



CONNECT • TRANSFORM • INNOVATE  
THE WORLD BANK GROUP



**Sector Strategy**

# **ICT for Greater Development Impact**

**Information & Communication Technology**



# **ICT for Greater Development Impact**

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**World Bank Group Strategy  
for  
Information and Communication  
Technology**

**2012-2015**

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## Abbreviations

AfDB	African Development Bank
AIR	Advancement through Interactive Radio
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
ATM	Automatic Teller Machine
CCTs	Conditional Cash Transfers
CDD	Community-Driven Development
CERT	Computer Emergency Response Team
DEC	Development Economics Vice Presidency
DFGG	Demand for Good Governance
DPO	Development Policy Operation
DRM	Disaster Risk Management
ESW	Economic and Sector Work
ETSI	European Telecommunications Standards Institute
EU	European Union
FBS	Fee-Based Service
FMIS	Financial Management Information System
FOOD	Foundation of Occupational Development
G2B	Government to Business
G2C	Government to Citizens
GDP	Gross Domestic Product
GIS	Geographic Information System
GPS	Global Positioning System
HELP	High-level experts, leaders and practitioners group
IBRD	International Bank for Reconstruction and Development
ICANN	Internet Corporation for Assigned Names and Numbers
ICT	Information and Communication Technology
ICT LDB	ICT Little Databook
IDA	International Development Association
IEG	Independent Evaluation Group
IFC	International Finance Corporation
IFMIS	Integrated Financial Management Information System
IMT	Information Management and Technology
ISO	International Organization for Standardization
IT	Information Technology
ITE	Innovation, Technology, and Entrepreneurship
ITES	IT-Enabled Services
ITS	Intelligent Transportation Systems
ITU	International Telecommunications Union
KTF	Korean Trust Fund
MIGA	Multilateral Investment Guarantee Agency
MIS	Management Information System
mLab	Mobile Applications Laboratory
NGO	Nongovernmental Organization
OAS	Organization of American States
OECD	Organisation for Economic Co-operation and Development
OGP	Open Government Partnership
P4R	Program for Results

PFM	Public Financial Management
PPIAF	Public Private Infrastructure Advisory Facility
PPP	Public-Private Partnership
R&D	Research and Development
SME	Small and Medium Enterprise
SMS	Short Message System
TA	Technical Assistance
UNPAN	United Nations Public Administration Network
WBG	World Bank Group
WBI	World Bank Institute
WDI	World Development Indicators

## **Executive Summary**

1. **Information and communication technologies (ICTs) have great promise to reduce poverty, increase productivity, boost economic growth, and improve accountability and governance.** That promise only grew when ICTs underwent a revolution in the 2000s. Nearly 5 billion people in developing countries now use mobile phones, up from 200 million at the last decade's start, and the number of Internet users has risen 10-fold. People across the globe do much more than chat and play games. They learn where best to fish and what market to sell their produce in. They trace cattle from pastures to supermarkets. They report illegal logging and misuses of local budget. They pay bills, send money back home, and receive cash transfers. They do business on mobile phones. They use ICTs to prevent violence against women—and community radio to empower them. They get state-of-the-art schooling online. They remotely monitor and switch on irrigation pumps. And as we've seen in the Mediterranean they use social networks to make their voices heard and trigger change.
2. **ICTs help reduce poverty directly and indirectly.** By providing access to information, equalizing opportunities in rural areas, and contributing to pro-poor market developments such as microfinance and mobile money, ICTs offer new tools to directly address poverty. By contributing to growth, the ICT sector—infrastructure, networks, ICT service industries, and media—also indirectly reduces poverty. Recent evidence suggests that increasing high-speed Internet connections can be a key source of economic growth (see annex 2). Local ICT service industries create jobs, especially for youth and women—and promote trade and competitiveness through exports. The ICT sector also fosters innovation across the economy and greatly improves productivity.
3. **To realize ICTs' promise countries have revamped regulations, opened their telecom markets to competition, and privatized telephone operators.** This has allowed them to attract great amounts of private investment and radically expand access. In high- and low-income countries alike, the impact of market reforms in the sector has been considerable—much greater than in any other infrastructure sector. The deep penetration of mobile phone networks, combined with the advent of text messaging and Internet-enabled mobile networks and devices, has created opportunities for entrepreneurs and governments to interact directly with households and businesses—and to deliver services with much greater reach and efficiency than before. These networks allow citizens to give feedback on how governments and public officials are performing and whether services are reaching their intended recipients, thus holding governments more accountable. Governments have also used IT applications to transform back-end finance and public administration functions, for instance to modernize and integrate tax, customs, and financial management systems.
4. **Many countries have now embarked on next-generation reforms.** To speed the rollout of broadband, governments are updating regulatory frameworks, auctioning the scarce radio spectrum essential for wireless networks, and structuring public-private partnerships (PPPs) to rapidly expand backbone infrastructure and last-mile networks. To foster competitive IT-based service industries, several countries are developing skilled workforces in partnership with the private sector—and working to improve the business environment. To make mobile devices more affordable, they are lowering import tariffs, while offering the private sector incentives to build applications of value to the poor. And they are rationalizing IT spending by setting up shared cloud-computing platforms with clear standards of interoperability, encouraging all agencies to migrate their services to this infrastructure.
5. **The World Bank Group (WBG) has worked with its clients as they have pursued these opportunities—and has supported sector reforms through technical assistance and lending operations, guided by its 2001 ICT Strategy.** The WBG has been most successful in fostering ICT sector reform and attracting private investment in mobile communications. Over the 2000s World Bank

support for ICT sector reforms helped attract an estimated \$30 billion in private investment for mobile network infrastructure in International Development Association countries. The International Finance Corporation's (IFC) \$2.3 billion in telecommunications infrastructure investments and the Multilateral Investment Guarantee Agency's (MIGA) \$550 million in political risk guarantees supported private investment in mobile service providers in difficult and high-risk environments. And since 2007 the WBG has strengthened its support for public-private ventures for broadband and high-speed Internet, reducing retail prices and greatly increasing service use, in some cases by a factor of 10.

6. **WBG support for ICT applications has grown rapidly over the past decade.** More than 1,300 active Bank investment projects have ICT components (74 percent of the Bank's 1,700-project portfolio) to modernize internal processes and upgrade service delivery. Results have been mixed, with only 59 percent of Bank project components for ICT applications achieving or likely to achieve their objectives fully or substantially. Considering that the World Bank intervenes mostly in challenging environments and developing countries, its performance compares reasonably well with the 50–70 percent success reported for private and public ICT projects in both developed and developing countries. In this high risk–high reward field co-investment in technology must be tied to institutional reforms, change management, and IT project management capacity. The IFC is increasing support to ICT applications, focusing on mobile banking, other payment systems, health, e-commerce, and e-government. IFC performance in such investments is also comparable with that in the private sector, but the projects entail more risk than the IFC normally takes. MIGA has issued five guarantees for ICT applications in the services and financial sectors since 2002, supporting solutions in government agencies and electronic and mobile payments.

7. **Going forward the WBG will follow a new ICT strategy, comprising three pillars.** It will promote ICTs to transform services for greater development impact—strengthening accountability and governance, improving public services, and enabling more inclusive private delivery of services (Transform pillar). It will advance ICTs to improve competitiveness and accelerate innovation across the economy and target skills development for ICT-related jobs (a large portion known to be going to women) to improve productivity (Innovate pillar). And it will scale up its support for policy reforms and private and public-private ventures to catalyze investment in broadband infrastructure and expand access to broadband services, including for women (Connect pillar).

8. **The strategic priorities were chosen in view of WBG's strengths and comparative advantages, in addition to its value as a financing partner:**

- Under the *Transform pillar* the World Bank will draw on its deep sector expertise (across sectors) and relationships with government institutions and sector agencies to integrate innovations into service delivery and accountability processes—and to carry out associated policy and institutional reforms. World Bank capabilities across all sectors and themes will be essential to support this cross-cutting agenda effectively. The IFC will leverage its skills in assessing growth-stage IT-enabled investment opportunities to support venture funding. The IFC is also well placed to support e-payment ventures given its growing experience in this area.
- Under the *Innovate pillar* the World Bank and IFC will leverage their experience financing IT companies, supporting grassroots technology entrepreneurship, and supporting public-private programs aimed at developing ICT skills—making use of strengths in the Private Sector Development, Education, and ICT sector teams. The World Bank's expertise in education and incubation (through *infoDev*) can foster skills development, build IT-based industries, and promote innovation.
- Under the *Connect pillar* the World Bank, IFC, and MIGA will build on a well-documented track record. The Independent Evaluation Group's recent study found that countries receiving WBG support for policy reforms and investments have gained greater access to ICT services and developed

more competitive market structures than other countries have. The IFC’s and MIGA’s private sector investment and guarantee instruments will be essential to developing broadband markets in higher risk countries. The IFC has in-depth experience helping companies raise capital, attract co-investors, and give confidence to markets otherwise deemed risky. MIGA has a track record of providing guarantees to mitigate noncommercial risks associated with ICT investments. The World Bank also brings credibility to proposed sector reforms, demonstrating the link between broadband sector reforms and economic growth. And the World Bank’s ICT sector has unique experience and expertise in helping structure PPP arrangements for broadband communications infrastructure.

**9. Consultations on the strategy elicited broad support for the three proposed pillars.** Stakeholders confirmed the priority of broadband infrastructure, underscoring its growing importance. They also endorsed e-government and applications that transform public services. Discussions on transformational infrastructure in the context of the G20 and Africa Union also informed the strategy, as did the regional CONNECT summits and the Global Broadband Commission convened by the International Telecommunication Union. The Independent Evaluation Group’s recent study of the WBG’s intervention in the ICT sector contributed as well.<sup>1</sup>

## **Transform pillar—Making development more open and accountable and improving service delivery**

**10. The near ubiquity of mobile technology and the proliferation of social networks and geospatial tools create new ways for citizens to express demands and take initiatives—and for governments to respond through data-driven policymaking.**

**11.** Concrete actions that governments can initiate in this area include:

- Use ICTs to create pressure points for accountability and performance (collecting, publishing, and verifying data, leveraging citizen participation).
- Increase the transparency of government activities and leverage citizen participation: encourage applications such as revenue watch, procurement watch, and open budget—and use anticorruption hotlines, utility misuse reporting, and participatory budgeting.
- Open and publish disclosable government-collected data on public services, infrastructure, and national statistical information, enabling civil society and entrepreneurs to create services and applications with the data.
- Solicit solutions to clearly stated development challenges through crowdsourcing, gamification models, and “solver” communities.
- Adapt institutional arrangements, legal and regulatory frameworks (open government directives, freedom of information legislation, information security and privacy), and in many cases information technology infrastructure (open standards, interoperability frameworks, information security and privacy) to make these initiatives sustainable.

**12. Governments can use ICTs to transform public service delivery across sectors—health, education, social protection, justice, agriculture, water, energy, and transport—both central and local.** ICTs offer an opportunity to revolutionize public service management by capturing information efficiently in shared databases accessible to all government agencies (such as a national database of electronic identification of citizens). ICTs help governments to simplify administrative procedures and share services (such as citizen authentication and payment systems). And governments can pool resources, reduce costs, adopt common standards for information exchanges, and perform government functions more efficiently (with faster response time and fewer errors).

**13. To achieve such transformation, governments need to foster and promote cross-sector and sector-specific foundations to support ICT-enabled government-wide transformation.** These include:

- Developing e-transformation strategies, including at the sector level.
- Building institutions capable of driving the transformation agenda across government and advancing skills within these institutions and across the civil service.
- Breaking down siloed approaches to technology investments.
- Formulating sector-specific policies, regulations, and laws (such as those for health, education, and energy) to support the use of ICTs to transform service delivery—and to strengthen the private sector’s ability to create new ICT-enabled services (such as m-banking).
- Formulating common standards and policies for transformation across government that enable:
  - An environment for open government and civil society participation, as part of accountability mechanisms and the co-creation of content and services.
  - Sector objectives.
  - Interoperability and efficiency.
  - An environment to strengthen the private sector’s ability to engage in PPPs for government service delivery (PPP framework, investment climate framework).
  - ICT “trust” policies: laws and regulations regarding information security and privacy, including online authentication, electronic transactions, cyber-security, critical infrastructure protection, data and privacy protection, consumer protection, cyber-crime, freedom of information and of expression, and intellectual property and information security.

**14. Under the Transform pillar the WBG will focus on two strategic priorities:**

- *Open and accountable development.* Under the new strategy the World Bank will promote engagement between government and citizens through mobile phone and mobile Internet applications. The World Bank will focus on an enabling environment and applications that help monitor development results and facilitate citizen feedback on service delivery to government and service providers. It will also focus on using ICTs to increase transparency (including national and local budget transparency), and to open up opportunities through platforms of open government data, for private sector and civil society to access information and develop innovative services. The IFC will focus on media applications and content as well as social media ventures to produce higher quality, relevant, local content that generates jobs, extends the reach of knowledge, and gives easy access to the information that people in emerging economies need to expand their opportunities.
- *Transformation of service delivery.* The rapid spread of mobile phone networks presents the opportunity to transform service delivery across all sectors of the economy, public and private. The World Bank and the IFC will support ICT applications that extend the reach of service delivery and improve their efficiency. The IFC will use its financing and advisory services to promote enterprises that develop such applications (for example, e-payments). MIGA will explore opportunities to support the rollout of applications with political risk guarantees. The World Bank will help governments frame sector issues and define specific development challenges that mobile applications can address. The World Bank will also work with governments to stimulate private sector and civil society development of applications. And the World Bank will work with government ministries and agencies to reform institutions and retrofit service delivery processes in order to take advantage of new opportunities and business models around mobile applications.

## **Innovate pillar—Developing competitive IT-based service industries and fostering ICT innovation across the economy**

15. **The growth of IT-based services is creating opportunities for developing countries.** For example, many multinational corporations are drawing on the brainpower residing in developing countries and shifting part of their research and development to emerging markets. Governments need to integrate these opportunities with their national development strategies.

16. **Governments can promote private sector use of ICTs, especially by small and medium enterprises, through incentives.** ICTs can help the private sector reduce business costs, improve internal management, and expand access to new technologies and information on market opportunities. ICTs can also help optimize supply chains, making it easier to get goods and services to the market. Government programs that aim to help the private sector use ICTs for business can contribute greatly to competitiveness.

17. **To unlock the potential of ICT innovation, governments have to calibrate their interventions.** There is a fine balance between facilitating innovation and stifling it with too much intervention. Innovation, mainly led by the private sector and at the grassroots level, relies on creativity's ability to blossom—not a feature usually associated with government bureaucracy. The success of India's IT-based services industry is widely believed to have taken off in the absence of heavy government intervention, other than effective telecommunications and education policies and marketing for major Indian cities as investment destinations. Kenya's m-Pesa thrived thanks to light regulation. Rather than direct intervention, governments should focus on the key enablers of ICT innovation: developing a skilled workforce, implementing ICT innovation policies, promoting ICT entrepreneurship, and facilitating a bottom-up approach to innovation.

18. **Entrepreneurs have introduced game-changing products and services, transforming the way millions of people interact.** New technologies, services, and service delivery models can reach out to marginalized populations in the global economy. The ability of individuals and entrepreneurs to innovate, with the right incentives, is critical to success. Creating a class of ICT entrepreneurs will help developing countries capture the high value added of homegrown enterprises. While incubation and business acceleration are attractive, it is not easy to foster local entrepreneurship in countries with low capacity, a weak culture of entrepreneurship, and a lack of mechanisms to facilitate the sharing of ideas among stakeholders. Entrepreneurship also requires access to global talent (for example, through virtual teams) to work on cutting-edge technologies and processes.

19. **Under the Innovate pillar the WBG's strategic priority will be to support the development of local IT-based services industry and ICT innovation for competitive industries.** Recent experience shows that all developing economies—large and small, low income and middle income—can use ICTs to develop competitive industries, accelerate growth, and promote job creation, notably for women and youth. To enhance competitiveness in these areas, governments are strengthening business environments, building the skills of their talent pools, facilitating industry access to finance and entrepreneurial support, and ensuring adequate urban infrastructure to create attractive locations for industry and knowledge workers. Under the new strategy the IFC will invest more in IT companies. The World Bank will focus on policy enablers and the development of ICT skills. Such skills empower IT industry development and innovation across the economy but place a binding constraint on industry growth when lacking. The WBG will also emphasize ICT-based entrepreneurship development programs—and promote an enabling environment for ICT-based innovation.

## **Connect pillar—Scaling up affordable access to broadband**

20. **Widespread access to affordable broadband is a key driver of national competitiveness and economic growth.** Given high-speed Internet's value for development, and the fairly low cost of greatly extending coverage, sound broadband policies are essential to attract investment and keep prices affordable. Public financing may also be needed in select contexts to catalyze private investment in transformational infrastructure, such as national backbones, cross-border links, and international submarine cables.
21. **Broadband policies need ongoing work to continue to attract investment and keep prices affordable.** As networks evolve from narrowband (mainly for voice services) to broadband (for high-speed Internet services), new types of policy and regulatory frameworks will be necessary to make broadband available to most citizens at affordable prices and avoid a second digital divide. Developing countries need to continuously improve their policy and regulatory frameworks to remain current with rapidly changing industry structures and business models. Work on broadband policies is essential to attract new waves of private investment and maintain competition to keep prices affordable. The voice telephony divide has mainly been addressed through private investment, which flows as a result of liberalized markets and technological change. Addressing the broadband divide will also be driven mainly by sound policies and up-to-date regulatory frameworks. In most markets this will include support for reforms in radio frequency spectrum management and infrastructure sharing among telecommunication operators.
22. **Selective public financing will also be needed to catalyze private investment in national backbones, cross-border links, and international submarine cables.** In countries or market segments where private investment does not sufficiently respond to sound policy and regulatory frameworks (including large transformational infrastructure, routes between secondary cities, and post-conflict countries with high political risk), it can be important for governments to allocate public funds to support PPPs aimed at catalyzing further private investment. Because private investment is usually forthcoming in this industry, and actual infrastructure costs are fairly low, such PPPs often require a fraction of the amount needed for other infrastructure sectors.
23. **Under the Connect pillar the WBG's strategic priority will be affordable access to broadband connectivity.** Expanding broadband access has been shown to greatly advance growth. Ongoing attention to policy and sector reform will be the main driver to expand broadband networks. Because broadband technologies, markets, and business models are evolving rapidly, countries must stay ahead of the curve and adapt their policy and regulatory frameworks. The need for policy, regulatory, and institutional reforms in this sector is continuous.
24. **Given the growing importance of broadband infrastructure for development, and the World Bank's track record in supporting telecommunications reform, the Bank will expand its policy engagements in this area.** It will promote competition (including in next-generation policy issues such as radio spectrum management and cyber-security), to attract private investment, and increase affordable access, including for women, disabled citizens, disadvantaged communities, and remote and rural areas. The Bank will support the development of telecenters, where applicable, as ecosystems of connectivity, ICT learning, and skills development. The IFC and MIGA will continue to directly support private investment. The IFC will support upgrades and expansion of wireless and mobile networks in frontier markets and low-income countries. It will support investment in shared infrastructure such as independent tower companies. It will continue to support the expansion of high-capacity international and domestic broadband connectivity through submarine cables, satellites, and fiber optic backbone networks. And in selected cases where private investment is not forthcoming enough, the WBG will support PPPs to invest in transformational broadband infrastructure (such as submarine cable and terrestrial backbones),

including in fragile states and low-income countries. The WBG has developed unique expertise in structuring such PPPs in ICT and will support more countries in this field.

## **Doing business differently**

25. **Recognizing that ICT is a fast-changing sector, this strategy has a three-year horizon, starting in mid-2012.** The strategy will be revisited in 2015 through an Implementation Update and Way Forward Note.

26. **Given the opportunities of ICTs to accelerate development across sectors, the new ICT strategy is more ambitious than the last.** Thus a new approach to implementation will be essential. This approach will leverage partnerships with external sources of expertise and share ownership of the agenda across the institution. Key features of this new approach are:

- *Using country diagnostics to prioritize WBG interventions at the country level.* For interested countries and country programs a rapid diagnostic will be performed when developing Country Partnership Strategies, Country Assistance Strategies, or Interim Strategy Notes—or as a separate analytical exercise. Thus assessments of development potential will inform the choice of country interventions., The country diagnostics will also inform greater selectivity to help reduce the risk of failures of IT components in sectoral projects.
- *Strengthening collaboration in the WBG and with partners.* Collaboration can leverage the different strengths of the relevant units of the Bank, IFC, MIGA, World Bank Institute, and the specialized partnership units hosted by the WBG (such as *infoDev*, Public Private Infrastructure Advisory Facility, and Consultative Group to Assist the Poor). And joint work with development partners can lead to a greater impact.
- *Becoming a “connector” of expertise for our clients.* Building on the new Open Development Technology Alliance (a World Bank-sponsored Knowledge Platform for ICT), the WBG can leverage the wealth of knowledge about ICTs that resides in firms, governments, universities, and civil society and among external experts and practitioners.
- *Adopting a stronger cross-sector and cross-region leadership of the ICT agenda, improving IT procurement outcomes, and focusing on ICT skills development.* The WBG will establish a cross-sector and cross-region practice leadership group to better integrate the ICT agenda with regional management teams and regional staff. As of 2011 more than 70 percent of World Bank projects across sectors include ICT components. But specialized skills are limited internally, and a push is needed to develop ICT skills, including staffing and training, across the World Bank Networks and Regions.

27. **The ICT strategy will use a results-based framework to track progress (see annex 1).** The ICT agenda will be demand-driven, and each World Bank Region and country program will confirm its own priorities in implementing the proposed strategy (see annex 4).

# **Chapter 1. What the World Bank Group's ICT activities are doing to spur growth, reduce poverty, and improve governance**

**The World Bank Group's (WBG) 2001 strategy had four pillars: institutional and sector reform, access to information infrastructure, ICT applications, and building human capacity.** WBG-supported reforms have attracted considerable private investment, contributed to mass market access to ICT infrastructure services (especially in mobile voice services), and helped trigger an information revolution, even in difficult environments and the poorest countries. A 2011 Independent Evaluation Group (IEG) assessment found that countries with WBG support for ICT policy reform and investments increased competition and access to ICT services faster than countries without it. Interventions that supported access for the poor focused on sector reform, the enabling environment, and private investments. Although many subsidy programs had limited success in promoting universal access, positive examples indicate the potential of targeted subsidy approaches, including public-private partnerships (PPPs). Work that focused on ICT applications and building human capacity was less effective. Much more remains to be done to enable transformation and build human capacity with ICTs.<sup>2</sup>

## **Sector reform continues to underpin private investment and expand access**

1. **The World Bank has supported ICT sector reform over the past 10 years by introducing competition, helping to privatize incumbent operators, revamping regulatory frameworks, and building regulatory capacity.**<sup>3</sup> Such support has been delivered through 410 technical assistance activities in 91 developing countries and 95 lending operations with a strong focus on low-income countries. The World Bank instruments included advisory service; technical assistance under investment operations; investments in sector institutions, including ministries and regulatory agencies; and support for policy reforms under development policy operations. Activities supporting the reform agenda have had a major impact in developing countries, especially where governments were strongly committed to the reforms. Bank operations were less effective where the commitment was lacking—a difficult issue given the Bank's focus on countries with challenging environments.

2. **Fostering private investment in mobile telecommunications has been the most successful area of WBG activity in ICTs.**<sup>4</sup> World Bank support for sector reform has helped attract an estimated \$30 billion in private investment for mobile network infrastructure in International Development Association (IDA) countries (box 1.1). The International Finance Corporation (IFC), with infrastructure investments of \$2.3 billion in telecommunications<sup>5</sup>—and the Multilateral Investment Guarantee Agency (MIGA), with political risk guarantees of \$550 million—supported private investments for the rollout and expansion of mobile telephony infrastructure and the operations of mobile service providers in difficult and high-risk markets. IFC telecommunications projects in IDA and conflict-affected countries increased access, expanded coverage, reduced prices, and enhanced competition. In Africa, the Caribbean, and the Pacific Islands the IFC often promoted access by backing unknown entrepreneurs, with several becoming household names. MIGA projects support private investments in the ICT sector (particularly for mobile licenses) through political risk insurance, heavily concentrated in IDA (83 percent in volume) and conflict-affected countries (55 percent). Only three MIGA projects encountered disputes between investors and host governments.

**Box 1.1 World Bank Group ICT intervention for FY03–FY10**

<b>ICT Sector</b>			
World Bank: \$875 million in investment lending (36 projects) + 59 Development Policy Operations IFC: \$2.7 billion (100 projects) MIGA: \$550 million (12 projects)			
<b>Infrastructure and networks</b>  World Bank: \$506 million (45 operations) IFC: \$2.3 billion (61 projects) MIGA: \$550 million (12 projects)	<b>Information technology and media</b>  World Bank: \$89 million (11 operations) IFC: \$407 million (39 projects)	<b>Regulatory and policy framework</b>  World Bank: \$212 million in investment lending (27 projects) + 57 Development Policy Operations	<b>Human capacity</b>  World Bank: \$68 million in ICT sector investment lending (7 projects)
<b>Telecommunications (Internet/broadband)</b>  World Bank: \$118 million in investment lending (24 projects) + 8 Development Policy Operations (access for the poor); \$375 million (4 projects for backbones) IFC: \$2.3 billion (61 projects) MIGA: \$550 million (12 projects)	<b>Hardware, software applications and IT-enabled services</b>  World Bank: \$89 million (11 projects: IT/IYES matching grants, IT parks, incubators, and so on) IFC: \$314 million (35 projects)  <b>Broadcasting (TV and radio)</b>  IFC: \$93 million (4 projects)	<b>Competition Licensing &amp; spectrum standards Consumer protection</b>  World Bank: \$212 million in investment lending (27 projects) + 57 Development Policy Operations	<b>Skills to use, adapt, develop, install, and maintain ICT</b>  World Bank: \$68 million (7 projects) + components in education sector (5 projects)
<b>Postal</b>  World Bank: \$13 million in investment lending (6 projects) + 3 Development Policy Operations			
<b>ICT Applications in Other Sectors</b>			
World Bank: 1,300 projects (74 percent of all investment lending) IFC: \$119 million (15 projects) MIGA: \$12.5 million (5 projects)			
Integrated financial management systems – e-procurement – Computers for education – Computerized land information systems – m-banking – Health surveillance systems – Electronic withdrawals for social programs – Traffic and road information systems – Mobile telephony for disaster relief			

**Source:** Independent Evaluation Group

3. **Since 2007 the WBG has strengthened its support for complex public-private ventures in ICT infrastructure in order to catalyze private investment.** The WBG has invested in PPPs to expand access to broadband and high-speed Internet. This was done mainly by supporting national and multicountry backbone networks to improve the access and affordability of high-speed Internet. Examples include IFC support for the Eastern Africa Submarine System (EASSy), IDA support for Burundi's national backbone rollout, and IDA support for The Gambia, Guinea, Liberia, São Tomé and Príncipe, and Sierra Leone for the forthcoming Africa Coast to Europe (ACE) submarine cable. Since the commercial launch of EASSy in 2009, wholesale prices for broadband in East Africa have fallen 90 percent and retail prices for high-speed Internet 30 percent, with take-up rising more than 10-fold in Kenya and 6-fold in Tanzania. A comparable impact is expected in West Africa when ACE comes on stream in late 2012, and in Central Africa when backbone infrastructure is established among Cameroon, the Central African Republic, Chad, and Sudan. Similar programs are under preparation in the Caribbean and the Pacific.

4. **Sector reforms and competition led to exponential growth in access to mobile telephony.** Low-income African countries with more competitive markets have 31 percent higher rates of mobile penetration than those with uncompetitive markets.<sup>6</sup> This growth has provided services for the

underserved, including the urban and rural poor, as operators typically compete on geographic coverage and prices.

5. **But World Bank support for universal access programs needs to be reexamined.** IEG noted that Bank support for ICT policy and sector reform has been more effective in expanding access to marginalized groups than operations that specifically target low-income people with subsidies.<sup>7</sup> The World Bank financed output-based aid in about 20 countries, offering incentives to private players through targeted subsidies. Such programs sought to provide services to rural areas that otherwise would not have been commercially viable. Close to half of these investment projects were cancelled, often because the market moved faster than the planned subsidy programs, making the projects unnecessary. Other issues included the limited capacity of agencies to design and carry out the bidding processes and to implement efficiently and transparently.

6. **As the focus of universal access policies and programs changes from voice telephony to broadband for high-speed Internet, Bank support for next-generation access is likely to become more complex.** Successful programs offer lessons. The Pakistan Universal Access Fund, which focuses on expanding access to broadband and high-speed Internet, is one example. Given the mixed success of universal access programs, future Bank support needs to be informed by careful analysis of key success and risk factors, adapted to the changing needs of broadband markets.

## **Applications—High risks and high rewards**

7. **Bank work on applications has grown rapidly over the past decade, with more than 1,300 active investment projects with ICT components (74 percent of the Bank's 1,700 project portfolio).** Support for applications includes two categories. Back-end applications modernize internal processes of government functions, such as taxes, customs, and financial management information systems. Front-end applications enable direct interaction with citizens and businesses for the delivery and accountability of public and business services—such as e-health, mobile banking, and market information to farmers—as well as the ability to monitor these services through citizen feedback. Until recently Bank work on applications was focused on back-end applications. But work on front-end, citizen-facing services is growing rapidly.

8. **This is a high risk–high reward field that requires continuous learning.** Many applications that the Bank supports do not achieve their objectives: only 59 percent of Bank IT project components have achieved or are likely to achieve their objectives fully or substantially. But considering that the Bank intervenes mostly in challenging environments and developing countries, their performance compares reasonably well with the 50–70 percent success rate reported for private and public IT projects in both developed and developing countries.

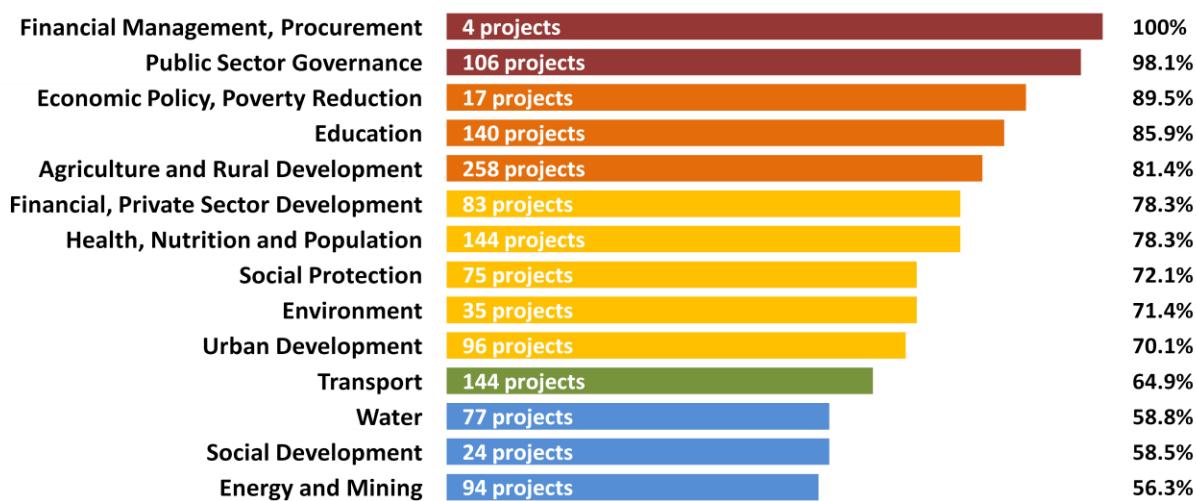
9. **Some applications bring about large benefits while others have small impacts.** One critical success factor is the ability to tie technology investment to institutional reforms and change management. In this context the Bank clearly needs to improve its expertise across sectors in business process reengineering and change management. Another factor is properly designing the procurement of ICT components. Both the Bank and its clients need to improve ICT project design and approaches to procurement to improve such outcomes.

10. **Support for the private delivery of ICT applications (modest in volume) has mainly come from the IFC and MIGA.** The IFC's investments in ICT companies have been among its most successful, with high quality ratings. The IFC has grown its support to applications, focusing mainly on mobile banking, electronic payment systems, e-health, e-commerce, and e-government. IFC performance in this field is at least as good as that of the private sector, but riskier than the average IFC project. Since

2002 MIGA has issued five guarantees for ICT applications in the services and financial sectors for a total of \$12.5 million. These guarantees supported solutions in government agencies (in Kenya and the former Yugoslav Republic of Macedonia) and electronic and mobile payments (in Rwanda, Sierra Leone, and South Africa).

**Figure 1.1 1,300 projects with ICT components in a portfolio of 1,700 World Bank projects (FY03–FY10)**

(share with ICT components)



Source: World Bank, adapted from the Independent Evaluation Group analysis.

## Human capabilities in government, industry, and civil society

11. **The WBG has piloted valuable ICT human capacity initiatives, but it can do much more.** The multidonor partnership program *infoDev* has supported innovative pilots in human capacity building, arranging financing and technical assistance for 300 incubators supporting more than 20,000 micro, small, and medium businesses in 80 countries. It has also provided toolkits, knowledge maps, and surveys of ICTs for education in Africa and the Caribbean. WBG support has been limited to small and medium enterprises, rather than other parts of the sector or economy.

12. **More recently the WBG partnered with leading IT companies to facilitate technical skills training for an ICT workforce, but so far implementation has been on a very limited scale.** In 2008 the Bank's Africa Region Human Development Department, the Finance and Private Sector Development Department, and the ICT Department jointly initiated the New Economy Skills for Africa Program, with a focus on developing ICT skills in partnership with the IT-based service industry. A large-scale approach to align skills with industry requirements is also being tested with the Mexico FIRST project. To date 10,000 Mexican students have been trained and tested under a certification framework developed with industry. The IFC has invested in 54 ICT service companies in the past 10 years, all with extensive in-house training programs. Overall, however, the activities are not integrated enough with the WBG's core country and sector programs—few Bank operations have included ICT skill development at an adequate scale.

## Priorities for the new ICT Sector Strategy (2012–15)

13. **Given the exponential growth of mobile networks and innovative applications, the WBG needs to refocus its role and priorities in the ICT sector and in promoting the use of ICT across sectors.** The world has changed dramatically in the past decade: mobile phones are nearly ubiquitous in developing countries, Internet use is rapidly growing as it becomes more affordable, and innovative ICT applications are emerging across the economy. These changes present great opportunities for development objectives (see annex 2 for key sector trends). The following priorities emerge from WBG experience over the past decade:

- Given the significant impact of ICT connectivity infrastructure on growth (see annex 2), competitiveness, poverty reduction, inclusion, and accountability, the WBG will continue to promote competition and support private sector rollout of ICT infrastructure. But it will emphasize policies for broadband rollout, complemented by support for public-private ventures in ICT infrastructure.
- WBG will strongly promote ICTs to transform services for greater development impact. There is considerable potential to use ICTs to strengthen accountability and governance and to improve government services.
- Given ICTs' importance in driving innovation and productivity gains in industry, the WBG will target skills development for ICT-related job creation and promote ICT use across the economy.

14. **The new ICT sector strategy has a three-year horizon, starting in mid-2012.** The strategy is organized under three pillars:

- *Transform*: Use ICTs to transform service delivery and accountability for greater development results.
- *Innovate*: Develop IT-based service industries and competitiveness enabled by ICTs.
- *Connect*: Expand connectivity infrastructure —as a foundation for all uses of ICTs.

15. **Consultations on the ICT strategy were held in 17 countries in all six regions, and in four Organisation for Economic Co-operation and Development (OECD) countries.** Government officials, regulators, academics, industry, civil society organizations, and international organizations were consulted. Online consultations were also carried out and included three live town hall sessions in Africa, Europe, Asia, and Americas. Consultations elicited broad support for the three pillars. Stakeholders confirmed that connectivity infrastructure is still the top priority, though focus should evolve from voice to broadband in order to expand access to high-speed Internet. Stakeholders showed keen interest in e-government and applications that transform public services. The consultations also highlighted: weaknesses in IT procurement in World Bank projects, the need for skills development to create jobs for women and youth, and the use of ICTs to promote transparency and accountability. The proposed strategy incorporated these directions as part of the Innovate and Transform pillars, respectively.

16. **The strategy also built on the IEG's recent evaluation of the WBG's intervention in the ICT sector.<sup>8</sup>** Key recommendations from IEG are summarized in box 1.2.

**Box 1.2 Lessons from the Independent Evaluation Group's 2011 assessment of Bank Group intervention in the ICT sector.**

***Connectivity agenda***

- Continue to focus on competition and promote stability and predictability in the regulatory system.
- Update technical assistance to deal with next-generation business models, technology convergence, and policy and regulatory issues.
- Support catalytic public-private partnerships to accelerate the rollout of regional and national backbone infrastructure.
- Find more effective approaches to promote access to the underserved (including women), given that this industry's market usually moves faster than public subsidy programs.

***Applications agenda***

- Implement ICT applications:
  - Consider country readiness, local context and capabilities, complementary investments in infrastructure and training—and project-specific change-management challenges.
  - Support cross-sectoral enablers—including policies and standards that apply across agencies and apex institutions—to lead the ICT agenda across sectors.
  - Take advantage of shared infrastructure and services for joint use across government agencies wherever feasible.
- Strengthen WBG support for skills development in client countries for ICT applications.
- Strengthen WBG capacity to respond to client demands:
  - Build greater ICT expertise, spread awareness within WBG about ICT applications, and capture ICT aspects in country and sector strategies more consistently.
  - Create incentives for collaboration, coordination, and joint approaches to innovation between WBG units.
  - Serve as a connector between internal/client demands and outside expertise from the public and private sectors.
- Improve the WBG procurement outcomes in ICT projects and ICT components:
  - Build ICT expertise of procurement specialists.
  - Adapt procurement rules to reflect sector specificity and growing use of public-private partnerships.
  - Design consistent procurement procedures to facilitate collaboration between technical staff and procurement specialists.

## **Chapter 2. Transform—Making development more open and accountable and transforming service delivery**

17. **The Transform agenda is the most important pillar of the new ICT sector strategy.** The strategy focuses on two opportunities: open and accountable development and transformation of service delivery.

### **Open and accountable development using ICTs**

18. **Across the world an open development movement is emerging to use technology to improve service delivery and increase government accountability.** In India the Right to Information Act gives citizens quicker access to land records and basic services such as water and ration cards. In East Africa the Open Budget Initiative helps governments make the legislative process more transparent. In Malaysia citizens can obtain a wide range of government information by texting a short code. From the United States to Kenya, governments are putting data online in formats accessible to agencies and citizens alike. Ad hoc maps can be created to visualize different variables, from health centers to water access points. Citizens can become journalists, reporting on social issues and infrastructure needs such as infrastructure rollout, necessary service repairs, and the quality of public service delivery. Open budget information paired with creative and intuitive visualizations can reduce corruption and increase accountability.

19. **Cities and central governments are beginning to co-create services and applications with citizens and businesses.** From programming marathons to solve critical development challenges (known as “hackathons”), to competitions to build applications from existing datasets (“app contests”), governments are finding in citizens and technologists a pool of creativity with the power to improve the delivery of public services, closing a “service delivery gap” that many governments did not even know existed.

20. **Mobile phones and the Internet enable end-users to identify challenges, produce information, and share ideas through online exchanges and other crowdsourcing mechanisms.** ICT-enabled crowdsourcing—best known in the context of crises in Chile, Haiti, and Kenya—allows citizens to publish news and emergency information to increase accountability and transparency. But the principle extends beyond crisis-mapping. Numerous tools have emerged in a worldwide movement of ICT-enabled crowdsourcing that forges communities of “solvers” to address development challenges.

21. **In consultations on the new ICT strategy, stakeholders called on governments to take bolder steps toward open and accountable development using ICTs.** Concrete actions that governments can initiate include:

- Use ICTs to create pressure points for accountability and performance (collecting, publishing, and verifying data, leveraging citizen participation).
- Increase the transparency of government activities and leverage citizen participation: encourage applications such as revenue watch, procurement watch, and open budget—and use anticorruption hotlines, utility misuse reporting, and participatory budgeting.
- Open and publish disclosable government-collected data on public services, infrastructure, and national statistical information, enabling civil society and entrepreneurs to create services and applications with the data.
- Use participatory mechanisms to solicit solutions to clearly stated development challenges through crowdsourcing, gamification models, and “solver” communities.

- Adapt institutional arrangements, legal and regulatory frameworks (open government directives, freedom of information legislation, information security and privacy), and in many cases information technology infrastructure (open standards, interoperability frameworks, information security and privacy) to make these initiatives sustainable.

22. **Open aid is also taking shape.** Governments and international development organizations can now monitor their programs in the field through ICTs. AidData tracks nearly 1 million government aid projects from 87 governments and coalitions, making this information publicly available online to increase accountability. Aid and budgetary data standards—such as the International Aid Transparency Initiative, subscribed to by 21 major aid donors—enables data-driven oversight and monitoring of aid expenditures and outcomes. The AidFlows website ([www.aidflows.org](http://www.aidflows.org)), launched in 2010 by the World Bank and OECD, also makes the flow of development funds more transparent. The civil society in developed and developing countries alike is calling on the international development community to measure development program results more systematically. This was echoed in IDA16 replenishment negotiations, when Bank Management committed to improve its results focus, effectiveness, and efficiency through changes to the IDA Results Monitoring System.

23. **Social media can help make women's voices heard.** Social media empowers women to participate in public processes, strengthening their voices in society. ICTs help women to move freely, exercise control over resources, make decisions in the family, and free themselves from risk of violence (see annex 2 for details).

## **Transformation of service delivery**

24. **Governments can use ICTs to transform public service delivery across sectors—health, education, social protection, justice, agriculture, water, energy, and transport—both central and local.** ICTs offer an opportunity to revolutionize public service management by capturing information efficiently in shared databases accessible to all government agencies (such as a national database of electronic and biometric identification of citizens). ICTs help governments to simplify administrative procedures and share services (such as citizen authentication and payment systems). And governments can pool resources, reduce costs, adopt common standards for information exchanges, and perform government functions more efficiently (with faster response time and fewer errors).

25. **Mobile phones can function as a service delivery platform.** More than 90 percent of adults in most countries have access to a mobile phone. This penetration creates opportunities to use mobile phones as a service delivery platform for both public and private services. Basic phones can already transform how some services are performed. Reminding an HIV/AIDS patient to take medication or a pregnant woman to check regularly with the nearest clinic requires only a text. Fifteen million Kenyans take advantage of a 23,000-strong mobile-money authorized agent network, using basic texting on their mobile phones to make payment transactions. As mobile devices gain computing power, the variety and depth of services is poised to grow rapidly.

26. **ICTs can transform government functions and back-end systems.** Upgrading economic management and public administration back-end functions through IT systems is a core activity of public sector reform, mostly through public management information systems. These typically include customs and taxation, electronic procurement, human resource management (including payroll), financial management (accounting, budgeting, control, and treasury functions), and social security management. Such activities will no longer need heavy software development because many best-practice applications already exist in the market (see annex 2). In the open source market and the software-as-a-service space, governments can buy IT services rather than produce and manage IT services themselves. Governments may, however, need to develop capacity to manage the transition.

**27. ICTs can revolutionize transactions between government and citizens, and between government and business.** Accessing government services online—such as obtaining a land title, a marriage certificate, a certificate of school completion, or a copy of tax statements—allows citizens to transact with government from a computer or Internet-enabled mobile device, without having to visit crowded government offices. Well-implemented online services drastically reduce transaction costs and increase society’s trust in government. In Brazil one-stop-shop portals allow 95 percent of citizens to file returns and pay their taxes online. In the Republic of Korea e-procurement systems help governments save 20 percent a year on procured goods and increase local small and medium enterprise participation in public procurement (in most countries e-procurement helps to reduce corruption and avoid tempering of the bids). In Jordan a passport is issued in a few hours. And in Rwanda a business can register online in an hour.

**28. ICTs improve disaster risk management and help countries adapt to climate variability.** Whether triggered by climate change or other causes, the frequency of natural disasters requires that preparedness and disaster relief become the “new normal” in all countries. ICTs can play a large role in all stages of disaster risk management, including risk identification through remote sensing, crowdsourcing, and data repositories; risk mitigation through mobile applications; preparedness through advanced early warning systems; disaster response and early recovery through remote sensing technology and GIS situational awareness tools; and reconstruction through interactive mapping and data sharing. ICTs help collect and visualize hazard and exposure data, provide tools to reach the most vulnerable, and promote transparency by monitoring relief and reconstruction. And facing climate variability, ICTs can serve as a tool for prevention and adaptation.

**29. ICTs can enrich endowments of women and girls.** ICTs help address gender gaps in endowments, including health, education, and material assets. Mobile phones can deliver basic services, such as health information, and collect citizen feedback. ICTs can extend access to education and offer distance education. Supportive land management policies, coupled with the use of information systems, can strengthen women’s land and ownership rights. When conducted in a gender-neutral way, these steps help address gender inequality traps affecting the poor and those excluded in society. ICTs also create opportunities for women. Female entrepreneurs use the Internet to access domestic and international markets more directly. In Morocco home-based female weavers use the Internet to sell rugs and other textiles and to keep a larger share of their profits than in traditional middle-man systems. See annex 2 for additional details.

**30. ICTs’ impact on the media has transformed development.** The rapid growth of ICTs has profoundly affected the media and its role in development. The media landscape has become more dense, complex, and participatory. More people than ever can engage in public discourse, undertake collective action, and demand improved services or greater accountability on sociopolitical and economic issues. New and social media empower people to go beyond social connection to transform how they engage in development. These new technologies and behaviors also have important economic implications that contribute to growth and job creation. Local, national, and international organizations, including government and nongovernment entities, have already engaged the media sector to address development challenges ranging from governance and anticorruption to combating the effects of climate change.

**31. The private sector can be a partner and leader for faster implementation.** Private firms invest where there are market opportunities, mobilizing resources and responding to customer needs. Governments may leverage the private sector’s drive for results and partner with it to operate ICT-based solutions. For example, the government of Ghana is working with a private firm to develop and run its new online taxation system. This can also be part of a country strategy to foster the local IT-based services industry (a main feature of Singapore’s private sector success).

**32. The governments of developing countries, often the single biggest consumers of IT services and applications, can use their customer status to accelerate the private sector's development of ICT-based pro-poor services.** Governments can use conditional cash transfers to create demand and boost volume, prompting private operators to enter the market, use mobile-based identification mechanisms, and set up mobile payment services. Governments may want to establish ICT-based public goods platforms (managed by private partners) to offer common services to an entire sector. Examples include a credit bureau for the financial sector, an electronic health records system for the health sector, and an ICT platform for the microfinance sector.

**33. Establishing the enabling environment for transformation: A cross-cutting approach to transformation is essential.** Governments are typically organized in vertical silos for individual ministries and departments. Without overarching enterprise architecture, there is often duplication and waste in technology investments. In several instances ID cards for health services were started separately from those for social protection. A national e-ID system would have been more effective. Similarly, one project may help establish a data center in the ministry of finance, while another finances a data center in the ministry of land administration. A consolidated data center catering to both ministries could prevent this duplication. New technologies make consolidation more efficient and cost-effective. A cross-cutting approach, including having an apex institution (at a high level) to lead the ICT agenda across sectors, can bring coherence to the delivery of government services and reduce technology-related investments.

**34. Countries need to establish institutional arrangements and coordination mechanisms to drive ICTs for transformation.** The interdependencies among the strategy's three pillars—applying ICTs for service delivery and open development, promoting the IT-based services industry, and securing broader connectivity access—require institutional arrangements and coordination mechanisms. These would ensure the coherence of policies and investments for building common infrastructures, shared platforms, core capabilities, and vibrant ecosystems. For example, government ICT applications should be sequenced with the development of relevant content, local ICT industry development, and enabling policies concerning regulation, as well as information security and privacy (see annex 5 for a discussion of the latter). This approach is even more important for developing countries, where financial resources and skills are scarce, and prioritizing and sequencing are essential. It requires empowering public and public-private entities to provide leadership, strategy, policy, and advisory functions—and to implement, monitor, and evaluate programs continuously. Critical issues include positioning this coordinating organization within the government and establishing its enabling links to other stakeholders in the private sector and civil society. Developing the capacity of leadership institutions is a key factor in designing and implementing national ICT strategies, exploiting synergies across the three pillars, and sustaining the transformation process over time.

**35. Countries need sector-specific policies and institutional arrangements to create an enabling environment for using ICTs to improve the reach and efficiency of government services to citizens and businesses.** These policies and arrangements are also necessary to strengthen the private sector's ability to create new ICT-enabled services and engage in public-private partnerships (PPPs) for government service delivery. The private sector can create m-banking, for example, and funds its network of agents to transport cash. But it cannot get started unless the central bank has established enabling banking legislation and regulations, payment security standards, and rules for what happens when things go wrong.

**36. As developing countries transition to a digital world, they must build trust among users of ICT applications—information security and user privacy are essential.** This requires establishing policies, laws, and regulations (such as online authentication, electronic transactions, cyber-security, critical infrastructure protection, data and privacy protection, consumer protection, freedom of information and of expression, and intellectual property). It also requires building capacity and awareness

within the government and private sector, and among citizens to address issues. And it requires protecting physical infrastructure, networks, systems, and mobile and cloud platforms, and investing in reliable business-continuity and disaster-recovery arrangements. These issues become critical for electronic identification and biometric technology. Developing countries in particular have severe problems with service delivery and financial inclusion due to a lack of robust and ubiquitous identification. The ability of a government or private provider to authenticate an individual's identity, while securing that information and preserving the individual's privacy, is the foundation of any program that interacts with people (see annex 5 for a discussion of information security and privacy).

**37. Governments need to foster and promote cross-sector and sector-specific foundations to support ICT-enabled government-wide transformation.** These include:

- Developing e-transformation strategies, including at the sector level.
- Building institutions capable of driving the transformation agenda across government and advancing skills within these institutions and across the civil service.
- Breaking down siloed approaches to technology investments.
- Formulating sector-specific policies, regulations, and laws (such as those for health, education, and energy) to support the use of ICTs to transform service delivery—and to strengthen the private sector's ability to create new ICT-enabled services (such as m-banking).
- Formulating common standards and policies for transformation across government that enable:
  - An environment for open government and civil society participation, as part of accountability mechanisms and the co-creation of content and services.
  - Sector objectives.
  - Interoperability and efficiency.
  - An environment to strengthen the private sector's ability to engage in PPPs for government service delivery (PPP framework, investment climate framework).
  - ICT "trust" policies: laws and regulations regarding information security and privacy, including online authentication, electronic transactions, cyber-security, critical infrastructure protection, data and privacy protection, consumer protection, cyber-crime, freedom of information and of expression, and intellectual property and information security (see annex 5).

## **The World Bank Group's strategic focus going forward**

**38. WBG comparative advantages. The World Bank will leverage its deep sector expertise and relationships with government institutions and sector agencies.** These advantages will allow the World Bank to help integrate innovations into service delivery and accountability processes and to carry out associated policy and institutional reforms. World Bank capabilities across all sectors and themes will be essential to support this cross-cutting agenda effectively. The International Finance Corporation (IFC) will draw lessons from its early investments in media ventures to invest further in the content industry. And it will use its skills in assessing growth-stage IT-enabled investment opportunities to support venture investment. The IFC is also well placed to support e-payment ventures given its growing experience in this area (see annex 3 for more on WBG's comparative advantages).

### ***Supporting governments on open and accountable development***

**39. The open and accountable development agenda requires both government and civil society initiative.** Governments can make information publicly available through open data and other transparency initiatives. Governments can also reform to become more responsive to growing citizen demands and pressures. Promoting citizen engagement without government reform risks unrealistic expectations that will not be met and may fan discontent. For this agenda to have a real impact on

development, interested governments need to facilitate citizen participation, and reform institutions and processes to respond with remedies to problems identified by citizens.

40. **The World Bank will pursue this agenda of open and accountable development by focusing its intervention on cross-sector enablers and sectors where it is engaging government counterparts and providing financing.** It will help strengthen citizen voices in holding government and service providers more accountable. And it will support government reform to become more demand-responsive and address these priorities. The selectivity lens adopted by the World Bank for open and accountable development will thus be aligned closely with its lending program. See annex 3 for examples of World Bank work in Afghanistan, where it supports the government's use of mobile applications to expand and improve public service delivery and strengthen program management; and in Tanzania, where it uses community mapping to support the design of an urban project.

41. **The IFC will focus on media applications and content.** The IFC is looking for ways to support the production of higher quality, relevant, local content that generates jobs, extends the reach of knowledge, and provides easy access to meaningful information that people in emerging economies need to expand their opportunities. And it is looking for opportunities to invest in social media, focusing on mobile and Internet-based applications that support user-generated content beyond social communication, such as e-health, e-learning, and e-commerce applications.

### *Supporting open aid*

42. **Recent efforts to improve the accountability of World Bank-financed projects have included several features that could be replicated or adapted by other aid institutions:**

- The World Bank Open Data Initiative, spearheaded by the 2011 Apps for Development Challenge, grants citizens, civil society, and entrepreneurs' access to the data it collects.
- The World Bank recently launched the “World Bank Finances” mobile application for International Bank for Reconstruction and Development and International Development Association financial information by country, project, and loan. It can be downloaded to mobile phones.<sup>9</sup>
- The External Implementation Status and Results Reports Plus Initiative, a pilot now under way in the Africa Region, uses ICTs to inform the true owners of a project—a country’s citizens—about what the project is and what it is meant to accomplish. Just as important, the initiative solicits citizen reactions to the pace and value added of project implementation. The pilot is exploring how to strengthen the monitoring and development effectiveness of Bank-financed government-implemented projects, as well as how to enhance the Bank’s engagement with civil society as part of its broader social accountability agenda.
- The Mapping for Results initiative, led by the World Bank Institute, collects and publishes geospatial data to map activities financed under its project portfolio. The World Bank plans to expand this initiative as part of a new “open aid partnership.” That partnership aims to increase aid transparency by making aid information more accessible—not only for World Bank projects but also for development partners, thanks to a comprehensive view of aid-supported activities at the global, country, regional, and sectoral levels. The partnership also aims to inform and empower citizens in developing countries to provide feedback on aid-supported activities to make the aid process more open and participatory.

43. **To complement the Mapping for Results initiative, the World Bank will develop a tool to survey beneficiaries of World Bank-financed investment projects to monitor progress on intended project results.** The tool will include a dissemination module so that survey data are publicly available and easy to visualize. Systematically embedding the tool into project design will be phased through a demand-driven process.

## ***Transforming service delivery***

44. **The Independent Evaluation Group studied the main reasons for the failure of ICT components in sectoral projects.** The reasons included resistance to reform, lack of capacity in government, systematic underestimation of change management and process reengineering requirements (the “soft” part of IT project implementation), lack of relevant expertise in World Bank teams, and challenges with Bank procurement guidelines for IT project components. An analysis carried out in the European and Central Asia Region also suggested more corruption investigations in IT procurement components than in other components.

45. **Transforming government requires an alignment between the ICT experts and the reformers and administrators.** It also requires large-scale change management to train the civil service on the new rules and processes, as well as new computer-based skills to use the management information systems. Applying ICTs to poorly performing processes cannot lead to transformation.

46. **Given the high failure rate of government IT spending (including that supported by World Bank financing), and the high risk–high reward nature of IT spending, the World Bank will be much more selective in supporting government IT systems going forward.** The Bank will also encourage governments to adopt the approach of “buying IT as a service” (managed by private sector firms as opposed to governments’ internal IT departments) or engaging in PPPs to carry out government functions or deliver government services. World Bank support will focus on those agencies that show a strong commitment to reform their processes under a strong reform leader. Also, they must demonstrate that they are willing to build the capacity of civil servants (or to in-source qualified consultants) to run IT projects (including project management, design, and procurement of IT activities)—and to handle the interaction with the private sector when services are outsourced.

47. **Priority will also be given to countries with strong champions and the will to invest in an enabling environment for transformation.** This environment includes: the formulation of e-transformation strategies at the country or sector level, the establishment of institutions empowered to integrate IT across government, the formulation of common standards and policies for transformation across sectors (including information security and privacy, and consumer protection considerations), and investments in shared-service IT infrastructure platforms (such as application store platforms—and cloud data centers to host private services aimed at government and the applications agencies use across government). For new projects (with preparations beginning after July 2012) country programs will prioritize IT components with sectors that have committed to advancing their IT expertise—training existing staff, bringing in new staff, or contracting external expertise—within their sector strategic staffing plan and/or through external IT experts who can be integrated in project teams for the design and implementation of IT project components. This will apply to government investments to upgrade public administration management information systems (payroll, revenue collection, expenditure monitoring, procurement, other large-scale process automation, data digitization and publication, and government e-mail). This will also apply to the financing of government solutions to improve the reach and efficiency of government services.

48. **The World Bank is gaining expertise in structuring PPPs to carry out government functions.** The WBG can offer a combination of World Bank (concessional financing), IFC (private sector financing), and Multilateral Investment Guarantee Agency (MIGA; political risk mitigation guarantees) instruments to support PPPs where firms are partnering with government in to deliver public services or carry out government functions (including outsourcing services). The IFC is well placed to support sound ICT applications projects that deliver commercially viable services to citizens and businesses (including traditional sectors but also software-as-a-service, independent data centers, and e-government). The IFC has also developed expertise in e-payments by investing in new payment platforms

and service providers with innovative and evolving business models. Given ICT's transformative impact on other sectors, the IFC's ICT team is also exploring venture investment support through "internal JVs" with other IFC industry groups—foremost health, education, and financial markets—where the IFC's skills in assessing growth-stage IT-enabled investment opportunities can be leveraged.

49. Examples of World Bank Group interventions to support ICTs to transform service delivery include transforming back-office systems in India and Guatemala, improving urban transport in the Philippines, using PPPs to transform government functions in Ghana, using a development policy operation to establish an environment for transformation in India (World Bank), using a MIGA guarantee to support the rollout of mobile payments in Sierra Leone (MIGA), and supporting a private venture to help farmers get crop information (IFC). See annex 3 for details.

## **Chapter 3. Innovate—Supporting ICT innovation for growth, jobs, and competitiveness**

50. **ICT innovation—a definition.** With the advent of personal computers, broadband Internet, and mobile phones, ICT has become an important driver in fostering innovation leading to enhanced firm productivity and economic growth. For this strategy ICT innovation is defined as introducing new or improved goods and services into the market—or as finding new ways to organize production or develop new markets with the help of ICTs.<sup>10</sup> Under the Innovate pillar the World Bank Group (WBG) will support its clients in using ICT innovation as a source of competitiveness across the economy and in harnessing economic opportunities in the growing IT-based services industry.

51. **ICTs can foster competitiveness.** Doing so requires helping markets work better, improving the efficiency of management and production systems, making business environments more transparent and enabling, and facilitating access to information, knowledge, financial services, and other resources. ICTs can greatly contribute to meeting these requirements.

52. **In a connected world ICT innovation can help create products and services relevant to the poor.** Developing countries are becoming hotbeds of ICT innovation, introducing new products and services that are locally relevant with a potentially wide outreach to the poorest consumers. Such products and services have started to contribute to “reverse innovation” (innovation seen first or likely to be used first in developing countries before spreading to the industrialized world).<sup>11</sup> For example, Medtronic designed a low-cost pill-sized pacemaker inside a stent for use in India.<sup>12</sup> Remote sensors in the pill-sized pacemaker transmit signals through any smartphone to a cloud-computing infrastructure. Medtronic now plans to market this low-cost pacemaker in the United States and Europe.

53. **Promoting technology diffusion across the economy can increase productivity and accelerate economic growth.** Empirical evidence shows that, on average, firms that use ICTs grow faster, invest more, and are more productive and profitable than those that do not. According to a World Bank study sales growth and profitability are 3.4 and 5.1 percentage points higher, respectively, among firms that use ICTs effectively in their businesses (table 3.1). But progress in improving developing countries’ capacity to absorb and use these technologies throughout their economies has been much slower. This lag is particularly due to the weakness of domestic skills and competencies, as well as rigidities in the regulatory environment, which prevent the creation and expansion of innovative firms. Despite their technologically sophisticated cities and world-class firms, many developing countries fall far below the technological achievement in more ICT-savvy economies. In Brazil and India the most sophisticated firms use technologies and achieve productivity levels that compete with world leaders, but the vast majority of other firms operate at a fifth of the top performers’ productivity.<sup>13</sup> Small and medium enterprises (SMEs) have particular disadvantages due to their lack of capacity and financial resources, which leads to problems in their ability to absorb new technologies and know-how into their products and processes.

**Table 3.1 Effect of ICT use on firm performance in developing countries**

Enterprises	not using ICT	using ICT	Difference
Sales growth (%)	0.4	3.8	+750%
Employment growth (%)	4.5	5.6	+24%
Profitability (%)	4.2	9.3	+113%
Labor productivity (\$, value added per worker)	5,288	8,712	+65%

Source: World Bank 2006, “Information and Communications for Development: Global Trends and Policies.

54. **IT-based services have the potential to create jobs and advance the economic goals of developing countries.** It is estimated that IT-based services represent an addressable market of approximately \$800 billion globally, and only about a third has been realized. IT-based services offer many direct and indirect employment opportunities, particularly for youth and women. Globally the industry will create an estimated 4 million additional direct jobs by 2016, while indirectly creating as many as 12–16 million more in other sectors. In India young people (ages 26–35) hold around 70 percent of jobs in this industry, and in the Philippines women account for 60 percent of the IT-based services workforce—a much higher rate of youth and female participation than in the service and manufacturing sectors in general, for jobs that pay 50–100 percent more than comparable service jobs. As governments and policymakers harness the potential of IT-based services, these markets can become an integral part of national development strategies for growth.

55. **The industry has diversified geographically over the past five years.** While earlier India and the Philippines captured the lion’s share of the growth opportunity in the IT-based service industry, many countries have begun to emulate Bangalore, Hyderabad, and Manila, with opportunities for large and small countries alike. The Dominican Republic, El Salvador, Malta, and Mauritius show that small countries have as much potential to succeed as large ones. Relative to total exports, Mauritius exported a higher proportion of IT-based services than India.<sup>14</sup>

## Promoting ICTs for competitiveness

56. **Policies to promote affordable access to ICTs.** To promote adoption of ICTs across the economy an important requirement is affordable ICT infrastructure (broadband and computing devices). Policies that enhance competition and reduce the cost of ICTs can help promote ICTs across sectors.

57. **Governments can promote private sector use of ICTs, especially by SMEs, through incentives.** ICTs can help the private sector reduce business costs, improve internal management, and expand access to new technologies and information on market opportunities. ICTs can also help optimize supply chains, making it easier to get goods and services to the market. Government programs that aim to help the private sector use ICTs for business can contribute greatly to competitiveness.

58. **Regulatory frameworks that establish trust in ICT use are important.** Legal and regulatory frameworks for secure electronic transactions are essential to foster trust and enhance the use of ICTs in business.

59. **Mobile banking can help create more inclusive financial markets.** Mobile banking can reduce the cost of accessing finance, especially for micro and small enterprises. Regulatory frameworks and institutions that promote mobile finance can be very useful for small businesses.

## Promoting IT-based services

60. **To unlock the potential of ICT innovation, governments have to calibrate their interventions.** There is a fine balance between facilitating innovation and stifling it with too much intervention. Innovation, mainly led by the private sector and at the grassroots level, relies on creativity's ability to blossom—not a feature usually associated with government bureaucracy. The success of India's IT-based services industry is widely believed to have taken off in the absence of heavy government intervention, other than effective telecommunications and education policies and marketing for major Indian cities as investment destinations. Kenya's m-Pesa thrived thanks to light regulation. Rather than direct intervention, governments should focus on the key enablers of ICT innovation: developing a skilled workforce, implementing ICT innovation policies, promoting ICT entrepreneurship, and facilitating a bottom-up approach to innovation.

61. **Policies to enhance competitiveness of IT-based services industries.** Enhancing competitiveness of IT-based services industries usually requires policy action on a number of complementary levels:

- *An active government role.* In countries with successful IT-based services, governments have adopted an active role in promoting the sector. Most public intervention to promote the industry—improving education, providing broadband infrastructure, establishing IT parks, or streamlining government interfaces with business—are “no-regret” moves that carry little risk, as opposed to past industrial policies that led many economists to argue against governments “picking winners.”
- *A focus on skills.* Given the importance of skills to the growth of IT-based services industries, a focus on quality of education, closely aligned with local and global industry needs, is often essential. Regional centers of excellence and distance learning can play a role.
- *Leadership.* Extensive commitment and support from the highest echelons of government are essential to make rapid and deliberate policy choices, apply them effectively, and overcome bureaucratic resistance.

62. **Skills are essential to grow innovative IT-based services that create jobs and generate income in developing countries.** Within the IT-based services industry, the level of education, cost of labor, attrition rates, fluency in business languages, and size of the skilled labor pool determine the competitiveness of the local talent pool. Innovation requires not only technological skills but also management, teamwork, and networking skills. Human capital is the most important component in developing and sustaining the IT-based services industry, as well as establishing a culture of ICT entrepreneurship to benefit from the promise of enhanced access to infrastructure.

63. **Countries that want to capture part of the global opportunity in IT-based services need to promote a skilled workforce by focusing on three practical areas, in close partnership with the private sector and education institutions.** The first is assessing skills—testing trainees against international benchmarks relevant to the IT-based services industry. The second is building skills for IT-based services, preferably as part of the secondary and tertiary education system. And the third is developing higher science and engineering skills to absorb ICTs and put them to use across the economy. Governments should ensure that these programs are designed to create a high-quality talent pool that meets long-term industry demands and is sustainable in the long run.

64. **It is necessary to nurture skills for more sophisticated use of ICTs across sectors and transfer them to the market.** Instruments need to support the skills and competencies of applied research constituencies in tertiary education and vocational training institutions. Instruments such as national technology programs, open cooperation platforms, and innovation funds can help in developing higher-end skills and technological competencies. Governments should also support human capacities to create digital content (the public sector can have a major role simply by opening its data or commissioning content creation in close collaboration with universities, the private sector, and civil society).

## Promoting ICT innovation

65. **A holistic innovation policy that emphasizes ICT as a strategic driver, and has adequate financial support and buy-in from the highest offices, is essential to foster ICT-enabled innovation across the economy.** Countries can offer incentives to innovation stakeholders, promote local and international collaboration, establish supportive ICT-enabled platforms for “ideation,” and pilot co-creation with users and end-customers. They can do all this while supporting the development of ICT infrastructure for creating test beds and building capacity and skills. Governments can establish enabling environments that strengthen the entire innovation value chain: ideation, research and development (R&D), funding, and commercialization, with a strong emphasis on leveraging ICTs. Singapore has led the way with its National Framework for Innovation and Enterprises, which systematically leverages ICTs in selected strategic sectors and thus builds competitiveness and leadership for ICT innovation across sectors. In India ICT innovation moves businesses up the global value chain, and policymakers help integrate ICTs into production and manufacturing.

66. **Governments should develop innovation policies to clarify mandates and strengthen the coordination and collaboration mechanisms for leveraging ICT capacities, management practices among institutions involved in the innovation ecosystem, and multiple innovation actors and networks.** Government should strengthen development strategies for the IT-based services industry and implement plans for national information social policy to help disseminate the use of ICTs to other sectors through a “cluster approach” (for instance, encouraging collaboration between the textile industry and SMEs specializing in ICT tools relevant to clothing design and manufacturing); support piloting and prototyping across the value chain; promote cross-cutting technologies (such as electronic identification) and their inclusion in projects for key sectors (such as national health care or pension schemes); and integrate ICTs into strategies for rural and urban development. Finland and Korea, at the forefront of the ICT-enabled innovation agenda, have strong traditions of such mechanisms involving all key stakeholders, with innovation policy that explicitly supports networking among industry, universities, and public researchers.

67. **Developing countries should build policies that both enhance the technological absorptive capacity in firms and accelerate the general population’s acquisition of technologies.** Countries should build policies with the following four aims. First, policies should speed up broadband infrastructure and services that help connect poor users and extend competition to all market segments—whether delivered directly by the state or in partnerships with the private sector. Second, the policies should strengthen skills and competencies among the domestic population to help build “absorptive capacity” at the subnational and national levels—and to strengthen dissemination channels within the countries. Third, they should use tax incentives to promote technology transfer through increased foreign direct investment. Fourth, the policies should develop shared infrastructure (cloud-computing platforms, render farms) that could support and stimulate technology diffusion, particularly among SMEs that have scarce resources to fund their own infrastructure.<sup>15</sup>

## Promoting ICT-based entrepreneurship

68. **Entrepreneurs have introduced game-changing products and services, transforming the way millions of people interact.** New technologies, services, and service delivery models can reach out to marginalized populations in the global economy. The ability of individuals and entrepreneurs to innovate, with the right incentives, is critical to success. Creating a class of ICT entrepreneurs will help developing countries capture the high value added of homegrown enterprises. While incubation and business acceleration are attractive, it is not easy to foster local entrepreneurship in countries with low capacity, a weak culture of entrepreneurship, and a lack of mechanisms to facilitate the learning and sharing of ideas among stakeholders. Entrepreneurship also requires access to global talent (for example, through virtual teams) to work on cutting-edge technologies and processes.

69. **Most developing countries still lack an incubation ecosystem for technology entrepreneurship, including experienced mentors, knowledge networks, affordable broadband, physical space, or proven financing models.** Local business incubators—providing business services, training, mentoring, reasonably priced space, connections to industry and academia, and introductions to potential investors—remain weak, with poor links to global markets. To mitigate these challenges countries can connect technology teams in developing countries with technology firms in developed markets. In this model technology companies in developed countries gain access to high-quality talent in developing countries at low initial cost, growing their businesses across borders. U.S.-based Y-Combinator, Beta Works, and Idea Labs, as well as London’s Tech Hub, specialize in funding and providing incubation support to early-stage startups. Similar models need to be replicated in developing countries.

70. **To support entrepreneurs, start-ups, and SMEs, developing countries should create business incubation ecosystems:**

- Clustering IT-based businesses (for content and applications) to link SMEs and local research institutions to economic activities. In Europe the clustering of SMEs and the creation of “subclusters” (for example, “digibusinesses” of creative industries through the DigiBIC network<sup>16</sup>) have helped start-ups and SMEs exploit new technologies and catch market opportunities through cooperation with leading research institutions.
- Leveraging the lower value-chain segments of the IT-based service industry to incubate decentralized SMEs at scale, following Kenya (pursuing “impact sourcing,” especially in rural areas), India (rural business process outsourcing), and Cambodia (digitizing government data in rural centers).
- Creating capacity-building intermediaries to help entrepreneurs turn business ideas into reality and to modernize and improve companies’ competitiveness through ICTs. New models that demonstrate and prototype activities—borrowing western intellectual property rights for local application development—can be explored with international industry leaders and specific initiatives such as Mobile Apps Labs established by infoDev, the World Bank Group’s multidonor partnership program and the government of Finland.
- Creating open innovation forums or “Living Labs” to engage start-ups and small firms in cooperation with other innovation actors to evaluate concepts and develop prototypes in real-life settings with real users. Examples are available in Europe, where Living Labs are strengthening the innovation chain from ideas to incubation and engaging local SMEs to develop local ICT services.<sup>17</sup> The model is also becoming popular in China, Latin America, and Africa.<sup>18</sup>

## Promoting a bottom-up, user-centric approach to innovation

71. **Light innovation is the low-cost, agile development and rapid prototyping of ideas, concepts, products, services, and processes with a highly decentralized and user-centric approach.** Rather than picking a handful of big projects to fund from an idea network of internal and external experts, countries need to build capacity for parallel, incremental, and high-velocity innovation that can expand and become viral across the economy over long periods. Light innovation mechanisms allow those ideas to be developed through prototyping, engagement with end-users, and lean financing structures.

72. **Light innovation, a new innovation model most common in the web industry, will set the pace for every sector over the next decade.** While open innovation expands the sources of new ideas, light innovation disaggregates and accelerates R&D, engages end-users, and constantly invents and reinvents new platforms. Light innovation, as a disruptive way of generating and executing ideas, stands to fundamentally transform the way organizations innovate and profit from innovation.<sup>19</sup>

### 73. To support light innovation, developing countries should:

- Establish voluntary collaborative communities and support existing networks. A good example is MobileMonday, an open community platform of mobile industry visionaries, developers, and influential individuals. The platform fosters brand-neutral cooperation and cross-border business opportunities through networking events designed to demonstrate products, share ideas, and discuss trends from local and global markets. MobileMonday originated in Helsinki, and has helped organize events across the world. Such communities can drive services' introduction and take-up, thus organizing stakeholders for value creation from ICTs. Such networking boosts the inclusion of new members in global ecosystems, where the culture promotes cooperation, knowledge, idea sharing, and risk taking.<sup>20</sup>
- Promote light structures, like Living Labs and Co-Creation Forums, to form local innovation ecosystems and support local business and content development through greater community outreach. Draw on technology test beds, labs (such as infoDev's Mobile Apps Labs), and networks (such as Southern African Network of Living Labs) to link local systems and innovation actors to global multinationals and international knowledge networks (such as European Network of Living Labs).
- Provide access to finance through social networks established by entrepreneurs or global systems for pooled citizen (micro) financing.
- Extend light innovations for meaningful engagement among rural communities, using more coordinated approaches to micro-work and co-creation of new data, services, and business plans in real-life environments with end-users.

## The World Bank Group's strategic focus

74. **WBG comparative advantages. The World Bank and International Finance Corporation (IFC) will leverage experience accumulated over the past years in supporting grassroots technology entrepreneurship, in financing IT companies, and in supporting PPPs aimed at developing ICT skills.** The WBG will use strengths available in the Education, Private Sector Development, and ICT sector teams (see annex 3 for details on WBG comparative advantages).

75. **Building on these comparative advantages, the WBG strategic focus will have three components:**

- *A focus on skills.* The WBG will support the development of a skilled workforce, including skills aligned with the IT-based services industry, which has a natural positive bias toward employing youth

and women. This will be done through a partnership involving the World Bank's ICT Unit, Education Sector Units, and Finance and Private Sector Development Units, including the Innovation, Technology, and Entrepreneurship practice (ITE). ITE is engaging with regions to develop innovation strategies to foster inclusive growth and create jobs, which will inform a more holistic WBG Innovation Strategy support system.

- *IFC investment in IT firms.* The IFC is performing an opportunity-scoping study to assess how it can increase support to the IT-based services industry in emerging markets. This study gathers global IT market data and identifies market trends. It also identifies key emerging countries that have unrealized potential to expand the IT-based services sector, as well as the subsegments of the industry that offer these countries the best opportunities. Further study will find funding gaps and specific project opportunities where the IFC could provide assistance. The results will inform the next wave of IFC investment in IT firms, starting in mid-2012.
- *ICT innovation ecosystem.* The World Bank will support ICT innovation ecosystems across the economy by supporting policies that promote ICT innovation, developing local business incubation ecosystems, and promoting light innovation as a bottom-up and user-centric approach to drive ICT innovation across the economy.

76. WBG interventions to support ICT innovation for growth, jobs, and competitiveness include using a tertiary education project to test and align student skills with IT-based services industry requirements in Nigeria; developing IT-based services, with a core focus on skills development aligned with industry needs, in Mexico (World Bank); combining World Bank and *infoDev* instruments to help create an ecosystem for innovation in Armenia; and financing an IT company in Ukraine (IFC). See annex 3 for more examples.

## **Chapter 4. Connect—Increasing affordable access to broadband**

77. **Mobile telephony is becoming ubiquitous in the developing world, mainly due to market competition enabled by sector reforms during the 1990s and 2000s.** Competition drove the expansion of networks and caused price reductions that translated into high penetration rates, even in the lowest income countries. According to Wireless Intelligence, there were 5.7 billion mobile users in June 2011, nearly 4.8 billion of them in developing countries.
78. **But gaps in access remain for the rural poor.** In most countries mobile phone companies are rapidly upgrading their networks to offer broadband wireless data. More than 150 countries already offer third-generation (3G) mobile services. Despite this positive trend, gaps in access—caused by coverage and costs—remain for the rural poor, in terms of both coverage and affordability (even in Peru, with 84 percent mobile phone penetration, the highlands are barely covered by mobile operators). Globally, broadband connections (defined as those providing Internet access at speeds in excess of 256 kilobits per second) now number around half a billion on fixed line networks and just under a billion on mobile networks, but access distribution is skewed heavily toward the developed world. Less than 1 percent of Africans have broadband access at home or on their mobile device, and even then at generally low speeds and high prices.
79. **The gender gap in access also remains.** Gender differences in mobile phone access and use are large in low-income countries, where a woman is 21 percent less likely than a man to own a mobile phone. This figure increases to 23 percent in Africa, 24 percent in the Middle East, and 37 percent in South Asia. Mobile phones alleviate time and mobility constraints on women by making it easier to coordinate their family and work lives, and cutting down the physical labor or travel required to acquire information. Some governments have set up village telecenters for public use, generally with a service fee, to expand access to basic ICT services among underserved populations. In Cameroon 50 percent of female entrepreneurs in textiles reported using these centers for professional and social uses and extolled their usefulness for business-related communication. Closing the gender gap in mobile phone access would bring benefits to an additional 300 million women in low- and middle-income countries, generating up to \$13 billion in incremental revenue for mobile operators.

### **Increasing affordable access to broadband services should be a priority for all countries**

80. **Widespread access to affordable broadband services has become a key driver of country competitiveness and economic growth.** Developing countries that increase access to high-speed Internet faster than others also experience more rapid economic growth.<sup>21</sup> The Internet contributes to productivity gains in various ways, accelerating information flows and transactions among economic agents. The Internet also creates major opportunities for innovation, the impact of which is difficult to predict or quantify. One example is a new distribution infrastructure for producing green energy that can be shared through an “energy Internet.” Internet technology can transform power grids into energy-sharing “intergrids,” where millions of buildings generate a small amount of energy on-site that can be sold to the grid and offered to the market.<sup>22</sup>

81. **Given high-speed Internet’s high value for development, and the fairly low cost of wide coverage at affordable prices, sound broadband policies are essential for all developing countries.** Because few other development partners have the capacity to engage in this sector, it is critical for the World Bank Group (WBG) to scale up its engagement. World Bank involvement can also support country reformers, and make the case for the link between broadband sector reforms and the objectives of competitiveness and economic growth.

82. **Broadband policies need ongoing work to continue to attract investment and keep prices affordable.** As networks evolve from narrowband (mainly for voice services) to broadband (for high-speed Internet services), new types of policy and regulatory frameworks will be necessary to make broadband available to most citizens at affordable prices and avoid a second digital divide. Developing countries need to continuously improve their policy and regulatory frameworks to remain current with rapidly changing industry structures and business models. Work on broadband policies is essential to attract new waves of private investment and maintain competition to keep prices affordable. The narrowband (voice telephony) divide has mainly been addressed through private investment, which flows as a result of liberalized markets and technological change. Addressing the broadband divide will also be driven mainly by sound policies and up-to-date regulatory frameworks. In most markets this will include support for reforms in radio frequency spectrum management and infrastructure sharing among telecommunication operators.

83. **Selective public financing will also be needed to catalyze private investment in national backbones, cross-border links, and international submarine cables.** In countries or market segments where private investment does not sufficiently respond to sound policy and regulatory frameworks (including large transformational infrastructure links between secondary cities, and in postconflict countries with high political risk), it can be important for governments to allocate public funds to support public-private partnerships (PPPs) aimed at catalyzing further private investment. Because private investment is usually forthcoming in this industry, and actual infrastructure costs are fairly low, such PPPs often require a fraction of the amount needed for other infrastructure sectors.<sup>23</sup>

84. **Ensuring universal access to broadband services is expected to require more government intervention than for voice telephony.** The investment required for broadband is much higher than for narrowband. For narrowband networks, low-volume mobile users can be “cross-subsidized” by higher volume users because they receive more calls than they make. Under universal access schemes for voice telephony, operators build networks into rural areas to achieve network effects and economies of scale. But for broadband networks, no such possibility for cross-subsidy exists. And broadband demands much more investment from service providers (higher-density base stations) and end-users (DSL modems, Wi-Fi routers, and computing mobile devices).

## Developing a broadband ecosystem

85. **Stable licensing regimes can reduce uncertainty, and governments need to strengthen their efforts to remove regulatory obstacles to investment and competition.** This will involve handling license renewals with multiple-year lead times to encourage continuing investment. It will also entail the migration of 2G-only services (mobile voice and texting) to broadband services and a move to class licensing, where the use of scarce resources does not apply. And it will involve introducing a competition framework for downstream broadband markets.

86. **Infrastructure sharing can reduce the cost of infrastructure development and facilitate extending networks.** Infrastructure sharing can include physical resources (such as towers and buildings), whole transmission links, or coverage areas (so that different mobile operators provide equipment in different areas, with the understanding that retail customers of the other mobile operators would be allowed to roam there). To reduce the cost of investments for deploying broadband, governments should offer rights of way and support easy access to passive facilities (for masts, ducts, and buildings).

87. **Spectrum management can promote broader, more efficient use of scarce spectrum resources.** Spectrum is a shared resource, and policy reform in this area requires both stewardship (refarming, repurposing, and releasing more spectrum) and forbearance (allowing market mechanisms to

define more efficient use of spectrum). Countries need to free up spectrum in line with the allocation plan of the International Telecommunication Union radio-frequency bureau to make way for mobile broadband and high-speed wireless networks. Doing so will encourage reallocating and licensing spectrum using market-based auctions, competitive tenders, and spectrum trading.

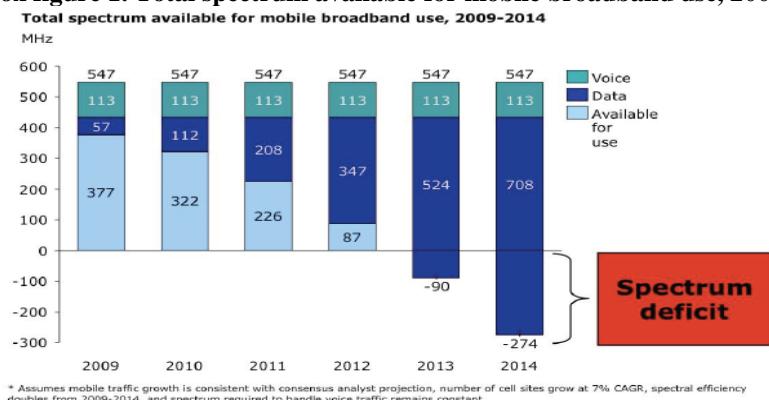
**88. For spectrum allocation, governments need to promote open access and market mechanisms, such as spectrum trading, which allows for price setting, and the secondary use of spectrum.** Reallocating spectrum allows for the use of new, more spectrum-efficient technologies, and efficient use of spectrum makes maximizing economic benefits possible (box 4.1).

**89. Developing countries also need to prioritize the digital switchover by converting analog television broadcasting to digital.** The shift from analog to digital will be a mandated reality by 2015 for all countries. The shift presents an opportunity for developing countries to free up and commercialize spectrum currently used by the broadcasting industry. Support for this agenda requires developing an enabling environment, freeing up spectrum, establishing market-based licensing regimes, facilitating infrastructure development, and promoting universal service.

#### Box 4.1 The race for spectrum

Industry analysts and equipment suppliers are projecting growth of mobile data traffic by several multiples by the year 2014 (such as 35 times). At such growth rates a severe spectrum deficit—as much as 274 MHz of bandwidth—may occur, significantly limiting future growth (box figure 1). The analog-to-digital TV migration is one option to release more spectrum: digital TV is much more efficient in using spectrum, and the migration produces a “digital dividend” that can be repurposed for wireless broadband services.

**Box figure 1. Total spectrum available for mobile broadband use, 2009–14**



Source: ITU presentation at the Latin America Spectrum Conference, September 7, 2011.

**90. Open access to landing stations and international capacity can reduce prices.** Huge differences among countries in the price per unit of bandwidth are often explained by variations in wholesale market competition and bottlenecks in the supply of international bandwidth, especially in landlocked countries. To address these problems governments need to promote open access to international gateways and greater competition in the supply of international bandwidth, with targeted interventions to stimulate the market as necessary.

## **Promoting transformational broadband infrastructure through public-private partnerships**

**91. Strategic public investments in the development of ICT infrastructure can address exceptional circumstances and special needs, notably in small economies and fragile and postconflict states.** Many countries and market segments lack private investment, despite sound policies and regulatory frameworks. To bring forward the economic benefits of high-speed Internet, public-private partnerships (PPPs) can be used to provide global broadband connectivity from new international submarine cables and national or regional fiber optic backbones. PPPs, properly tailored to country context and ICT sector specificities, are a practical solution where large-scale transformational programs are deemed too large or too risky for the private sector to undertake on their own.

## **Repurposing universal access funds, with a focus on broadband**

**92. Some governments are adopting policy instruments to achieve universal service with a focus on broadband and mobile services.** Policies for universal service aim to overcome the access gap, which is the difference between what a fully liberalized and efficient market offers and what the market actually does. Repurposing universal access funds with a focus on broadband can include:

- Incentive-based private sector models that provide telecom operators benefits for cooperating in the development of backbone and access networks in underserved areas where infrastructure competition is not commercially viable.
- Competitive subsidy models to give telecom operators incentives to build networks in underserved areas through tax reductions or contributions from repurposed universal access funds. World Bank policy advice will focus on disbursing such funds effectively, rather than establishing new funds—and on shared infrastructure, including the rollout of passive infrastructure (towers for mobile network equipment) to reduce the investment cost of operators' rural broadband networks. Because of the cost savings, infrastructure sharing may be a prerequisite for receiving support from universal access funds for remote areas.
- A shift toward “demand-side” programs for broadband infrastructure, such as mobile applications that can drive the take-up of devices for the poorest. The universal access funds could be used to provide incentives for the private sector to create applications of value to the poor. This may require broadening the criteria for universal access funds.

## **Upgrading government infrastructure and networks**

**93. Governments want better connectivity to accelerate the take-up of e-government services and improve access to high-speed Internet for government agencies, local governments, and universities.** Governments are investing in connectivity infrastructure for government systems; installing high-bandwidth-low-cost networks; extending government networks and services to unconnected institutions, provinces, and universities (National Research and Education Networks); establishing emergency communications; and minimizing the risks of information-security and privacy breaches. The focus should be on leveraging the infrastructure developed by private sector operators, as well as establishing standards and service delivery platforms to optimize scalability, flexibility, manageability, and interoperability of existing and planned applications. Emphasis should be given to shared infrastructure platforms (data centers) that are sustainable, cost-efficient, and energy-efficient (mitigating greenhouse gas emissions), and that can be applied across all government institutions, information security infrastructure, media infrastructure, and energy-efficient shared infrastructure for data storing and processing.

## **The World Bank Group's strategic focus**

**94. WBG comparative advantages. The World Bank, International Finance Corporation (IFC), and Multilateral Investment Guarantee Agency (MIGA) will build on a well-documented track record.** The Independent Evaluation Group recently found that countries receiving WBG support for policy reforms and investments have achieved, on average, more competitive market structures and greater access to ICT services than other countries. The private sector investment and guarantee instruments of the IFC and MIGA will be essential to develop broadband markets in higher risk countries. The World Bank also brings credibility to proposed sector reforms, demonstrating the link between broadband sector reforms and broader economic growth strategies. And the World Bank's ICT sector has unique experience and expertise in helping to structure PPPs for broadband infrastructure development (see annex 3 for more details on WBG comparative advantages).

**95. While maintaining a strategic focus on the connectivity agenda, the WBG will shift support toward affordable broadband, with a focus on competition and private investment.** Using a demand-driven model the WBG will scale up support to countries that want to accelerate the rollout of affordable broadband infrastructure by helping them attract private investment. WBG support will take one or several of the following forms:

- The World Bank can provide policy support for aggressive reforms to develop a broadband ecosystem, with a focus on enabling competition and private sector investment through technical assistance, fee-based assistance, and development policy loans. This will be the main focus of the World Bank intervention for the connectivity agenda. The WBG will support policies that allow access to ICTs for all, including women, disabled citizens, disadvantaged communities, and remote and rural areas.
- Where the basic reform agenda remains incomplete, as in countries that have not fully liberalized their telecommunications sectors, the WBG will continue to support sector reform and private sector development by promoting competition, strengthening regulatory regimes, and establishing a level playing field with regulatory certainty. The main instruments will be lending and nonlending technical assistance and the leveraging of the Public Private Infrastructure Advisory Facility.
- IFC support to private broadband infrastructure projects will expand where access to capital is an issue. The IFC will continue to support the expansion of high-capacity international and domestic broadband connectivity through submarine cables, satellites, and fiber optic backbone networks required for hauling voice, video, and data traffic to and between network operators. With the data explosion associated with wireless broadband, IFC support is likely to be in demand for upgrading and expanding wireless and cellular networks in frontier markets and low income countries. The IFC will also continue to promote investments in shared infrastructure, such as independent tower companies and other outsourced managed services.
- MIGA support will focus on opportunities where mitigating political risk can foster private broadband infrastructure investment. MIGA will continue to provide political risk mitigation services to telecommunications operators for a range of investments, including fixed and wireless access and backbone infrastructure.
- World Bank investment lending will be used where complex and transformational broadband infrastructure—such as national backbones, continent-wide cross-border links, and submarine cables—require PPPs or other complex transaction structures, especially in fragile states and low-income countries. The WBG will continue to support fragile and postconflict client governments to crowd in, not crowd out, private investment. As a prerequisite to possible support for public investments, the WBG will first support client countries in creating an enabling environment to make the investment sustainable: structuring a sound PPP arrangement that minimizes government participation and prepares the future divestiture of the government participation, enforcing open

- access and fair pricing rules for network services, and allowing new entrants to become partners over time.
- Research will be carried out on best practices to reform and repurpose universal access funds. Given that past World Bank support for universal access funds has achieved mixed results (in particular because market reforms in many countries resolved access gaps faster than expected and increased access to the poor without targeted subsidies), the World Bank will engage very selectively and focus first on researching good practices. The WBG will also promote telecenters where applicable as ecosystems of connectivity, ICT learning, and skills development.

96. **WBG interventions to support broadband access include:** supporting a major policy shift with policy advice in Moldova, using a PPP to build a national backbone in Burundi, supporting five PPPs to connect five countries to a regional submarine cable for high-speed Internet access (World Bank), supporting private sector rollout of telecommunications infrastructure in Afghanistan (IFC, MIGA) and Iraq (IFC), and supporting a global venture to develop affordable satellite-based Internet access for developing countries (IFC). See annex 3 for more examples.

## **Chapter 5. Implementing the new ICT Strategy: Doing business differently**

97. **The Independent Evaluation Group (IEG) evaluation and World Bank Group (WBG) assessment of the implementation of the 2001 ICT Sector Strategy are well aligned.** They indicate that the strategy had a clear positive impact in supporting reform of the connectivity infrastructure sector, promoting competition, and contributing to greater access to mobile telephony. But the results of supporting ICT applications across sectors and developing human capacity for ICTs were mixed. A revised approach to implementation is needed to achieve better results with the new strategy.

98. **Given the opportunities that ICTs present to accelerate development impact across sectors, the 2012–15 Sector Strategy is more ambitious than the last.** The new strategy will support the use of ICTs for open and accountable development and to transform service delivery. It will also support selected countries' development of IT-based service industries and use of ICTs to enhance innovation and competitiveness across industries. And it will scale up support for the rollout of affordable broadband infrastructure.

99. **Given the uneven success in implementing the earlier strategy, and the ambition of the new strategy, a different approach to implementation is essential.** The new approach will be based on selectivity—and will leverage partnerships with external sources of expertise. The key principles underlying the implementation of the proposed strategy are:

- *Using country diagnostics to prioritize WBG interventions at the country level.* The proposed strategy is a menu of options, and the selection of interventions will be based on demand-driven country diagnostics to assess relevance and impact potential. South-South exchange for knowledge sharing will be used where possible.
- *Strengthening collaboration across the institution to draw on complementary WBG instruments with partners for a greater impact.* This will entail leveraging the different strengths of the relevant units of the Bank, International Finance Corporation (IFC), Multilateral Investment Guarantee Agency (MIGA), World Bank Institute (WBI), and the specialized partnership units hosted by the WBG (such as infoDev and Consultative Group to Assist the Poor), as well as working jointly with development partners for greater impact.
- *Becoming a “connector” of expertise for our clients.* The WBG will build on the new Open Development Technology Alliance (a World Bank-sponsored Knowledge Platform on ICT) to draw on the wealth of ICT knowledge that resides outside the WBG—in the private sector, governments, academia, and civil society, and among experts and practitioners.
- *Within WBG, adopting a stronger cross-sector and cross-region leadership of the ICT agenda, improving IT procurement outcomes, and focusing on ICT skills development.* This will involve establishing a cross-sector and cross-region practice leadership group and better integrating the ICT agenda with regional management teams and regional staff. More than 70 percent of WBG projects included ICT components in 2011. But specialist skills are limited internally. A major push will raise staff awareness and develop skills across the World Bank Networks.

### **Principle 1—Being more selective in country interventions**

100. **As the scope of the strategy is broad, the WBG will be more selective at the country level, making the best use of scarce development resources.** Chapters 2–4 of the strategy propose options that, based on assessing development potential, may be applied in response to country demand.

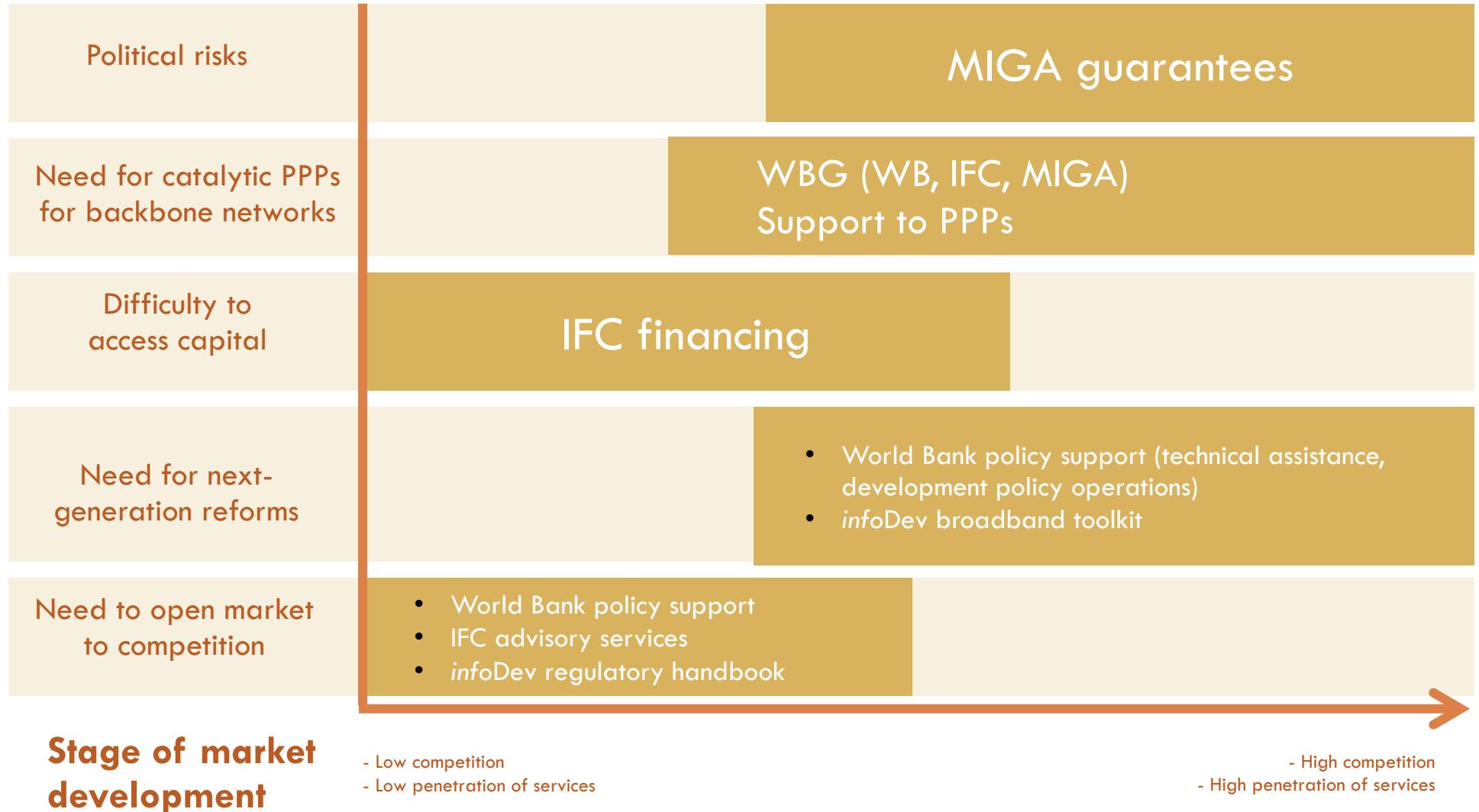
101. **For interested countries and country programs a rapid diagnostic may be performed when developing Country Partnership Strategies, Country Assistance Strategies, or Interim Strategy Notes—or as a separate analytical exercise, in collaboration with relevant client counterparts.** The country diagnostic will be the main tool to prioritize intervention and inform selectivity decisions (see annex 3 for details on the country diagnostics). Under the Transform pillar, greater selectivity will reduce the risk of failures of IT components across sectors (we propose to support significant IT components only when there is a serious client commitment to reform and IT project management capacity). Attention will also be given to cross-sector issues such as gender, climate change, country-specificities, integrity risks associated with IT investments, and the enabling environment for public-private partnerships (PPPs). Country diagnostics will help tailor WBG interventions to clients' strategic priorities, and to country specificities (such as postconflict and fragile states, low- or middle-income countries).

## **Principle 2—Strengthening collaboration across the WBG and with development partners**

102. **The WBG's breadth of instruments and expertise is an important comparative advantage.** The WBG's support to the ICT connectivity infrastructure agenda, which combined complementary instruments to add value for clients, is a case in point (figure 5.1). World Bank support for policy sector reforms and private sector participation, as well as investment projects involving PPPs, has set the stage for many IFC private sector investments and MIGA investment guarantees. The knowledge work of *infoDev*—for example, its telecommunications regulatory handbook—has been instrumental in supporting Bank advisory work and strengthening the environment for IFC investments.

**Figure 5.1 World Bank Group instruments for supporting clients' connectivity agenda**

## Key issues



103. **The new ICT agenda for open and accountable development is another example of how collaboration across the WBG can deliver more impact and better services for our clients.** Collaboration between the Public Sector Management sector, the Social Development sector, and the ICT sector unit can support policy formulation on how to make governments more open and accountable by combining the lenses of governance, citizen participation, and technology. Similarly, significant value can be drawn from the combined experience of the WBI and the Development Economic Research group in opening World Bank data, the Information Management and Technology (IMT) group in helping establish a platform, and WBI's Mapping for Results initiative. This collaboration can take place under the umbrella of the new Open Development Technology Alliance, the main tool for the World Bank to connect clients with expertise and knowledge in ICTs. Strong cross-sectoral coordination will be used to broker transformative ICT engagements.

104. **The WBG will explore partnership opportunities to achieve greater impact.** The IFC has an extensive track record in mobilizing finance, driven by its principle of financing no more than 50 percent of any private investment project so as not to crowd out the private sector.<sup>24</sup> The World Bank will make more efforts in that space:

- Partnering with other financiers to extend the reach of our instruments and have a greater impact for our clients.
- Leveraging private sector investment in PPPs, as with the Africa Coast to Europe (ACE) submarine cable and the modernization of the Ghana tax system. In both cases the Bank's catalytic role reduces uncertainties, giving the private sector confidence in the project's viability.
- Partnering with willing donors to test new concepts, as with the *infoDev/Finland* mobile application labs and agribusiness incubators and the *infoDev/Danida/DFID/AusAID* Climate Innovation Centers.
- Partnering with governments and private organizations to develop action-oriented knowledge products that shape the public debate for change. A recent example is the regional e-Transform flagship report in collaboration with the African Development Bank, the African Union, and the government of Korea to raise awareness about ICT's transformational power in eight sectors. Other examples include the information security and broadband policy workshops hosted by Korea in partnership with the Bank; joint support with the government of Australia for ICT sector reform in the Pacific; support for electronic identification knowledge products with Belgium, France, and New Zealand; and support for e-government strategies and programs with Singapore.
- Partnering with client governments to implement policy reforms through fee-based services (advisory services from the World Bank and IFC).
- Partnering with academia to evaluate impact and refine application and system designs.

### **Principle 3—Becoming a “connector” of expertise for our clients**

105. **Demand for ICTs to transform public service accountability and delivery is growing rapidly, and the potential impact on development is very large.** The World Bank can help bring these opportunities to scale, but it cannot provide this advice based on its staff resources alone. Capacity within the Bank is limited and will not be able to keep pace with the speed of innovation. So it is necessary to match the fast-growing demand for technology innovations with global external expertise to advance knowledge and develop practical solutions. Expertise resides in IT industry companies, governments that have pioneered the use of technology to modernize government and enhance the effectiveness and accountability of services, and communities of technology experts and application developers. But these sources of expertise are fragmented and not sufficiently leveraged for the benefit of developing countries.

106. **In connecting this expertise, the Bank's comparative advantages include its broad convening power, expertise in development economics, ability to frame challenges and problems in**

**development, and to dialogue with leaders in ministries of finance and across sectors.** The Bank will enter or strengthen partnerships to provide expertise to clients. This will be a new way of doing business at the Bank, emphasizing its role as a “connector.” Rather than being dependent on expertise from within the institution only, the partnerships will leverage external expertise to present developing countries the best available knowledge from across the globe. The Bank will seek partnerships with careful attention to avoid potential or perceived conflicts of interest.

107. **The main instrument for becoming a connector is the newly established World Bank Knowledge Platform on ICT, branded as the Open Development Technology Alliance ([opendata.org](http://opendata.org)).** The Alliance aims to identify ICT solutions that give voice to citizens, allowing for feedback on public services and improving service delivery. It seeks to give developing countries access to relevant external knowledge, expertise through communities of practice, and tools (applications and processes to catalyze applications development). Within the WBG, the Alliance is co-hosted by the Sustainable Development Network and WBI, with technical support for web tools provided by IMT. As the Alliance grows, it will give our clients access to tested innovations so they can learn from others’ successes and failures—and replicate and tailor what works rather than create solutions from scratch.

#### **Principle 4—Within the WBG, adopting stronger leadership of the ICT agenda, improving IT procurement outcomes, and focusing on ICT skills development**

108. **Leadership of the agenda needs to evolve from ICT as a sector to ICT as a cross-sector enabler, “owned” by all sectors of the institution.** As an essential element of this transition, a Practice Leadership Group will be set up to monitor progress and provide strategic direction. The Group will consist of vice-presidents and directors representing the World Bank Networks and Regions, WBI, Operations Policy and Country Services, Development Economics, and Legal. Chaired by the vice-president of the Sustainable Development Network, it will also include representation from the IFC and MIGA.

109. **To better integrate the ICT agenda within regions of the World Bank, the business model from the Africa Region pilot will be replicated.** This pilot, implemented over the past three years, includes the appointment of one director to assume the role of ICT champion in the region, promote the agenda across sectors, and chair a cross-sector regional team on ICT. The ICT Unit’s regional coordinator for the Africa ICT portfolio is located in the regional champion’s front office. The coordinator is invited to join meetings of the regional management team (including directors, managers, and country program coordinators) and coordinates the ICT agenda for the region. The model scaled up the region’s ICT connectivity portfolio, provided exposure to ICTs for transformation initiatives, and mobilized additional internal and external funds to advance the agenda. The recent IEG evaluation concluded that the model should be replicated. To initiate this effort each World Bank Region has developed a preliminary roadmap, articulating how ICTs (and the ICT strategy) can support its own regional strategy, with proposed actions and activities for the first 12 months of the ICT strategy implementation (see annex 4).

##### ***Reviewing IT procurement processes for better outcomes***

110. **The WBG is reviewing its IT procurement processes to strengthen procurement outcomes.** ICT procurement is a critical design element in WBG projects with ICT components—and it is also an implementation constraint. WBG procurement rules were designed for infrastructure projects that required goods and works to be separate from consulting services. The same procurement procedures, when applied to ICT, have had limited success. The WBG will explore the simplification of procurement and technical procedures as applied to ICT.

111. **To strengthen procurement outcomes the Bank will help equip client institutions with the skills to prepare sound technical specifications and bidding documents.** This implies greater attention to client capacity building in this domain in Bank-financed operations (with a particular effort on building IT procurement capacity upstream in project preparation through the Project Preparation Advances), as well as greater skills among Bank staff and Bank consultants to support clients preparing technical ICT specifications.

112. **The WBG has already taken several steps to improve procurement outcomes.** In January 2011 the procurement guidelines were revised to include ICT-specific approaches (framework contracts) and procurement methods to reflect the complexities of ICT system design and development (for example, the use of brand names and nonprice factors for bid evaluation). The provisions related to PPPs were amended to provide flexibility to accommodate PPP procedures, supported by guidance notes to help WBG staff apply the flexible interpretation. An ICT procurement working group has been formed to better support the needs of ICT projects. The group will consult experienced task team leaders and a small number of clients to better capture the perceived operational problems with the procurement of IT project components. The group will update ICT-specific standard bidding documents and staff guidance as well as training materials for procurement staff to focus on ICT risk management. The staff guidance and training material will also be available to clients. Reviews of large and complex ICT procurement contracts (where most issues are present) will be channeled through the most experienced procurement officers.

### *Focusing on ICT skills development in the WBG*

113. **Talent and staffing within WBG.** The WBG will focus on ICT skill development across Networks by raising awareness, investing in training staff, and using strategic staffing plans. To be a leader in the field, the WBG will need to hire ICT specialists across the sector families. And it will focus more on continuously training staff—ICT and non-ICT specialists working in operations—on ICT issues.

114. **For the Transformation agenda, the ICT Unit will focus on skills for cross-cutting issues and key priorities.** Because the ICT Unit cannot develop expertise on all sectors where technology is relevant, it will develop capacity in two main categories:

- The first includes some of the main cross-sectoral corporate priorities of the WBG: ICTs for governance, ICTs for competitiveness and job creation, ICTs for green growth, and ICTs for service delivery and accountability (including the use of technology for monitoring results across sectors).
- The second relates to the foundations that countries need to use ICTs for transformation across sectors: shared IT infrastructure, technical standards, enabling policy environments, and apex institutions to lead the ICT agenda across the whole government.

115. **World Bank sectors that wish to use ICTs for greater development impact need to skill up and build expertise.** For example in Public Sector Reform, where large-scale IT components are common, the need for greater in-house IT skills should be considered part of strategic staffing reviews. For relevant sectors such reviews will be informed by the sector-specific background papers prepared for the ICT Strategy (see annex 4). And World Bank sectors will be encouraged to standardize approaches to IT components so that, within sectors, methodologies are reusable across countries and depend less on in-house expertise, facilitating replication and reducing risks.

116. **The WBG will also leverage the Open Development Technology Alliance to guide its Knowledge and Learning activities.** The WBG's ICT sector operates an active Knowledge and Learning program. As part of this program, the ICT Sector Unit has delivered many learning and global

knowledge-sharing events in recent years. In fiscal 2011 the program held 26 events on such topics as government clouds, online security, mobile applications, open government, and mobile financial services. Most events use live Internet streaming, videoconferencing, and social media, allowing staff from the field to take part. Going forward, the Knowledge and Learning program will be integrated with the Open Development Technology Alliance (Knowledge Platform). The Sustainable Development Network and the WBI will work together to mobilize additional Trust Fund resources to expand the Alliance. We expect to build on the early experience of the Alliance (with its initial focus on ICT for accountability and service delivery) to develop a similar approach for other strategic priority issues such as safety nets, green growth, food security, urbanization, health, and agriculture by mid-2013.

## **From strategy to results: introducing the WBG ICT Strategy Results Framework**

117. **The proposed Results Framework attempts to capture activities across the WBG, reflect the cross-sector nature of the Transform and Innovate pillars, and assess the indirect impact of some WBG interventions (policy reform and political risk guarantee instruments).** The ICT agenda will be demand-driven, and each World Bank Region and country program will confirm its own priorities in the context of the proposed strategy (see annex 1 for the proposed Results Framework).

118. **The system in place for tracking the volume of World Bank activities in ICT needs to be strengthened.** ICT sector codes enable the tracking of stand-alone ICT sector projects, which are only a small part of Bank activities in ICT. A manual count of ICT components across sectors, carried out in 2006 by the Information Solutions Group, concluded that the active World Bank ICT portfolio committed more than \$7 billion. And the recent IEG evaluation determined that 74 percent of Bank projects had an ICT component. The coding system was recently amended by Operations and Policy Country Services to include two new theme codes to capture ICT components across all sectors. Implementation is expected to begin in calendar year 2012.

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# Annex 1. ICT Sector Strategy Results Framework 2012–15<sup>1</sup>

## Tier 1 Global development context and challenges in ICT, at the sector level

*Long-term development outcomes that provide the context and direction for the Group's work. These high-level outcomes cannot be attributed to the Group.*

	Global outcome indicators	Baseline	Type of indicator	Source
<b>Transform</b> Using ICT for transformation	<b>Open and accountable development.</b> Developing countries with an action plan to implement their commitments under the Open Government Partnership (OGP) <sup>2</sup>	5 (2011) <sup>3</sup>	Outcome	OGP
	<b>Transformation of service delivery using ICT.</b> Developing countries ranked in the top 50 of UNPAN's e-Government Web Measure Index	8 (2010) <sup>4</sup>	Outcome	UNPAN
<b>Innovate</b> Supporting ICT innovation for growth, jobs, and competitiveness	ICT service exports (% of total service exports)	14 (2010)	Outcome	WDI/ICT LDB
	Developing countries ranked in the top 50 of the Global Innovation Index	11 (2011) <sup>5</sup>	Outcome	INSEAD
<b>Connect</b> Expanding affordable broadband access	Active mobile broadband subscriptions (per 100 people) <sup>6</sup>	5.3 (2010)	Outcome	ITU
	Fixed broadband Internet subscribers (per 100 people) <sup>7</sup>	4 (2010)	Outcome	ITU/WDI

*Sources:*

ITU – World Telecommunications Indicators Database, International Telecommunications Union

WDI, WB – World Development Indicators, World Bank

ICT LDB – ICT Little Databook, World Bank

Core ICT – Core ICT Indicators, which were identified across SDN as part of a “Core Sector Indicators” initiative to enable aggregation of SDN results across sectors

UNPAN – United Nations Public Administration Network’s e-Government Readiness Index

<sup>1</sup> The indicators will be finalized upon the revision of the Core Sector Indicators for ICT expected by December 2012.

<sup>2</sup> The Open Government Partnership is a multistakeholder coalition of governments and civil society organizations working to advance transparency and accountability in government. ICT is recognized by the OGP as a key enabler for open government.

<sup>3</sup> Five developing countries have commitments delivered: Brazil, Indonesia, Mexico, the Philippines, and South Africa.

<sup>4</sup> Eight developing countries among the top 50 of the [2010 UNPAN's eGovernment Web Measure Index](#)—Colombia (31),

Malaysia (32), Chile (34), Uruguay (36), Bulgaria (44), Kazakhstan (46), Romania (47), and Argentina (48). The value in subsequent years will reflect not only the ranking but also whether the index value of these countries goes up.

<sup>5</sup> Eleven developing countries along with China in the top 50 of the Global Innovation Index—China (29), Malaysia (31), Chile (38), Moldova (39), Jordan (41), Bulgaria (42), Costa Rica (45), Brazil (47), Thailand (48), Lebanon (49), and Romania (50); [INSEAD's Innovation Index 2011](#). The index is derived from 80 indicators, of which 21 are related to some form of ICTs, with an additional 10 related to tertiary education and research and development, which is covered under the *Innovate* pillar. No other theme has as much representation as ICTs in the indicator sets. The value in subsequent years will reflect not only the ranking but also the absolute value differential, capturing whether the index value of developing countries goes up.

<sup>6</sup> Gender-disaggregation of this indicator will be provided when available from the ITU.

<sup>7</sup> Gender-disaggregation of this indicator will be provided when available from the ITU.

## Tier 2

### Country Results Supported by the World Bank Group

*Aggregate data collected through standardized sector indicators. The data show results supported by Group operations. Going forward, the Group aims to develop and use more outcome indicators.*

(Baseline data to be collected during the first six months of the Strategy)

	Output and Outcome Indicators	BASELINE		PROGRESS		Type of Indicator	Source
		Year	Value	Year	Value		
Transform	<b>Open and accountable development.<sup>8</sup></b> Number of ICT-enabled accountability and transparency initiatives with citizen engagement (such as open budget, <sup>9</sup> community mapping) in use and supported by the WB					Outcome	World Bank
	<b>Transformation of service delivery using ICT.</b> Number of ICT applications for service delivery in use and financed through WB projects (IDA/IBRD) <sup>10</sup>					Outcome	World Bank
Innovate	Persons trained in ICT skills under WB projects (IDA/IBRD, <i>infoDev</i> ), disaggregated by gender <sup>11</sup>					Output	World Bank
	Employment in IT/ITES supported by IFC and disaggregated by gender					Outcome	IFC
Connect	Amount of private sector investment mobilized through WBG connectivity projects (IDA/IBRD through PPPs, IFC, <sup>12</sup> MIGA)					Outcome	WBG
	Length of fiber optic network built under WBG projects (km) <sup>13</sup>					Output	Core ICT
	Number of open access <sup>14</sup> arrangements <sup>15</sup> in place for broadband infrastructure supported by the WB					Outcome	World Bank
	Number of women employed in Village Phones Program supported by IFC					Outcome	IFC

\*Core ICT indicators may be revised in the first year of the ICT Sector Strategy, with revisions to this Results Framework to follow.

<sup>8</sup> To be finalized while revising the Core Sector Indicators on ICT.

<sup>9</sup> Open budget for the purposes of this indicator is considered as instances where the budget has been done with citizen participation and input.

<sup>10</sup> To be finalized while revising the Core Sector Indicators on ICT.

<sup>11</sup> Consistent with corporate scorecard indicators.

<sup>12</sup> Including IFC equity and IFC mobilized private sector investment.

<sup>13</sup> Consistent with corporate scorecard indicators.

<sup>14</sup> Within the context of the *Connect* pillar, open access to networks is broadly defined as unfettered access by existing operators and new entrants to given network infrastructure on transparent and nondiscriminatory terms and conditions (price and nonprice). Network infrastructure may include but not limited to both active and passive infrastructure for the provision of electronic communications services. This indicator is a proxy to measure advances in policy reform.

<sup>15</sup> “Arrangement” for the purposes of this indicator includes processes approved, changes in policies, regulations, and institutional structures, among others.

# Tier 3 & 4

## Operational and organizational effectiveness

*(Sector portfolio /organizational performance)*

*Effectiveness of Group products and services in supporting development results and dimensions of the Group's organizational efficiency and modernization agenda.*

Key Result S	Intermediary result indicators and/or milestones	Baseline		Progress		Type	Source
		Year	Value	Year	Value		
Overall Strategy	Number of Bank sector strategies addressing ICT <sup>16</sup>	FY07–11	7			Input	World Bank
	Number of country diagnostics	FY11	0			Input	World Bank
	Staff participation in ICT-related learning events (staff participant hours, internal learning)	FY11	5,208			Input	WBG
	Number of staff mapped to ICT including in regions and networks		<sup>17</sup>			Input	World Bank
	Number of procurement staff with ICT expertise		<sup>18</sup>			Input	World Bank
	Number of IDA/IBRD ESW, FBS, and other nonlending TA addressing ICT <sup>19</sup>	FY10	65% <sup>20</sup>			Outcome	WBG
	Number of practitioners who are part of the Open Development Technology Alliance Communities of Practice	November 2011	1,414			Input	Linked-In
	Number of World Bank projects supported by the Open Development Technology Alliance Communities	FY12	10 <sup>21</sup>			Input	World Bank
Transform	Number of unique countries supported by one or more Bank Group projects with ICT approved over the period <sup>22</sup> :						
	IDA/IBRD lending	FY03–10	123			Input	WBG
	MIGA guarantees	FY03–10	5			Input	MIGA
Innovate	Number of unique countries supported by one or more World Bank projects with ICT-enabled innovation approved over the period, <sup>23</sup> IDA/IBRD lending	FY03–10	5			Input	World Bank
Connect	Number of unique countries supported by one or more Bank Group projects with ICT connectivity approved over the period:						
	IDA/IBRD lending	FY03–10	24			Input	WBG
	IFC financing	FY03–10	55			Input	WBG
	MIGA guarantees	FY03–10	12			Input	WBG

<sup>16</sup> Addressing ICT refers to a discussion of ICTs as important to the sector's strategy. This could include but not be limited to telecommunications, Internet, broadband, IT sector, or e-Government.

<sup>17</sup> Baseline data to be collected during the first six months of the Strategy

<sup>18</sup> Baseline data to be collected during the first six months of the Strategy

<sup>19</sup> Captured through staff review of Concept Notes and deliverables. Consistent with corporate scorecard indicators.

<sup>20</sup> Of 40 AAAs in FY10.

<sup>21</sup> To date; number for FY12 will be finalized in July 2012.

<sup>22</sup> Initial data from IEG (projects with IT components); updates to be obtained through theme code or scanning through Business Warehouse with an algorithm consistent with IEGs.

<sup>23</sup> ICT-enabled innovation defined for this purpose as development of the IT/IT Enabled Services Industry and ICT Skills development.

## **Annex 2. Key trends relevant to exploiting ICTs to accelerate development**

*This annex explores the main ICT-related trends and how our clients can turn them into opportunities to accelerate development. The annex also explores ICT and poverty reduction and empowerment, as well as ICT and Gender.*

### **The Top 12 Trends**

119. **Overview:** When the World Bank Group formulated its previous strategy for ICTs in 2001, the world had just experienced the bursting of the Internet bubble and counted 200 million mobile users in developing countries. Facebook would not launch for another three years, and Twitter not for another five. Fast-forward to 2012. More than 5 billion mobile phones are in use in developing countries. Facebook has more than 800 million users worldwide. And Twitter handles more than 1.6 billion searches a day. These facts point to how the world has changed, and with it the role and ubiquity of ICTs in many aspects of society.

**Trend 1: Sound broadband policies have become a key for faster GDP growth.** Broadband has become necessary infrastructure in developing countries. World Bank econometric analysis found that a 10 percentage point increase in high-speed Internet connections boosts annual GDP growth in developing countries by 1.38 percentage point<sup>25</sup>. Yet the broadband gap between developed and developing countries remains wide. In 2010 fixed broadband penetration in developing countries was 4.4 percent, a fifth of the 24.6 percent in developed countries.<sup>26</sup> There is reason to be optimistic, as mobile networks increase their capacity for high-speed Internet.

120. **Trend 2: Many countries are developing competitive IT-based service industries, replicating the success of India and the Philippines.** IT-based service industries are becoming a source of growth and job creation, particularly for youth and women. Developing countries have the opportunity to make IT-based services, which pay 50–100 percent more than comparable service jobs, a key driver for growth and job creation. Employment for youth and women is a particular benefit. Globally, the industry is expected to create 4 million more direct jobs by 2016, while indirectly creating as many as three to four times more jobs in other sectors.

121. **Micro-work, another promising trend, consists of firms and entrepreneurs dividing of work into micro-tasks and use of mobile phones to outsource those tasks to workers worldwide.** Micro-work can provide small but sustained income-generating opportunities for the unemployed, particularly in developing countries. TXTEAGLE, a start-up focused on micro-work, employed several thousand part-time and full-time employees within a month of its launch in Nairobi in 2009.<sup>27</sup>

122. **Trend 3: Mobile broadband, combined with the plunging costs of Internet-enabled devices, is democratizing Internet access and expanding the reach of services.** Mobile phone networks are being rapidly upgraded to offer 3G and soon 4G mobile broadband. Added to this, the spread of more affordable Internet-enabled mobile devices—such as smartphones, tablets, and netbooks—is democratizing access to the Internet. The implications are profound, and the world will increasingly connect to the Internet through a handheld mobile device.

123. **Trend 4: Social media are increasingly being used to amplify the voices of citizens and to hold governments accountable.** They are revolutionizing how people communicate, collaborate, and do business with one another. One of every nine people in the world now uses Facebook. Twitter generates 200 million tweets a day<sup>28</sup>. More than 250 million people use mobile devices to access Facebook.<sup>29</sup> Such social media are being leveraged across society for collaboration and collective action.

124. **Trend 5: Policies of open government are gaining momentum—for improving transparency, accountability, and public participation for more effective government.** Digitization and broadband have redefined how governments, civil society organizations, and ordinary users access and use information, redefining what it means to be a global citizen in the digital age. More than 20 countries now have open data portals, enabling users to create local innovations.<sup>30</sup>

125. **Trend 6: Cloud computing is gaining momentum to improve the efficiency and quality of IT services.** Through cloud computing, a government can use a shared infrastructure, accessible by all government entities over the Internet or the government intranet. It holds great promise for developing countries that have already overcome the connectivity challenge, allowing governments to pool resources, exploit economies of scale, achieve operational efficiencies, and save costs.

126. **Trend 7: Using analytics and data mining to understand behaviors and tailor services.** The massive amount of information transiting through the Internet and mobile phones when users click on a link, write an e-mail, or send a text message can be analyzed to better understand individual behaviors and tailor information, services, and offerings accordingly. And this information can help in formulating informed public policies and improving local governance.

127. **Trend 8: Gamification and crowdsourcing—tools to solve public policy problems.** Gamification uses game-playing parts of websites to encourage people to learn, participate, and solve problems. Gamification can also help solve scientific problems. Crowdsourcing is a similar trend to leverage citizens or IT developer communities using the crowd to solve well-defined problem statements.

128. **Trend 9: Countries at all levels of development are integrating ICT strategies into their national development strategies.** In confronting the economic crisis that started in 2008, many countries have incorporated ICT initiatives as an integral part of their stimulus plans with an eye on preparing the foundations for long-term growth.

129. **Trend 10: Countries are building leadership and institutional capabilities to use ICTs to transform their economies.** Countries are responding to the growing centrality of ICTs to national development and to their cross-cutting nature and pervasive impact on all ministries and sectors. Governments are experimenting with institutional mechanisms to bring coherence to ICT investments across government agencies and promote partnerships with the private sector and civil society.

130. **Trend 11: ICTs are raising demands for new skills to promote competitiveness.** ICTs are beginning to transform universities to become open systems, globalize their offerings, and support just-in-time learning. Applied to education administration, ICTs are enhancing transparency, accountability, and participation in education policy and governance.

131. **Trend 12: Redefining trust in the broadband world: information security and privacy.** As developing countries transit to a broadband digital world, they must build trust in ICT infrastructure, services, and applications. This will be built by balancing security with privacy and access. While good international practice is still evolving, creating a trusted environment surrounding ICT use is recognized by the private sector, governments, and civil society (see annex 5 for further details).

## **ICT, poverty reduction, and empowerment**

132. **ICT helps bring about economic growth and create jobs, thus reducing poverty and achieving sustainable development.** It helps address the larger development challenges of a country and is not necessarily an end in itself. And it helps developing countries achieve greater connectivity

(*Connect*), a vibrant IT-enabled services (ITES) industry (*Innovate*), and transformative ICT applications (*Transform*). These outputs improve development outcomes such as economic growth, jobs, productivity, transparency, accountability, and social inclusion, which in turn impact poverty reduction and sustainable development. Technological progress has been driving economic growth since 1990, lifting more than 10 percent of the world’s people out of poverty.<sup>31</sup> ICTs’ contribution to economic growth and poverty reduction has steadily increased since, and ICTs now play a catalytic role in several aspects of economic and social life. The ICT sector—infrastructure and networks, IT-related services and media—is regarded as an engine of growth and a source of innovation, with some of the highest growth in productivity.<sup>32</sup> The sector also raises productivity throughout the economy by increasing efficiency across sectors.<sup>33</sup> Internet use has a positive correlation with enterprise product and process innovation, total factor productivity, and employment growth.<sup>34</sup>

133. **Broadband impacts a country’s economic growth.** A World Bank study using a panel of 120 countries concluded that a 10 percent point increase in broadband penetration results in a 1.38 percent increase in annual GDP growth in developing countries.<sup>35</sup> McKinsey & Company also estimated that “a 10 percent point increase in broadband household penetration delivers a boost to a country’s GDP that ranges from 0.1 percent to 1.4 percent.”<sup>36</sup> And a study of Organisation for Economic Co-operation and Development countries by Booz & Company found that among high-income countries, those “in the top tier of broadband penetration have also exhibited 2 percent higher GDP growth than countries in the bottom tier of broadband penetration.”<sup>37</sup>

134. **IT-based industries can be an engine for inclusive growth.** IT-based industries create jobs in developing countries, including for youth and women, and lead to a growing middle class. IT-based industries can bring about social well-being in economically disadvantaged communities.

135. **ICT serves rural communities through local content.** In the past decade many ICT applications sought to automate government functions to increase the efficiency and transparency of public administration. Recent trends suggest that the transformative impact of ICT applications is just beginning in developing countries. Local content has an even greater value in reducing poverty. ICT provides basic services to communities marginalized by distance or geography.

136. **ICTs empower people and help reduce poverty.** ICTs overcome the asymmetric flow of information to the poor and allow for a participatory form of government in which the poor have a voice and can influence government policy. ICTs’ role in poverty reduction includes:

- *Access to information*
- *Provision of basic services*
- *Better local governance*
- *Improved national governance and public sector reforms*
- *Greater accountability and public participation*
- *Pro-poor market development*
- *Access to justice and legal aid*

## Using ICT to empower women

137. **ICTs can provide access to information to women.** ICT sectors help expand information access, especially to women, who are otherwise excluded. Improvements in ICT technology allow women (and men) to access markets in growing numbers by lowering the transaction costs associated with market work. Because time and mobility constraints are more severe for women than men, women stand to benefit more from these improvements.

138. **ICTs hold promise for women's participation in economic opportunities.** Greater access to economic opportunities and, in some cases, higher returns to economic activity provides strong incentives to accumulate human capital, particularly for women. These incentives are likely to increase investments in the skills of girls and young women—tomorrow's workers. New ICT-enabled jobs in services—particularly information processing in banking, insurance, printing, and publishing—are being taken up mainly by women because the new jobs require skills such as keyboarding, English, and sometimes French. Female employment in data entry and processing was initially highest in Barbados, Jamaica, and the Philippines. ICT-related jobs are now concentrated in software, call centers, and geographical information systems, clustered in Malaysia and India, particularly Delhi and Mumbai, where call centers employ more than 1 million people, most of them women.

139. **Gender differences are large in mobile phone access.** Gender differences in mobile access and use are almost imperceptible in high- and middle-income countries, especially among young people, but gender differences are still large in low-income countries, where women are 21 percent less likely than men to own a mobile phone. This figure increases to 23 percent in Africa, 24 percent in the Middle East, and 37 percent in South Asia<sup>38</sup>. In Uganda women ages 16 and older are 67 percent less likely to use a mobile phone than are men.

140. **Gender outcomes result from interactions among households, markets, and institutions.** The three dimensions of gender equality are accumulating *endowments* (education, health, and material assets), using these endowments to realize *economic opportunities* and generate incomes, and applying these endowments to take actions—*agency*—affecting individual and household well-being. Investments in health and education (human capital endowments) shape the ability of men and women to reach their potential in society. Agency is an individual's (or group's) ability to make effective choices and transform the choices into desired outcomes. Expressions of agency include: control over resources, ability to move freely, decisionmaking over family formation, freedom from the risk of violence, and ability to have a voice in society and influence policy. *Households, markets, and institutions (formal and informal)* and the interactions among them shape the relationship between economic development and gender equality. In doing so they determine gender outcomes.

#### 141. **What countries can do:**

- *Use ICTs to enrich endowments for women and girls.* ICTs can address gender gaps in endowments, including health, education, and material assets. ICTs can help restructure and reform institutions that deliver public services. ICTs can improve access to education for the disadvantaged.
- *Promote equitable market access and inclusive economic opportunities for women using ICTs.* IT-based service industries offer better economic opportunities to women.
- *Empower women to use ICTs to make their voices heard and strengthen their agency.* Social media can empower women to participate in public processes and have a voice in society.

## **Annex 3. Defining the World Bank Group comparative advantages and examples of interventions**

### **Open and accountable development**

142. **The open and accountable development agenda will mainly be driven by civil society, through developing and using mobile applications and creating accountability pressure points.** This is likely to occur regardless of government or World Bank Group (WBG) involvement. But promoting citizen engagement without associated reforms in government risks raising unrealistic expectations that will not be met and may fan discontent. For this agenda to impact development, interested governments need to embrace a role of enabler and facilitator of citizen participation and need to reform institutions and processes to respond effectively with remedies to problems identified by citizens.

143. **The WBG comparative advantages to support open and accountable development include:**

- The World Bank's sector experts (social, infrastructure, and macroeconomic experts) are involved in in-depth policy dialogue with most sectors and agencies within client countries. The World Bank is thus well placed to build cross-sectoral collaborations, working with governments to help reform their processes to better interact with citizens and become more responsive to new channels of citizen demand.
- In most client countries the World Bank is financing projects to address development challenges in specific social and infrastructure sectors or help the government function better.
- The World Bank has a new instrument to tap external expertise on ICT for Open Development: the Open Development Technology Alliance (a World Bank Knowledge Platform on ICT). It connects interested governments with ICT innovations and experts to strengthen citizen feedback loops in relation to delivery of public services and to improve service delivery. The Alliance is there to provide developing countries with access to relevant knowledge, communities of practice (people), and tools (applications and processes to stimulate development of applications) that can be replicated.

144. **By focusing its intervention on open and accountable development on cross-sector enablers as well as sectors where it is engaging government counterparts and providing financing, the World Bank can contribute to strengthening the voices of citizens to align government priorities with citizen priorities—and support government reform to address these priorities.** The selectivity lens of the World Bank for open and accountable development will thus be aligned closely with its lending program.

145. **Examples of World Bank Interventions on open and accountable development are in box A3.1—and provide a concrete picture of the interventions proposed to be scaled up under the new strategy.**

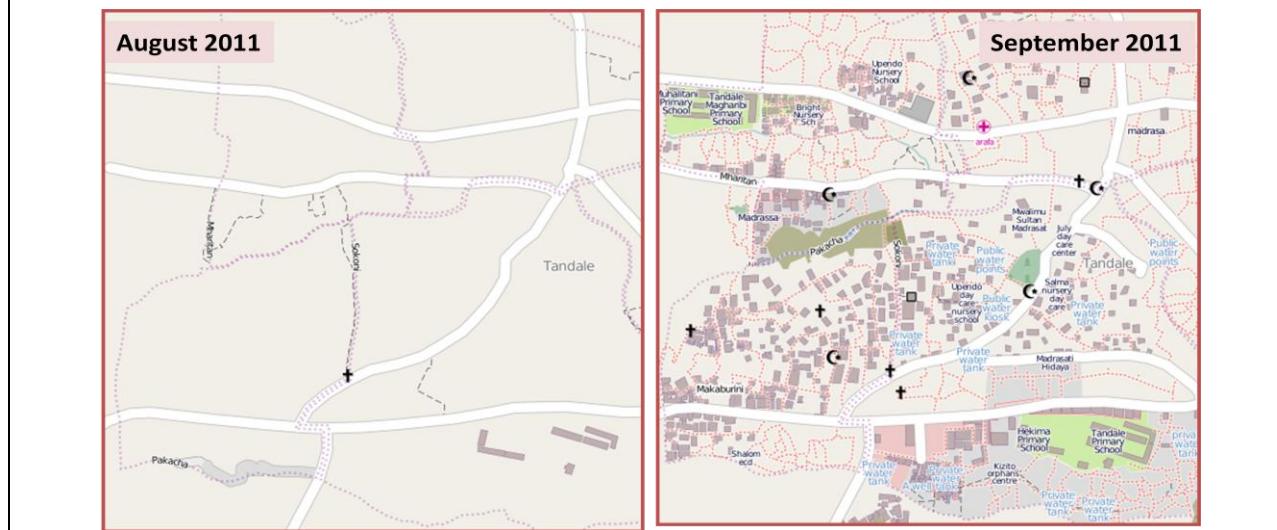
146. **The International Finance Corporation (IFC) will be focusing on media applications and content.** Notably, the IFC is looking for ways to produce higher quality, relevant, local content that generates jobs, increases the reach of knowledge, and provides easy access to meaningful information that people in emerging economies need to expand their opportunities. And it is looking for ways to invest in social media—focusing on mobile- and Internet-based applications that allow the creation and exchange of user-generated content that can impact the likes of e-health, e-learning, and e-commerce applications as a subset beyond social communication.

### **Box A3.1 Examples of World Bank interventions on open and accountable development**

**Focusing on cross-sector enablers and sector-specific applications in Afghanistan.** In Afghanistan an ICT project and multiple sector-specific projects support the government's intention to mainstream mobile applications to expand and improve public service delivery and strengthen program management. The approach uses several complementary instruments and includes two dimensions: creating the horizontal, cross-cutting foundations for transformation—and supporting various sector agencies and programs in their use of mobile applications. The project will help create horizontal enablers such as an m-government strategy, a government-wide shared services infrastructure for mobile applications, an innovation support program to encourage government agencies to demand (and entrepreneurs to develop) m-government applications, legal and regulatory frameworks (open government directives, freedom of information legislation, data privacy), and institutional arrangements for cross-sector coordination. Working with various government programs and sector projects, the World Bank team has started mainstreaming mobile applications to improve accountability and create citizen-feedback loops. With the community-driven National Solidarity Program and with the agriculture sector program, the focus is on improving output, result-monitoring, data collection, and asset verification, using GPS-enabled smart phones, which allow the easy collection of location and pictorial data. For education, a project is expected to involve village councils and citizens in evaluating their community schools. Mobile phones will likely be the first tool through which citizens have regular interactions with the state.

**Urban Sector in Tanzania—Embedding open and accountable development in sector lending: Using ICT for citizen participation to inform an IDA-funded Urban Development Project in Tanzania.** The World Bank—together with Twaweza, a regional ICT nongovernmental organization—activated a network of practitioners, including 25 students from Ardhi University's School of Urban and Regional Planning and 25 local residents, to capture citizens' voices by creating dynamic, online maps of Tandale Ward, a community without access to public services and one of the target areas of the Dar es Salaam Metropolitan Development Project (box map 1). The initiative took place during four weeks in August 2011, and emerged from government interest in a network of citizens who could identify local priorities and monitor progress. The community mapping methodology from the Map Kibera experience in Kenya was applied to Dar es Salaam. Three mapping practitioners traveled from Kibera to Dar es Salaam to provide training to local communities and ward officers—and in the process established a community mapping curriculum at the Ardhi University. The resulting high-quality, open-source dataset contains thousands of points on the location of roads, schools, clinics, trash dumps, and water points. Since local capacity now also exists within the university and local government to replicate the work at low cost, this network will continue to collect and verify data, while the World Bank will explore with the authorities how to use the map to improve citizen feedback around such public services as trash collection, road maintenance, pothole repair, and flood management. Financing from the project will help address local priorities identified in the mapping exercise.

**Box map 1. Tandale citizen mapping: helping design an urban revitalization project, August–September 2011**



## **Early efforts on open aid**

147. **Recent efforts to improve the accountability of World Bank–financed projects include several features that could be replicated or adapted by other aid institutions.**

- The World Bank Open Data Initiative opens data to citizens, civil society, and entrepreneurs, as spearheaded by the 2011 Apps for Development Challenge.
- The World Bank recently launched the “World Bank Finances” mobile application for International Bank for Reconstruction and Development and International Development Association financial information by country, project, and loan. It can be downloaded to mobile phones.<sup>39</sup>
- The External Implementation Status and Results Reports Plus Initiative, a pilot now under way in the Africa Region, uses ICTs to inform the true owners of a project—a country’s citizens—what the project is and what it is meant to accomplish. Just as important, the initiative solicits citizen reactions to the pace and value added of project implementation. The pilot is exploring how to strengthen the monitoring and development of Bank-financed government-implemented projects, as well as how to enhance the Bank’s engagement with civil society as part of its broader social accountability agenda.
- The Mapping for Results initiative, led by the World Bank Institute and financed under its project portfolio for aid effectiveness, collects and publishes geospatial data to map activities ([maps.worldbank.org](http://maps.worldbank.org)). The World Bank plans to expand this initiative as part of a new “open aid partnership.” That partnership aims to increase aid transparency by making aid information more accessible—not only for World Bank projects but also for development partners, thanks to a comprehensive view of aid-supported activities at the country, regional, global, and sectoral levels. The partnership also aims to inform and empower citizens in developing countries to provide feedback on aid-supported activities to make the aid process more open and participatory.

148. **To complement the Mapping for Results initiative, the World Bank will develop a tool to survey beneficiaries of World Bank–financed investment projects to monitor progress on intended project results.** The tool will also include a dissemination module so that the survey data are made public and easy to visualize. Systematically embedding the tool into project design will be phased through a demand-driven process.

## **Using ICT to transform service delivery**

149. **The WBG comparative advantages to use ICT to transform service delivery include:**

- World Bank sector experts carry out in-depth policy and program design dialogues with many different sector agencies within client countries (box A3.3).. The World Bank is thus well placed to understand government processes, assess the relevance of using ICT solutions as a part of broader change management solutions or in support of reform efforts, and advise on best practices of what works, including lessons on what may not work.
- The World Bank is developing the capacity to better leverage external IT expertise through a newly established Knowledge Platform, the Open Development Technology Alliance.
- The World Bank is gaining expertise on structuring public-private partnerships (PPPs) to carry out government functions. The WBG can also offer a combination of World Bank (concessional financing), IFC (private sector financing), and Multilateral Investment Guarantee Agency (MIGA; political risk guarantees) instruments to support PPPs where firms are partnering with government in delivering public services or carrying out government functions (including outsourcing services).
- The IFC is also well placed to support sound ICT application projects delivering commercially viable services to citizens and businesses (including traditional sectors but also software-as-a-service, independent data centers, and e-waste). IFC also developed expertise on e-payments by investing in

new payment platforms and service providers that develop these services with innovative and evolving business models. Given the transformative nature of ICT on other sectors, the IFC ICT team is also exploring venture investment support through “internal JVs” with other IFC industry groups—especially health, education, and financial markets—where IFC’s skills in assessing early/growth stage IT-enabled investment opportunities can be leveraged.

#### **Box A3.3 WBG interventions to use ICT to transform service delivery**

**Revamping back-office systems in India and Guatemala.** Given the criticality of back-office systems in ensuring robust e-service delivery, the World Bank has focused on creating management information systems. In India these systems are carried out under Bank-funded projects focusing on states and sectors where there is strong commitment to reform, such as agriculture, water resource, public administration, and health. For example, a health management information system, developed under the Bank-funded Tamil Nadu State Health System Project, finished the pilot phase in which 30 hospitals are live with the online system. Functions such as patient registration, supply, pharmacy, ward, lab, and doctor outpatient management are now fully online.

In Guatemala the World Bank has supported the government in public financial management, including strengthening its accountability and transparency mechanisms through a sophisticated integrated financial management information system. The system helped make financial transactions more efficient and the production of information on government finances more timely and transparent in most of the central government as well as in 333 local governments.

**Using ICT to improve urban transport in the Philippines.** In the Philippines the Bank has started using mobile technologies to improve urban transportation services. In Cebu, where there is a strong commitment to reform and reengineering processes, the Bank will fund a system that uses GPS-enabled mobile phones distributed to taxis to support traffic data collection and dispatch. Data will be used to generate real-time congestion maps, identify network stoppages, and generate traffic volume estimates. Mobile tracking will also be used to integrate the informal transit system into the formal bus rapid transit system as feeder routes. In the same project an SMS platform will allow citizens to report on local transport needs while allowing the city to verify, prioritize, direct, and manage reports, as well as to print maps and reports that can support evidence-based planning and budget allocations.

**Transforming government functions through public private partnerships in Ghana.** Building on the modernization of its customs service IT system through a public-private partnership (PPP), Ghana’s government is setting up a PPP to create an electronic tax collection system. The system, expected to be online in April 2012, will handle returns processing, tax collection, taxpayer accounting, revenue accounting, exemptions, and refunds. This system has allowed the reengineering of business processes and deployment of best-in-class software and hardware. As a partnership, public and private sector organizations share investments, risks, and revenues (the private sector partner is rewarded with a share of the incremental tax revenues up to a capped amount). Of the total investment of \$60 million, the government only needed to contribute \$20 million, provided through the World Bank e-Ghana project.

**Establishing an environment for transformation through a development policy operation—e-transformation in India.** Development policy operations can be used to establish an e-government enabling environment. In India the e-Delivery of Public Services Development Policy Loan supports the government’s National e-Government Program at the policy level. Main areas supported include strengthening central and state institutions that implement e-services projects, defining technical standards, improving access to e-services through rural connectivity and mobile platforms, and verifying users and beneficiaries of e-services. Support for the development policy operations has already included a policy framework for delivering basic financial services through mobile phones.

**Using a MIGA guarantee to support the rollout of mobile payments in Sierra Leone.** The MIGA has issued a \$1 million guarantee to the Sierra Investment Fund LLC and the ManoCap Soros Fund LLC—covering their investment in Splash Mobile Money, a greenfield mobile payments and banking company in Sierra Leone. The coverage is for up to 10 years, against the risks of transfer restriction, expropriation, war, and civil disturbance. Building on successful payment systems across Africa, Splash Mobile Money will allow customers to transfer money through mobile phones—with SMS, online access, or near-field communication technology. Mobile-banking

allows customers to make deposits, check account balances, arrange credit facilities, and establish direct debits. It is expected to improve user security, increase liquidity, and reduce the cost of transferring funds, which is high in formal banking.

**Helping farmers access crop information through IFC financing in Africa.** The IFC and the Soros Economic Development Fund both invested \$1.25 million of equity into Esoko, a Ghanaian technology firm. Esoko's software takes advantage of rapidly growing mobile phone use in Africa and allows parties in the agricultural value chain to exchange real-time market information. Farmers receive current demands, crop prices, and the location of seeds and fertilizers directly on their mobile phones. Businesses can track how their products are used and market themselves to new customers. And associations and governments can share critical information with thousands, using a simple bulk-text messaging feature. Expanding quickly, Esoko's technology is already used in nine African countries. Esoko is also publishing Africa's first commodity indices, a powerful tool for ensuring that farmers are compensated fairly for their crops, as Africa has very few formal commodity exchanges. The company is first publishing two indices that provide prices for 12 agriculture commodities in seven markets in Ghana.

## Supporting ICT innovation for growth, jobs, and competitiveness

150. **The WBG comparative advantages in supporting country efforts to develop an IT-based services industry include:**

- The World Bank has developed a Location Readiness Diagnostic Methodology with support from McKinsey & Company. The potential to develop an IT-based services industry varies by country. In theory outsourcing government functions or services can provide a ready demand to stimulate a local domestic-oriented IT-based services industry, but not all countries can develop a competitive export-oriented IT-based services industry. The diagnostic methodology makes it possible to carry out a country assessment of the potential to develop an IT-based services industry.
- The World Bank has ongoing policy dialogues and lending for education in many countries, which can align skills development with IT-based industry requirements.
- The World Bank has gained experience with skills development for IT-based service industry needs, for projects managed by the education sector, private sector development, and ICT—through IT-based services industry projects or project components in Armenia, Bhutan, Ghana, Kenya, Mexico, Nigeria, and Sri Lanka.

151. **The WBG's comparative advantages in supporting country efforts to develop an ecosystem for ICT innovation include:**

- The multidonor partnership program hosted by the World Bank, *infoDev*, has gained in-depth experience with incubation over the past 10 years, recently expanding to support mobile applications laboratories on three continents, including Africa, Asia, and Eastern Europe.
- The World Bank has gained substantial analytical experience supporting the development of a knowledge economy and promoting science and technology diffusion.
- Under its Finance and Private Sector Development Network, the World Bank has established an Innovation, Technology, and Entrepreneurship Practice (ITE) in 2011. The practice will create a robust community of practice across all regions (building partnerships with internal and external innovation programs and activities and identifying and scaling up innovation initiatives, where appropriate), to facilitate the transfer of knowledge and establish thought leadership. To intervene strategically and consistently, the WBG is establishing a joint ICT innovation practice team, including staff from *infoDev* (the World Bank's ICT unit), education sector units, the ITE, and other units of the Finance and Private Sector Development Network.

#### **Box A3.4 Examples of WBG instruments to support ICT innovation for growth, jobs, and competitiveness**

**Combining World Bank and *infoDev* instruments to support an ecosystem for innovation in Armenia.** In Armenia the World Bank's E-Society and Innovation for Competitiveness project contributes to Armenia's competitiveness—by financing programs to promote the creation, growth, and competitiveness of knowledge and technology-driven enterprises while encouraging traditional sectors to adopt new technologies. This includes support for an innovation grants program and for an early stage venture fund that will extend loans to stimulate technology absorption and new firm creation. In a parallel program, *infoDev* has funded a mobile applications laboratory (mLab). The mLab will provide a platform for developing the technical and entrepreneurial skills and the personal contacts and relationships needed to scale innovative mobile solutions into flourishing businesses.

**Developing IT-based services, with a core focus on aligning skills development with industry needs, through a World Bank loan in Mexico.** In 2008, as part of the IT Industry Development Project, the World Bank helped Mexico establish MexicoFIRST, a nonprofit organization with leading industry associations as partners—the Association of Mexican IT industry; the National Chamber private sector of Electronics, Telecommunications, and Information Technology; and the National Association of Computer Education Institutions. MexicoFIRST created strong links among the private sector, academic and training institutions, and the government to improve IT skills development. In its first three years MexicoFIRST made agreements with Microsoft, Oracle, Sun, Carnegie-Mellon, PMI, and other important global players in IT and academia to bring world-class IT training standards and certifications to Mexico. It trained more than 30,000 IT engineers, software developers, and other specialists—and provided internationally accredited certifications to 25,000.

**Using a tertiary education project to help test and align students' skills with IT-based services industry requirements in Nigeria.** The Assessment of Core Competence for Employability in the Services Sector in Nigeria is an industry-oriented skills development program to make youths and university graduates employable in the IT-based services industry. The program was designed as part of the World Bank's New Economy Skills for Africa Program, using a framework developed by the consultancy firm Hewitt. The framework, used to conduct skills-gap analysis, assessment, and benchmarking, captures 20 competencies required for building IT-based communication, computer, and cognitive skills. A pilot was conducted with 300 students at the University of Lagos in December 2010, followed by a live rollout in Lagos, Abuja, Enugu, Kaduna, and Kano. More than 3,000 university students, National Youth Service Corps members, and recent graduates were tested. And results identified the need for incremental training in key skills and for reducing the skills gap between the education system's output and industry requirements.

**Financing an IT company in Ukraine through the IFC.** The IFC invested \$3.5 million in Ukraine's De Novo to create a data center that will use energy-efficient technologies to improve data security and the local information technology infrastructure—IFC's first investment in Ukraine's IT sector. Data centers are an important part of the IT infrastructure to grow and attract companies with high-skilled workforces. The IFC's investment will help De Novo expand its business to include Ukraine's first enterprise-class data center that will serve financial institutions and large corporations. De Novo's data center uses a special computing concept to operate energy-efficient computers, network servers and peripherals, and free air-cooling technologies. The center will use a special power management system to optimize power use, saving up to 30 percent in energy consumption.

## **Supporting countries' connectivity objectives**

### **152. The WBG comparative advantages in supporting client country connectivity include:**

- After 15 years of support across the globe to open markets and promote private sector investment in mobile telecommunications, the WBG has gained considerable expertise and credibility on ICT sector policy reform. And it is thus well placed to advise governments on policy reforms to attract private sector investment for the rollout of affordable broadband access networks. The World Bank can also link the impact of in-depth broadband policy reforms to economic development and growth strategies. This is especially powerful in supporting reform champions and convincing their government

colleagues (in the broader context of growth objectives) that the ICT sector is an area where reforms are feasible and returns on reform are substantial.

- The IFC has in-depth experience in leading or co-leading transactions—and can raise additional funds through its syndications and guarantees. It almost always brings co-investors into projects, providing comfort and acting as a catalyst in encouraging other private investors into markets considered too risky. Investments typically range from \$5 million to \$150 million per transaction, with the IFC able to finance, from its own funds, up to 25 percent of total project cost for new projects and up to 50 percent for expansion projects.
- The MIGA has a proven record of working with private investors in telecommunication projects who are looking for specific protection from the large, unique risks associated with ICT connectivity investments in emerging markets (such as those relating to revocation of license, licensing, removal of spectrum or frequency band, and nationalization). MIGA's investment guarantees mitigate the noncommercial risks associated with investment in ICT projects, enhancing the deal structure and protecting the bottom-line potential. Recently, operators and investors in the market expressed concern with risks related to license nonrenewal or cancellation. This is an area where a MIGA guarantee can prove valuable through expropriation coverage or breach of contract coverage (depending on the licensing arrangement).
- For transformational infrastructure that requires PPP structuring, the World Bank is uniquely placed to support governments. It has gained significant PPP structuring expertise in some of the most difficult environments globally, with experience in more than 10 PPPs in Burundi, the Caribbean, Central African Republic, Chad, The Gambia, Guinea, Liberia, the Pacific islands, Sierra Leone, and São Tomé and Príncipe.

#### **Box A3.5 WBG intervention on the connectivity agenda**

**Advice on broadband policy in Moldova: Development Policy Operation supported a major policy shift and helped transform the country's access to high-speed Internet.** In Moldova the World Bank assisted the government through a development policy operation to break up the monopoly in international Internet connectivity in April 2010. In the following three months, three private firms constructed new cross-border fiber optic cables, leading international Internet bandwidth to increase four times and retail prices to drop by half. Moldova now ranks among the top 20 fastest broadband countries in the world.

**Egypt: Fee-based services provided advice on broadband strategy and supported reform champions.** In Egypt reformers within the government contracted with the World Bank for advice on broadband policy. The first phase of the fee-based arrangement focused on identifying international best practices and country case studies and applying them to Egypt. The second phase of the exercise developed a detailed economic model to assess the macroeconomic impact as well as the employment impact of the broadband policy, to analyze broadband's impact on three key sectors (financial, education, and IT), and to design strategic options for national broadband deployment policy.

**Afghanistan: IFC and MIGA support in a conflict-afflicted country.** In 2009 the IFC provided a \$65 million loan and \$10 million in equity to MTN Afghanistan to support the expansion of the company's mobile network, particularly for low-income populations. In 2007 and 2011 the MIGA issued guarantees totaling \$165 million to MTN Dubai Limited for its investment in MTN Afghanistan. The coverage is for up to 10 years against the risks of transfer restriction and expropriation. Both interventions support the growth of the private sector in a conflict-afflicted country, providing access to capital and financing—and mitigating political risks, to increase private sector confidence.

**Iraq: IFC using its syndication expertise to support to develop a mobile network in conflict afflicted country.** The IFC supported economic growth and expanded access to telecommunications services in Iraq through a landmark \$400 million facility for Zain Iraq, the country's largest mobile phone operator. The IFC brought together the commercial bank syndication market and the development finance community to provide access to different sources of financing for Zain Iraq and to help promote a syndicated loan market in Iraq. Zain Iraq—majority-owned by Zain Group, a pioneer in delivering high-quality and innovative communications services in the Middle East and

North Africa—has more than 50 percent of the country’s mobile phone market by customer market share. The company expects to add more than 4 million Iraqi mobile users over the next five years, growing its customer base to almost 20 million subscribers in a country with one of the lowest mobile penetration rates in the region. Many of these users are expected to come from some of Iraq’s poorest governorates, including Al-Anbar, Diala, and Salahuddin.

**IFC support to a global venture: affordable satellite-based Internet access for developing countries.** The IFC led a group of development institutions in providing \$260 million in financing to help O3b Networks (O3b) complete a satellite system that will provide affordable broadband access to developing countries near the equator. O3b, which stands for the “other 3 billion,” refers to the nearly half of the world’s people not adequately served with broadband Internet access. Affordable high-speed broadband provides people and businesses the opportunity to connect with each other, innovate, and grow their economies. O3b, using eight satellites that circle the equator, will provide broadband services for developing countries 45 degrees latitude north and south of the equator. The satellites will serve countries in Africa, Asia, the Middle East, Europe, and South America that have insufficient connectivity because of geographic obstacles or the high cost of alternative means of connectivity.

**West Africa International connectivity: Five PPPs to connect countries to a regional submarine cable for high-speed Internet access.** To attract more private sector investment in low-income, postconflict countries with small economies, the World Bank is financing the government contributions to five PPPs in a transformational ICT infrastructure in West Africa: the Africa Coast to Europe (ACE) submarine cable. This will connect The Gambia, Guinea, Liberia, São Tomé and Príncipe, and Sierra Leone with low-cost, high-speed Internet. The PPPs are country-specific, tailored to fit the extent of private sector presence, and provide the country membership in the ACE Submarine Cable Consortium. The PPP arrangement guarantees open access of the landing station and submarine cable capacity for all operators, including future operators (operators can gain ownership of the PPP through purchase of capacity overtime). Already in most countries, ACE will be commercially operational at the end of 2012. The ACE submarine cable will be an approximately 17,000 kilometer submarine cable system connecting Europe to 23 countries in Africa. For many of these countries, ACE represents the first fiber optic international connectivity to the global networks, promising much greater bandwidth per capita at the lowest cost. The World Bank will continue to draw lessons from PPP arrangements supported by Bank financing (often in partnership with others) in Africa, the Caribbean, and the Pacific islands to inform future project design and implementation.

## A Tool for Selectivity: Country diagnostics

153. **For interested countries and country programs a rapid diagnostic may be performed when developing Country Partnership Strategies, Country Assistance Strategies, or Interim Strategy Notes—or as a separate analytical exercise, in collaboration with relevant client counterparts.** The country diagnostic will be the main tool to prioritize intervention and inform selectivity decisions. Under the Transform pillar, greater selectivity will reduce the risk of failures of IT components across sectors (we propose to support significant IT components only when there is a serious client commitment to reform and IT project management capacity).

154. **The diagnostic will include the following considerations:**

- *Transform pillar—open and accountable development.*
  - Sectors where open and accountable development can be meaningfully implemented: strength of relationship with government counterparts in the sector; counterpart commitment to a reform agenda associated with open development applications; existing or pipeline Bank lending operation to support government reform efforts to address priorities and issues identified through citizen participation; existing strategy on demand for good governance; and enabling environment for information security and data privacy.
  - Project teams who believe that a citizen-driven technology solution could help address a development challenge in their project.
- *Transform pillar—service delivery applications.*

- In targeted sectors, degree of client commitment to reform processes under the leadership of a strong reform champion and opportunity for South-South dialogue.
- In targeted sectors, likelihood of building the capacity of civil servants and competent technical team to handle the interaction with the private sector for IT services—and to handle procurement and contract management.
- Existence (or commitment to create) institutional mechanism for cross-sector coherence of investment across government.
- Client interest in adopting an approach of buying IT “as a service” from the private sector, as opposed to managing IT projects in-house.
- World Bank sector team committed to skill up their IT expertise and to access external IT experts and integrate them into the project team for IT project components.
- *Innovate pillar.*
  - Assessment of competitiveness potential using the Location Readiness Diagnostic Methodology.
  - Credible and empowered in-country champion to lead that effort.
  - Main constraints on skills development.
  - Country readiness to embrace ICT innovation using the Oslo protocol methodology.
- *Connect pillar.*
  - The broadband access gap (policy issues, private investment issues, and the like).
  - Potential impact on economic development of addressing this gap.
  - Need for public finance to help catalyze private investment on risky or low-return market segments.
  - Relevance of the International Finance Corporation and Multilateral Investment Guarantee Agency instruments to attract additional private investment.
  - Whether a public-private partnership is needed to build a transformational ICT infrastructure.

**155. Attention will also be given to such cross-sector issues as gender, climate change, country-specificities, integrity risks associated with IT investments, and an enabling environment for public-private partnerships.** Country diagnostics will help tailor World Bank Group interventions to clients' strategic priorities—and to countries (postconflict, fragile, low income, middle income).

## Annex 4. Implementing the ICT Strategy: World Bank Sectors and Regions' Perspectives

### Sectors' Perspective - Using ICT interventions in economic, social, and infrastructure sectors

*Most sectors in the World Bank used the development of the ICT strategy as an opportunity to reflect on how ICT can transform sector interventions. While the sector teams' background papers are to be published, the table below summarizes the current thinking, as well as options for integrating ICT in sectors.*

Sector	ICT contribution	Possible sector-specific directions
<b>Agriculture</b>	<ul style="list-style-type: none"> <li>• Access to information for policymakers and smallholders</li> <li>• Supply chain efficiency</li> <li>• Improved public services such as agriculture extension</li> <li>• Enhanced collective action through more affordable and reliable communication tools, and better access to training and devices</li> <li>• Smallholder agriculture growth through better aggregation of production and reduced information asymmetry</li> </ul>	<ol style="list-style-type: none"> <li>1. Promote rural ICT infrastructure development</li> <li>2. Support enabling policy and regulations for ICT use in agriculture</li> <li>3. Distinguish gender in ICT and agriculture</li> <li>4. Conduct impact assessments of agriculture using ICT applications</li> <li>5. Create sustainable business models and PPPs</li> <li>6. Promote food safety and security using ICT-based applications</li> <li>7. Provide transformative service for resource-poor producers</li> </ol>
<b>Climate change</b>	<ul style="list-style-type: none"> <li>• Mitigation through energy efficiency in sectors using ICTs</li> <li>• Adaptation through ICT-based applications such as early warning systems and disaster relief management</li> <li>• Measurements and monitoring using ICTs to assess the impact of greenhouse gas emissions on climate change</li> </ul>	<ol style="list-style-type: none"> <li>1. Promote carbon savings and reduced greenhouse gas emissions with ICT use in energy, transport, agriculture, and water</li> <li>2. Focus on energy efficiency in sector strategies through use of ICTs</li> <li>3. Partner to promote CleanTech incubators, applications development, and sensor and related technology developments</li> </ol>
<b>Demand for good governance</b>	<ul style="list-style-type: none"> <li>• Transparency of governments and service providers using open data and government</li> <li>• Citizen empowerment and social intermediaries via social media</li> <li>• Effective collective action of citizens</li> <li>• Accountability and participation in remote/fragile areas using ICT</li> </ul>	<ol style="list-style-type: none"> <li>1. Participate in global advocacy</li> <li>2. Support open data and open governance</li> <li>3. Support institutional reform and capacity building</li> <li>4. Support independent accountability and social intermediaries</li> <li>5. Promote knowledge sharing for DFGG measurements</li> </ol>
<b>Disaster risk management</b>	<ul style="list-style-type: none"> <li>• Risk identification via remote sensing and crowdsourcing</li> <li>• Risk mitigation through mobile applications</li> <li>• Risk preparedness through advanced early warning systems</li> <li>• Disaster response and early recovery via remote sensing and GIS</li> <li>• Reconstruction through interactive mapping and data sharing</li> </ul>	<ol style="list-style-type: none"> <li>1. Develop guidelines for enabling environment for ICTs in DRM</li> <li>2. Support in-house capacity building for ICTs and DRM</li> <li>3. Support development of ICT applications for DRM</li> <li>4. Develop best practices in ICT and DRM</li> <li>5. Promote open data standards</li> </ol>
<b>Education</b>	<ul style="list-style-type: none"> <li>• Restructuring, reform, and accountability of education</li> <li>• Teacher training and innovative teaching and learning practices</li> <li>• Distance education opportunities</li> <li>• National research education networks</li> <li>• ICT-related skills development</li> <li>• Capacity for content development</li> </ul>	<ol style="list-style-type: none"> <li>1. Use ICT for broader education development</li> <li>2. Promote basic ICT skills along with broader skills</li> <li>3. Be broad-based in identifying technology options and solutions</li> <li>4. Facilitate teacher development using ICTs</li> <li>5. Monitor and evaluate regularly using ICTs</li> <li>6. Assist WBG staff to develop relevant ICT-based skills</li> </ol>

<b>Sector</b>	<b>ICT contribution</b>	<b>Possible sector-specific directions</b>
<b>Energy</b>	<ul style="list-style-type: none"> <li>• Power sector reform enabled by ICTs</li> <li>• Energy supply management</li> <li>• Energy efficiency</li> <li>• Reliability of existing energy infrastructure</li> </ul>	<ol style="list-style-type: none"> <li>1. Support stability of energy networks using ICTs</li> <li>2. Monitor energy systems remotely using ICTs</li> <li>3. Develop smarter grids</li> <li>4. Manage energy efficiently with ICT applications</li> </ol>
<b>Finance</b>	<ul style="list-style-type: none"> <li>• Access to financial services for unbanked using mobile and branchless banking</li> <li>• Consumer protection, transparency, and security</li> <li>• Stability and integrity of the financial system</li> <li>• National payment systems, mobile money, stored value cards, and Internet banking</li> </ul>	<ol style="list-style-type: none"> <li>1. Build legal, regulatory, and supervisory frameworks</li> <li>2. Better identify the role of government in fostering ICTs for finance</li> <li>3. Improve overall market conditions and incentivize ICT providers</li> <li>4. Expand partnerships with stakeholders &amp; standard setting bodies</li> <li>5. Ensure ICT sector strategies include financial sector objectives</li> <li>6. Provide operational lending and technical assistance</li> </ol>
<b>Health</b>	<ul style="list-style-type: none"> <li>• Strengthening of health system</li> <li>• M-health and tele-health including for vulnerable communities</li> <li>• Surveillance and public health information systems</li> <li>• Emergency medical services for crisis time</li> <li>• Effective sector governance, accountability, and transparency</li> <li>• Links with mobile money, insurance, service delivery, and HR</li> </ul>	<ol style="list-style-type: none"> <li>1. Build global framework of ICT tools for health care</li> <li>2. Support countries to strengthen health care systems using ICT</li> <li>3. Build capacity of health care workers in basic ICT skills</li> <li>4. Help systematize clinical data, evidence, and medical knowledge</li> <li>5. Provide tools for financing health programs, including insurance</li> <li>6. Improve access to health care services in rural and remote areas</li> </ol>
<b>Investment climate</b>	<ul style="list-style-type: none"> <li>• Reduced cost of regulatory compliance</li> <li>• Improved access to information for the private sector</li> <li>• Increased transparency of government regulatory actions</li> <li>• Improved regulatory oversight</li> <li>• Reduced opportunities for rent-seeking by civil servants</li> <li>• Enhanced information and service delivery</li> </ul>	<ol style="list-style-type: none"> <li>1. Implement Open Government/Open Data initiatives</li> <li>2. Integrate government databases and unified user interfaces (one-stop portals) to improve service delivery</li> <li>3. Move information &amp; service delivery to web and mobile platforms</li> <li>4. Implement government data centers and clouds</li> <li>5. Implement integrated windows for trade</li> </ol>
<b>Media</b>	<ul style="list-style-type: none"> <li>• Distribution platforms (traditional media and new media)</li> <li>• Social media and applications</li> </ul> <p><b>Media contributes to ICT:</b></p> <ul style="list-style-type: none"> <li>• Content and information</li> </ul>	<ol style="list-style-type: none"> <li>1. Support policy and regulation of the media sector</li> <li>2. Provide analytical and advisory work in media</li> <li>3. Support knowledge sharing and capacity building in media</li> <li>4. Provide operational lending in media infrastructure</li> <li>5. Build partnerships with institutions for media sector development</li> <li>6. Advocate media's role in growth</li> </ol>
<b>Public financial management</b>	<ul style="list-style-type: none"> <li>• Improving operational efficiency and results in the public sector</li> <li>• Planning, execution, and monitoring of state budget through FMIS</li> <li>• Improving participation, fiscal transparency, and government accountability in PFM processes</li> </ul>	<ol style="list-style-type: none"> <li>1. Develop a consistent approach to address PFM reform challenges</li> <li>2. Support development of reliable FMIS for performance monitoring</li> <li>3. Promote knowledge sharing and learning in ICTs and PFM</li> <li>4. Continuously improve internal practices in ICTs and PFM</li> </ol>

<b>Sector</b>	<b>ICT contribution</b>	<b>Possible sector-specific directions</b>
<b>Social protection</b>	<ul style="list-style-type: none"> <li>Client tracking using mobile-based solutions</li> <li>Transaction processing using MISs</li> <li>Cash delivery using mobile phones</li> <li>Monitoring and evaluation using mobile phones and MISs</li> </ul>	<ol style="list-style-type: none"> <li>Support client identification and registration using ICTs and biometrics</li> <li>Deliver cash benefits through mobile phones</li> <li>Monitor and assess spatial dimension of poverty and vulnerability using GIS, mobile phones, and ICT solutions</li> <li>Support citizen feedback and grievance redressal systems</li> <li>Support MIS for social protection</li> </ol>
<b>Transport</b>	<ul style="list-style-type: none"> <li>Safe, clean, and affordable transport using ICTs</li> <li>Intelligent transportation systems</li> <li>Data collection with mobile-based and GIS solutions</li> <li>Online access to transport and logistics information (tickets, timetables)</li> <li>ICT infrastructure laid in road and railway systems</li> </ul>	<ol style="list-style-type: none"> <li>Support reduction of emissions using ICTs applications</li> <li>Support mobility, safety, and efficiency of transport systems using ICT solutions</li> <li>Support trade and logistics with ICTs</li> </ol>
<b>Urban</b>	<ul style="list-style-type: none"> <li>City growth, improved governance, and service delivery</li> <li>Intergovernmental fiscal relations and municipal finance</li> <li>Urban poverty reduction and slum upgrading</li> <li>Urban planning, land, and housing</li> <li>Urban environment and climate change</li> </ul>	<ol style="list-style-type: none"> <li>Enact supportive policies and regulations</li> <li>Encourage stakeholder involvement and citizen participation in formulating sustainable local solutions</li> <li>Provide capacity building to stakeholders</li> <li>Facilitate industry partnerships in formulating applications</li> <li>Facilitate seed capital for ICTs and urban applications</li> </ol>
<b>Water</b>	<ul style="list-style-type: none"> <li>Information on water use and availability with ICT-based systems</li> <li>Better availability of hydrological information</li> <li>Feedback from water users using mobile and GIS technologies</li> <li>Efficiency and accountability in water sector</li> <li>Monitoring of water use with remote sensing technologies</li> </ul>	<ol style="list-style-type: none"> <li>Scale up reporting on water resources and control of water use</li> <li>Support climatic information provision to water users</li> <li>Enhance service provision and accountability via citizen reporting</li> <li>Improve water resources management via citizen feedback</li> <li>Encourage evapotranspiration management and water conservation</li> </ol>

Note: DFGG = demand for good governance, DRM = disaster risk management, FMIS = financial management information system, GIS = geographic information system, MIS = management information system, PFM = public financial management, SME = small and medium enterprise

## World Bank's Regions perspectives

*A preliminary roadmap for year 1 of the ICT Strategy in line with each Region's strategy*

### Africa

Regional Priorities	Africa's potential activities in year 1 (FY13) of the ICT Strategy
Pillar 1 Competitiveness and employment	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>• Draw lessons from PPPs on tax system and customs in Ghana and identify replication opportunities where clients have a strong commitment to reform</li> <li>• Pilot e-procurement approach in one country</li> <li>• Explore use of MIGA instrument for PPPs to carry out government functions (tax, customs, payroll)</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>• Develop local IT-based services industry, and initiate programs in countries to align local ICT skills development to industry requirements</li> <li>• Explore how ICT skills development can be integrated in forthcoming project on African regional centers of excellence in higher education</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>• Expand Bank intervention on policy reform and PPPs for affordable broadband infrastructure (from 17 countries to 21). Use support from IFC and MIGA.</li> </ul> <p><b>Country diagnostics:</b> Use country diagnostics to identify how ICT can increase competitiveness and employment in at least two countries</p>
Pillar 2 Vulnerability and resilience	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>• Draw lessons and replicate ICT use in irrigation/water management, health supply chain, health monitoring for results, and safety net cash transfers</li> <li>• Draw lessons and replicate from the situation room for Benin Floods and Africa Spatial Help desk for rapid-response capability</li> <li>• Identify countries for replication of farmers' applications for increased income such as e-soko (IFC)</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>• Sponsor hackathons or tech camps; draw early lessons from m-application labs in Kenya and Senegal to facilitate grassroots ICT innovation</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>• Continue support to the Village Phone Program (IFC)</li> <li>• Engage in policy dialogue on enabling environment for information security and privacy in at least two countries</li> </ul> <p><b>Country diagnostics:</b> Use country diagnostics to identify three countries where applications on ICT and climate change can be supported</p>
Pillar 3 Governance and public sector capacity	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>• Launch pilots on ICT use for social accountability in projects in Nigeria (health, agriculture, urban planning, and violence prevention)</li> <li>• Replicate the Tanzania pilot of community mapping in support of project design for a urban revitalization World Bank operation to two other projects</li> <li>• Support governments who have subscribed to the Open Government Partnership (Rwanda, Liberia, Ghana, Tanzania, Kenya)</li> <li>• Initiate conversations with at least two other African countries on joining the Open Government Partnership</li> <li>• Leverage the Open Development Technology Alliance in at least six countries for ICT for accountability.</li> <li>• Support successful IFMIS transitions in at least three countries</li> <li>• Leverage PPIAF funding in at least two countries to structure PPPs in e-government areas, such as cloud computing, e-procurement, e-tax, etc.</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>• Support virtual government networks in at least four countries</li> </ul> <p><b>Country Diagnostics:</b> Use country diagnostics in at least three countries for transformation through ICT and for a shared IT infrastructure platform</p>

## East Asia and Pacific

Regional Priorities	EAP's potential activities in year 1 (FY13) of the ICT Strategy
Priority 1 Sustaining growth	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Develop innovative technical assistance on crowdsourcing to support transport planning (the Philippines, prospectively Indonesia)</li> <li>Introduce mobile applications for a coastal resources project, agriculture competitiveness project, and land management project (Vietnam)</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>Document and share lessons of ICT innovation and potential in the Philippines—a world leader in the business process outsourcing sector (Malaysia, Vietnam, Indonesia)</li> <li>Leverage experiences of Korea and Singapore in ICT innovation, develop smart community and smart city approaches in other fast growing EAP countries through case studies and learning modules for regional dissemination</li> <li>Coordinate ESW with the Education team on ICT skills for competitiveness in the region (priority countries to be determined)</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>With infrastructure teams, identify opportunities for co-location of broadband/backbone and other infrastructure in EAP, such as highways, pipelines, and power lines (all countries)</li> <li>Do analytical and advisory work on rural/remote broadband access including on leveraging of PPPs for ICT infrastructure (Indonesia, Vietnam, Thailand, Cambodia); in Vietnam, complete a rural broadband strategy with a focus on enabling broadband applications for rural relevance</li> </ul>
Priority 2 Poverty reduction	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Coordinate with IFC and EASPR on mobile money initiatives</li> <li>Support knowledge sharing for country office staff on mobile applications for health</li> <li>Support knowledge sharing and project identification for unique electronic ID programs to ease service delivery (especially in health sector) and cash transfer programs (Philippines, Vietnam, Indonesia, Mongolia), infrastructure service delivery to the poor, and social protection for the disadvantaged</li> </ul>
Priority 3 Governance and accountability	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Identify projects where ICT use and citizen engagement can support the lending intervention for improved governance and accountability (results monitoring, asset verification; Indonesia, Mongolia, Vietnam, and the Philippines)</li> <li>Innovate TA to promote citizen engagement on public services at the municipal and sub-national level (the Philippines, prospectively Indonesia)</li> <li>Innovate policies: for example, the Water Superbody in the Philippines requires ICT infrastructure to effectively integrate the almost 30 agencies working on different aspects of water</li> </ul>
Priority 4 Regional engagement	<p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>Pacific Regional Connectivity Program (regional horizontal APL-IDA): target improved access to high-speed Internet throughout the Pacific Region (Phase 1, Tonga-Fiji already approved)</li> <li>Support ICT sector market liberalization and regulatory reform throughout the Pacific, and support the Pacific ICT Regional Regulatory Resource Centre (Pacific Region)</li> <li>Through regional bodies such as C40, City net collective learning on regional mitigation and adaptation strategies</li> </ul>
Priority 5 Disaster Management	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Identify opportunity for DRM engagement with partner agencies, including regional bodies (ITU, ASEAN) in Pacific, the Philippines, and Indonesia</li> </ul>

## Europe and Central Asia

Regional Priorities	ECA's potential activities in year 1 (FY13) of the ICT Strategy
Priority 1 Deepened reforms for improved competitiveness	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Identify priority countries for e-government interventions, including e-services for private sector development</li> <li>Leverage KTF to use smart grids and smart metering in Uzbekistan</li> <li>Leverage HELP group for advising e-transformation leaders in countries such as Poland, Turkey, Russia, Kazakhstan, Tajikistan, and Uzbekistan</li> <li>Develop a 10-year Intelligent Transportation Systems (ITS) Strategic Plan for St. Petersburg; and support a national ITS framework in Russia</li> <li>Develop ICT-enabled integrated cadastre and registration system in Bosnia and Herzegovina, Russia, and Croatia</li> <li>Use ICT to improve environmental management and access to information, including for compliance monitoring and dissemination of information</li> <li>In the EU accession countries, support the setting up of EU Funds Paying Agencies and IT tools for administering controlling payments to farmers</li> <li>Support IFMIS and revenue administration systems (Albania, Croatia, Georgia, Moldova, Russia, Ukraine)</li> <li>Promote smart metering, billing, and collection systems for water utilities in Tajikistan, Uzbekistan, the Kyrgyz Republic</li> <li>Computerize accounts of water user associations in Armenia to improve efficiency of water delivery and irrigation fee collection</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>Support IT industry in Armenia and Moldova using development policy loan mechanisms</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>Support broadband connectivity in Armenia, Georgia, Moldova, and Azerbaijan</li> <li>Use mobile phones/Internet to transmit price, market, and weather info to rural entrepreneurs and farmers in Moldova and Uzbekistan</li> </ul>
Priority 2 Social sector reforms for inclusive growth	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Leverage KTF in Uzbekistan to develop priority ICT policies including strengthening public sector reform and governance through e-government—the government of Uzbekistan is keen to venture into citizen-centric and citizen-driven e-government services and improve government services by addressing social protection cash transfers, business services, statistical services, and unique ID (being explored under work by KTF)</li> <li>Use ICTs to support social protection services delivery</li> <li>Support knowledge sharing and project identification for unique electronic ID programs and cash transfer programs (social protection) in Uzbekistan</li> <li>Identify a pilot country or countries where mobile phones can be used for cash transfer programs</li> <li>Pilot e-IDs that can be used for identification to receive social safety net payment</li> <li>Work with the PREM team to implement BOOST for open and possibly participatory budgeting across ECA countries</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>Undertake a regional ESW to identify policy options to address the limits to broadband connectivity to second-tier cities and in rural areas across ECA</li> </ul>
Priority 3 Climate action for sustainable growth	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Leverage cloud computing for promoting Green Growth agenda and savings in public sector IT investments, including through PPP-based approaches</li> <li>Leverage Open Development Technology Alliance (ICT Knowledge Platform) and South-South Trust Fund to support Open Government initiatives in the ECA countries who joined the Open Government Partnership with special focus on citizen engagement and feedback as well as open budgets and open data, in partnership with WBI, PREM, SDV and DEC; this includes Moldova, Macedonia, Albania, Ukraine, Georgia, Armenia, Romania, and Azerbaijan</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>Benchmark major urban centers to identify how ICT can improve efficiency of urban management</li> </ul>

## Latin America and the Caribbean

Regional Priorities	LAC's potential activities in year 1 (FY13) of the ICT Strategy
Priority 1 Growth and jobs	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Identify at least two green growth-oriented infrastructure projects where ICT can be integrated (intelligent transport systems, smart grids, remote sensing)</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>Support at least one more country on promoting IT-enabled industries and services</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>Deliver the CARCIP and support at least one more country through FBS in introducing competition in domestic backbone</li> </ul>
Priority 2 Gini, poverty, and gender	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Leverage the Listening to LAC initiative for real-time data collection and identify at least one country to support through mobile banking services, mobile provision of CCTs, and pension payments</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>Explore inclusion in one or more innovative projects for the poor, such as mobile-based education, remote diagnostic, and treatment</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>Deliver AF for Nicaragua Rural Telecommunications Project and identify one more country to leverage ICT for access to agricultural markets</li> </ul>
Priority 3 Governance and institutions	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Leverage the ICT for Accountability Knowledge Platform to assist task team leaders in supporting e-government (particularly e-procurement) through their projects and promoting participatory technology-enabled approaches for transparency of public services</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>Identify at least one project to support a comprehensive ICT-enabled innovation policy</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>Support national Government Intranets interconnecting all government offices, such as through CARCIP</li> </ul>
Priority 4 Global involvement	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Leverage ICT to better track and target aid (AidData) and to underpin LAC's commitments related to climate change (through payment for Ecosystem Services and Carbon Finance)</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>Extend experience of MexicoFIRST (training on global ICT-skills with global standards and certification) to other countries</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>Promote design of new regional connectivity programs, similar to CARCIP</li> </ul>
Priority 5 Guarding against disasters	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Identify at least one initiative to enhance provision of granular meteorological information for disaster preparedness</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>Support open mapping platforms and mobile interfaces (such as Crisis Map of Haiti) for disaster response</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>Support cyber-security through at least one project (such as creating computer emergency response teams)</li> </ul>

## Middle East and North Africa

Regional Priorities	MENA's potential activities in year 1 (FY13) of the ICT Strategy
Priority 1 Macro, fiscal, and financial stability; management of inflation and food prices	<p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>Innovative TA on micro-work—initial focus on West Bank and Gaza, lessons to be extended to the rest of the region, and development to industry requirements (AFTED, AFTPS, TWICT)</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>A regional study on broadband connectivity and a concise strategic assessment of broadband access gap, constraints to further broadband penetration, and likely impact of broadband policy reform to prioritize countries for Bank intervention (TA, FBS, DPO)</li> <li>Develop options on how DPOs can increase ICT competition and improve the enabling environment for broadband development</li> <li>Initiate FBS in two countries (possibly Algeria and Gulf countries)</li> </ul>
Priority 2 Employment creation programs; scale up of public works, cash transfer, and microfinance	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Regional KTF on smart grids and smart meters, with pilots in Jordan</li> <li>Organize Transport Hackathon in Egypt</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>ESW among ICT sector, MENA education, MENA youth, and private sector development on ICT for job creation, including business process outsourcing</li> <li>Focus on Morocco, Tunisia, Egypt, Lebanon, and Jordan: selected hackathons and co-creation platforms to build youth graduate skills; embed software certification skill development in Bank projects</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>Perform a regional study on broadband connectivity and a concise strategic assessment of broadband access gap, constraints to further broadband penetration, and likely impact of broadband policy reform to prioritize countries for Bank intervention (TA, FBS, DPO)</li> <li>Develop a menu of options on how DPO can increase ICT competition and improve the enabling environment for broadband development</li> <li>Initiate FBS in two countries (possibly Algeria and Gulf countries)</li> </ul>
Priority 3 Protection for the poor and vulnerable	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Mainstream ICT and mobile money instruments as part of financial inclusion strategy and operations in MENA</li> </ul>
Priority 4 Governance, including economic, corporate, and banking	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>Identify projects where ICTs and citizen engagement can support the lending intervention for improved governance and accountability (results monitoring, asset verification )</li> <li>Test the model with the new Morocco CDD project and with the inclusion of ICT-enabled citizen feedback as part of the Governance and Development Policy Lending in Tunisia</li> <li>Assess transformational ICT application opportunities and relevant cross-sector enablers (e-government policies and institutions, shared IT infrastructure) in interested countries</li> </ul>

## South Asia

<b>Regional Priorities</b>	<b>South Asia's potential activities in YEAR 1 (FY13) of the ICT Strategy</b>
Priority 1 Dynamic private sector-led growth	<p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>• Leverage transnational power and transport projects to improve regional connectivity (Nepal, Bhutan, Bangladesh, India)</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>• Support IT industry development (Bangladesh, Bhutan, Pakistan, Sri Lanka)</li> <li>• Continue support for existing activities linked to innovation (m-applications lab, incubation support)</li> </ul>
Priority 2	<p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>• Support ICT skills development programs (Bangladesh, Bhutan, Pakistan, Sri Lanka)</li> </ul>
Skilled labor force	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>• Support shared transformative infrastructure such as cloud computing</li> </ul> <p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>• Support the broadband access agenda in Afghanistan (Operation)</li> <li>• Support second generation policy and regulatory issues to sustain the connectivity agenda (focus on Bhutan, Sri Lanka, Pakistan, India)</li> <li>• Knowledge sharing in the region and south-south exchange (on spectrum auctions, infrastructure sharing)</li> </ul>
Priority 3 World-class	<p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>• Assess, through a regional study, the improving cross border regional connectivity in South Asia (focus on Bangladesh, Bhutan, Nepal, India)</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>• Engage on the regional IT services trade agenda</li> </ul>
rural and urban infrastructure	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>• Engage on open government initiatives and build on Right to Information movement in the region</li> <li>• Support lending interventions for governance and accountability (results monitoring, asset verifying), focusing on Afghanistan, Nepal, and Pakistan</li> <li>• Knowledge sharing in the region and south-south exchange (learn from leaders in open governments such as Brazil, Moldova, and Kenya)</li> <li>• Use ICT to support social protection services delivery</li> <li>• Support the scale up of mobile applications for service delivery</li> <li>• Assess transformational ICT application opportunities and relevant cross-sector enablers in interested countries</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>• Continue support for existing activities linked to innovation (m-applications lab, incubation support)</li> </ul>
Priority 4 Improved	<p><b>Transform:</b></p> <ul style="list-style-type: none"> <li>• Engage on use of ICTs to support the green growth and urban development agenda.</li> <li>• Support the use of ICTs in the climate change and disaster management program in South Asia</li> <li>• Support innovative ICT use in the Water and Sanitation program</li> </ul>
regional integration	<p><b>Connect:</b></p> <ul style="list-style-type: none"> <li>• Leverage transnational power and transport projects to improve regional connectivity (Nepal, Bhutan, Bangladesh, India)</li> </ul> <p><b>Innovate:</b></p> <ul style="list-style-type: none"> <li>• Support IT industry development (Bangladesh, Bhutan, Pakistan, Sri Lanka)</li> <li>• Continue support for existing activities linked to innovation (m-applications lab, incubation support)</li> </ul>

## **Annex 5. Information security and privacy in a connected world**

156. As developing countries transition to a broadband digital world based on information flow, they must ensure security of the data, networks and systems, and build market and user trust in the use of Information and Communication Technologies (ICTs) for a range of on-line services, applications and transactions.<sup>40</sup> This trust is the enabler that will encourage governments, the private sector and users alike to innovate and realize the transformational potential of ICTs in a connected world. Lack of a secure and trusted environment would lead to delayed adoption of ICTs, putting developing nations at a disadvantage in participating in global innovation, education, and commercial networks.

157. **Creating a secure and trusted ICT environment requires balancing security, privacy, and access.** Striking this balance is key to preserve and encourage innovation. The foundation of this balance encompasses a holistic approach that includes, among others:

- Creating enabling policy, legal, and regulatory frameworks for authentication, electronic transactions, cyber-security, critical infrastructure protection, data and privacy protection, consumer protection, cyber-crime, freedom of expression and freedom of information, intellectual property, and information security.
- Building awareness and having a clear strategy and capacity to implement these policies, laws, and regulations.
- Having a robust capacity for response and recovery to withstand ICT disruptions and cyber-attacks, incorporating recognized international standards in these areas where such exist. Collectively, this Strategy refers to these issues as “information security and privacy.”

158. **An open and free Internet is also key for innovation, and it needs to be protected.** Care should be taken to ensure that users have the greatest possible access to Internet-based content, applications, and services of their choice (which could be subject to charges by the provider), using suitable devices of their choice.<sup>41</sup> This includes traffic management measures that impact the right to receive and impart information.<sup>42</sup>

159. **A secure and trusted ICT environment is critical to ensure that the public and the private sectors properly implement and deploy ICTs.** In 2010 cyber-attacks on the U.S. government increased by 39 percent over 2009. Since 2007 the private sector worldwide suffered from a fourfold increase in financial losses from security attacks, theft of intellectual property increased threefold, and brand or company reputation was compromised three times as often.<sup>43</sup> Loss of market confidence, intellectual property, and financial assets resulting from security breaches directly impacts economic growth and development. Nations that have not undertaken adequate measures to build trust in ICTs have fewer opportunities to participate in global research and development, risk having lower foreign direct investment, and struggle to secure their internal financial and service transactions.

160. **Information security and privacy as multidimensional, multidisciplinary issues involve the public and private sectors, nongovernmental organizations, and the academic and technical communities.** The World Bank’s approach to information security and privacy is consultative and collaborative, with major international bodies such as APEC, CERT First, ETSI, the EU, ICANN, ISO, ITU, the OAS, the OECD, and the UN.<sup>44</sup>

161. **Given that modern society depends on seamless operation of information infrastructure and flow of data, information security is crucial for all sectors.** Sectors

particularly vulnerable to security breaches and cyber-security attacks include telecommunications and financial services, health care, transport, energy systems, agriculture, and government data. The World Bank's approach thus needs to be multispectral—and involve not only government entities responsible for information security and privacy but also entities responsible for specific sectors.

**162. The World Bank Group (WBG) supports initiatives in the following areas of information security and privacy:**

- *Policy, Legal, and Regulatory Enabling Framework.* A sound legal and regulatory framework serves as a cornerstone of information security and privacy initiatives that the government, the private sector, and the broader stakeholder community are to undertake. Under the Policy, Legal, and Regulatory Framework the World Bank supports initiatives such as national strategy and planning and policy development and implementation for information security and privacy.
- *Awareness and Capacity Building.* Heightened awareness and capacity within the government and private sector and among citizens is crucial for ensuring sound information security and privacy measures and for preventing cyber-attacks. User education is also important in helping users understand their rights in digital transactions, avoid pitfalls, and build trust. The World Bank supports initiatives such as the following under Awareness and Capacity Building within the ICT Strategy:
  - Institutional governance and capacity building.
  - Partner collaboration (security of vendors).
  - Information security standards and certifications.
  - Security risk assessments and modeling.
  - Information security and privacy audit, and security management evaluation.
  - Evaluation, certification, and validation of IT security products and services.
  - Awareness building and information delivery to small and medium enterprises and other private sector entities.
  - User protection, user education, and awareness building.
  - Rights to correction, disclosures, and notifications to users, including effective breach notification, and enforcement and redress mechanisms.
  - Use of privacy enhancing technologies.
  - International collaboration in all areas of information security and privacy.
- *Response and Recovery Mechanisms.* An important element to ensure a secure and trusted ICT environment is an adequate response and recovery mechanism to information security attacks and loss of data. One key mechanism for cyber-security emergency response is setting up Computer Emergency Response Teams (CERTs) responsible for detecting, investigating, and monitoring cyber-incidents throughout the economy. CERTs are often responsible for coordinating government awareness, recovery, and preventive measures. They are also critical in collaborating with legal professionals in cyber-crime. A cohesive response mechanism would also address strong legal enforcement of cyber-crime measures. The World Bank may support initiatives such as the following under the Response and Recovery Mechanisms: CERT and Computer Security Incident Response Team setup and capacity building, establishment of business continuity facilities and data backup arrangements, and business continuity and disaster recovery planning.

**163. Implementation. The World Bank's ICT Unit will both implement and facilitate the implementation of the approach to information security and privacy.** The implementation will be undertaken through a coordinated effort of the different World Bank regional and sector departments and the International Finance Corporation (IFC). The Legal Department of the World Bank will lead the legal aspects of the enabling Policy, Legal, and Regulatory Framework. The following tasks are planned under the ICT Strategy:

- Streamlining guidance on a secure ICT environment through revised Operations Policy and Country Services (World Bank procurement) guidelines.
- Assessing information security and privacy risk through analytical work, including best practice procedures of the World Bank's ICT portfolio; and developing a framework of measures to strengthen information security and privacy in projects by type of ICT product offered by the WBG.
- Integrating information security and privacy into sector-specific projects by developing awareness among World Bank task team leaders and providing consistent support.
- Financing new projects with components addressing information security and privacy.

164. **With the growth of digital data there is increased need for more cost-efficient, reliable, and secure data storage and access.** The IFC is also focusing on financing independent data centers, which are more cost and energy efficient, and providing greater data security by being able to withstand natural disasters and having redundant systems to ensure almost 100 percent operational uptime. Similarly, as companies and their customers depend more on data, cyber-security, data protection, and privacy are increasing concerns. To raise awareness of information security and privacy issues for IFC's investments, the IFC will develop an Information Security toolkit for use by IFC client companies as well as internal tools and checklists for IFC officers to use when assessing potential investment opportunities—both in the ICT sector and in other industries that increasingly rely on ICT and digital data.

## Notes

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<sup>1</sup> IEG 2011.

<sup>2</sup> The statistics and findings draw heavily from the evaluation of WBG activities in ICT completed by IEG in June 2011 (IEG 2011).

<sup>3</sup> In addition to having directly supported reforms in many countries, the WBG has contributed to knowledge creation and sharing that focused on drawing and disseminating lessons from sector reforms—for instance, through *infoDev's ICT Regulatory Handbook*, among the most popular reference documents regulators use in developing countries.

<sup>4</sup> IEG 2011.

<sup>5</sup> This represents IFC financing for its own account. Actual project cost supported is more than \$9 billion.

<sup>6</sup> See Africa Infrastructure Country Diagnostic. More information at <http://www.infrastructureafrica.org/aicd/sectors/ict> IEG 2011.

<sup>7</sup> IEG 2011.

<sup>8</sup> IEG 2011.

<sup>9</sup> To download the app from the iTunes App Store, go to <http://itunes.apple.com/us/app/world-bank-finances/id465555488?mt=8>. The app is also available through mobile web browsers (see <http://financesapp.worldbank.org/>).

<sup>10</sup> Kraemer-Mbula and Wamae 2010.

<sup>11</sup> The term was introduced by Dartmouth professors Vijay Govindarajan and Chris Trimble and GE's Jeffrey R. Immelt.

<sup>12</sup> See <http://thehealthcareblog.com/blog/2011/09/14/reverse-innovation-the-cost-crisis-in-american-healthcare/>.

<sup>13</sup> World Bank 2008.

<sup>14</sup> Dongier and Sudan 2009.

<sup>15</sup> For example, the local government of Dongying, China, traditionally known for manufacturing and oil cultivation, recently announced a strategic initiative with IBM to use cloud computing for building a common platform to promote e-government and support the city's transition to a services-based economy.

<sup>16</sup> See the DigiBIC network at [www.digibic.eu/home.asp?slevel=0z0&parent\\_id=1](http://www.digibic.eu/home.asp?slevel=0z0&parent_id=1).

<sup>17</sup> See the Open Innovation EU website at [www.openinnovation.eu](http://www.openinnovation.eu).

<sup>18</sup> See, for example, [www.ict4entrepreneurship.com](http://www.ict4entrepreneurship.com); <http://ice-ethiopia.org/>.

<sup>19</sup> See the Institute for the Future website at [www.IFTF.org](http://www.IFTF.org).

<sup>20</sup> Salmelin 2011.

<sup>21</sup> A 2009 World Bank econometric analysis found that a 10 percentage point increase in high-speed Internet connections boost annual growth in GDP in developing countries by 1.38 percent on average (World Bank 2009).

<sup>22</sup> Rifkin 2011.

<sup>23</sup> One kilometer of installed fiber optic backbone network costs an average of \$10,000, versus more than \$100,000 for paved roads.

<sup>24</sup> IFC investment limit is up to 50 percent of project cost for existing business but total IFC investment must not exceed 35 percent of total capitalization. IFC investment limit is up to 25 percent of project cost for greenfield projects

<sup>25</sup> World Bank 2009.

<sup>26</sup> ITU 2010.

<sup>27</sup> See Meyer (2011).

<sup>28</sup> <http://blog.twitter.com/2011/06/200-million-tweets-per-day.html> (last accessed April 15, 2012)

<sup>29</sup> Source: [www.facebook.com](http://www.facebook.com).

<sup>30</sup> See "Open Data Sites" at [www.data.gov/opendatasites](http://www.data.gov/opendatasites).

<sup>31</sup> World Bank 2008. See also discussion of relevance of ICT to poverty, in Application of Empowerment, on the World Bank Poverty webpage at <http://go.worldbank.org/S9B3DNEZ00> (accessed September 28, 2011).

<sup>32</sup> IEG 2011. See the following literature on the positive link between ICT and economic growth: Hardy (1980), Norton (1992), Röller and Waverman (1996), Canning (1997), Madden and Savage (1998), Sridhar and Sridhar (2004), Waverman, Meschl, and Fuss (2005), and Qiang, Rossotto, and Kimura (2009).

<sup>33</sup> See i2010 (2006). But other complementary measures, such as firm organizational measures, may be needed to take full advantage of the productivity enhancement potential of ICT (European Commission 2010).

<sup>34</sup> Dutz and others 2011.

<sup>35</sup> Qiang, Rossotto, and Kimura 2009.

<sup>36</sup> Buttkeireit and others 2009, p. 4.

<sup>37</sup> Friedrich and others 2009, p. 4.

<sup>38</sup> World Development Report 2012.

<sup>39</sup> To download the app from the iTunes App Store, go to <http://itunes.apple.com/us/app/world-bank-finances/id465555488?mt=8>. The app is also available through mobile web browsers (see <http://financesapp.worldbank.org/>).

<sup>40</sup> "ICTs" in this annex include digital information and electronic media, information infrastructure, computer and mobile devices, systems, and applications.

<sup>41</sup> See, for example, Council of Europe (2011).

<sup>42</sup> The right to receive and impart information is inhered in article 19.2 of the UN's Covenant on Civil and Political Rights.

<sup>43</sup> PWC Report on Key findings from the 2011 Global State of Information Security Survey, 2011

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<sup>44</sup> APEC is the Asian-Pacific Economic Cooperation, ETSI is the European Telecommunications Standards Institute, EU is the European Union, ICANN is the Internet Corporation for Assigned Names and Numbers, ISO is the International Organization for Standardization, ITU is the International Telecommunication Union, OAS is the Organization of American States, OECD is the Organisation for Economic Co-operation and Development, and UN is the United Nations.