

Internet Governance and Pakistan's Digital Economy

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Abstract

The digital landscape in Pakistan is regulated through different legislations and public policies involving myriad stakeholders (private corporations, government/non-governmental organisations, think tanks and academia). This paper attempts to identify pivotal areas that need immediate and long-term intervention to stimulate and move Pakistan towards becoming a digital economy. It similarly highlights the impediments which need to be addressed to boost digital development in the country.

Keywords: Digitalisation, Digital Economy, Internet Governance, e-Commerce, Digital Divide.

Introduction

The term 'Internet Governance' includes decisions, policies, legislation, and regulation standards in technical and administrative areas to keep the Internet functional. It involves myriad actors exercising these measures from global institutions such as the United Nations, Internet Governance Forum (IGF), Internet Corporation for Assigned Names and Numbers (ICANN), and the Internet Engineering Task Force (IETF) to domestic actors such as governments,

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private corporations, academia, technical experts, think tanks and civil society organisations.¹

In Pakistan, Internet governance is affected by policies, regulations, and laws enacted at the national level by actors such as Ministry of Information Technology and Telecommunication (MoITT), Pakistan Telecommunication Authority (PTA), and the National Information Technology Board (NITB). The government also engages with different international multilateral forums such as ICANN, IETF, etc., as well as the domestic corporate sector, educational and research institutes, incubation centres, IT parks, academic institutes and civil society organisations.

The debate on Internet governance in Pakistan is predominantly focused on access, content regulation, infrastructure development, net neutrality, freedom of expression, domestic laws and policies about its functions and that of intermediaries. While these areas are important, the current debate has so far not focused on e-governance or digital governance and its links to economic development.

This paper looks at Pakistan's growing digital economy and state policies and how digitalisation can lead to stronger economic growth. It urges investment in human development and addressing bottlenecks related to digital governance, along with implementation of time-based strategies and effective evaluation mechanisms that can help Pakistan make a smoother transition towards a digital economy.

This study finds that while network coverage, access, and bandwidth speed are critical for the latter, fundamental structural changes to public policy and governance also need to be simultaneously undertaken. The findings and conclusions are based on secondary sources of qualitative and quantitative data from government reports, surveys, policy documents, private corporate surveys, interviews, news reports, case studies, and academic papers.

¹ Laura DeNardis "Hidden Levers of Internet Control: An infrastructure-based Theory of Internet Governance," *Journal Information, Communication and Society* 15, no. 5 (2012): 720:738 (721).

History and Evolution of Internet Landscape in Pakistan

The Internet made headway in Pakistan in the early '90s during 1992-93 when a little-known company by the name 'Imran-net' introduced email services in Pakistan. Later in 1993, a project of the United Nations Development Programme (UNDP) entitled 'Sustainable Development Networking Programme' (SDNP) served as a springboard for Internet to take root in the capital Islamabad. This initiative was an extension of a similar project executed by the UNDP in other countries. The project offered dial-up services and email service to users, which included stakeholders, mostly Non-Governmental Organisations (NGOs) working on different project areas such as education and sustainable development. From here, the SDNP network spread to Karachi, Lahore and Peshawar. The primary motivating reason for adoption by a growing consumer base was ease and lower cost of communication via email than through traditional means of fax and international dial-up services. The project phased out when other Internet Service Providers (ISPs) entered the online market. It was in 1995 when Digicom - a private corporation - launched internet service in Karachi and myriad competitors such as Paknet,² Brainet, Cybernet, Breezenet and COMSATS joined the race.³ By 1996, the Pakistan Telecommunication Authority (PTA) was set up by the government as a federal body to regulate policies and functions of telecom and the Internet.⁴

In 2001, the first broadband Digital Subscriber Line (DSL) was launched by Micronet Broadband, followed by the 'first alternate submarine cable linking Karachi to the United Arab Emirates (UAE)' in 2006. In the same year, Nayatel launched the first Fibre-to-the-Home

² Paknet, a subsidiary of the state-owned Pakistan Telecommunication Ltd (PTCL) started offering internet services for 14.4 to 28.8 kilo bytes/second (kbps) in Karachi, Lahore and Islamabad.

³ ISPAP "History of Internet in Pakistan," Internet Service Providers Association of Pakistan, accessed September 15, 2018, http://www.ispak.pk/internet_pakistan.php.

⁴ PTA, "Pakistan Telecommunication (Re-Organization) Act, 1996 with 2006 Amendments (Islamabad: Pakistan Telecommunication Authority), accessed April 15, 2019, https://www.pta.gov.pk/media/telecom_act_170510.pdf.

(FTTH) connections in Islamabad. However, it was the state-owned PTCL which launched broadband DSL service nationwide.⁵

At present, Pakistan has eight undersea cables which, in comparison to other countries, is a very small number. For instance, India has 17, while Singapore has 23, Thailand 10, Taiwan 11, and Japan has 20. Given the constant disruptions to undersea cables, this number needs to be increased in Pakistan. PTA is of the view that offering further Long Distance and International (LDI) licensing will attract investments in the digital infrastructure, such as Optical Fibre Communication (OFC) network, undersea cables, and also improve cross-border connectivity.⁶

In 2017, Pakistan was connected to the new Asia-Africa-Europe One (AAE-1) subsea cable. The AAE-1 consortium will manage the cable with PTCL. This subsea cable's design capacity offers 40 terabytes/second of internet bandwidth.⁷ The second undersea cable Pakistan East Africa Cable Express (PEACE) is being built by Chinese firm Huawei Marine and being funded by Tropic Science, while it will be managed by telecom giant Pacific Century Cyber Works (PCCW) Global from Hong Kong, while in Pakistan the local landing and connectivity partners are Jazz and Cybernet. The subsea cable will have two landing points in Pakistan - one in Gwadar and the other in Karachi. It will offer a bandwidth of 60 tera bytes/second. Similarly, an OFC network was inaugurated in 2018 which connects 'Rawalpindi with Khunjerab on the Pakistan-China border at an altitude of 4,700 metres, the highest fibre cable project in the world. The optic fibre cable will provide direct connection between Pakistan, the Middle Asia and East Asia and minimise the risk of disruption to international traffic.'⁸ This OF network will be managed by the Special Communication Organization

⁵ Amin Yusufzai, "Pakistan has the Least Number of Undersea Cables in the Region: Report," *ProPakistani*, August 2, 2017, <https://propakistani.pk/2017/08/02/pakistan-least-number-undersea-cables-asia-report/>.

⁶ Tahir Amin, "PTA reveals Lowest Number of Connectivity with Undersea, Cables," *Business Recorder*, August 4, 2017, <https://fp.brecorder.com/2017/08/20170804205158/>.

⁷ "Pakistan Gets New Submarine Cable with Design Capacity of 40 TBs per Second," *ProPakistani*, June 29, 2017, <https://propakistani.pk/2017/06/29/pakistan-gets-new-submarine-cable-design-capacity-40-tbs-per-second/>.

⁸ Zafar Bhutta "Optic Fibre Cable Connecting Pakistan, China to be Inaugurated Today," *Express Tribune*, July 13, 2018, <https://tribune.com.pk/story/1756458/2-optic-fibre-cable-connecting-pakistan-china-inaugurated-today/>.

(SCO), a telecom organisation operated by the MoITT, and maintained by the Pakistan Army. The project is worth USD 44 million, with 85 per cent of concessionary loan procured from Exim Bank of China, installed in collaboration by SCO and Huawei.⁹

There is increasing realisation to diversify alternative sources of internet infrastructure available in order to avoid disruptions to service which results in economic losses for businesses. The alternative OFC network seeks to reduce reliance on undersea cables connected with India.¹⁰ These cables include AAE-1, South East Asia-Middle East-Western Europe 3 (SEA-ME-WE 3), South East Asia-Middle East-Western Europe 4 (SEA-ME-WE 4), and South East Asia-Middle East-Western Europe 5 (SEA-ME-WE 5).

In 2014, the government undertook bidding for 3G and 4G Long Term Evolution (LTE) licensing in order to scale up mobile internet access and penetration. Service providers, such as Zong and Warid, were able to secure 4G licenses, while Jazz-Mobilink, Telenor and Ufone secured licenses for 3G. The auction exercise by PTA helped generate nearly USD 1.1 billion.¹¹ Later in July 2017, Jazz-Mobilink secured the license to operationalise its 4G services at USD 324.5 million.¹² This development helped pave the way for mobile companies to increase penetration of mobile internet among current users. This helped expand mobile internet users (subscribed to 3G and 4G) to 59 million users by October 2018.¹³

By 2020, Pakistan is aspiring to become the first South Asian country to operationalise 5G mobile internet.¹⁴ Infrastructure development

⁹ Zafar Bhutta "Pakistan-China Fibre Optic Cable to Start Functioning by Year-End," *Express Tribune*, September 16, 2018, <https://tribune.com.pk/story/1804386/2-pak-china-fibre-optic-cable-start-functioning-year-end/>.

¹⁰ Jahanzaib Haque "Exclusive: The CPEC Plan for Pakistan's Digital Future," *Dawn*, March, 22, 2019, <https://www.dawn.com/news/1361176>.

¹¹ Sohail Iqbal Bhatti "\$1.1 Billion raised from 3G, 4G Auction," *Dawn*, April 23, 2014, <https://www.dawn.com/news/1101760>.

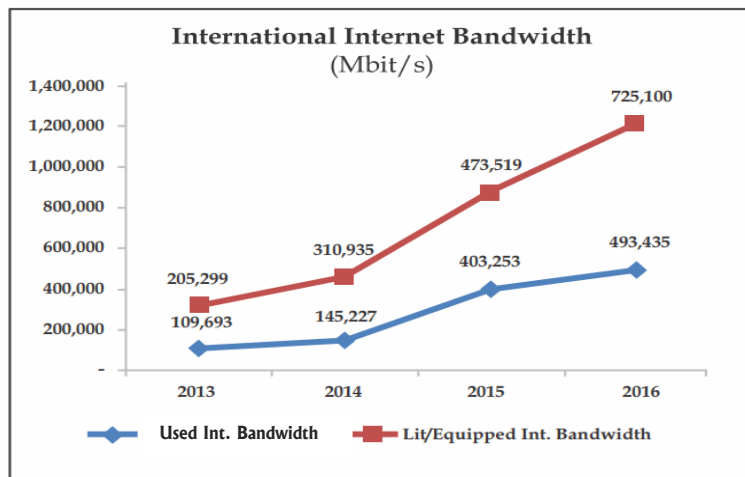
¹² Jamal Shahid "4G License Formally Handed over to Jazz Pakistan," *Dawn*, July 1, 2017, <https://www.dawn.com/news/1342511>.

¹³ PTA, "Telecom Indicators," (Islamabad: Pakistan Telecommunication Authority), accessed September 25, 2018, <https://www.pta.gov.pk/en/telecom-indicators>.

¹⁴ PTA, "Annual Report 2017 - International Internet Bandwidth," (Islamabad: Pakistan Telecommunication Authority, 2017), 20, https://www.pta.gov.pk/assets/media/ann_rep_2017.pdf.

such as lit/equipped international internet bandwidth has led to overall improvements in connectivity in the country (Figure 1):

Figure-1
Comparison between Lit/Equipped Internet Bandwidth with Used International Internet Bandwidth



Source: PTA, “Annual Report 2017 - International Internet Bandwidth,” (Pakistan Telecommunication Authority, 2017), https://www.pta.gov.pk/assets/media/ann_rep_2017.pdf.

However, connecting Pakistan with hi-speed internet along with converting this opportunity towards making the country a competitive digital economy is challenging. The next section will provide a cursory appraisal of Pakistan’s digital policy and areas critical for economic development.

Pakistan's Digital Policy 2017

The government in 2017 announced the 'Digital Pakistan Policy', which was approved in 2018 by the Federal Cabinet.¹⁵ The policy document sets forth multiple ambitious policy objectives, including promotion of sectoral digitalisation; youth and girls empowerment through ICTs; improving international ICT ranking; promoting innovation and entrepreneurship; e-governance; and increasing foreign and domestic investment. The policy document is divided into four parts - the first part discusses the key measures to be undertaken by the government. The second identifies different sectors which require digitalisation, and centrality of technologies such as IoT, financial technologies, artificial intelligence (AI) and robotics. The third and fourth parts deal with fiscal and non-fiscal incentives for the IT sector and policy implementation.

This strategy document could have been comprehensive had it included time-bound and condition-based action plans. Despite the fact that the document alludes to the need for action plans, it fails to account for judicious coordination between government departments for implementation. Moreover, without time-specific plans, stakeholders will be unable to hold policymakers accountable, leaving little room for transparent monitoring and evaluation of the overall policy itself. This makes the entire policy-making process a bureaucratic exercise rather than an actual desire for accomplishment of policy objectives.

That being said, formalisation of a digital policy sits well with the emerging digital economic growth trends in Pakistan. In a joint study, Groupe Spéciale Mobile Association (GSMA) and the World Bank, found that 1 per cent increase in mobile penetration positively increases 'GDP growth by up to 0.28 percentage points'. Domestically, mobile penetration currently stands at 73.24 per cent, whereas mobile internet penetration jumped from 19.2 per cent in 2015¹⁶ to 28.73 per cent in 2018,¹⁷ which

¹⁵ "First Ever Digital Policy of Pakistan approved by Federal Cabinet," *Tech Juice*, May 24, 2018, <https://www.techjuice.pk/first-digital-policy-pakistan-approved-federal-cabinet/>.

¹⁶ PTA, "Annual Report 2017-Digital Landscape of Pakistan," (Islamabad: Pakistan Telecommunication Authority, 2018), 1-7, https://www.pta.gov.pk/assets/media/ann_rep_2017.pdf.

¹⁷ PTA, "Telecom Indicators."

indicates an annual rise of over three per cent in mobile internet subscriptions.

23 per cent of Pakistanis have bank accounts, while the State Bank of Pakistan (SBP) aims to expand the number of account holders to 50 per cent, including 25 per cent female adults with a formal account by 2020.¹⁸ For accomplishing this target, the SBP is working to launch its Asaan Mobile Account (AMA) application. By using this mobile application, account holders will be able to make a transaction of PKR 30,000. The government plans to have 50 per cent subscription in the first two years. This application was supposed to be operationalised by December 2017, however, its launch is now rescheduled for a future date due to delays in licensing, submission and reviews of business proposals.¹⁹ This lackluster display of commitment by the SBP is problematic since the project has significant potential provided it taps the targeted consumer base.

Key Areas for a Digital Economy's Growth: Pakistan's Case

Driving the digital economy under the existing Internet governance structure requires paying attention to some key areas for broader interventions and coordination to drive economic growth. Some of the most important areas for growth include: Pakistan's IT exports and growing e-commerce industry, along with the inclusion of girls and women in the digital economy.

Growth in IT exports from Pakistan will expand the job market, and revenues for both the financial sector and the government. Similarly, a rise in e-commerce will provide businesses the opportunity to increase productivity, and encourage the government to strengthen small, medium and large business enterprises in the country. It will also allow the domestic economy to alleviate existing unemployment, increase the size of the middle class, and affect upward mobility.

Another important area is inclusion of females in the digital ecology. Educating and empowering women will not only affect a change in the economic muscle, but will also bring change at the societal level.

¹⁸ "No Stability without Financial Inclusion," *Dawn*, August 15, 2018.

¹⁹ Shahid Minhas "FBR Completes Working on Asaan Mobile Account (AMA) Scheme," *Customs Today*, October 9, 2018, <http://www.customstoday.com.pk/fbr-completes-working-on-asaan-mobile-account-ama-scheme/>.

Pakistan's female demography represents about half of the country's population, and empowering them through digital technology will improve the country's economic growth.

IT Exports and E-Commerce

Pakistan's IT sector has grown incrementally over the past few years courtesy of its exports. In 2016-17, Pakistan's IT-related exports stood at USD 3.3 billion. In 2018, IT exports touched the USD 5 billion mark, including unaccounted for IT exports. Experts anticipate that exports are likely to grow up to USD 6 billion by 2019.²⁰ This growth in the IT sector is happening in software development, financial services, consumer goods, and IoT. It is reported that enterprise softwares have witnessed a rise of 17 per cent; financial services of 13 per cent, followed by consumer goods at 9 per cent; retail or e-commerce at 8 per cent, IoT and hardware at 7 per cent, with healthcare and media at 4 per cent respectively, and non-profit services and products at 3 per cent.²¹

In order to sustain this growth, the government and private institutions have set up incubation centres with the help of higher education institutes and dedicated IT bodies across major urban cities of Pakistan. So far, there are 18 incubation centres functioning in Karachi, Lahore, Islamabad, and Peshawar. Most of these centres provide space to budding tech-entrepreneurs, programmers and start-ups. The expanding base of incubation centres is a positive sign for influx and growth of tech-based innovation, IT exports, and e-commerce.²²

A study by the SBP also found that e-commerce merchants had risen 2.6 times, and e-commerce 2.3 times in a span of twelve months.²³ Pakistani entrepreneurs and businesses are moving in this direction offering services and products ranging from clothes, electronic appliances, sporting equipment, books, automobiles, transportation services, house

²⁰ Usman Hanif, "Pakistan's IT Sector Advancing Rapidly as Exports Jump to \$5b," *Express Tribune*, February 16, 2018.

²¹ *Ibid.*

²² Hira Saeed, "List of Startup Incubators in Pakistan," *Pakwired*, November 30, 2017, <https://pakwired.com/list-of-startup-incubators-in-pakistan/>.

²³ SBP, "Payment Systems Review, October-December, 2017 (Quarter-2, FY-18)," (Karachi: State Bank of Pakistan, 2017), accessed April 16, 2019, <http://www.sbp.org.pk/PS/PDF/PS-Review-Q2FY18.pdf>.

maintenance services, etc. Since 2016, there has been an exponential surge in the number of e-commerce merchants registered with banks from 344 to 905.²⁴ This vertical shift also witnessed a proportional increase in the amount of transactions from PKR 3.9 billion in the last three months of 2016 to PKR 9.1 billion from Sept.-Dec. 2017.²⁵ Much of these transactions were through credit and debit cards. However, many consumers still prefer the ‘cash on delivery’ option, and nearly 95 per cent of e-commerce transactions are done through cash, due to lower number of credit and debit card holders and mobile wallet accounts.²⁶ Unfortunately, despite these promising figures, data on cash-based transactions is missing and hence, under-represented. Therefore, the actual volume of e-commerce transactions could be larger than presently estimated.

In order to provide an exact estimation of such transactions, the e-Commerce Policy Board working under the Ministry of Commerce (MoC) could work in tandem with the private sector and the SBP to enable inclusion of ‘cash on delivery’ data from e-commerce businesses in order to register and analyse its actual growth. This also underscores the need for MoC to work in closer collaboration with the MoITT. Similarly, the MoITT will need to strategise means to ensure connectivity of people living outside urban areas in order to increase the scale of e-commerce transactions and consumer base for businesses. Bringing ease of connectivity will not only allow businesses to have greater access to consumers, but will also create prospects for new businesses to emerge.²⁷ Bringing this extension into the digital economy will allow it to be sustainable.

Similarly, this will also provide prospects for the private sector to offer consumers ample incentives to use alternative forms of transactions such as debit and credit cards and mobile wallets rather than undertaking cash-based transactions. Offering early on incentives and sustaining them

²⁴ Sarfaraz A. Khan, “Pakistan’s Booming e-Commerce Market is Just Getting Started,” *Dawn*, March 26, 2018.

²⁵ SBP, “Payment Systems Review.”

²⁶ “Pakistan’s e-Commerce Market Size Likely to Hit \$1 Billion by 2020,” *Express Tribune*, December 5, 2017.

²⁷ Christopher Burns and Jonathan Dolan, “Building a Foundation for Digital Inclusion: A Coordinated Local Content Ecosystem,” *Innovations: Technology, Governance, Globalization* 9, no. 3-4 (2014): 33-42 (33-34).

at a varying degree across different intervals will enable businesses to retain and reinforce use of alternative means of transactions. This practice is also validated in empirical lessons from reinforcement-based learning in Psychology, which asserts that the application of incentives across intervals helps in reinforcing and retaining consumption habits. The same will stand true for encouraging and incentivising use of non-cash based means by consumers to carry out financial transactions as noted in different studies.²⁸

Empowering Women & Girls through Digital Inclusion

The sixth population census conducted in 2017 revealed that Pakistan's population increased by 57 per cent compared to the last population census held in 1998. The provisional data results show gender distribution of 106.45 million males, 101.31 million females, and 10,418 transgenders. The increase in growth rate was noted in Khyber Pakhtunkhwa, former Federally Administered Tribal Areas, and Balochistan in the lead, followed by Punjab and Sindh. Whereas, 36.4 per cent of the population lives in urban areas, the remaining 64.6 per cent live in sub-urban and rural areas of the country.²⁹

The UNDP's Sustainable Development Goals (SDGs) identify 'Gender Equality' as the fifth and 'Decent Work and Economic Growth' as the eighth most important goal, respectively. The 'Digital Pakistan Policy' stresses the importance of promoting use of ICT technology among females to bridge the digital divide and to promote their empowerment. It outlines the need to train girls under the 'ICT for girls' initiative in software skills for their capacity building and provide them with an opportunity to earn a decent living. Moreover, it alludes to the need of establishing facilities such as IT labs at school level for girls in collaboration with the private sector. It also indicates promoting international cooperation for participation of women and girls in the

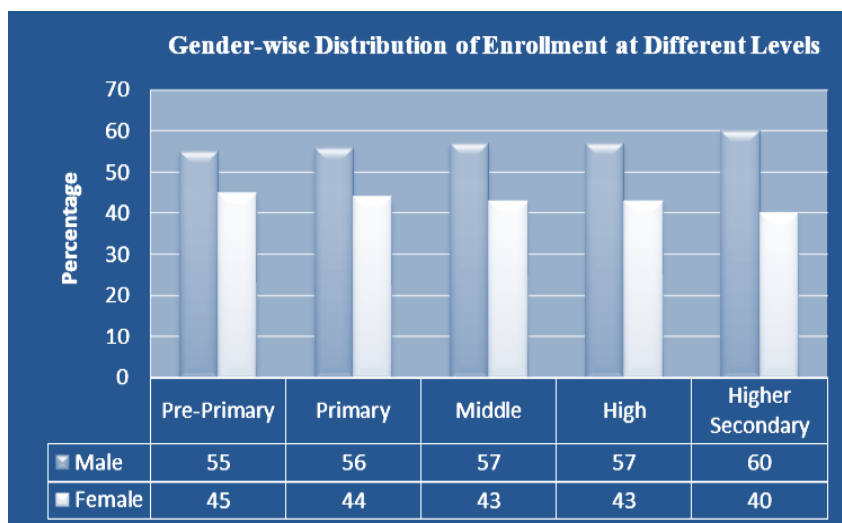
²⁸ Carlos Arango, Kim P. Huynh, and Leonard Sabetti, "How do You Pay? The Role of Incentives at the Point-of-Sale," (Working Paper Series No. 1386, European Central Bank, 2011), <https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1386.pdf?31c5aecf9caf14915c6ad1a950b4a62e>.

²⁹ "Pakistan's Population has Ballooned to 207.8m, Provisional Census Results Show," *Dawn*, August 25, 2017.

digital society, and offering incentives for provision of digital services and applications by lowering barriers to technology adoption.

Despite these provisions, this policy is likely to face challenges, unless a consideration is not made to tackle the challenge of literacy among Pakistan’s female population. This challenge requires radically and drastically scaling up the enrollment of young girls at schools, higher education, and inclusion of more female researchers in disciplines such as engineering and technology (Figure 2):

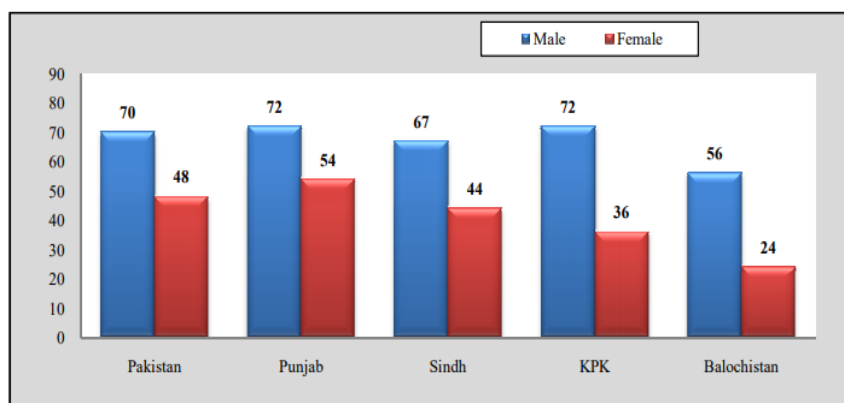
Figure-2
Gender-wise Distribution of Enrollment from
Pre-Primary to Higher Secondary Schooling



Source: NEMIS, AEPM and MoFEPT, “Pakistan Education Statistics 2015-16,” (Islamabad: National Education Management Information System, Academy of Educational Planning and Management, and Ministry of Federal Education & Professional Training, 2017), <http://library.aepam.edu.pk/Books/Pakistan%20Education%20Statistics%202015-16.pdf>.

Female enrollment at school level from pre-primary to higher education remains low in comparison to male enrollment. Figure 2 shows that the proportion of female participation continues to decline after pre-primary level. The pre-primary enrollment for female students stands at 45 per cent in comparison to male students at 55 per cent. There is nearly 5 per cent decrease in the proportion of female students when compared with enrollments at pre-primary and higher secondary levels. At higher secondary level, female enrollments drop to 40 per cent. Similarly, when considering the literacy rate of Pakistan according to the Economic Survey of Pakistan 2016-17, male enrollment remains high compared to females, though literacy rates remain low across the country (Figure 3):

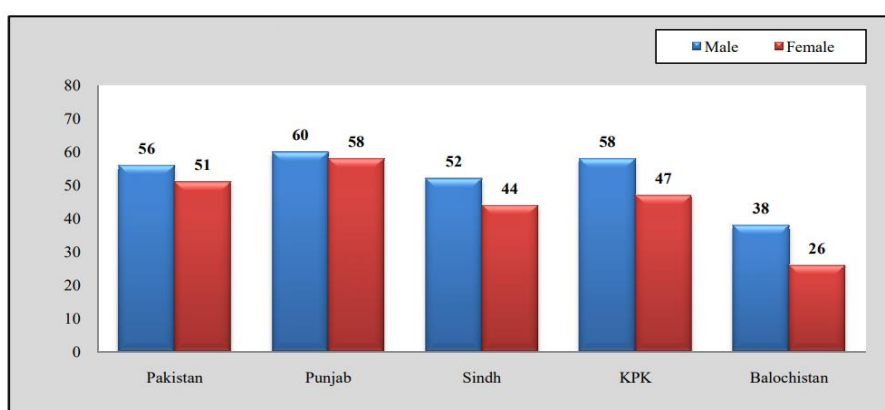
Figure-3
Literacy Rate in Pakistan (2016-17)



Source: MoF, "Education," in *Economic Survey of Pakistan 2016-17*, (Islamabad: Ministry of Finance, 2017), http://www.finance.gov.pk/survey/chapters_17/pakistan_es_2016_17_pdf.pdf.

Also, while net enrollment for males stands lower, it remains even more disproportionately lower for females across the country, especially in provinces such as Balochistan where it stands at an abysmal 26 per cent, as compared to 47 per cent in Khyber Pakhtunkhwa, 44 per cent in Sindh and 58 per cent in Punjab (Figure 4):

Figure-4
Net Enrollment Rates across Pakistan (2016-17)

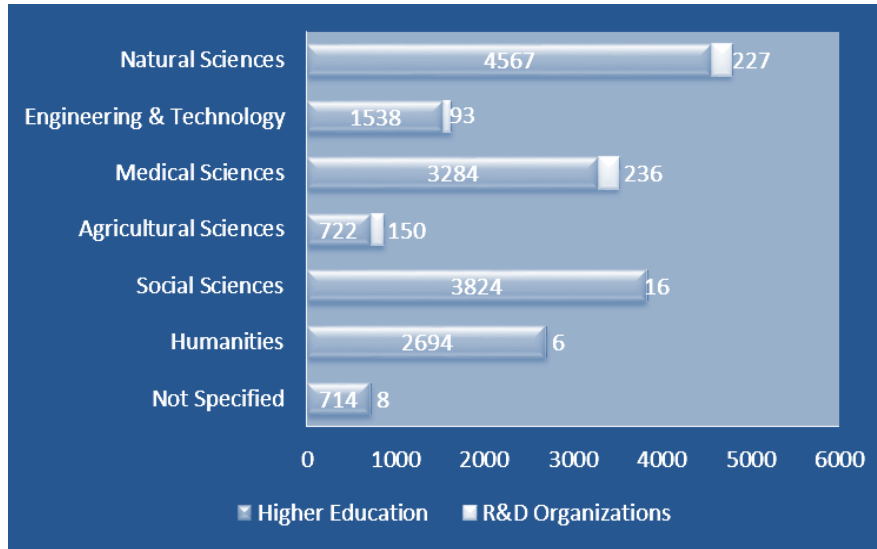


Source: MoF, "Education."

These figures indicate that the government is unable to successfully enroll students in their requisite age groups in the pre-primary and primary education system.

Similarly, considering the present trends of representation, there is an insignificant participation of female researchers in Research and Development. Findings shared by the Pakistan Council for Science and Technology (PCST), show that against 1538 researchers working with higher education institutes, there are only 93 researchers working with an R&D organisations in engineering and technology. Such patterns are also consistently found in Social Sciences, Humanities and Natural Sciences (Figure 5):

Figure-5
Number of Female Researchers (headcount) by
Field of Science and Sector of Employment (2013)



Source: PCST, “PCST Survey 2013-14,” (Islamabad: Pakistan Council for Science and Technology), accessed April 23, 2018, http://www.pcst.org.pk/wst/wst_ghedu.php.

UNESCO’s report titled ‘Science Report towards 2030’ observed Sri Lanka with highest representation of women at 41 per cent in Science, followed by Pakistan at second with 36 per cent, India with 15 per cent, and Nepal with 8 per cent. This finding, on the one hand, inspires optimism, the larger picture, on the other hand, is a reminder that much more needs to be done by the government, in order to increase enrollment of children at schools.³⁰

The government both at the federal and provincial level needs to undertake an intensive social awareness drive for participation of females. A strategy needs to be developed which consists of public outreach, public

³⁰ PCST, “Women in Science,” report (Islamabad: Pakistan Council for Science and Technology), accessed April 23, 2018, http://www.pst.org.pk/wst/wst_wsci.php.

awareness, and incentives for female participation and performance. For such a strategy to be effective, an attitude-behaviour model needs to be introduced under 'ICT for Girls' to identify, intervene, and modify attitudes and consequent behaviours of families towards girls' education, and their contribution to the national economy. This strategy can be harnessed under a more immaculate vision, which relies on a national public campaign to increase enrollment for Pakistan's economic development.

To mitigate this challenge, the government can seek services of NGOs that could play an instrumental role in persuading families to make enrollment rates sustainable and prevent drop-outs at different levels of education. Conditioning national development with individual participation and consequent individual development will help the government in motivating participation of the public.

Similarly, interventions to encourage families to educate their girls in science, technology, engineering and mathematics (STEM) programmes will bring about more female participation.

Along with this, addressing social constraints and stereotypes must be an immediate priority of the government. It will need to ensure application of zero tolerance on workplace harassment of women. This will help allay concerns of families that are conditioned to see careers under fields of engineering and technology specific to men only. An inclusive approach, in addition, to encouraging women to pursue STEM majors, is likely to serve as lynchpin for government's policy success. However, gender balance should be struck at the yardstick of merit alone to ensure quality with increase in female researchers and entrepreneurs.

Bottlenecks in Digital Inclusion and Governance

Bridging the digital divide is not only crucial for driving growth, but also to connect consumers to businesses and vice versa. It also requires various initiatives on part of the government and private corporations at different levels. Similarly, the question of digital literacy is intrinsically linked to overall textual literacy. While textual literacy usually requires efforts by

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government and the education system, it also requires taking a novel and contextual approach to literacy by corporations to increase the number of consumers.

Moreover, e-governance is also conditional on the presence of necessary infrastructure and systems for effective governance and development of digital ecology. Requisite public services will have a correlational effect on public revenues and make it easy for private corporations to offer the same. It will also complement a healthy relationship between the government and private corporations.

Digital Divide & Literacy

At present, mobile penetration stands at about 153 million connections (73 per cent), however, only 29 per cent of mobile users are subscribed to mobile internet. According to PTA, there are nearly 59 million subscribers of 3G/4G services in Pakistan. This penetration shows that only 28.79 per cent of the population has access to mobile data services which means only a third of cellular users have access to the Internet via cell phones. Similarly, broadband subscription stands at 29.77 per cent.³¹ Broadband services often involve multiple users in households. However, there is little data available on the number of connections based on households and businesses.

The term 'digital divide' refers to the inability of an individual or communities to have access to the Internet, and communication technologies in comparison to those that do, thereby, creating a condition of 'haves' and 'have nots'. Lack of access in today's information-driven age entails an opportunity cost for the economy,³² and leads to inequality in social and economic development across the population.

The afore-mentioned figures in Pakistan's case, call for more aggressive and renewed measures by the government to include private corporations in provision of ICT services in order to increase internet

³¹ PTA, "Telecom Indicators."

³² OECD, "Bridging the Digital Divide," Organization for Economic Cooperation and Development, accessed June 25, 2018, <https://www.oecd.org/site/schoolingfortomorrowknowledgebase/themes/ict/bridgingthedigitaldivide.htm>.

penetration across the country. With 70 per cent of the population without access to quality and high-speed internet services, efforts for sustainable and equitable economic growth are likely to be impacted. The existing digital divide also hampers the government from generating additional revenue. Lopsided accessibility also indicates that a large segment of the population will miss opportunities for better access to knowledge and education available in the virtual domain.

A 2018 study noted that annual digital growth in Pakistan increased by 27 per cent, indicating an additional ten million internet users compared to January 2017. Moreover, active social media users' postings increased by 13 per cent at over 4 million, with nearly the same figures for mobile social media users, perhaps because mobile internet speed is twice as much as broadband internet connections.³³ The same study notes that the country lacks a nationwide OFN as a result of which large segments of the public are unable to have access to high speed internet. This unequal access will also affect the government in effectively implementing its e-governance plans.

Bridging the digital divide is not only about access and penetration. It will also require overcoming problems associated with textual, technical and conceptual literacy. Textual literacy is the ability of individuals interacting with a digital device to understand, comprehend, engage and create textual content, whereas, technical literacy is an individual's ability to understand and operate different technical applications. On the technical front, introduction of touch technologies along with voice-based responses has made interface easier. Use of visual cues from the physical world, like handset icons, make it easy for people to understand where they can locate a dialer for the call.³⁴

Technical access to smart phones will be crucial for digital migration to mobile internet connections. However, the government's decision to impose taxes on imported smart phones – in order to bridge the country's trade deficit – can increase the average price of smart phones,

³³ "Digital in 2018 in Southern Asia," *We are Social and Hootsuite*, accessed October 21, 2018, <https://www.slideshare.net/wearesocial/digital-in-2018-in-southern-asia-86866282>.

³⁴ Ravi Chhatpar and Robert Fabricant, "Internet Design for Emerging Markets," *Innovations: Technology, Governance, Globalization* 9, no. 3-4, (2014): 113-121 (114).

and as a result, have a relative effect on the projected average price of smart phones.³⁵

Issues such as high cost of data, costly internet-enabled devices, illiteracy, lack of security and privacy, relevant content,³⁶ and recurring power outages³⁷ are some of the reasons why smart phone and mobile internet penetration is struggling to make headway in Pakistan. Along with addressing textual and technical literacy, companies need to improve content for users by understanding cultural context of the domestic market.³⁸

Conceptual literacy requires understanding general cultural preferences of consumers in order to design, place and promote products in a manner which is market-relevant, and simultaneously, stimulates internet usage. To this end, conceptual literacy in developing digital economies is gaining currency.

A World Bank study 'Consultative Group to Assist the Poor' found that only 10 per cent of mobile services were able to increase the number of registered users beyond 200,000.³⁹ The lack of adoption was attributed to lack of understanding about conceptual literacy and contextual cultural understanding by businesses. Case studies of five countries Uganda, Kenya, South Africa, and Indonesia found that businesses were not targeting cultural preferences. For example, in South Africa savings are undertaken for funerals more than any other thing, including medical emergencies, or higher education. In Rwanda, people were willing to contribute their savings to projects of community welfare. In Kenya and Uganda, rural savings were associated with purchasing seeds and fertilizers in comparison to children's school

³⁵ "Regulatory Duty to be Introduced for Unregistered Mobile Smart Phones," *Dawn*, October 30, 2018.

³⁶ Jan Stryjak and Henry James, "Country Overview: Pakistan: A Digital Future," report (London, UK: Global System for Mobile Communications, 2016), 13, https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2016/12/Country-Overview_Pakistan_Digital-Future.pdf.

³⁷ Chhatpar and Fabricant, "Internet Design for Emerging Markets," 114.

³⁸ If there is enough content on the Internet in Urdu or other regional languages such as Punjabi, Sindhi, Pashtu, Balochi, Sheena and Balti, it will be convenient for users to interact or find value-added information.

³⁹ Chhatpar and Fabricant, "Internet Design for Emerging Markets," 116.

education. In Indonesia, due to its exponential economic growth, savings were closely related with the aspiration of buying a house or funding college education. In response to this study, businesses adopted and designed their products accordingly: e.g., businesses in South Africa combined savings with burial and funeral insurance. In Rwanda, savings were redesigned to cater to community goals, and in other countries, saving accounts incentivised school fees and specific long-term plans, such as education or medical treatment.⁴⁰

Another factor that is stressed in bridging digital literacy-related issues is to focus on digital fluency. A study by UNICEF's RapidPro, which provides a mobile reporting platform for community health workers (CHWs) to monitor and track health progress of pregnant mothers, found that most CHWs in Zambia were working voluntarily. Despite being unpaid, the programme's success was conditioned on providing CHWs with a sense of empowerment and pride which motivated them to do more to assist their communities.⁴¹

These examples underscore that studying peoples' behaviour can enable digital fluency. In Pakistan's case, addressing literacy in the long run, and in the short-run designing products, services and digital platforms that cater for conceptual and cultural context is likely to improve internet usage. Products should not only address questions like what is used, and how it is to be used (behaviour associated to usage), but also 'when and where it is used' (the context of usage), along with the purpose (why a digital solution is being used in the first place).

Moreover, incentivising, manufacturing and assembling of digital technologies such as smart phones and other digital devices in Pakistan can help reduce the import of finished digital products, and lead to development, production and sales of relatively less costly local smart phones.

⁴⁰ CGAP, "What Human Centered Design Means for Financial Inclusion," Consultative Group to Assist the Poor, 2014, <http://www.cgap.org/research/publication/what-human-centered-design-means-financial-inclusion>.

⁴¹ "Early Infant Diagnosis of HIV Infection in Zambia through Mobile Phone Texting of Blood Test Results," Bulletin of the World Health Organization, March 15, 2012, <http://www.who.int/bulletin/volumes/90/5/11-100032/en/>.

E-Governance Issues

E-governance consists of operations which involve provision of services and information to the public by the government through Information Communication Technologies (ICTs) and the Internet.⁴² The objective is to facilitate interaction, ensure efficient dispensation of services, and reduce bureaucratic hurdles between citizens and the government. An additional benefit is that ICT interface allows round-the-clock interaction between the public and public institutions.⁴³

There are three distinct categories of e-governance: Government-to-Government (G2G); Government-to-Business (G2B); and Government-to-Citizen services (G2C). It is not solely confined to interaction between government institutions and citizens, rather, it requires close interlinkages between different public institutions and businesses for provision of services, troubleshooting, mitigation,⁴⁴ procurement, development and upgradation of information systems, devices, technologies and infrastructure. Under such a mechanism, the government is mandated to ensure sustainability, maintainability, and security of systems for convenient and 24/7 availability.

In 2002, the Electronic Government Directorate (EGD) was established and under the Electronic Transactions Ordinance, 2002, the federal government moved to regularise a few public services.⁴⁵ It acknowledged provision of online services for 'tax returns, cheques, banking instructions, payments, employment applications, court documents, custom documents, fee payments, academic transcripts and

⁴² Jeffrey W. Seifert, "A Primer on E-Government: Sectors, Stages, Opportunities, and Challenges of Online Governance," report (Washington, D.C., USA: Congressional Research Service, 2003), <https://fas.org/sgp/crs/RL31057.pdf>.

⁴³ Muhammad Ilyas, "E-Governance Practices and Models; Options for Pakistan," *ISSRA Papers* 8, no. 1 (2016): 43-64 (2).

⁴⁴ V.M. Rao, *E-governance* (Jaipur: ABD Publishers, 2007), 146.

⁴⁵ Aamna Rafiq, "E-governance in Pakistan: A Reality Check," (Issue Brief, Institute of Strategic Studies Islamabad, 2018), http://issi.org.pk/wp-content/uploads/2018/02/IB_Aamna_February_27_2018.pdf.

complaints legally.⁴⁶ In 2014, the EGD was merged with the Pakistan Computer Bureau to form the NITB.⁴⁷ The Electronic Transactions Ordinance, 2002 was replaced by the Prevention of Electronic Crimes Act, 2016. This law deals with crimes taking place in the cyber domain. Unfortunately, this law lacks the requisite nomenclature for undertaking or regulating various financial technological solutions and financial services operating in the digital domain.

There are several e-governance initiatives spearheaded by the provincial governments of Khyber Pakhtunkhwa and Punjab. The Khyber Pakhtunkhwa Information and Technology Board offers e-governance services for e-complaint systems and e-Right to Information (e-RTI). It is also in the process of launching e-recruitment services for candidates to apply for public positions. Similarly, there are also provisions for online registration of First Information Reports (FIRs) and e-filing of complaints against police officials.⁴⁸ The provincial traffic police also offer services for online license authentication, complaint registration, challan verification, and mobile driving license units.⁴⁹ Moreover, among its services, the KPK Government has augmented publication and interaction aspects in its e-governance systems. There is a list of other initiatives which are still in the pipeline. However, other than publicising, and interacting, the provincial government is unable to incorporate a ‘transaction and participation’ element in its e-governance systems because of the absence of online payment solutions which could increase output.

The Punjab Information Technology Board (PITB) has also introduced similar initiatives in Punjab with the addition of *e-Khidmat Markaz* (help centre) established across nine districts. They offer one-window services such as provision of birth, character, death, divorce,

⁴⁶ Khalil-ur-Rehman Khan, “Cyber Laws in Pakistan,” International Judicial Conference, Supreme Court of Pakistan, accessed February 19, 2018, <http://www.supremecourt.gov.pk/ijc/articles/10/1.pdf>.

⁴⁷ “National IT Board Constituted,” *Dawn*, July 19, 2014.

⁴⁸ “Complaint against Police”, Khyber Pakhtunkhwa Police, accessed April 23, 2018, <http://kppolice.gov.pk/online/cap.php>.

⁴⁹ City Traffic Police, “Services- Peshawar Traffic Wardens,” *City Traffic Police*, accessed April 23, 2018, <http://ptpkp.gov.pk/#>.

domicile, marriage certificates; issuance of national identity cards, route-permits, vehicle registration and transfer of ownership.⁵⁰ There are also similar proposals under consideration to introduce e-governance services by the Capital Development Authority (CDA) in Islamabad under public-private collaboration. These services are, however, yet to be developed, introduced and operationalised by the government.⁵¹

Despite developments in the last few years, Pakistan's ranking on the UN's e-governance survey list has been falling each year. In 2010, Pakistan ranked was ranked 131/193 on the E-Government Development Index, whereas it ranked 98/193 on the E-Government Participation Index. In 2016, Pakistan's ranking dropped to 159/193, and 114/193 in these indices, respectively. Whereas, in 2018 Pakistan's E-Government Development Index slightly improved to 148/ 193, ranking on the Participation Index fell to 115/193.⁵² Such reversal of gains can be attributed to several reasons, including poor results in net enrollment of children at school, weak literacy rates, the government's inability to stimulate subscription to broadband services, including failure to increase 3G-4G subscriptions which are pivotal in augmenting e-governance services. Most importantly, there is lack of interest in harnessing internet-based services for e-governance. This also demonstrates limited drive to work closely with the private sector to ensure provision e-governance services to make the interaction between the government and the public relatively convenient.

Recommendations

As discussed earlier, the government needs to work on designing e-governance services that are not solely focused on the textual and technical elements of literacy, rather are developed with interactive

⁵⁰ E-Khidmat Markaz, "About Us," *E-Khidmat Markaz*, Government of Punjab, accessed April 23, 2018, <https://fc.punjab.gov.pk/about-us/>.

⁵¹ Sadaf Khan (Director Programs, Media Matters for Democracy Pakistan) in discussion with the author.

⁵² UN E-Government Knowledgebase, "Pakistan," *UN E-Government Knowledgebase*, accessed October 23, 2018, <https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/128-Pakistan/dataYear/2018>.

programme interfaces which enable greater service usage by citizens in order to remove barriers to efficient governance.

The government can also financially incentivise use of e-based platforms by offering faster service in return to those who demonstrate the inclination to use them, rather than those who rely on availing the traditional means of public services. While this move is likely to ensure digital migration of the public to adoption of technology for acquisition of public services, it will require public officers to also embrace technology and e-governance platforms.

The decision to embrace digital platforms holds the potential to structurally reform public sector organisations by removal of inefficient procedures which often cause delays in timely access to public services. This will also enable government institutions to maintain updated records and transparently audit performance of public institutions.

Incorporating online payment systems in e-governance based platforms can reduce transaction time and public inconvenience of making payments through cash-on-cash counters at public offices and in banks. It will also increase the number of citizens public sector departments can service at any given time.

Policy Evaluation Mechanism

The ‘Pakistan Digital Policy’ sets out ambitious goals to promote growth of ICTs, entrepreneurship, innovation, research & development, investment, ICT for girls, infrastructure development, software exports, cloud computing, big data, and local manufacturing of hardware, etc. Many of these ambitious initiatives are still in the pipeline, while some are experiencing progress. The government needs to design specified policy evaluation mechanisms for appraisal of ongoing initiatives to ensure transparent, fair, accountable and just functioning of the projects. Apart from appraising policies, it is vital to scrutinise project designs and programmes for their revision, adaptation and where necessary termination and replacement with viable and relevant interventions.

Standardisation in E-Governance

The telecom sector also needs investment in infrastructure, particularly, completion of fibre optic cables across the entire country. Most importantly, the government needs to encourage capacity building of the digital immigrant work force⁵³ for transition towards adoption of ICT by public servants. Efforts to increase government-to-business engagement for procurement of more online-based services require little physical interaction with administrative systems.

Similarly, the government needs to conceptualise, design, develop, and launch products and services for interoperability and standardisation of e-governance services across the provinces. To this end, at the institutional level, the NITB and under it the EGD, can be of crucial benefit. The government needs to make the EGD functional for interoperability of various e-governance platforms; and enact laws to provide new powers to NITB.

Following the 18th Constitutional Amendment, the government needs to enact laws under the Federal Legislative List Part II for empowering the MoITT, and Ministry of Inter Provincial Coordination Division for administration of regulations, interoperability, and penalising powers for failure to standardise e-governance services. In order to improve Pakistan's deteriorating UN global rankings in e-governance, the federal government can subject performance in terms of standardisation of e-governance services as prerequisite conditions for the National Finance Commission (NFC) award.

Public-to-Private (P2P) & Public-to-International (P2I) Cooperation

In Pakistan, the public sector, particularly the MoITT, along with NITB, and provincial technology boards can further their collaboration with the private sector, such as corporations, and higher education institutes for promotion of entrepreneurship, inclusion of start-ups at incubation centres, development and promotion of technology parks, particularly in major cities.

⁵³ Digital immigrants are people born before large-scale adoption of digital technology.

Similarly, public sector departments need to collaborate with financial institutions for provision of digital monetary services, their diversification, development, procurement, integration and protection.

A more inclusive approach is also needed towards the academia, think tanks, and educational institutions to initiate debate on the technical, and policy aspects, along with a discourse on research, development and investment. Unless a well-aware, adequately resourced academia and scholastic culture is not harnessed, development of research-driven internet governance ecology will remain an unrealised dream.

Furthermore, public-to-private collaboration must also have an international tier, under which the private corporations need to be encouraged for engaging global corporates for investment in Pakistan's growing digital economy.

The MoITT and Ministry of Foreign Affairs (MoFA) need to have close collaboration with global institutions such as the IETF and ICANN for policy input on internet content, application, and coding regulations; law enforcement agencies, including institutes for cooperative security; the World Intellectual Property Organization (WIPO) to find means for evolving domestic regime for conformity with global standards on intellectual property protection; and groups such as Commission on Science and Technology Development. Lastly, the government needs to enhance collaboration with the International Organization for Standardization (ISO) for policy input at the international level.

Conclusion

Moving Pakistan towards a digital economy, under its existing internet governance architecture, requires significant holistic and action-oriented changes to enable and harness the actual potential of the local ITC industry and market.

To ensure implementation of policy objectives, not only is timely introduction of action plans central, but also effective monitoring and evaluation. Overcoming the abysmal literacy rates, particularly of the female population, women enrollment in science and technology-related

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fields, issues of digital exclusion and access are some of the areas meriting attention.

Public-private partnership can be undertaken for promoting financial inclusion, access and use of financial technologies for e-commerce and e-payments for public services. Significant action is also needed to develop standardised federal and provincial e-governance platforms and services. This will enable ease of using services across the provinces, overcome bureaucratic friction and generate public revenues making governance in return more efficient and improve Pakistan's international internet governance rankings.

Lastly, the country needs to further diversify its internet infrastructure by expanding the number of undersea cables, and cross-border connectivity networks in order to prevent internet failures and breakdown. ■