



Information & Communications for Development: Extending Reach & Increasing Impact (Excerpts from recent World Bank Report 2009)

Knowledge-based activities have become increasingly important and pervasive worldwide. ICT is the foundation of this knowledge-based world. It allows economies to acquire and share ideas, expertise, services and technologies locally, regionally and across the world. It also contributes to making the global economy more integrated than ever before. ICT can help create and sustain new opportunities for economic development. Accelerated knowledge transfer and technological diffusion amplify the competitive advantages of fast-learning economies. As the information requirements for innovation in economic and social activities increase, the importance of ICT for the development agenda will continue to expand.

Broadband Increases Productivity and Contributes to Economic Growth for Which It Deserves a Central Role in Development Strategies: Broadband networks, both fixed and mobile, are necessary to deliver modern communication

and information services that require high rates of data transmission. Enterprise file transfer, television and high-speed Internet are examples of such services. High-speed Internet connections provide ready access to a wide range of services, such as voice, video, music, film, radio, games and publishing. Broadband networks enhance the efficiency and reach of existing services and provide spare capacity for unknown future applications. Indeed, broadband networks are key to the ongoing transformation of the ICT sector through the convergence of telecommunications, media and computing. The convergence process comprises service convergence, which enables providers to use a single network to provide multiple services; network convergence, which allows a service to travel over any combination of networks; and corporate convergence, by means of which firms merge or collaborate across sectors. Driven by technology and demand, convergence is resulting in major changes in market structures and business models.

Summary of Findings of User Surveys on E-Government Projects in India

Indicator	Bhoomi		KAVERI	CARD	eSeva	AMC
	RTC	Mutation				
Number of trips saved	0.479	0.473	1.200	1.384	0.285	0.654
Standard error	0.139	0.152	0.119	0.115	0.089	0.145
Significance	***	***	***	***	***	***
Travel cost saved (rupees)	-79.958	-81.381	116.684	39.632	9.342	21.853
Standard error	5.083	11.305	18.103	6.317	2.228	5.256
Waiting time saved (minutes)	4.230	41.206	62.915	96.240	18.498	16.164
Standard error	9.433	9.149	7.003	7.950	1.642	1.579
Significance	Not significant	***	***	***	***	***
Difference in overall service quality score (five-point scale)	0.756	0.946	0.316	0.475	0.947	0.700
Standard error	0.067	0.078	0.037	0.046	0.044	0.049
Significance	***	***	***	***	***	***

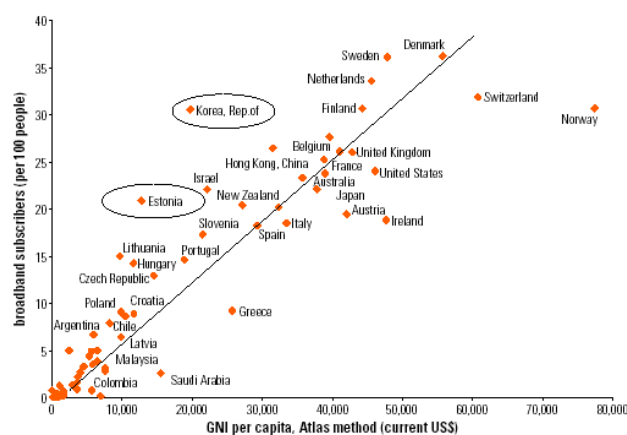
Source: Data are from surveys and authors' analysis.

Note: *** Significant at the 99 percent confidence level.

Broadband has considerable economic impact at all levels of individuals, firms and communities. Individuals increasingly use broadband to acquire knowledge and skills to increase their employment opportunities. Where broadband has been introduced in rural areas of developing countries, villagers and farmers have gained better access to crop market prices, training and job opportunities. In developed countries and urban areas in developing countries, an increasing number of individuals build up

social networks through broadband-enabled, peer-to-peer Web-based groups that facilitate economic integration and drive development. Blogs (Web logs, or online diaries), wikis (Web sites where users can contribute and edit content), video sharing sites and the like allow new, decentralized and dynamic approaches to capturing and disseminating information that allows individuals to become better prepared for the knowledge economy.

Broadband Penetration and Gross National Income in various Economies, 2007



Sources: ITU, World Telecommunication/ICT Indicators Database; World Bank, World Development Indicators Database.

Access to broadband supports the growth of firms by lowering costs and raising productivity. Realising these performance improvements, however, depends on firms' ability to integrate their technological, business and organisational strategies. When fully absorbed, broadband drives intense, productive uses of online applications and services, making it possible to improve processes, introduce new business models, drive innovation and extend business links. A study involving business and technology decision makers in 1,200 companies in six Latin American countries - Argentina, Brazil, Chile, Colombia, Costa Rica and Mexico - showed that broadband deployment was associated with considerable improvements in business organisation, including speed and timing of business and process reengineering, process automation, data processing and diffusion of information within organisations.

Firms in the media, export and other information-intensive sectors have benefited most from integrating broadband into their business processes. Clarke and Wallsten (2006), in a study of 27 developed and 66 developing countries, found that a 1-percentage-point increase in the number of Internet users is correlated with a boost in exports of 4.3 percentage points. Increases of 25 percent or more in the efficiency of claims processed per day have been documented by US insurance companies that have adopted wireless broadband. Other industries that have benefited significantly include consulting, accounting, marketing, real estate, tourism and advertising.

Local communities around the world have realised considerable economic gains and new opportunities from broadband services. Studies from Canada, the United Kingdom, and the United States find that broadband connectivity has a positive economic impact on job creation, community retention, retail sales and tax revenues. In rural areas of developing countries, communities have recently begun to launch broadband services and applications that give local populations access to new markets and services. Facilitating information exchange and value creation between buyers and sellers of agricultural products, which has

improved income and livelihoods in rural areas, is a prime example of this. Previously, such opportunities were available only in the largest or wealthiest localities.

According to a recent World Bank econometrics analysis of 120 countries, for every 10-percentage-point increase in the penetration of broadband services, there is an increase in economic growth of 1.3 percentage points. This growth effect of broadband is significant and stronger in developing countries than in developed economies and it is higher than that of telephony and Internet. The impact can be even more robust once the penetration reaches a critical mass.

Because broadband networks have the potential to contribute so much to economic development, they should be widely available at affordable prices and should become an integral part of national development strategies.

Currently though, few people in developing economies have access to broadband networks. In 2007, an average of less than 5 percent of the population of low-income economies was connected to broadband networks, and that was mostly in urban centers. In this light, developing countries are missing a great development opportunity.

E-Government can lead the way to mainstream ICT applications: E-government is the most cited and high profile of all ICT applications, given its importance in underpinning development efforts. In many countries, developed and developing alike, there has been significant government expenditure on IT. In Europe, IT spending in government is growing faster than in most other sectors. Since 1999, China has embarked on major initiatives in this area. Total e-government spending is expected to increase to more than \$10 billion in 2008, from \$7 billion in 2006. China's investment in the State Economic Management Information Systems program alone amounts to about \$2.5 billion. **India** is also planning large investments; its National e-Government Program will receive \$5.5 billion in funding between 2007 and 2012.

Table 1.1 Models for E-Government Institutions in Various Countries

Model	Countries	Benefits	Drawbacks
<i>Policy and investment coordination</i> (cross-cutting ministry such as finance, treasury, economy, budget, or planning)	Australia, Brazil, Canada, Chile, China, Finland, France, Ireland, Israel, Japan, Rwanda, Sri Lanka, United Kingdom, United States	Has direct control over funds required by other ministries to implement e-government. Helps integrate e-government with overall economic management.	May lack the focus and technical expertise needed to coordinate e-government and facilitate implementation.
<i>Administrative coordination</i> (ministry of public administration, services, affairs, interior, state, or administrative reform)	Bulgaria, Arab Republic of Egypt, Germany, Republic of Korea, Mexico, Slovenia, South Africa	Facilitates integration of administrative simplification and reforms into e-government.	May lack the technical expertise required to coordinate e-government or the financial and economic knowledge to set priorities.
<i>Technical coordination</i> (ministry of ICT, science and technology, or industry)	Ghana, India, Jordan, Kenya, Pakistan, Romania, Singapore, Thailand, Vietnam	Ensures that technical staff is available; eases access to nongovernmental stakeholders (firms, NGOs, and academia).	May be too focused on technology or industry and disconnected from administrative reform.
<i>Shared or no coordination</i>	Russian Federation, Sweden, Tunisia	Least demanding and with little political sensitivity (does not challenge the existing institutional framework and responsibilities of ministries).	May lead to rivalries among ministries. No cross-cutting perspective. Fails to exploit shared services and infrastructure and economies of scale.

Such significant funding for e-government reflects growing recognition of its benefits for the delivery of public services. Users rank improved transactional efficiency (as reflected in a reduced number of visits and less waiting time), reduced corruption, and better quality of service (such as reduced error rates and increased convenience) as most important in their dealings with public services. Non-discriminatory treatment and an effective complaint handling system are also desired features.

Successful e-government projects have reduced transaction costs and processing time and increased government revenues. For instance, the e-Customs System in Ghana (GCNet) increased customs revenues by 49 percent in its first 18 months of operation and reduced clearance times from three weeks to two days. An e-procurement system in Brazil cost only \$1.6 million, yet it enabled savings of \$107 million for the state in 2004 alone as a result of improved process efficiency and lower prices for goods and services procured. The fully automated tendering process launched as part of the same system in Brazil saved suppliers an estimated \$35 million.

Some e-government projects have also improved governance by reducing corruption and abuse of discretion, thereby making vital

contributions to development. In **India**, a survey found that fewer users were required to pay bribes to accelerate service delivery under e-government projects than under manual systems, and that the frequency of paying bribes to service officials has fallen. For example, the land registration system in the state of **Karnataka in India** is estimated to have cut bribes by about \$18 million annually. Furthermore, an overwhelming proportion of supervisors sense that abuse of discretionary power through means such as denying services to citizens has narrowed. They are also more aware of the need to comply with service standards specified in citizen charters.

The potential to access public services at home or at a local center also empowers women and minorities. For example, among the users of e-government services, women are usually in charge of dealing with public administrations at the household level. The delivery of e-government services translates to easier access and less time than traveling to or queuing up at government departments. For minorities, ICT facilitates access to relevant public information on rights and benefits, inheritance and family laws, health care and housing, allowing the public to make informed decisions on issues of importance.

Some Policy Directions: The agenda of ICT for development is rather new and still in flux. A good case can be made for ICT as a factor of economic development. But how to use ICT cost-effectively to meet private and public objectives is less clear. There are examples of failures as well as successes. The technology and its products continue to change at a fast pace. The market responses are hard to predict. The jury is still out on the extent to which the evolving ICT sector should be regulated. Both developing and developed economies are struggling to understand the difficulties, constraints and uncertainties and how best to handle them. The following are some of the most challenging issues faced by developing countries:

- Convergence does not fit easily into established sector frameworks. Translating a broad vision into specific policies and regulations is likely to be difficult. Although a proactive response could yield the greatest development benefits, some countries adopt a “wait and watch” strategy while policy options become clearer or until the issues gain urgency.
- Broadband networks are developing mainly in the potentially profitable cities and intercity corridors. People living in commercially less-attractive provincial and rural areas, as well as low-income groups in urban areas tend to be left behind.
- Although there are a number of success stories, a high rate of failure has been reported in the adoption of e-government by developing countries. Ensuring robust performance from new large-scale information systems has proven to be a challenge even for countries with sophisticated technical skills.
- Many countries have major gaps in their ability to compete in the IT services and ITeS markets, most notably in relation to scarcity of skilled labor.

To address these challenges, elements of good practice are emerging for policy, regulatory and investment frameworks to extend the reach and increase the impact of ICT on development.

Policy responses to Convergence facilitate ICT development: The technological drivers for convergence are in place or are quickly diffusing. Fundamental to convergence are the digitisation of communication and the rapidly falling cost of computing. More recently, expanding use of Internet protocol-based networking has made interconnection among diverse networks, devices, and applications possible. These developments have led to the deployment of broadband next-generation networks that deliver a wide range of services interactively over any combination of communication networks anytime and anywhere.

As these technical factors fall into place, convergence finds market traction with service providers seeking to diversify their businesses, increase revenues and cut costs. Globally, service providers are embracing convergence by investing in broadband networks. They are entering new markets and improving business prospects by consolidating content and services and by adopting new business models. An evolving set of providers offers innovative services with high quality and maximum choice at low prices.

As users adopt new ICT services and applications, demand for greater access and content is growing with previously unmatched breadth and speed in both developing and mature economies. Since its first release in 2003, the Internet telephony service provider Skype has attracted more than 300 million subscribers in 225 countries and territories. In 2007 alone, Skype carried an estimated 27 billion minutes of computer-to-computer calls. By the end of 2008, there will be an estimated 40 million “triple play” subscribers worldwide - all of whom receive most of their telephony, video and Internet services over broadband networks. Further, consumers are now also participating in content creation. Growing access to a broader variety of services and applications through a range of new and constantly improving devices, including mobile phones that go well beyond voice services, has stimulated enormous social interaction and exchange. This has led to higher demand for advanced ICT networks and services that have the ability to support new applications.

As supply and demand align, the technical and market factors driving convergence are visible in markets at all stages of economic development, from Brazil to France and from **India** to Nigeria. While high-income countries have had these conditions in place for some time, there are clear indications that even low-income countries and population groups are now recognising these forces and the resulting convergence as a reality.

The greatest benefits of convergence are realised in markets that enable it promptly. Convergence, though, typically does not fit easily into traditional policy frameworks. Attempting to stick to existing policies creates regulatory uncertainty and inconsistency—the economic costs of which will increase over time in a way that will hinder technological progress and market evolution. Consequently, countries that resist convergence or adopt a “wait and watch” approach will ultimately miss the benefits of improved ICT networks and services.

As understanding of convergence evolves, emerging trends point to three global good practice principles for regulatory frameworks to enable convergence. First, regulatory frameworks must promote competition. Service providers can deploy converged networks and services only if regulatory frameworks lower entry barriers in order to increase competition, reduce prices and drive growth. However, it is equally important that regulators intervene in cases of market failures and do not allow abuse of market dominance. Hence, regulatory frameworks that establish and effectively enforce competitive, level playing fields will result in the greatest benefits for users.

Second, policy makers should rely more on market forces and less on regulation. Maintaining legacy regulatory frameworks will likely stifle the growth of convergence. Instead, regulation can move toward allowing innovation and the entry of value-added service providers to promote the development of content and ICT-enabled businesses and social services.

Finally, policy and regulatory frameworks should allow new technologies to contribute everything they have to offer. Regulatory frameworks that are technology neutral and allow flexibility in service provision will encourage investments and innovation. When service providers are able to use their networks to the fullest extent, they can reduce costs, increase business viability and ultimately encourage markets that are more efficient. Users of the networks will benefit from lower prices, more choices and better quality.

Policy makers seeking to respond to and enable convergence will find that doing so enhances the effects of earlier sector liberalisation efforts and supports innovation in services that benefit the ICT sector. Countries that begin these second-generation reforms in the ICT sector will find themselves better off for it.

Cross-sector Leadership and Institutions are essential to realise the benefits from investing in E-Government: E-government often entails institutional and political reform facilitated by technology. Competent leaders and institutions are essential to overcome resistance and inertia, to make timely policy choices and to implement policy effectively. The cross-cutting nature of e-government makes it impossible to use traditional institutional arrangements that assign the entire agenda to a single ministry. Rather, e-government requires coordination among various government agencies. Public leadership needs to shift away from focusing on individual agencies and turf protection and toward management through collaboration across agencies. Moreover, e-government is a continuous process of policy development, investment planning, innovation, learning and change management. This process must fit with and respond to a dynamic development strategy that supports evolving national goals and creates sustained institutional reforms and public service improvements while providing frameworks and structures that ensure continuity and proper institutional coordination.

In order to realise development gains from e-government investments, a sufficiently influential institutional structure that attracts strong commitment and support is essential. Many countries have moved toward direct, institutionalised engagement of top public leaders to position the coordination of government transformation under the highest authority. Often the office of the prime minister or the head of state hosts a coordinating unit and chairs the inter-ministerial e-government steering committee. Such an approach has three benefits. First, the head of this coordinating unit becomes a visible leader. Second, this leader can use e-government as a core component of a public management reform agenda and, more broadly, as a key to shifting to a knowledge-based, innovation-driven economy. Third, the coordination unit encourages work across ministries and levels of government to implement e-government programs.

A survey of 30 developing and developed countries found four basic models of a national institutional framework to lead their e-government agenda and fulfill the key functions of governance and coordination. In practice, though, these frameworks are more diverse and complex than suggested by these basic models and may evolve over time, shifting from one model to another or becoming hybrids.

These four institutional models focus on the leading or central institution for e-government strategy & policy making and on governance & coordination. But in terms of facilitating implementation, governments have increasingly experimented with new arrangements outside the ministerial structure to overcome sectoral

fragmentation and civil service constraints and to expand e-government institutional capability. Countries such as Bulgaria, Ireland and Singapore now have dedicated executive ICT agencies in their civil services. These agencies have special autonomy and salary structures to attract and motivate the best technical talent. Others, including **India** and Sri Lanka are experimenting with ICT agencies that have a government-appointed board of directors and representatives of key stakeholders from the private sector and civil society.

Institutional innovation in these countries has a number of advantages. Apart from being shielded from the larger bureaucracy and having the flexibility to react swiftly to changing demands, agencies dedicated to e-government can hire personnel at competitive wages, provide shared services (such as network infrastructure) to the government and outsource tasks to the private sector. Active private sector participation helps the agencies operate in an agile, businesslike way and accelerate e-government financing and implementation, making the best use of scarce public resources and relevant expertise.

One disadvantage, however, is the potential struggle to obtain political weight and financial resources if the new entity lacks institutional links to powerful ministries. On the other hand, if such links are too strong, the government bureaucracy might assert control over the agency and undermine the effectiveness or businesslike culture of agency staff. Hence, the viability of these agencies depends on political leaders giving the agency the autonomy needed to act in an agile manner and avoid interference in staffing and day-to-day management.

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