

# How Information and Communication Technology Can Fast-Track Development

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Regional | ICT

## Highlights

- Rapid developments in the storage, retrieval, manipulation, transmission, or receipt of digital data by information and communication technology (ICT) are revolutionizing the way we learn, live, work, and even play.
- Many developing countries have yet to reap digital dividends. In these countries—across the sectors and themes that development assistance aims to impact—accessible, affordable, open, and safe ICT can boost collaboration, efficiency, inclusion, and innovation.
- Technology is never a solution *per se*: informed by needs, ICT must deliver context-appropriate solutions framed by a reform-oriented mind-set, requisite institutional structure and capacity, necessary set of skills, appropriate business models, and enabling policy and regulatory environments.

## ON TIME-SPACE COMPRESSION

Information and communication technology (ICT) are technologies that facilitate by electronic means the processing, transmission, and display of information.<sup>1</sup> Ever faster and cheaper, ICT condenses or elides temporal and spatial distances. ICT has already transformed the financial services, media, retail, and telecommunications sectors. Through the globalization it simultaneously feeds on and accelerates, it is reshaping societies, economies, and governments worldwide.<sup>2</sup>

## ICT IN DEVELOPMENT ASSISTANCE

In developing countries, insufficiencies and inequalities across the dimensions of connectivity, structure, support, and usage constrain what benefits ICT might leverage. Fundamentally, ICT infrastructure is a precondition to ambition. But even where an ICT ecosystem is in place, there is insufficient understanding of how ICT can boost development assistance.

### Illustrative ICT-Related Opportunities in Sector and Thematic Areas of Interest

Sector or Theme	Opportunity
Climate Change	Information and communication technology (ICT) can play multiple roles at all stages of climate change—from monitoring it, adapting to it, mitigating its impacts, and developing long-term solutions—in sectors such as energy, housing, transport, etc. To note, ICT itself contributes to climate change through the proliferation of user devices, all of which require power and radiate heat. Investment: Modeling systems, space technology
Education	ICT strengthens educational systems' capacity, facilitates access to educational services, and improves teacher ability to deliver those services. In higher education, for one, ICT is beginning to globalize open, online, and flexible systems that deliver cost-effective and equitable pathways to just-in-time, mobile learning. Investment: Online pedagogical platforms
Energy	Beyond “build and grow,” smart grids are the emerging paradigm: these are webs of technologies aiming to automate, improve efficiency, monitor, and increase electric grids' availability at generation, transmission, and distribution levels. ICT can rejig business models. Investment: Smart grid solutions
Environment	ICT that frees detailed trend and real-time data offers promising solutions to enhance monitoring, policy design, regulations, and citizen engagement for environmental management. This can enable significant transformations of economic and social structures, human activities, and governance processes to speed transitions to green growth. Investment: Green technology solutions
Finance	ICT can promote the cost-effectiveness, stability, and integrity of financial systems; and advance consumer protection, security, and transparency. The alternative delivery channels for financial services it makes possible include ATMs; agent banking; call centers; e-wallets; extension services, e.g., field staff, mini-branches, and “branches on wheels”; as well as internet banking, all of which quicken financial inclusion. Investment: FinTech Solutions
Gender Equity	ICT can enrich the education, health, and material asset endowments of women, whose mobility and time constraints are more severe compared to men. For example, women are likely to take up ICT-enabled jobs in banking, insurance, printing, and publishing. Social media can also empower women to participate and have a stronger voice in society. Investment: Mobile platforms, security systems
Health	Growing and aging populations challenge health-care spending and dictate a shift away from treatment to predicting, diagnosing, and monitoring. ICT can drive sector-wide improvements in accountability, efficiency, and transparency. E-health and e-medicine have increasingly important roles to play. Opportunities also exist for medical services in times of crisis. Investment: E-health platforms

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<sup>1</sup> ICT is an umbrella term for any communication device or application, e.g., computer and network hardware and software, radio, satellite systems, telephones, television, etc., as well as the various multidimensional services associated with them.

<sup>2</sup> Significantly, more than three-quarters of the world's population of 7.3 billion (2015) have mobile phones, and the number of mobile or cellular subscriptions is close to 7 billion.

Sector or Theme	Opportunity	
ICT Infrastructure	A reliable ICT infrastructure for connectivity and storage underpins all ICT-related services. Priority topics must be addressed such as sustainable and redundant international and domestic connectivity, coverage, sustainable operation and maintenance, processes, quality of service, performance, standardization, security, affordable tariffs, storage, resiliency, well-trained staff, and adequate budgets for capital and operating expenditure. Of even higher priority is that the development of ICT infrastructure must to go hand in hand with ICT-related national or regional strategies, policy and regulatory frameworks, and reliable power supply.	
	Investment	Cabling, cloud computing
Public Sector Management	Open government is gaining momentum. Increasingly, ICT can be used to hold governments accountable, raise efficiency, and improve transparency. By helping monitor and report on trends and events and engage citizens in dialogue, the participation it fosters can also optimize service delivery.	
	Investment	E-governance
Rural Development and Food Security	ICT can serve rural communities by providing local content and basic services to people marginalized by distance or geography. It can also help rural communities stay in touch, eliminate intermediaries, directly access markets and value chains, grow bargaining power, facilitate the provision of agriculture extension services, aid long-distance learning, improve farm productivity, and develop nonagricultural economic activities.	
	Investment	E-agriculture platforms
Social Protection	ICT can enable client identification, registration, and tracking; transaction processing using management information systems; cash delivery; and monitoring and evaluation. Opportunities also exist to support citizen feedback and grievance redress systems; and monitor and assess spatial dimensions of poverty and vulnerability.	
	Investment	Mobile platforms, smart cards, biometrics
Transport	Intelligent transportation systems emphasize safety, management, and efficiency. But ICT can also lessen environmental impact, for example, through guidance systems that lead motorists to parking spaces, which reduce engine time; use of the global positioning system for navigation or vehicle dispatch, which cuts journey time; and road pricing schemes that encourage greater use of public transport, which alleviates congestion and reduces energy use.	
	Investment	Intelligent transport systems
Urban Development	Cloud-based services, increasingly powerful mobile phones, sensors, big data, and data analytics present huge opportunities for cities to enter new phases of technological development and better delivery services. Game-changing opportunities exist across most aspects of urban life and related urban planning. Integrated geographic information systems are key tools and mechanisms that can ensure cohesion, efficiency, and articulation across all urban subsectors. Smart and connected buildings using cutting-edge material would enhance optimization and sharing of resources. Community-based mapping and planning would improve local governance and civil society engagement.	
	Investment	Smart cities
Water	Integrating ICT such as supervisory control and data acquisition systems in water and sanitation projects can, for instance, reduce the cost and duration of monitoring and inventory activities, disseminate hydrological information, improve efficiency gains of water service providers, track water use with remote sensing, improve collection rates of water service providers through ICT-based payment systems, ensure better services to the poor, decrease business and physical nonrevenue water, optimize water pressure and pumping stations' energy efficiency, measure water quality and implement water safety plans, and strengthen citizen voice and accountability frameworks.	
	Investment	Smart water

Notes: Across the sample sector and thematic areas of interest, to which others such as disaster risk management, public-private partnerships, regional cooperation and integration, and trade facilitation might be added, the transformative power of ICT stems from the generic factors of heightened efficiency, enlarged scale, reduced risks, and informed decision making: singly or in unison, these drivers beget improved outcomes. This table paints a broad-brush picture of ICT-related opportunities: it invites fuller reflection of how ICT can propel sector and thematic interventions.

Source: ADB.

## THE STRATEGIC REQUIREMENTS OF ICT

Technology is never a solution *per se*: informed by needs, ICT must deliver context-appropriate solutions framed by infrastructure—first and foremost, requisite institutional structure and capacity, a reform-oriented mind-set, necessary skills and expertise, appropriate business models, and enabling policy and regulatory environments. Once these prerequisites are at hand or in train, there is great scope for the deployment of e-services and applications across the sectors and themes that development assistance aims to impact.

## Related Links

- ADB. 2016. *Ramping Up ADB's Role in Information and Communication Technology for Development—ICTD Team Work Plan, 2016–2017*. Manila.
- ADB. 2016. *Road to 2030: Information and Communication Technology in ADB's Corporate Strategy and Operations*. Manila. [www.adb.org/projects/documents/helping-transform-asia-and-pacific-support-for-adb-new-corporate-strategy-jul-2016-dpta](http://www.adb.org/projects/documents/helping-transform-asia-and-pacific-support-for-adb-new-corporate-strategy-jul-2016-dpta)



### KNOWLEDGE CONTRIBUTOR

**Olivier Serrat** ([oserrat@adb.org](mailto:oserrat@adb.org)) is a principal knowledge management specialist in ADB's Sustainable Development and Climate Change Department.

The Knowledge Showcases Series highlights good practices and innovative ideas from ADB technical assistance and other operations to promote further discussion and research.

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[pubsmarketing@adb.org](mailto:pubsmarketing@adb.org)

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