Book Review

Thinking About Digital Dividends

Nagy K. Hanna

University of the Witwatersrand, South Africa

The World Bank, *World Development Report 2016: Digital Dividends.* The World Bank: Washington, DC, 2016, 330 pp., ISBN-13: 978-1464806711, ISBN-10: 1464806713. doi:10.1596/978-1-4648-0671-1 or http://www.worldbank.org/en/publication/wdr2016.

The World Bank launched *World Development Report 2016: Digital Dividends* on January 14, 2016 at the Bank and since has widely disseminated it at many global and national forums. The topic was unusual for the Bank's *World Development Report* (WDR2016) since its research department had ignored investigating this topic for decades. Resources dedicated to information and communication technologies (ICTs) have been relatively marginal in the Bank's policy, financial, and technical assistance portfolios. Such scant attention is also common among other multilateral development banks, despite decades of a technological revolution. The Report sums up a great deal of academic research, providing empirical evidence on the conditions under which ICT investments can provide "digital dividends." But it leaves some critical gaps: organizational capabilities to manage digital transformation, policies and institutions to nurture a dynamic ICT ecosystem, and capabilities to plan and implement digital transformation strategies and integrate them with national development strategies.

What Are the Key Messages of WDR2016?

Digital technologies have spread rapidly to much of the world. In many cases they have boosted growth, expanded opportunities, and improved service delivery. But the broader development benefits of using these technologies have lagged behind. The Internet's impact is unevenly distributed, contributing to rising inequality. For digital technology to have broad benefits requires closing the Internet access divide. But greater access to the Internet is insufficient. Countries must work on the analog complements—strengthening regulation to ensure competition, strengthening human capital, and strengthening the accountability and governance of the institutions that deliver services. These remain the usual foundations of economic development policy.

The digital dividends and the long-term impact of digital technologies are by no means definitive, being continuously shaped by the evolution of technology (connectivity) and the country's choice of complements. Digital technologies amplify the impacts and raise the opportunity costs of not undertaking the necessary reforms. The stakes have risen for developing countries, which have *more to gain or lose than high-income countries.* Also, digital technologies can be enablers and perhaps accelerators by *augmenting the quality of the complements,* for example, by easing market entry via online business registration and by upgrading skills via online training.

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The Report examines the many ways the Internet promotes development. *By overcoming information barriers, augmenting capital and labor, and reducing transaction costs* to almost zero, digital technologies can make development more *inclusive, efficient, and innovative*. Digital technologies can lead to more trade, better capital use, and greater competition. They can support job creation, make workers more productive, and increase consumer surplus. They can make governments more capable and productive, improve management by monitoring the performance of workers and services, expand citizen participation and feedback, and support faster and better informed policymaking.

While not conclusive about how to resolve the risks arising from the Internet, the Report points to the risks involved when digital technologies are introduced without the important complements. When the Internet delivers scale economies, but the business environment inhibits competition, the outcome could be excessive concentration of market power and the rise of monopolies, inhibiting future innovation. When the Internet rapidly automates many tasks but workers lack the skills that technology augments (and to which education systems cannot respond quickly enough), the outcome will be greater inequality and higher social costs. In the race between education and technology, adjustments will take time and cause pain for many. When governments remain unaccountable, the outcome of information availability will be greater control rather than greater empowerment and inclusion.

Making the Internet universal, affordable, open, and safe requires both supply- and demand-side policies. First-generation, supply-side Internet policies involving market competition, private participation, and light-touch regulation have led to near-universal access and affordability of mobile technology, but have so far been less successful in spreading Internet services. This limited Internet diffusion is mainly due to continued policy failures such as regulatory capture, troubled privatization, poor spectrum management, excessive taxation of the sector, and monopoly control of international gateways. The next-generation Internet policy issues are focused on online privacy, cybersecurity, censorship, and Internet governance. The Report discusses these issues, but is circumspect about their resolution, absent a global consensus in dealing with them. But the Report does call for global cooperation to solve these global problems, create a global digital market, and share global public goods.

Three policy objectives aim to *strengthen the analog complements:* (1) a business environment where firms can leverage ICT to compete and innovate; (2) workers, entrepreneurs, and public servants who have the right skills to adapt and take advantage of the digital opportunities; and (3) an accountable government that effectively uses the Internet to empower its citizens and deliver services. These elements of the development agenda are becoming more important with the spread of the Internet. For countries where the digital economy is *emerging,* the emphasis should be on removing barriers to digital adoption, building the foundational skills and ICT literacy early on, and leveraging mobile-based monitoring for accountable institutions. For *transitioning* countries, the emphasis would be on competition regulation and enforcement, rethinking curricula and teaching methods, and promoting e-government delivery and citizen engagement. For *transforming* countries, these elements should address the regulatory puzzles of the new economy, facilitate lifelong learning, and deepen digital collaboration and participatory policymaking.

What Are the Report's Strengths and Limitations?

The Report's key strength is to move the debate about ICT's role in development beyond anecdotes and hype and toward economy-wide policies that complement to the digital revolution. To ensure that everyone will reap the dividends of the Internet, focusing on technology access is essential, but far from sufficient. Technology must be complemented by improvements in factors that determine whether firms, individuals, and governments can make effective use of the new digital tools. Yet, the analog foundation takes time to be strengthened and requires overcoming some of the most protracted development challenges concerning competition, education, and governance.

The Report leaves the reader with unanswered questions: Should developing countries wait for the complements to be strengthened before investing in ICT? Put differently and in view of the fast pace of technological change, can developing countries afford to wait for these complements to mature? Is the Report unduly pessimistic by setting the longstanding policy complements as preconditions to pursuing digital transformation?

Another potential strength of the Report is its emphasis on empirical evidence. Yet, this may also be a major weakness, since the Report had to rely on limited evidence, based on measurable, short-term payoffs. Much of the full impact of this technological revolution can be understood and measurable only over the medium and long term. The power of exponential improvement, driven by Moore's Law, and the recent advances of big data, analytics, and artificial intelligence, among others, are just about to be explored, exploited, and scaled. By taking a strictly retrospective approach, the Report misses out on the inflection point we are at: the early stages of a shift as profound as that brought about by the industrial revolution (Brynjolfsson & McAfee, 2014).

There is a major gap between the Report's pessimistic tone and its shared optimism among Silicon Valley visionaries and digital entrepreneurs who expect and bet on a world transformed by ICTs. Are the authors remiss in not projecting a positive vision of the future? Or, are they avoiding the hype of technology suppliers and tech utopians? Put positively: How can development practitioners and policy makers—working with ICT entrepreneurs and innovators—harness ICTs to meet the massive appetite for innovation and reform in their countries?

The Report's third strength is its recognition of the risks facing individuals and countries due to this fast-paced technological change. ICTs offer many opportunities for new ICTs and ICT-enabled jobs, for increased productivity of labor and capital, and about five indirect jobs for each ICT job. But most of ICTs' benefits and risks come from automating the ICT-using sectors. By automating routine tasks, ICTs enable workers to focus on nonroutine, higher value tasks. Yet, automation creates downward pressure on routine tasks that require low- and mid-level skills. Almost two thirds of jobs in developing countries are susceptible to such automation. This creates a race between education and technology, and polarized labor markets, with jobs and rewards shifting toward advanced cognitive, technical, and socioemotional skills. As educational and training systems are slow to reform, there is an urgency to start reform now to make the Internet work for everyone. Complementary reforms are also needed in tax policy, social protection, and labor market institutions to facilitate workers' transition to new-economy jobs and address the distributional consequences of the digital revolution.

Other major limitations to the Report will bedevil its translation into development practice.

First, a digital transformation demands substantial investment in organizational capabilities, process innovation, and institutional learning, far beyond the Report's focus on digital access and macro policy (analog) complements. The analog complements are usually addressed as part of mainstream development practices, while digital access is driven by the private sector, established regulatory agencies, and public–private partnerships. What is missing? It is the substantial investment needed to implement organizational changes, process innovations, and other intangible digital assets (such as digital content, systems integration, data management, and analytics skills) to realize the promised digital dividends. Little attention is given to this technological and institutional learning and capability building in developing countries, where these capabilities are most needed.

Maximizing the digital dividends calls for organizational changes and learning capabilities to master this technological transformation over time. As a general-purpose technology, ICT is fueling a technological revolution, demanding deep changes in the policy, socioeconomic and institutional adjustments, and business and managerial practices, perhaps similar in magnitude to the industrial revolution (Perez, 2002). Policymakers, public administrators, and business managers must learn to navigate a world of digital disruption. At the government or firm level, best practice involves investments in ICT-related process improvements, training, and reorganization, far exceeding investment in computerization, by a ratio of 5 to 1.

Organizational capabilities to lead and manage digital transformation must extend beyond the effective procurement and management of digital assets. Government and firm capabilities should also cover building and managing new ICT-enabled relationships and business models such as open innovation, open data, client feedback, cocreation of services and content with clients, extended partnerships and supply chains, knowledge and client relationship management, agile and data-driven decision making, governing by networks (Goldsmith & Eggers, 2004), and competing by clusters and ecosystems (Hanna, 2016). These capabilities involve deep changes in skills, roles, norms, routines, teamwork, and leadership and managerial practices. They are different, but analogous to firm capabilities that have proved to be essential to industrialize and learn to compete in global economy (Newman, Page, Rand, Shimeles, & Soderbom, 2016). Partnerships among the state, local consulting and business development services, and foreign direct investment can play critical roles

as catalysts to learning and diffusing such practices in the public and private sector (Hanna, 2011; Stiglitz & Greenwold, 2014).

Second, digital technologies, infrastructures, platforms, and core applications are highly interdependent and should be treated holistically and as a dynamic ecosystem (Hanna, 2016). This ecosystem can be conceived to include these components: information and communication infrastructure (connectivity), digital platforms for identification and payments, a local ICT services and digital entrepreneurship sector, technical ICT skills and leadership, content and media industries, digital applications for government and business, digital service provision for all sectors, e-education, enabling cyber policies, and ICT-sector management and regulatory institutions. Maximizing digital dividends requires assessing and nurturing this digital ecosystem and tapping into its synergies at the national, cluster, and sector levels. For example, local ICT services and content industry capabilities are critical to apply and adapt ICTs in various sectors and local contexts, to provide and manage digital content, and to help organizations pursue digital entrepreneurship and innovation. A digital transformation strategy should be broader than an ICT infrastructure or industry strategy. It should take a holistic approach to digital transformation that takes account of all key actors, components, and their interactions.

The Report treats the Internet as if it were the whole ICT sector or ecosystem, thus reinforcing the common neglect of the ecosystem's other elements and the interactions among them. Much of aid agencies' focus has been on providing physical access. Many countries are developing ambitious investment plans that focus on supplying broadband connectivity. Yet, as a new sector, ICTs lack strong institutions and the necessary partnerships to nurture and synchronize the elements of this ecosystem.

Third, the capabilities to plan and implement national digital transformation strategies are increasingly important for engendering a shared vision and mobilizing a long-term commitment to digital transformation; to integrate ICT opportunities and investments into national and sectoral development strategies; invest in broadband infrastructure; reform complementary policies; engage stakeholders; pursue partnerships with civil society and the private sector; secure wide diffusion and inclusion; and enable local initiatives, adaptation, and learning. A digital transformation strategy should be developed in continuous interaction with the national development strategy and as a crosscutting enabler of priority economic sectors.

The Report hardly covers the critical role and challenges of national digital transformation strategies. It acknowledges that when countries make a conscious decision to develop a national broadband plan, they are rewarded with higher uptake rates. The Report also points to the importance of the consultation process in plan development and implementation. The Report prescribes generic policy priorities for emerging, transitioning, and transforming countries. This is an oversimplification of what is needed: building capabilities and institutions at the national and local levels to lead the process of digital transformation.

The challenges of planning and capturing the interdependencies among technology and complements are likely to be complex, demanding substantial interactions across stakeholders and sectors. Given the pace of technological change and the need to adapt ICTs to diverse local contexts, digital transformation management should adopt strategic planning practices such as extensive feedback, local experimentation, and agile learning. Governments are typically poorly organized to deal with this dynamic sector and its demands for collaboration and learning. Without powerful leading and coordinating institutions, digital silos replicate the ministerial silos, and pilots and digital platforms proliferate without sharing. Attention to building local policy and planning capabilities is much needed: to provide strategic direction, to plan and implement digital transformation, and to adapt planning processes to diverse local contexts and stakeholders. Fortunately, lessons of experience are emerging from transforming countries about how they learn to plan and plan to learn. These lessons should be captured, shared, and practiced (Hanna, 2016; Hanna & Knight, 2011, 2012).

A Challenge to Global Development Institutions

Some practitioners recognized early on the need for ICT investments to be aligned with and complemented by macroeconomic policies, sector strategies, and investments in new organizational competencies and learning. For example, a 1993 study of ICTs in World Bank lending demonstrated that ICT lending (including telecom and ICT applications in projects) accounts for 6–10% of annual investment lending and that ICT components

are present in about 70% of World Bank–financed projects (Hanna & Boyson, 1993). Estimates of more recent ICT lending in the Bank's portfolio are 3–5%. This and other follow-up studies confirmed that these ICT investments were not used strategically or aligned with the necessary complements, nor were they systematically integrated into the reforms of the sectors to be transformed. This disconnect has persisted in developing countries where complementary assets and coordination mechanisms are weak or missing.[1] Within development agencies, ICT sector specialists are usually disconnected from interactions with development specialists in education, governance, business, and other providers of complementary assets.

Multilateral development banks (MDBs) and other aid agencies must ask and answer hard questions: Given the dynamism and growing demands of this sector, why has ICT assistance remained a stagnant or declining part of their portfolio? What barriers did client countries face in getting development agencies to respond to their needs for ICT policy, investment, and capacity building? Why did the MDBs shy from using their comparative advantage in development policy lending to shape the crucial policies of this sector? Why did ICT practices remain isolated from the complementary policies and practices of ICT-user sectors? Would the absence of effective ICT use in user sectors risk the quality of MDBs' whole portfolio in areas concerned with competitiveness and public service delivery? Some pioneering and innovative efforts did succeed in overcoming barriers to ICT integration into countries' development strategy. But these were exceptions. Can the MDBs learn from these successes and move to replicate and scale them? In the case of the World Bank in particular, substantial resources were devoted to producing and disseminating a fine WDR2016. Yet, plans are under way to cut staff and budgets of the Bank's assistance to countries for Internet access and digital transformation. Is there a disconnect here?

The ongoing technological revolution poses significant challenges to development agencies: to prioritize development assistance for digital transformation, leverage ICT as a common platform and as an enabler that cuts across all sectoral silos, consider the opportunities and risks of the digital revolution in their development thinking, and update and adapt their skills and practices to use 21st-century tools for development. These challenges call for leadership at the highest levels of aid agencies to carry out the necessary reforms to retool and revamp their capabilities and to respond to client needs for ICT-enabled development assistance. The continuing fast pace of the digital revolution raises the opportunity costs of not undertaking the necessary learning and reforms by development agencies and developing countries. The stakes are high. ■

Nagy K. Hanna, Visiting Professor, University of the Witwatersrand, South Africa and former Senior Advisor, The World Bank. He is also an advisor to governments on digital economy strategies and a member of several think tanks. nagyhan@gmail.com

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1. The author identified these disconnects in a 1993 World Bank publication that reviewed information technology components in World Bank lending (Hanna & Boyson, 1993). Subsequently, the author elaborated on these gaps and how to bridge them in development programs (Hanna, 2009, 2011, 2015). Other scholars have also shed light on this disconnect, including Heeks (2008), Fountain (2001), and Mansell et al. (2007).

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