in 2002 (Department of Statistics, 2005). According to Arab Advisors Press Room (2005) reduced rates, per second billing, extended validities and special offers were expected to introduce the market with a healthy growth rate of over 46% in 2005. Between 2006 and 2009, the Arab Advisors Group projects the Jordanian cellular market to grow at a rate of 10% to exceed 3.43 million subscribers by 2009, a penetration rate of more than 57% (Arab Advisors Press Room, 2005). The Department of Statistics indicate that the percentage of Jordanian households who own a fixed telephone line is 54.4%, though the number of fixed lines' subscribers has gone down to 623,000 in 2004 from 629,000 in 2002 (Department of Statistics, 2005). Table 1 provides a comparison of communication channel in terms of popularity over the past few years and for the next few years.

Communication Channel	Year			
	2000	2002	2004	By 2009
Internet users	42,000	62,242	111,054	-----
Mobile phone's subscribers	-----	1,219,000	1,624,000	3.43 million
Fixed telephone line	-----	629,000	623,000	-----

**Table 1** Analysis of Communication Channels Popularity

Despite the thrive for enhanced competitiveness of the Jordanian Telecommunication market and the existence of a number of competitive service providers whether wireless or wire-full, the unaffordable prices of both hardware and telecommunication devices as well as the high cost of telephone calls are perceived as the major constraints to the proliferation of ICT in Jordan. REACH 2.0 (2001) shows that despite the sharp fall in phone tariffs, affordability of Personal Computers remains the main hindrance to engaging in on-line activities for individuals.

For the purpose of this research project, the authors interviewed two prominent figures in the e-Government Program; the e-government Program Director (Mr. Khaldoun Naffa) and e-government Program Chief Technology Officer and Head of Operations (Mr. Hasan Hourani). These interviews aimed to assess the viability of mobile government from a strategic point of view. The interviews lasted for 1 hour each both held on Thursday 24th of November 2005 at the e-government Program headquarters in the Ministry of Information and Communication Technology. The interviews started by assessing the past experiences of electronic governmental services provision. Both interviewees agreed on the utter importance of electronic governmental services and expressed concern towards many operational obstacles. These obstacles included: education, awareness, preparedness, public sector reform, organisational and technical change management and transformation management. The interviewees indicated that the e-government program is perceived as a tool of public sector reform in terms of becoming more customer-centric, i.e. improve governmental entities/employees performance, increase cost effectiveness and increase transparency. The interviewees agreed on the technical success of the launched electronic services in terms of systems, technologies and infrastructure. Though they drew attention to the need to properly handle the softer human aspects of the change process. The interviewees pointed out that internal surveys show a fluctuation in usability of electronic governmental services. The interviewees attributed such fluctuation in service usability to over- sensitivity of users towards information confidentiality and security, lack of proper change management during the transition process, the need for more sponsorship and support, loss of key staff during the change process and ulterior/personal motives of both enthusiasts and resisters to change.

Regarding the liberalisation and deregulation of the local telecommunication market, the interviewees indicated that this move will result in providing alternative and/or complementary delivery channels to the already established Internet/Web based service delivery to capitalise on high penetration rate (reach) of such channels. Though the interviewees drew attention to limited richness of such alternative channels, in terms of limited bandwidth and capacity for data- intensive services, limited data presentation/display capacity and challenges to security/confidentiality of private data over public

networks. On the other hand, the interviewees drew attention to one of the most neglected areas of the liberalisation effort, the need for electronic legislative enablement to be led by involved stakeholders.

## Conclusions

The Jordanian e-Government initiative aims to transforming Jordan to a knowledge based society via improved governmental performance, enhanced national competitiveness, increased transparency and accountability, reduced cost of interaction and improved technical and non-technical competencies of the government (MoICT, 2003a). To achieve such an aim, the delivery of e-Government services in Jordan is currently planned to be service-oriented, customer centric, results-driven, based on modular and interoperable IT components and accessed via multiple channels (MoICT, 2006a). The paper has presented and analysed the different aspects of Jordan's Electronic Government Program based on the published material of the Government of Jordan as well as non-governmental organisations. In addition, the paper presented the findings of a number of quantitative and qualitative assessment efforts to the past few years of electronic services provided by a number of governmental entities. In summary, lack of advanced and secure technical infrastructure, lack of high-volume of Internet users and limited use of digitised payment methods in the Jordanian society (like credit cards) remain the main reasons why most organizations and individuals in Jordan refrain from using the Internet to exchange products/services and funds on-line.

In terms of future scenarios, the paper provided an analysis of the possibility of using mobile governmental services as supplementary and/or alternative communication channel to web-based service delivery based on validating the richness and reach of the mobile network in comparison to the Internet. The analysis carried out in this paper shows that while mobile networks enjoy a higher level of penetration, these networks and mobile devices provide an inferior service in terms of display, interactivity and customisation specially when compared to web based service delivery. In addition the paper has highlighted a number of lessons learnt from the Jordanian e-Government experiment (low level of Internet penetration, infrastructural constraints (high cost and inadequacy of bandwidth), the digital divide, privacy and security concerns, limited IT skills, limited public sector reform efforts, lack of an enabling legal framework and lack of awareness (MoICT, 2000). The paper has highlighted the importance of paying attention to the need to properly handle the softer human aspects of the change process (education, awareness, preparedness, public sector reform, organisational and technical change management and transformation management).

## Reference

- Abu-Ghazaleh & Co. Consulting (2005), "Market Brief on Telecommunications Sector in Jordan" [http://commercecan.ic.gc.ca/scdt/bizmap/interface2\\_nsf/vDownload/ISA\\_2665/\\$file/X\\_8404815.DOC](http://commercecan.ic.gc.ca/scdt/bizmap/interface2_nsf/vDownload/ISA_2665/$file/X_8404815.DOC), retrieved on 1st of February 2005.
- Abu-Samaha, A. "Chapter 16: Strategic and Operational Values of E-Commerce Investments in Jordanian SMEs", in "Electronic Business in Developing Countries: Opportunities and Challenges", edited by Sherif Kamel, Idea Group, 2005, pp 315-335.
- Amor, D. (2002). *The e-business (r)evolution: living and working in an interconnected world*. New York: Hewlett-Packard Books.
- Arab Advisors Press Room (2005), <http://www.arabadvisors.com/Pressers/presser-181005.htm>, retrieved on 11/12/05
- Department of Statistics (2005), [www.dos.gov.jo](http://www.dos.gov.jo), retrieved on 11/12/2005
- Economist Intelligence Unit (2006), "The 2006 eReadiness Rankings", <http://www.eiu.com/2006eReadinessRankings>, retrieved on 19th of January 2006.
- eEurope 2002, An information Society for All Action Plan, [http://europa.eu.int/comm./information\\_society/eeurope/documentation/index\\_en.htm](http://europa.eu.int/comm./information_society/eeurope/documentation/index_en.htm), 2000, retrieved on 1st of February 2005.
- Evans, P.B. and Wurster, T.S. (1997), "Strategy and The New Economics of Information", *Harvard Business Review*, September-October, pp 71-83.

- Ginige, A. and S. Murugesan (2001). "The Essence of Web Engineering: Managing the Diversity and Complexity of Web Application Development." *IEEE Multimedia* 8(2): 22-25.
- Jordan eGovernment Initiative (2003), "The e-Government Status Update", [http://moict.gov.jo/MoICT/downloads/e-Gov\\_Intaj\\_6102003\\_v1.0.ppt](http://moict.gov.jo/MoICT/downloads/e-Gov_Intaj_6102003_v1.0.ppt), retrieved on 1st of December 2005.
- Lawrence, E., Corbitt, B., Tidwell, A., Fisher, J., & Lawrence, J. (1998). *Internet Commerce: Digital Models for Business*. Brisbane: John Wiley.
- McConnell International (2006), "The National E-Readiness of the Hashemite Kingdom of Jordan: A Global View of Jordan's Competitive Advantages", [http://www.mcconnellinternational.com/ereadiness/Government\\_of\\_Jordan\\_E-Readiness\\_Report\\_McConnell\\_International.pdf](http://www.mcconnellinternational.com/ereadiness/Government_of_Jordan_E-Readiness_Report_McConnell_International.pdf), retrieved on 19th of January 2006.
- Ministry of Information and Communication Technologies (2000), *Launching E-Government in Jordan: Readiness and Approach*, <http://www.MoICT.gov.jo>, retrieved on 1st of December 2005.
- Ministry of Information and Communication Technologies (2000), "The e-Readiness Assessment of The Hashemite Kingdom of Jordan 2006", <http://www.MoICT.gov.jo>, retrieved on 19th of January 2006.
- Ministry of Information and Communication Technologies (2003), *Statement of Government Policy*, <http://www.MoICT.gov.jo>, retrieved on 1st of December 2005.
- Ministry of Information and Communication Technologies (2005)a, *Universal Service/Access ICT Policy And Fund Mechanism: Market Research Study*.
- Ministry of Information and Communication Technologies (2005)b, *National Outlook and Expectations*, <http://www.MoICT.gov.jo>, retrieved on 1st of December 2005.
- Ministry of Information and Communication Technologies (2005)c, "Detailed Study and Recommendations on the Access and Delivery Channels for e-Services Implementation".
- Ministry of Information and Communication Technologies (2005)d, "The Ministry of Information Communication and Technology Strategic Plan 2007-2009", <http://www.MoICT.gov.jo>, retrieved on 19th of January 2006.
- Ministry of Information and Communication Technologies (2006), "The e-Readiness Assessment of The Hashemite Kingdom of Jordan 2006", <http://www.MoICT.gov.jo>, retrieved on 19th of January 2006.
- Ministry of Information and Communication Technologies (2006)a, *Jordan e-Government Program: e-Government Strategy*, <http://www.MoICT.gov.jo>, retrieved on 19th of January 2006.
- Moon, G. J. (2003), "Can IT Help Government to Restore Public Trust?: Declining Public Trust and Potential Prospects of IT in the Public Sector", *Proceedings of the 36th Hawaii International Conference on System Sciences*.
- REACH 1.0 (2000), *IT Forum*, [http://www.reach.jo/Downloads/R1/R1\\_report.pdf](http://www.reach.jo/Downloads/R1/R1_report.pdf), retrieved on 1st of December 2005
- REACH 2.0 (2001), *INTAJ*, [http://www.reach.jo/Downloads/R2/R2\\_report.pdf](http://www.reach.jo/Downloads/R2/R2_report.pdf), retrieved on 1st of December 2005
- REACH 3.0 (2003), *INTAJ*, [http://www.reach.jo/Downloads/R3/R3\\_report.pdf](http://www.reach.jo/Downloads/R3/R3_report.pdf), retrieved on 1st of December 2005
- Simpson, P. and Swatman, P. (1998), "Small Business Internet Commerce Experience: A Longitudinal Study", *Proceeding of the 11th Bled International Electronic Commerce Conference*. Bled Slovenia June 8th –10th. 295-309.
- Tambouris, E. (2001), "An Integrated Platform for Realising Online One-Stop Government: The eGOV Project", *Proceedings of the DEXA International Workshop "On the Way to Electronic Government"*, IEEE Computer Society Press, Los Alamitos, CA, pp. 359-363.
- Tapscott, D. (1996), "The Digital Economy: Promise and Peril in the Age of Networked Intelligence", New York: McGraw-Hill.
- Telecommunications Regulatory Commission (TRC) (2005)a, [http://www.trc.gov.jo/Static\\_English/market.shtm](http://www.trc.gov.jo/Static_English/market.shtm), retrieved on 11/12/05
- Telecommunications Regulatory Commission (TRC) (2005)b, [http://www.trc.gov.jo/Static\\_English/market.shtm](http://www.trc.gov.jo/Static_English/market.shtm), retrieved on 11/12/05
- Telecommunications Regulatory Commission (TRC) (2005)c, [http://www.trc.gov.jo/Static\\_English/telecomss.shtm](http://www.trc.gov.jo/Static_English/telecomss.shtm) retrieved on 11/12/05
- Turban, E., Kuy Lee, J., and King, D., (1999). *Electronic Commerce: A Managerial Perspective*. New Jersey: Prentice Hall Business Publishing.
- Turban, E., Jr., R., Potter, R. (2001), "Introduction to Information Technology", USA, Von Hoffmann Press.
- Vélez-Rivera, B., Díaz, W., Fernandez-Sein, R., Rodríguez-Martínez, M., Núñez, M., Rivera-Vega, P. (2005), "Multidisciplinary E-Government Research and Education as a Catalyst for Effective Information Technology Transfer to Regional Governments". *DGO*, pp 133-134.





