7 Digitization of Services in Pakistan:

Will the Emerging Trends Pave the Way for a Technology Revolution?[1]

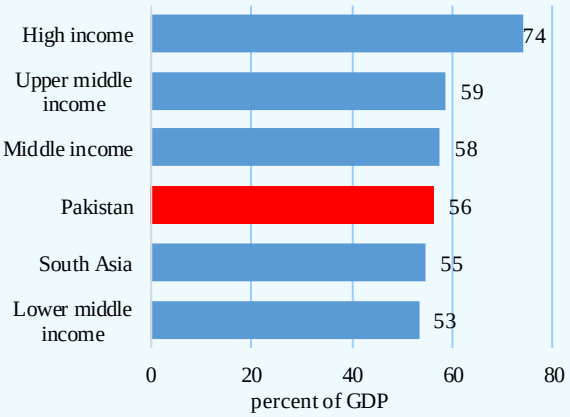
7.1 Introduction

The services sector can play a vital role in the development of an economy. Apart from its direct contribution to GDP, numerous services are inputs for other economic activities, and thus have potential indirect benefits; for instance, finance, telecommunications, and transport all tend to facilitate the commodity-producing sectors. Similarly, well-developed health and education services contribute to enhanced labor productivity and govern the overall social development of an economy.

Globally, the services sector has been witnessing a shift towards digitization. Growing internet penetration is revolutionizing the way consumers and businesses gain and share information, execute transactions, and manage their day-to-day operations. Improved digital connectivity is reshaping consumer behavior, which is increasingly tilted in favor of convenience, cost savings, and customized retail experiences. Businesses are also capitalizing on opportunities emerging from digitization, such as supply chain efficiency, lower transaction costs, and enhanced flexibility in addressing consumer needs. A spillover impact of such services has also been observed on the productivity of the commodity-producing sectors, through processes such as automation and data handling.

In Pakistan's case as well, the services sector has gathered much prominence of late, as domestic commerce has thrived and telecommunications and finance sectors have grown steadily.[2] The overall share of the sector in the country's real GDP reached 60 percent at end FY18, and around 56 percent in nominal GDP; the latter is higher than the South Asian average (**Figure 7.1**). While export orientation of the sector remains lower compared to commodity producing sectors, its contribution to employment – and better employment opportunities – is significant.[3, 4]

Figure 7.1: Share of Services by Type of Economy (2017)



Data source: World Bank

Moreover, Pakistan is also among the economies where digitization is triggering changes in some components of the services sector. The shift is most prominent in domains like e-commerce, fintech, and e-government, where new ventures and approaches to deliver services are picking up. Specifically, the market size of e-commerce has grown significantly in Pakistan over the last few years, transforming the way consumers interact with – and especially pay – businesses. At the same time, fintech players are tackling broad imperfections

[1] This chapter draws heavily from our discussions with Pakistan Software Export Board; Pakistan Software Houses Association; Ignite (formerly National ICT R&D Fund); Planning Commission; National Incubation Centre, Islamabad; The Nest (I/O); Invest2Innovate; Daraz.pk; Karandaaz; and ePlanet. In addition, surveys conducted by Social Innovation Lab and Invest2Innovate were also useful in developing insights about the sector. Finally, we are also thankful to Payment Systems Department of SBP for providing regulatory insights about the sector.

[2] Over the last five years, the services sector has contributed 70 percent on average to the country's GDP growth.

[3] Employment in services accounted for approximately 34 percent of total employment in Pakistan as of 2017, according to an estimate cited by the World Bank.

[4] The average monthly income in the services sector is 129.1 percent higher than the overall national average. For males, the income is 54.6 percent higher, while for the women it is around nine times the national average. Data source: Household Integrated Economic Survey of Pakistan 2015-16.

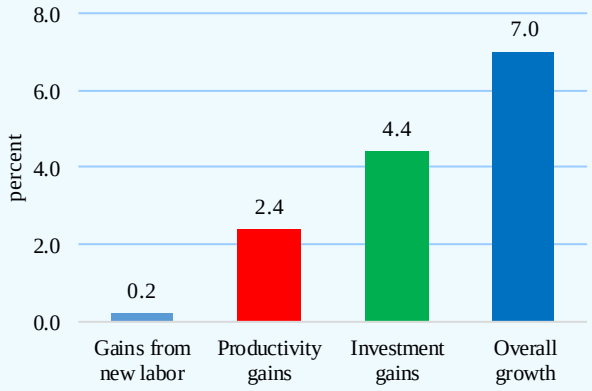
in the credit market by devising innovative solutions, which are increasingly being embraced by the mainstream financial sector. Finally, at the government level, new possibilities to deliver services to citizens more efficiently are being explored by harnessing the power of technology, with e-government initiatives promising more convenience for the masses while simultaneously cutting the costs and leakages incurred by implementing authorities.

This chapter expands on the aforementioned developments. To set the context, it begins by identifying the broad channels through which the digitization of services is impacting the macroeconomy. For background, it also touches upon the key enablers of digitization in Pakistan, such as the role played by New Generation (3G/4G) Mobile Services. Subsequently, the emerging trends in e-commerce, fintech and e-government in the country are analyzed at length. In terms of the big picture, the future model of global economic growth is discussed in light of the fourth industrial revolution, and what Pakistan will have to do to keep up with the curve. Finally, the chapter concludes by recapping some relevant policy measures, as well as the future outlook for digitization.

7.2 Impact on Pakistan's Macroeconomy

The ongoing digitization in provision of services may be growth-enhancing from a macroeconomic perspective.[5] This notion is supported by some gains that have already been made, as well as estimates of future potential. According to a McKinsey Global Institute (MGI) report, Pakistan can experience an increase in its GDP by a cumulative 7 percentage points (roughly US$ 36 billion) and create around 4 million new jobs during 2016-2025 via an increase in the use of digital financial services (DFS) alone (**Figure 7.2**).[6]

Figure 7.2: Expected Gains in GDP Growth of Pakistan due to Digital Financial Servcies (2016-2025)



Data source: McKinsey Global Institute (2016)

Firstly, the impact of DFS through increased *investment* may occur via (a) increased credit to SMEs and households, and (b) a shift in savings from informal vehicles to formal digital accounts. Bearing in mind that bank lending to SMEs in the country is particularly low at present, the investment channel may represent the biggest untapped opportunity from which DFS gains can be realized in the next couple of years.[7] At the moment, the *penetration and access to financial services* is showing some improvement, as digital technologies are being deployed for opening mobile accounts; carrying out funds transfers; introducing electronic payment systems; etc. In future, this may accelerate the shift in savings to digital accounts, and have further implications for policy goals like financial inclusion.

Secondly, even beyond the domain of DFS, the IT and data handling firms are already generating *productivity* gains across numerous sectors, by streamlining business processes and making them more efficient. The use of technology in the fields of commerce, finance, transport and communications is facilitating *cost effectiveness*, by providing convenient alternatives to consumers and producers. Similarly, in the retail business, growing broadband penetration is providing businesses new and cheaper ways of reaching out to customers and competing for market share.

[5] Like most other economies across the world, national accounts of Pakistan partly cover the value addition of computer-related activities (CRA) in the services sector. However, the activities of the 'digital economy' as a whole (the process by which digitization enhances the value addition of all sectors of the economy) is not adequately covered.
[6] Source: McKinsey Global Institute, 2016, 'Digital Finance for All: Powering Inclusive Growth in Emerging Economies' [mckinsey.com]
[7] The savings rate for Pakistan was 11.4 percent for FY18. Meanwhile, the SME share in private sector credit was 8 percent, as of end-2017.

Thirdly, the impact on *employment generation and entrepreneurship* is quite evident. As the overall digital connectivity has improved, new services and industries have emerged and along with it, self-employment opportunities and entrepreneurial space for startups (**Box 7.1**).[8] Commerce, transport and information sectors have benefited the most. The surge of mobile money has created a network of agents providing direct and indirect livelihood to thousands of people. Finally, in the domestic ICT sector, the presence of domestic freelancers and outsourcing firms is also growing.

Box 7.1: The Evolving Domestic Startup Ecosystem

Domestic startup activity in Pakistan is on the rise, attributed in part to a maturing support system. At present, around 52 'self-proclaimed' incubation and acceleration programs exist in the country[9], from which 7-15 startups are graduating every year (**Table 7.1.1**).[10] Thus, a conservative estimate would put the number of startups that came out in 2017 alone at around 500. In addition to incubators and accelerators, the startup ecosystem has been strengthened further by co-working spaces; [11] fellowship programs; growing scale of angel investment;[12] and the launch of local chapters of global initiatives like Startup Weekend, Startup Grind, Lean Startup Machine, and Startup Cup. Furthermore, Google Developer Group and Google Business Group meetings are now being held regularly in the country, and the launch of local chapters of the Organization of Pakistani Entrepreneurs (OPEN) and The Indus Entrepreneurs (TiE) has also added vibrancy to domestic startup activity.

Table 7.1.1: Noteworthy Accelerators and Incubators in Pakistan*

	Nature	Major Supporter	Portfolio firm(s)**
Plan X	Accelerator	Punjab IT Board (PITB)	Mangobaaz; BeautyHooked
Invest2Innovate	Accelerator	Dotzero; Pasha Fund for Social Innovation	Popinjay; DoctHers
10Xc	Accelerator	PlanetN	Labcloud; Fix My Phone
The Nest I/O	Incubator	Google for Entrepreneurs, Samsung	Mandi Express; ConnectHear
NIC Lahore (formerly LCE)	Incubator	LUMS; Ignite; MOITT	InteraCta; AutoGenie.pk
Plan 9	Incubator	PITB	Patari; Bookme
Social Innovation Lab	Incubator	LUMS	FindMyAdventure; Tahafuz
Nspire	Incubator	Netsol	shopdesk; esurge
DotZero Ventures	Incubator	Foundation for Information Technology	dealtoday.pk; PerkUp
Founder Institute	Incubator		Approkers; Verifapp
Arpatech Hatchery	Incubator		EatOye; Sheops

* In some instances, the entities serve as both incubators and accelerators

** Only one or two associated startups are mentioned. At times, a startup may be associated with multiple incubators/accelerators

As majority of startups fail within the first 3 to 5 years of launch, risk is considerably high and investors can lose all of their money, unless some value can be salvaged from disposal of assets. That said, the startups that do survive and successfully scale up can give an extraordinary return on investment. This extremely high risk-reward proposition means that investment in startups is typically unfeasible for conventional lenders like commercial banks. Thus, globally, mature startup ecosystems tend to be funded by venture capital (VC) and private equity funds, as well as angel investment.

In terms of impact, domestic technology startups often hire from the local workforce and have significant operations based in the country. However, in many instances, the entities are formally registered outside Pakistan, e.g., UAE and US. Thus, even when the startup gets some traction, its Pakistani origins may not be prominently highlighted. One of the major reasons for this pattern is the fact that ICT startups typically require considerable venture capital as well as adequate patent protection, which despite some improvement lately, are challenging to acquire in Pakistan.[13]

[8] A caveat is that the disruption that tends to accompany digitization can lead to the simultaneous creation of some jobs, while making other jobs redundant. Thus, the net impact on job creation in the long run is hard to quantify at this early stage.
[9] Source: Social Innovation Lab, (2018): "Beyond the buzz: A Deep Dive into Pakistan's Startup Ecosystem". The report defines incubators as follows: 'Business incubators provide early or idea-stage startups with basic facilities such as office space, equipment, access to networks, mentorship, and possibly seed funding, that these startups require to develop their businesses.' Meanwhile, accelerators are 'the logical successors of incubators. They induct startups with proven business models and help them scale up their operations, primarily by helping them raise investments'.
[10] That said, 'graduating' from an incubator or accelerator does not ensure that the startup remains a going concern.
[11] A startup ecosystem is 'formed by people, startups in their various stages and various types of organizations in a location (physical and/or virtual), interacting as a system to create new startup companies'. Source: Startup Commons
[12] Angel investment generally consists of investment of money and time by high net worth individuals in early stage startups.
[13] Computer software is excluded from patentability in Pakistan, according to the Intellectual Property Organization (IPO) of Pakistan. Specifically, inventions that are of an intellectual, abstract or aesthetic character (including computer software, discoveries, artistic works, and methods for doing business) are excluded from Patentability under section 7 of the Patents

For Pakistani startups, it is easier to raise VC funding in developed markets than it is back home. This is primarily because venture capitalists tend to be more comfortable about their investment when the startup is incorporated in the developed economy. On this note, SECP has introduced regulations to streamline venture capital and private equity funding in Pakistan.[14] As per SECP, there were two private equity funds and two private equity companies registered with the commission at end-May 2018, with total assets of around Rs 5 billion and Rs 170 million respectively. Going forward, sustained efforts to improve the regulatory framework and ease of doing business, better security situation, and macroeconomic stability could inspire further confidence in investors and see Pakistan's venture capital activity gather pace.

As a result of all these developments, investment in startups is gradually picking up in Pakistan. While the amount of funding received is undisclosed for a number of deals, the disclosed investment in 2015 alone was US$ 155.4 million.[15] Even if some of the larger deals in 2015 and 2016 are excluded (as outliers or one-off occurrences), these two years were quite promising, both in terms of the reported amount invested in startups, as well as the number of deals made with investors. Encouragingly, the amount of startup investment reported in 2017 was surpassed in just the first six months of the ongoing calendar year (i.e. H1-2018), indicating that a recovery in investor appetite may be underway.[16]

Mindful of these strong linkages and positive spillovers for the macroeconomy, policy-makers in Pakistan have prioritized the digitization agenda at the national level. In particular, the 2014 auction of next generation mobile services (NGMS) proved to be a decisive measure in terms of improving connectivity and enabling digitization (**Box 7.2**). Moreover, while factors like favorable demographics were more fortuitous, rather than a product of conscious policy design, they nevertheless came together to form an enabling environment in which digitization could take root.

Box 7.2: Key Enablers of Services Sector Digitization in Pakistan

Four factors have played a dominant role in the recent digitization spurt of the domestic services sector:

(i) A decent ICT base

From humble beginnings in early 1990s, Pakistan's ICT sector has steadily held its ground over the past three decades. In fact, the last decade has been a period of mushroom growth; the number of IT firms registered with the SECP has increased from less than 2,000 in 2007, to 4,600 firms at end 2017 (10 percent CAGR). Presently, the industry is providing various associated services in the domestic market, including software development, business analytics, gaming and animation, mobile applications, consulting, etc. The high potential of the domestic IT market is reflected by the presence of a large number of global enterprises. Also, big IT companies in Pakistan have recently begun to nurture and support new enterprises in the digital space, which bodes well for future prospects.

(ii) Connectivity and affordability

Regarding connectivity, while a steady improvement in telecom infrastructure was underway in Pakistan since 1991, the auction of NGMS in 2014 proved to be the most important trigger behind the recent wave of digital innovation (**Figure 7.3**). According to PTA, 3G cellular mobile signal covered more than 70 percent of the population as of end-March 2017; similarly, 4G LTE services were accessible to over 30 percent of the population. In addition, the affordability of smartphones and their operating systems in the country has been a boon. Presently, a large number of device manufacturers are eyeing the high growth potential in low-end smartphone space, especially in developing countries like Pakistan. As for operating systems, the launch of the Android One platform by Google in 2013 was a big game changer, which made smartphones easier and cheaper to produce. In Pakistan, nearly 85 percent of all cellular imports come from China[17], with Android dominating the operating systems space.[18]

(iii) Favorable demographics

Around 64 percent of Pakistan's population is under the age of 29, and the country will continue to enjoy the youth bulge for another thirty years or so, according to the United Nations' National Human Development Report 2017. The fact that this young population is more open to embrace technology and smart-phones compared to the older generation represents optimism regarding the demand for ITeS and digital transformation. The supply side is equally supportive: according to the Digital Pakistan Policy 2018, the country produces more than 20,000 IT graduates and engineers every year and is home to

Ordinance 2000 (as amended in 2002 and 2006). The IPO can only grant copyrights and trademarks in the computer software domain. Source: IPO website.

[14] For example, the Private Equity and Venture Capital Fund Regulations 2008, and the Private Funds Regulations 2015.

[15] Source: i2i Industry Insights Newsletter, July 2018 issue.

[16] Moreover, apart from angel and VC investment, domestic startups have raised funding via donor grants, and by winning startup competitions at home and abroad. Thus, reported investment deals account for only a portion of total funding raised.

[17] Source: Pakistan Bureau of Statistics.

[18] According to the statistics portal Statista, the market share of Android mobile operating systems was nearly 84 percent as of December 2017.

more than 300,000 English-speaking IT and BPO professionals with expertise in current and emerging IT products and technologies.

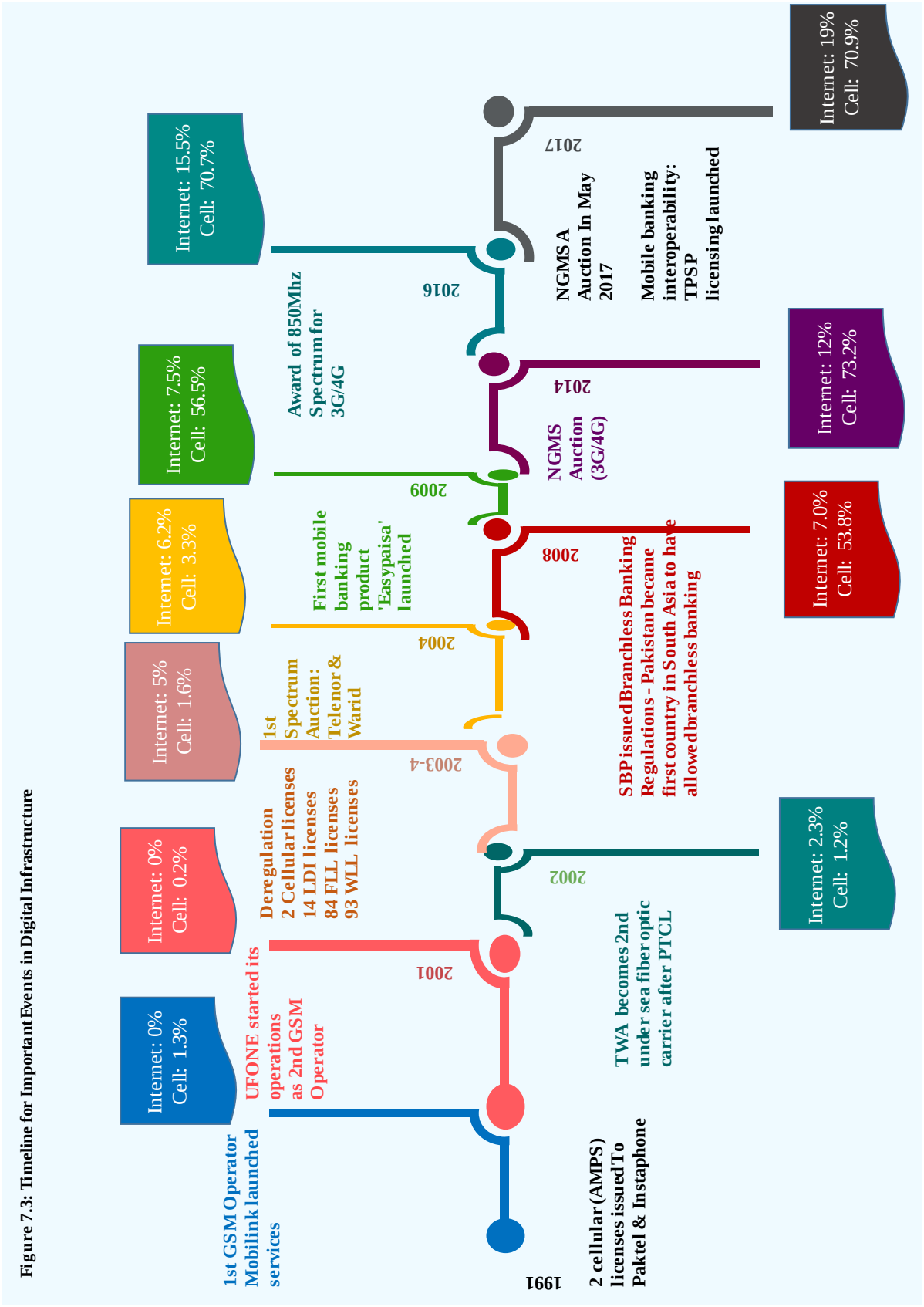


Figure 7.3: Timeline for Important Events in Digital Infrastructure

(iv) Support from the diaspora

A sizable contingent of Pakistani-Americans reside in Silicon Valley, working in established high-tech companies and startups alike. This large diaspora is helping in at least three ways:

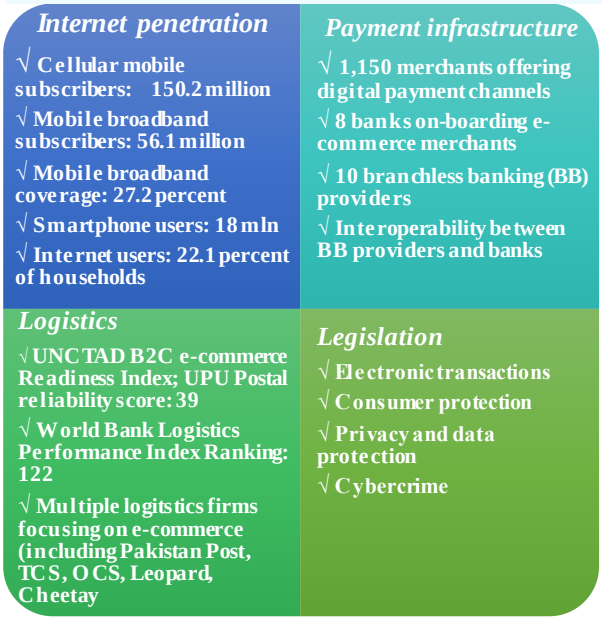
- First impact comes from those IT professionals who have had exposure of working in Silicon Valley, but have chosen to return to Pakistan. Familiar with successful startup ecosystems, these individuals are at the forefront of new support initiatives. In addition to formalizing advocacy for policy change, they themselves are reinforcing the angel investor activity in Pakistan, and are also launching institutional vehicles to deploy their capital.
- Second impact comes from CEOs and tech innovators who are still working in the US, but their presence and networking is a major source of encouragement for global companies to invest in Pakistan's technology sector.
- Finally, global business associations of Pakistani diaspora, like The Indus Entrepreneurs (TiE) and Organization of Pakistani Entrepreneurs (OPEN), have been active in encouraging Pakistan's technology sector.

Having provided context and established the broad connections between digitization and the economy, the next three sections elaborate the detailed dynamics and emerging trends specific to e-commerce (**Section 7.3**), fintech (**Section 7.4**) and e-government (**Section 7.5**), respectively.

7.3 E-commerce: Transforming the Retail Paradigm

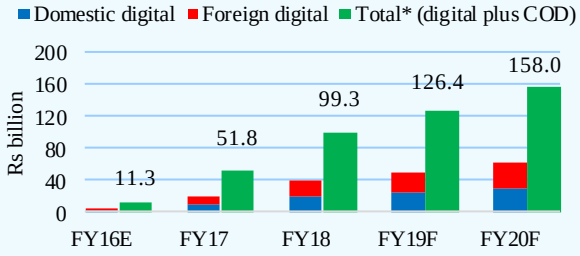
Pakistan has witnessed exponential growth in e-commerce activities over the past few years. Lured by lower transaction costs, convenience and expanding internet penetration, both enterprises and consumers have started shifting their transactions online (**Figure 7.4**). Thus far, business-to-consumer (B2C) side of the e-commerce has been the main beneficiary, though investments are underway to kick start the business-to-business (B2B) e-commerce on a large scale as well.

Figure 7.4: E-commerce Ecosystem in Pakistan



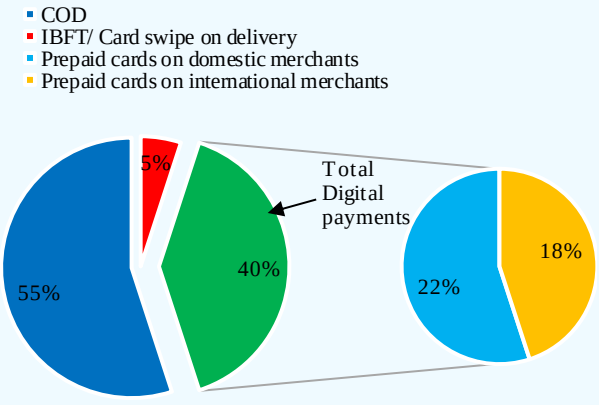
According to SBP data, the sales of local and international e-commerce merchants reached Rs 20.7 billion in FY17 and Rs 40.1 billion in FY18 – an encouraging growth of 93.7 percent. However, the data only covers transactions made via digital channels (credit/debit cards, interbank funds transfer (IBFT), prepaid cards, and mobile wallets). This is important to note,

Figure 7.5a: Estimates of E-commerce in Pakistan



* If we go by market estimates, the share of digital payments is about 40 percent in the total e-commerce transactions by value. For FY19 and FY20, a YoY increase of 25 percent in digital sales is expected.
E: estimated; F:forecast
Data source: SBP for actual digital transactions; market estimates for forecast

Figure 7.5b: Payment Mode Selection by Value



Data source: SBP; market estimates

as the market estimates put the share of postpaid cash on delivery (COD) settlements at around 80 to 90 percent of the total volume, and about 60 percent of the total value of e-commerce in Pakistan (**Figure 7.5b**). Extrapolating accordingly, the figures for total e-commerce activity in FY17 and FY18 may have touched Rs 51.8 billion and Rs 99.3 billion respectively (**Figure 7.5a**).

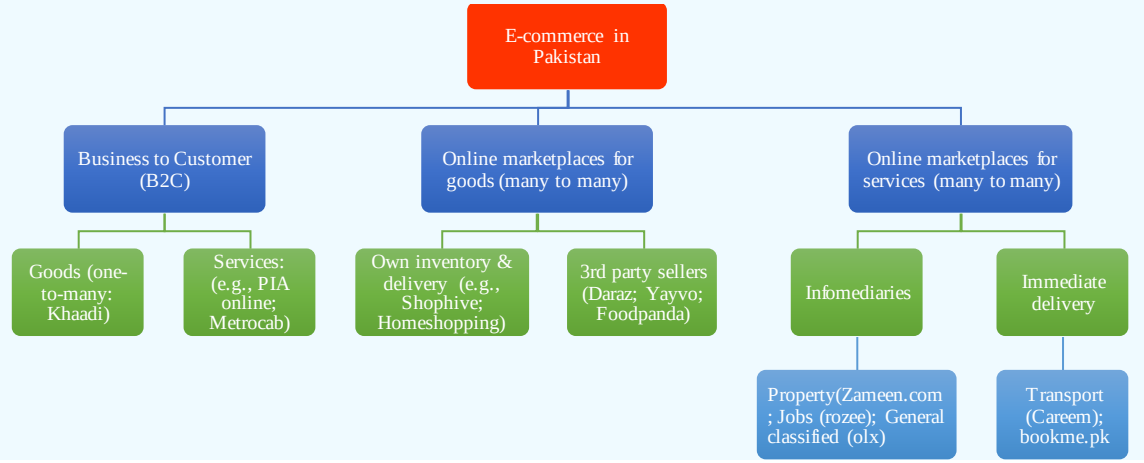
Increasing operational efficiency: from disintermediation to reintermediation

As mentioned above, digitization of commercial activities holds the potential to reduce transactional costs for businesses and consumers. A key enabler of this phenomenon is the concept of disintermediation and reintermediation. A conventional exchange would involve multiple agents such as producers, transporters, wholesalers, retailers, and consumers. E-commerce, however, allows the possibility to bypass the middle parties, thereby "disintermediating" the process and allowing direct dealing between a buyer and a supplier. In Pakistan, leading producers of apparel, smartphone, food, and electronics industries now have a one-to-many online "e-retailing" channel in place.

However, the more popular and established model of e-commerce is the online marketplace system. Online marketplaces are platforms that allow transactions and dealings between multiple buyers and sellers. Reducing search and contractual costs for the parties due to computerized systems and common digital infrastructure, they help increase efficiency by allowing swift transactions and providing co-sales services such as data analytics and payment platforms. In other words, they become the new intermediaries between producers and customers, except this time the "reintermediation" results in an overall improved experience for the parties involved.

In Pakistan, most of the major e-commerce players are either online marketplaces for goods - such as *Shophive*, *Daraz.pk* (for consumer electronics and apparel, etc.), and *FoodPanda* (for food delivery) – or online marketplaces for services via immediate delivery – like the ride-hailing platforms *Careem* and *Uber* (**Figure 7.6**). Then there are online information and financial intermediaries – or *infomediaries*, as they are often called – like *PakWheels* (for automobile sale and purchase), *Rozee.pk* (job hunting and recruitment), and *Zameen.Pk* (real estate business). These channels serve to fill information gaps and mostly earn profits through advertisements, contract making, and commission fees.

Figure 7.6: Structure of E-Commerce in Pakistan and Major Players



Incorporating logistics and inventory management into the mix

Longer delivery times are often cited as a major deterrent to the wider adoptability of the e-commerce channel. Delivery times are usually affected when either (a) third party logistics partners fail to deliver on time, and/or (b) the inventory management systems of the sellers prove inadequate to fulfill the flexible needs of the electronic channel.

In Pakistan, online marketplaces in particular have started focusing on this front. The venturing of leading logistic operator of the country, TCS, in the field of e-commerce provides a unique example. Its subsidiary, TCS E-com, launched its own online marketplace, *Yayvo.com* in 2015. Since *Yayvo.com* makes use of TCS's Hazir service, whereby selective commodities are delivered to customers in around 120 minutes, most part of the supply chain of this marketplace is vertically integrated. The outreach of the platform is also relatively wide, primarily owing to an extensive rural delivery system of TCS.

On the stock management front, most of the vendors selling their products through *Yayvo.com* are in the process of digitizing their inventory systems and integrating their warehouse database with that of the website's central domain. This enables the sellers to operate on a Just in Time (JIT) rather than on a Just in Case (JIC) basis,[19] thereby reducing storage and processing costs and quickening the purchasing process. Other marketplaces also make use of inventory management systems of varying scope and design. These include simple email notifications about the growth in orders of a certain commodity and the corresponding required inventory requirements, to incentive based schemes requiring a certain order fulfillment ratio to ensure scale production expansion for any existing seller.

In addition to TCS, other logistic firms are also venturing to capitalize on the growing e-commerce market. On the public sector front, Pakistan Post – the largest and oldest postal service enterprise of the country – has recently embarked on a comprehensive rebranding agenda to expand and diversify its operational capabilities. In this regard, it has established a new entity by the name of Pakistan Post Logistics Company, with the aim to facilitate the expansion of e-commerce to the remote and rural areas of Pakistan. On parallel terms, Pakistan Post is aiming to launch a mobile payment transfer service, whereby activities such as COD for e-commerce, international remittances, branchless wallet cards, and pension transfers, etc. would be available for the public. Pakistan Post also handles the majority of deliveries of e-commerce orders made by Pakistanis on international merchant platforms such as AliExpress and Amazon.

Emergence of online payment infrastructure is helping increase documentation

Payments infrastructure in Pakistan is quite adequate to meet requirements of local and international e-commerce transactions for both customers and merchants. Still, approximately 90 percent of e-commerce transactions in Pakistan are cash on delivery (COD) due to multiple reasons.[20] From the consumer side, a preference for cash may be attributed to low financial and digital literacy,[21] security of online payment channels and instruments, and availability of dispute resolution mechanism in case a wrong or substandard product is delivered to the customers. For businesses, upfront costs for developing an adequately secure and reliable infrastructure for payment processing, negotiating contracts with banks/PSO/PSPs, and stringent KYC requirements of banks for merchant on boarding[22] prove to be the major deterrents. In this regard, COD (among other options) serves as a cheaper

[19] Just in Case (JIC) inventory management refers to the technique of holding stock in bulk to meet the demand. This aim of firms following JIC is to minimize the risk of product shortfall. However, this also considerably increases the operating and warehousing costs of the companies. Just in Time (JIT) management on the other hand allows for stock keeping so long as the demand is there. This ensures higher efficiency and lower costs.

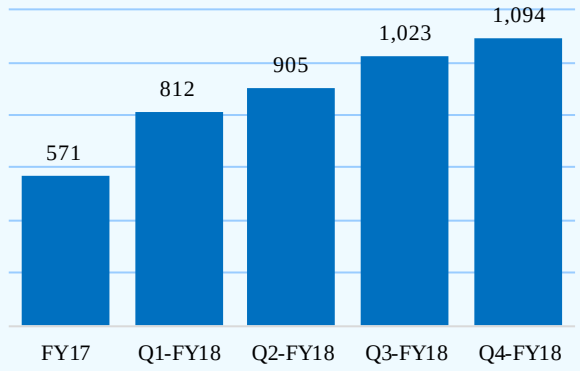
[20] Source: Pakistan Telecommunication Authority, Annual Report 2017.

[21] According to The Economist Intelligence Unit's Internet Inclusivity Index 2018, Pakistan ranks 68th out of 86 countries in terms of overall internet inclusion across the following four categories [individual category rankings are contained in parentheses]: 1. Availability (77th); 2. Affordability (43rd); 3. Relevance (70th); and 4. Readiness (68th). Moreover, within the Readiness category, the biggest drag comes from the literacy indicator ranking (85th), which reflects the level of education and preparedness to use the internet; essentially, the general level of literacy, as well as the support for digital literacy, are deemed to be particularly lacking. The silver lining is that the country fares relatively better on rankings for the remaining two indicators within the Readiness category, i.e. trust and safety (15th) and policy (48th).

[22] Merchant on boarding refers to the process whereby banks add new merchants as their clients and integrate their payment systems with the banks' payment gateways and PSO service.

alternative – though it brings its own set of challenges. For example, businesses bear the risk of nonpayment, and their operations become geographically constrained.

Figure 7.7: Number of E-commerce Merchants Accepting Digital Payments in Pakistan



Data source: State Bank of Pakistan

Over past few years, the digital payment infrastructure in Pakistan has gradually evolved. Encouraged by a rapid rise in branchless banking accounts (also called mobile wallets) and a continuous increase in subscriptions of 3G/4G networks, both e-retailers and online marketplaces have started to integrate such systems into their models. This is resulting in better documentation of commercial activities, as captured in the financial statistics of the economy. In FY17, SBP started publishing transactional data for e-commerce separately, in addition to the Point of Sale (POS) figures that were previously being published. The coverage is anticipated to enhance further, as large merchants nationwide are now inclined towards providing online payment options to their customers using e-payment gateways. According to SBP's Payment Systems Review FY18, the total number of e-commerce merchants using e-payment gateway of banks have risen to 1,093, i.e. up 91.6 percent from FY17, when the figure stood at 571 (**Figure 7.7**).

Another enabling factor to this development has been the presence of an inter-operable payment platform, whereby all banks are connected to various switches for services such as ATMs, IBFT, card payments and bill payment etc. through SBP licensed Payment System Providers (PSPs) and Payment System Operators (PSOs) like 1-Link and international card schemes like VISA, Mastercard etc.[23, 24] Furthermore, the regulatory environment is conducive for non-banks to venture in the payments space in Pakistan by offering innovative products and services. Apart from facilitating private sector participation, SBP has also issued guidelines that ensure standardization of payment instruments and ensure consumer protection through payment card security guidelines, security of internet banking etc.

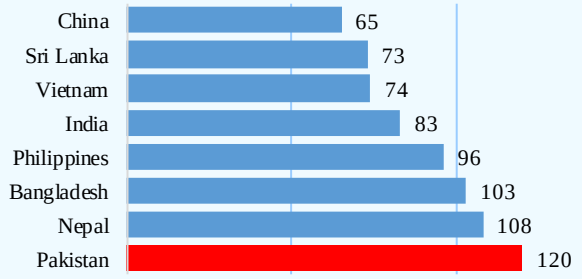
Widening acceptance and adoption of digital payments can also help the government to deliver services and subsidies to the poor in a faster and more efficient manner, therefore meeting their social needs in a better way. In Pakistan, a large amount of social safety payments is done by the government to beneficiaries of BISP. Though these have largely been through cash in the past, a shift has been witnessed in recent years towards digital channels such as mobile wallets etc. In addition, these digital payments to beneficiaries also allow greater transparency in transactions. Also, the digital payments enable the government to identify tax evasion in a relatively easier manner. If complemented by stronger government enforcement efforts, the overall size of the informal economy can be substantially reduced, and crucial fiscal revenue may be generated.

[23] According to PSD Circular regarding Rules for Payment System Operators and Payment System Providers, PSO/PSP is defined as such Authorized Party that is a company registered under Companies Ordinance 1984 and is engaged in operating and/or providing Payment Systems related services like electronic payment gateway, payment scheme, clearing house, ATM Switch, POS Gateway, E-Commerce Gateway etc. PSOs/PSPs act as intermediaries for multilateral routing, switching, and processing of payment transactions.

[24] The interoperability incurs a per-use fee, which particularly impacts the operational costs of smaller e-commerce players.

There is still room for improvement and expansion in the e-commerce landscape of Pakistan
Although the pace of increase in e-commerce adoption in Pakistan has been encouraging over the past few years, the country still lags behind regional and comparable economies in terms of digitization of its retail sector and efficiency of its logistics environment (**Figure 7.8**).

Figure 7.8: UNCTAD B2C e-Commerce Readiness Index* 2017 Rankings (Out of 144 Countries)



* Reflects processes involved in an online shopping B2C transaction. It is calculated by using data pertaining to number of internet users; number of secure servers; the Findex account penetration score; and the postal reliability (logistics) score.

Data source: UN Conference on Trade and Development

There are consumer protection laws at the federal and provincial levels of the government, and by virtue of functional equivalence provided to the electronic transactions by the Electronic Transactions Ordinance 2002, these laws are also applicable for e-commerce transactions. However, there is a problem of lack of awareness amongst the people about the rights they have when transacting online and about the scope and extent to which their activities are covered under the various protection acts.

Furthermore, absence of trust in online platforms and inadequate implementation of consumer protection laws pertaining to e-commerce, amid an already low digital literacy environment, become a deterrent to the rapid digitization envisioned by policymakers and industry players. Consumer protection is perceived to be weak in Pakistan, with an impression that end buyers may have little recourse available in case of payment disputes or instances requiring return of goods/services acquired via the e-commerce channel. In particular, consumers tend to be hesitant when transacting using online channels, as they worry that their personal information (such as credit card number, bank account number, address, etc.) may be leaked or misused by unauthorized persons.

With regulatory and infrastructural progress and advent of global players, the future is promising
The government is in the process of drafting an e-commerce policy framework for Pakistan, and a draft Trade Dispute Resolution (TDR) Act 2016-17 has already been developed in consultation with relevant stakeholders. These regulatory measures are particularly focused on establishing trusted and easier modes of payment; setting up of consumer protection bodies at federal and provincial levels; and launching a designated platform for trade dispute resolution based on international best practices. SBP has also mandated commercial banks to ensure "3-D" security on internet transactions involving credit and debit cards, whereby two-factor authentication (through SMS/email) is required before the amount is credited from the consumer's bank account and a transaction gets completed.[25]

Online marketplaces and e-retailers, on their part, must introduce comprehensive escrow facilities to safeguard the advance payments until a successful delivery and proper evaluation at customers' end. Another mechanism by which the online platforms are vying to increase consumer confidence in digital channels in Pakistan is through the adoption of a *click-and-mortar* structure. Understanding that majority of consumers feel more secure and confident when shopping conventionally for certain

[25] However, the efficacy of this system gets diminished as many banks do not by default allow debit cards to be used for online transactions. Either the customers have to contact bank's helpline to activate the debit cards for e-commerce for a set timeframe, or the debit cards simply cannot be used to transact online. In this regard, commercial banks should allow their consumers the option to pre-select at the time of issuance of debit cards the right of e-commerce application, alongside providing them due security and a Transaction Monitoring Systems protocol, which is already in place for credit cards.

products (such as apparel and electronics), the platforms have developed or are developing a physical presence alongside an electronic one.[26]

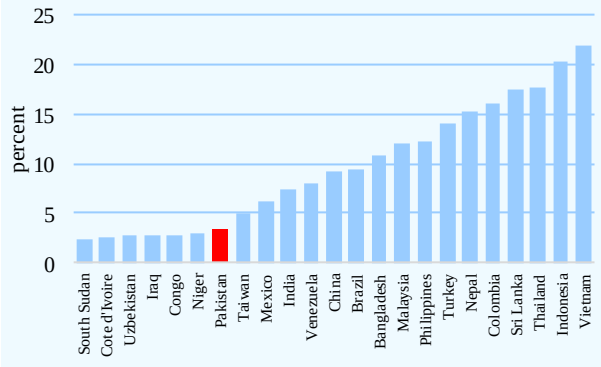
With the entrance of Chinese digital giants such as Alibaba (through acquisition of Daraz.pk) and Ant Financial (via a 45 percent stake investment in Telenor Microfinance Bank), the e-commerce landscape of Pakistan can be expected to evolve rapidly. Following the success of their technological products and services in China, these players are likely to introduce and inspire variants of the same in the digital landscape of Pakistan. For example, the marketspaces may give higher level of attention towards personalization and customization of their content and product recommendation protocols. The purchasers' history of browsing through the marketplace, and the record of their previous purchases would be used to improve marketing and sales experience. Secondly, thanks to advances in IT systems, the platforms would be able to provide comprehensive inventory and sales management systems to the suppliers. This would help bring down warehousing costs, while enhancing the speed of order processing via real-time interactive demand and supply data interfaces.

On the payments front, the market players would tap into the exponentially growing usage of e-commerce platforms on mobile phones (the phenomenon often referred to as m-commerce) and offer new modes of transaction settlements. The next step would be to use the consumers' purchasing history to devise a credit scoring mechanism to offer micro-loans for transactions and, eventually, savings.[27] The sellers can also expect small-scale lending facility to meet their running finance requirements in the near future.[28] Ant Financial and JD.com – the second largest online marketplace in China – lend to merchants, many of whom fall in the micro, small and medium enterprises category.

7.4 Fintech: Innovations are beyond E-commerce

The term fintech - short for financial technology- refers to technology-led innovation in financial services, which aims to exploit the gaps in coverage and affordability of the services offered by the mainstream financial sector. Emerging in the wake of the global financial crisis, fintech firms initially seemed to pose a genuine threat to established entities like commercial banks. However, in many cases, mainstream financial institutions now appear to be increasingly keen to forge partnerships with fintech firms in efforts to sharpen operational efficiency and respond to customer demands for more innovative services. Furthermore, the idea of fintech itself is evolving gradually and its scope has expanded from automation of support functions within financial institutions into platforms capable of providing end-to-end personal and commercial finance solutions. For instance, if small businesses or startups need funding, traditional banks often require collateral before sanctioning the loan; on the other hand,

Figure 7.9: People Who Borrowed From a Financial Institution (Age 25+), 2017



Data source: Global Findex Database

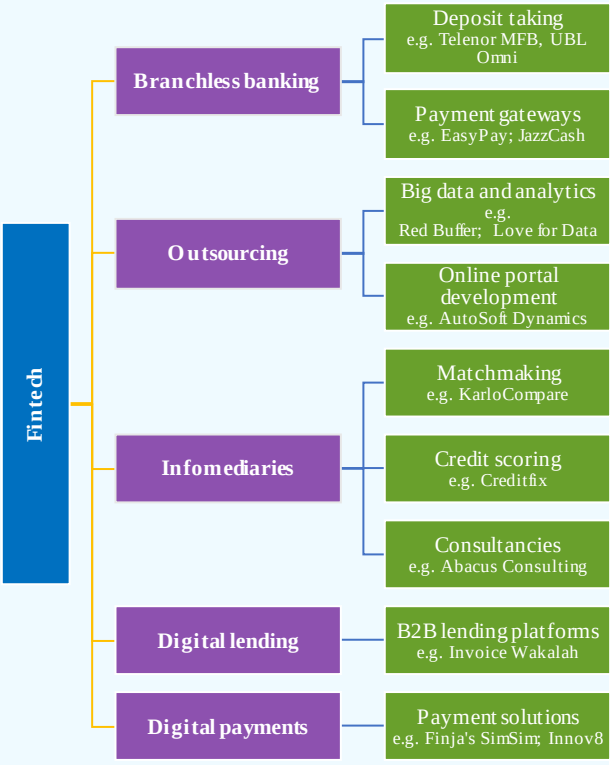
[26] For example, *Homeshopping.pk* and *Shophive.com*, two of the older online marketplaces of Pakistan, have set up physical stores in major urban regions to help improve their adoption and retention rates, marketing, and return mechanisms. Other marketplaces are following suit: *Daraz.pk* plans to open physical outlets across various urban and rural regions of Pakistan.
[27] The regulatory environment as of now does not allow deposit taking by non-bank institutions (which include e-commerce merchants and marketplaces). However, SBP is in the process of drafting a framework that would allow greater flexibility in this regard.
[28] Finja, a domestic fintech player, is already offering payment services via Quick Response codes and is aiming to start disbursing "nano-loans" (Rs 500-1500) through its SimSim platform, thereby establishing a trail for assessing big loans later.

fintech allows startups to raise capital through crowdfunding where they can raise money more cheaply and quickly without having a collateral pledged.[29]

Pakistan is an ideal place for fintech services, given that the country has a huge unbanked population of around 100 million, according to the World Bank's Global Findex 2017 database. Low levels of financial inclusion make it challenging for policymakers to devise and implement adequate social safety nets; for instance, disbursing welfare payments in a targeted manner is an uphill task when most poor people do not have access to a basic transaction account. This also considerably restricts individuals' ability to borrow from formal channels (**Figure 7.9**). Fintech firms can help plug such gaps.

Of late, branchless banking has played an instrumental role in providing basic banking facilities, with the number of active accounts reaching 21.7 million as of end-June FY18 (**Table 7.1**). Fintech firms in this space are helping their clients develop cloud-based solutions, big data analytics etc., to help the banks provide more personalized services to their customers and enable them to expand their market share. Interestingly, branchless banking and associated outsourcing of services are just two of the five broad categories of fintech's areas of impact; the other three being (a) infomediation (b) digital payments, and (c) digital lending (**Figure 7.10**).

Figure 7.10: Classification of Fintech Companies



Data source: State Bank of Pakistan

(a) Infomediation

Infomediaries help their clients to capture insights related to potential customers, competitors, and market dynamics. Such firms can be broadly categorized into three main classes i.e. credit scoring, consultancy, and matchmaking.[30] Credit-scoring fintechs can thrive in countries like Pakistan, where credit scoring through traditional methods is difficult due to absence of credit history among the unbanked population. They may deploy a range of technologies to determine credit scores, ranging from the use of predictive modelling on digital data of thin-file customers to analysis of mobile phone calls and text messages.

Meanwhile, fintechs offering consultancy services typically assist their clients to optimize their business processes by using technology to make informed decisions. For example, a domestic fintech is trying to develop a niche in the agriculture sector by streamlining the entire value chain. This MIT-based Pakistani startup provides farmers with insights that help them produce a healthy crop; facilitates access to a variety of quality agri inputs (fertilizers, pesticides, etc.) at competitive rates; assists in selling their produce at best possible rates; and helps in getting access to credit, etc.

[29] Crowdfunding involves raising small amount of funds from a large number of people for a new venture or project. Some of the popular crowdfunding websites include Kickstarter, Crowdfunder and Fundly.

[30] To give just one example of a fintech infomediary from each class that already exists in Pakistan, consider CreditFix (credit scoring), Ricult (consultancy), and KarloCompare (matchmaking). However, this is by no means an exhaustive list of domestic fintechs in each of these specialized niches.

The third class of infomediaries offers matchmaking services that help businesses and people to find relevant financial products. For instance, they may allow users to conveniently compare features of various credit cards, auto loans, insurance products etc. on their digital devices from the comfort of their homes or on the go, thereby saving a lot of time and effort in finding out the most feasible option available in the market.

Table 7.1: Key Branchless Banking Indicators

	FY12	FY13	FY14	FY15	FY16	FY17	FY18*	CAGR (%) **
Number (No.) of agents (end-Jun)	29,525	93,862	168,615	251,865	346,716	402,710	405,531	54.8
Active BB agents (end-Jun)	-	-	140,747	193,816	236,874	185,297	159,983	-
No. of accounts (end-Jun, in '000')	1,447.4	2,642.9	4,238.2	10,881.4	14,576.4	27,313.0	39,235.9	73.3
Active accounts (end-Jun, in '000')	-	-	-	-	6,693.6	13,158.3	21,737.7	-
Deposits (end-Jun, million Rs)	753	2,391	6,219	8,553	13,734	15,423	15,335	65.3
No. of transactions during year (in '000')	90,167	153,102	245,715	310,667	437,197	551,544	748,605	42.3
Value of transactions during year (billion Rs)	338.5	635.9	1,062.9	1,608.1	2,065.2	2,427.8	3,181.0	45.3

*provisional; **FY12-18
Data source: Branchless Banking Newsletter, State Bank of Pakistan

(b) Digital payment solutions

Until recently, consumers used to have limited payment options when transacting online. The online payment options through e-payment gateways were limited in terms of payment acceptance. For instance, some online retailers and marketplaces did not accept payment via branchless banking channels, and options were confined to plastic cards. Others accepted payment through branchless banking agents, but not via mobile wallets due to non-interoperability of BB service providers.

To bridge this gap, a number of Payment Service Operators and Payment Service Providers, along with banks/MFBs, are venturing into the payments arena. EasyPaisa by Telenor, for instance, has its own payment gateway called EasyPay, which allows consumers to transact online using any debit/credit card, their EasyPaisa account, or through an EasyPaisa agent. FonePay, another entrant, is taking things further by allowing payments through two mobile wallet accounts (e.g., EasyPaisa and JazzCash) and through Masterpass QR on merchant locations. Anecdotal evidence indicates that the mobile wallet channel now accounts for roughly 30-40 percent of total transactions carried out via electronic payment gateways (relative to 60-70 percent share of credit and debit cards).

Furthermore, trust in and usability of prepaid channels is rising, as evidenced from the fact that such transactions make up around 40 percent of the total value of e-commerce (as opposed to the 10-20 percent share in volume mentioned earlier) and that the usage of prepaid mode of payments rises as the cost of products increase. Going forward, SBP is working towards building a national payment infrastructure that facilitates electronic/digital payments for customers, especially at retail level.

(c) Digital lending

In its initial years, digital lending was more related to digitization of back office processes, which were done manually in financial institutions. With the increased popularity of machine learning and the Internet of Things, the concept of digital lending now involves complete digitization of the loan disbursement process, including the ability of the algorithms to make decisions of accepting or rejecting a loan application.[31]

Another area of digital lending includes peer to peer (P2P) lending, which has not been able to get any big names in Pakistan until recently. Peer to peer lending allows individuals to lend and borrow

[31] Internet of Things (IoT) refers to the use of internet and digital devices to interconnect the machines, electronic devices, buildings, vehicles and other objects thereby establishing internetworking for machine-to-machine communication. Source of definition: PTA Annual Report 2017.

money without having a financial intermediary sharing risks and rewards. In contrast with crowdfunding, which is more related to funding for an innovative business idea, P2P lending has more to do with funding specific needs of consumers such as educational expenses, vacations or any medical expenses, etc. It benefits the borrower in terms of increasing their chances of getting an unsecured loan and at the same time benefits the investors to get a higher return compared to what they could have received from investing in a bank.

7.5 E-government

E-government harnesses the capabilities of ICT to improve the delivery of public services.[32] There are four main delivery modes of e-government, namely: (i) government-to-citizen, which digitizes consumer-centric services (like obtaining certificates, passports, etc.); (ii) government-to-business, which caters to business-specific transactions (like procurement); (iii) government-to-employee, which consists of interactions involving guidelines, benefits, trainings etc. of government employees; and (iv) government-to-government, which involves data exchange and electronic transactions within and between national, provincial and local governments.

At the country level, Pakistan has some catching up to do with regional peers in terms of its e-government readiness and overall development. The country's e-government ranking dipped one place between 2014 and 2016, as measured by the United Nations' E-government Surveys (**Table 7.2**). Decomposing the findings, it becomes clear that while India and Bangladesh have improved their e-government ranking by making gains in (i) the scope and quality of their online services and (ii) inherent human capital, Pakistan needs to do more work on these fronts.

Table 7.2: Relative Performance on E-government

Rank/index*

	PAK		BGD		IND	
	2014	**2016**	**2014**	**2016**	**2014**	**2016**
E-government rank	158	159	148	124	118	107
E-government development	0.258	0.258	0.276	0.38	0.383	0.464
i. Online service	0.323	0.326	0.346	0.623	0.543	0.746
ii. Human capital	0.334	0.319	0.387	0.397	0.47	0.502
iii. Telecom infrastructure	0.117	0.13	0.094	0.119	0.137	0.143

* Rank out of 193 countries. Top rank = 1. Fall in numerical value of rank indicates an improvement (vice versa for index). Index values range from 0 to 1.

Data source: UN E-government Development Database

That said, at the provincial level, the Punjab Information Technology Board (PITB) has delivered over 270 ICT-related projects in the past six years. Examples of its e-government initiatives include:

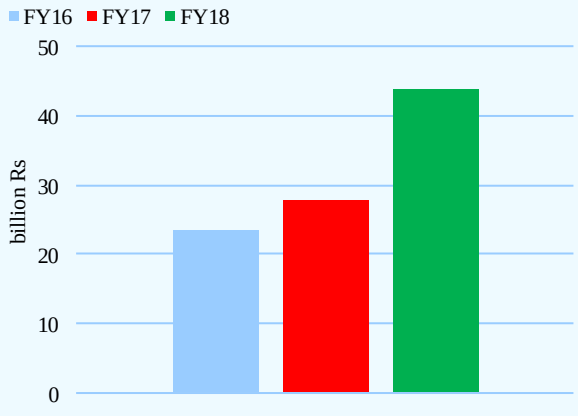
- Land records: Full computerization of Punjab's land revenue system, involving digitization of land records of over 54 million rural landowners
- Police: Full computerization of all 713 police stations in Punjab
- E-stamping: Introduction of e-stamps in place of high value non-judicial and judicial stamp papers, with the aim of countering leakages (**Box 7.3**). Revenue collection from e-stamping amounted to Rs 48.9 billion in 2017-18, up from Rs 32.2 billion a year earlier.
- Education: Development of school monitoring system using low cost computer tablets, to counter ghost schools, teacher absenteeism, and bogus student enrolment, while also improving the overall quality of education outcomes
- Health: Launch of e-Vaccs program, which used a smartphone-based application to track vaccinators. As a result, geographical coverage rose from 22 percent to 92 percent over the last three years. Similarly, a dengue tracking system introduced in 2012 enabled real-time information on larvae prevention, dengue detection and public hygiene activities to be tracked across 36 districts, facilitating over 21 million anti-dengue surveillance activities to date.

[32] The difference between e-government and e-governance is nuanced. According to a UNESCO publication, e-government is the use of ICT to promote efficient and effective government, and make it more accessible and accountable to citizens. By contrast, governance is the societal synthesis of politics, policies, and programs, and e-governance is the application of ICT to the system of governance to ensure a wider participation and deeper involvement of citizens, institutions, NGOs and private firms in the decision-making process. Source: E-government Toolkit for Developing Countries, UNESCO, 2005.

Box 7.3: The Impact and Customer Response to E-Stamping

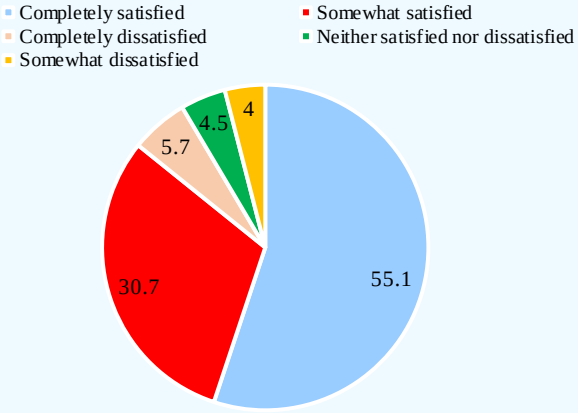
The government of Punjab, in collaboration with PITB and Bank of Punjab (BOP), introduced e-stamping system for the first time in Pakistan in 2016.[33] The major objective behind this initiative was to provide a hassle-free and quick access to stamp papers and to prevent fraudulent activities. With the manual system, it used to take two to three days for someone to get judicial and non-judicial stamp papers issued; e stamping has reduced this process to few hours with two simple steps.[34] To counter fraud, the system allows online verification of the e-stamps and prevents reuse of stamp papers. In case of sale or purchase of a property, the value of stamp duty is determined through DC valuation tables based on the data of location, covered area and property type i.e. residential or commercial. This feature helps to prevent tax pilferage resulting from understatement of the property value, which used to be a common practice with manual stamping. As a result of these features, there has been a marked increase in collection of stamp duties since the inception of this system (**Figure 7.3.1**).

Figure 7.3.1: Revenue Generated through e-Stamp Papers



Data source: Punjab Information Technology Board

Figure 7.3.2: Overall Satisfaction with e-Stamping Facility



Data source: SBP e-stamping customer satisfaction survey (FY18)

An e-stamping customer satisfaction survey conducted by SBP revealed that over 85 percent of the respondents were either "completely satisfied" or "somewhat satisfied" with the service (**Figure 7.3.2**). That said, a few concerns identified during the survey may be addressed going forward, such as the relatively limited knowledge and awareness of e-stamping; limited access, with only a few BOP branches providing the facility; and unavailability of an online payment option. There also appears to be room to make the online form more user-friendly, according to the survey.

Regarding the way forward for PITB, Goal 10 of the Punjab IT Policy 2018 touches upon how the government's demonstrated commitment to a cause like digitization can give confidence to the private sector. However, anecdotal evidence suggests that some private sector stakeholders have reservations over the PITB's massive footprint in the digital space, including e-government solutions. For these stakeholders, it would be preferable if PITB identified the prevailing gaps, outlined the solutions required, and then tasked the specialized private sector ICT firms to develop the relevant software and applications. Otherwise, PITB could inadvertently crowd out the private sector.

As for the other provinces, a noteworthy e-government initiative of the KP Information Technology Board (KPITB) is E-Ilaj, a telehealth facility whose pilot phase took off in October 2017 in Mansehra. In addition, the KP eCitizen portal, currently in pilot phase, enables citizens in Mardan to apply for e-domiciles online. More broadly, the KP government's e-Recruitment portal is also an example of e-government, which enables online recruitment of employees.

Similarly, Sindh has implemented an agriculture policy under the World Bank-financed Sindh Agricultural Growth Project. One of the initiatives taken under the policy is the establishment of a digital marketplace (through a framework agreement) for farm machinery equipment (harvesters, tractor trolleys, and plastic baskets, etc.). Farmers make use of an Interactive Voice Response (IVR) system from their mobile phones to placing, tracking, and reviewing the orders. Since its

[33] Currently, this facility is only available for judicial (Rs 21- Rs 15,000) and high-value non-judicial stamp papers (i.e. worth more than Rs.1000), which will be extended to lower denominations as envisaged in Punjab's IT Policy 2018.
[34] Namely, (1) fill the online form 32-A, and (2) get e-stamp paper on payment of stamp duty at any designated BOP branch.

inauguration, the submission and holding time orders for farmers for their share of the payment has declined from 4-6 months previously to 15-30 days.

As things stand, PITB has been assisting the other three provincial governments in setting up and upgrading their e-government platforms, especially in portfolios like police and health. While such inter-provincial collaboration is welcome to plug immediate gaps, in the long run each province needs to develop its own capacity to initiate and execute e-government projects. Beyond this, any collaboration – or healthy competition – among provincial IT boards and departments to deliver better e-government services would simply be a bonus.

7.6 What Lies Ahead? The Fourth Industrial Revolution and Pakistan's Potential

In developed economies, technological advances are galvanizing a paradigm shift known as the fourth industrial revolution. It encompasses cutting-edge technologies that had limited practical applications until some time back, but have come to pervade daily life in a short span of time. These include artificial intelligence, machine learning, robotics, 3D printing, blockchain, the internet of things, and neurotechnology, to name a few. The speed, breadth, and impact on entire systems that technology has unleashed since the advent of the 21st century – within and across companies, industries, and countries – sets this new era apart from the third industrial revolution.[35]

A key feature of the fourth industrial revolution is the blurring of traditional boundaries between the services and industrial sector. Manufacturing processes are being re-engineered in a way that the hardware is optimized by technology or software components, which add significant value to the end-product. The automobile industry is a case in point, where consumer focus is shifting away from car ownership towards personal mobility, and features like self-driving capabilities, connectivity and automation are gaining prominence. Car and auto part manufacturers are responding accordingly, since their revenues are increasingly linked to technological innovations and embedded services.

Table 7.3: Rankings on 'Technology & Innovation' Driver
out of 100 sample countries

	Pakistan	Bangladesh	India	Philippines
'Technology & Innovation' driver ranking	88	86	34	59
(1) Technology platform	87	78	59	47
FDI and technology transfer	60	88	52	56
Cyber security commitment	66	55	26	39
Mobile-cellular telephone subscriptions	97	94	88	72
Internet users	98	97	86	65
(2) Ability to innovate	80	97	29	85
Govt. procurement of advanced tech products	26	69	7	68
Companies embracing disruptive ideas	39	83	12	35
Company investment in emerging technology	43	67	28	54
State of cluster development	47	57	29	54
Patent applications	86	87	54	68
Venture capital deal volume / size of economy	90	99	27	59

Data source: WEF Readiness for the Future of Production 2018 Report

While there is ample evidence to support the notion that the fourth industrial revolution is well underway in developed economies, it may be premature to say the same in Pakistan's case. This is evident from the country's profile in the WEF's inaugural Readiness for the Future of Production Report 2018, particularly with respect to its 'technology and innovation' driver (**Table 7.3**). In terms of technology and innovation, Pakistan is trailing far behind India and the Philippines, i.e. the two economies that have had great success in tapping the potential of ICT in South and Southeast Asia.

[35] The third industrial revolution, also known as the computer or digital revolution, extended from the 1960s to the 1990s.

Narrowing the focus to technology platforms, Pakistan's ranking for 'FDI and technology transfer' and 'cybersecurity commitment' is relatively better compared to other sub-indicators. However, its ranking in the cellular subscriptions and internet user categories comes as a surprise. Evidently, while the country has made gains in these aspects relative to its own past performance, other countries in the region have forged ahead faster.

Regarding ability to innovate, Pakistan's overall ranking is again unsatisfactory. The drag created by funding constraints for startups and gaps in patentability is reflected in the sub-indicators relating to 'venture capital deal volume per size of economy' (90th rank) and 'patent applications' (86th rank). That said, the 'government procurement of advanced technology products' offers some comfort. Viewed in conjunction with the 'state of cluster development', it signals that the public sector is making a conscious effort to facilitate innovation. Furthermore, the private sector's dynamism is captured in the sub-indicators relating to companies' receptiveness to embrace disruptive ideas and to make investments in emerging technologies.

Going forward, it will be imperative to build upon the current base of multi-stakeholder collaboration. Startup founders, VCs, incubation centers, regulators, tax authorities, large ICT firms, associations, ministries, academia, think tanks, and the Pakistani diaspora will need to complement each other's activities to ensure that the country does not miss the 'fourth industrial revolution' bus.

7.7 Future Outlook and Policy Direction

Industry experts are bullish regarding the future outlook of Pakistan's ICT sector.[36] This optimism is based on factors like the increasing pace of digitization in the country; stimulus from established foreign firms entering the domestic e-commerce space; gains in financial inclusion; and rise in consumerism. Initially, these developments may spur demand for IT and ITeS in the domestic economy, encouraging firms and developers to offer solutions and applications tailored to the needs of locals. Then, as firms mature and expand their outreach globally, ICT exports can really take off. The predominant export-orientation of the sector is an added bonus: for an economy like Pakistan, where pressures emanating from trade imbalances have all too often held back economic growth, the prospect of adding a new sector to the list of traditional export-oriented industries – like textile, leather, carpets, sports goods, and surgical instruments – is enticing.

That said, at the moment, many IT and ITeS stakeholders are guilty of gravitating in large part towards the low-value added segment of ICT, namely small, service-based firms.[37] While there is nothing wrong with small-scale service-based firms per se, their prospects and scope may be relatively limited in the long run. As things stand, country's service-based firms have largely been unable to attain the kind of scale that their regional peers have achieved over time.

Furthermore, industry experts maintain that firms in the ICT sector have increasingly faced issues in dealing with tax authorities.[38] The net impact of these developments is that the affected firms may need to invest time, effort, and possibly financial resources in order to extricate themselves. Thus, as the government turns its attention towards providing incentives and support to the ICT sector, it also needs to ensure that, going forward, the federal or provincial tax authorities do not create any unintended disincentives of doing business in this area.

[36] According to representatives of the Pakistan Software Houses Association for IT and ITeS (P@SHA), ICT may grow into a US$ 6-8 billion sector in Pakistan in the next three to four years.
[37] Industry experts from P@SHA estimate that around 90 percent of Pakistan's IT and ITES industry consists of service-based firms, compared to only 10 percent of product-based firms.
[38] This may take the form of intimidating notices for tax compliance. In more extreme cases, it has reportedly resulted in bank accounts being frozen on the precept of alleged suspicious activity, and company funds remaining blocked for a long time even after the plaintiffs have won the associated court cases.

Some efforts to address the industry's concern are reflected in the Digital Pakistan Policy (**Box 7.4**). Going forward, this policy needs to be built upon, with specific deliverables, responsibilities, timelines and key performance indicators to be collaboratively agreed upon and owned by respective stakeholders. Furthermore, the Ministry of Information Technology and Telecommunication (MOITT) has recommended that the Board of Investment should extend Special Economic Zone (SEZ) incentives to the IT sector, by establishing technology SEZs.[39] In particular, the requirement for SEZs to have a minimum size of at least 50 acres may be revised downward for IT firms.

Box 7.4 Digital Pakistan Policy

Keeping in view the rapid expansion of IT sector in Pakistan, MOITT formulated the Digital Pakistan Policy, which was approved by the cabinet in May 2018. This policy provides a generic framework to synergize the expanding digital ecosystem and harness socio-economic growth in the country. The policy identifies key policy areas and relevant ministries and institutions that would be responsible for execution of these objectives. Currently, the federal government is already offering (or has proposed) several incentives for the IT industry including:

(i) Extension of income tax holiday on IT exports till 2025
(ii) Reduction in sales tax to 5 percent in Islamabad Capital Territory
(iii) 5 percent cash reward on IT exports
(iv) 100 percent foreign ownership and 100 percent repatriation of capital and dividends
(v) 3-year tax exemption for IT startups
(vi) Tax holiday for venture capital funds till June 2024

Among several other objectives, the policy aims to double the country's IT and ITeS exports by 2020, which may help the country to improve the external account imbalances while also creating employment opportunities. It envisages boosting foreign and domestic investment by making Pakistan an attractive location for IT/ITeS. To incentivize the sector, the policy clearly outlines the need for development of state of the art IT zones/technology parks, incubation centers for tech startups, and Telecenters in unserved and underserved areas in order to enhance mass adoption of ICT services. The goals also include the expansion of e-commerce industry, with an objective to triple the market size by 2020. Among other objectives, this involves establishment of an efficient e-commerce gateway with the help of SBP in order to provide enabling environment to key stakeholders and investors in trade and e-commerce industry.

Other noteworthy initiatives recently taken by MOITT and Ignite (formerly known as the National ICT R&D Fund) include the launch of National Incubation Centres (NICs) and the Digital Skills (DigiSkills) Training Program. The NICs have been set up in five major cities and are public- private partnerships established in collaboration with universities and corporations.[40] They are a welcome addition to the incubators and accelerators that were already functioning in the private sector. In fact, some NICs have positioned themselves as hubs of innovation that will cater to fourth industrial revolution applications, reflecting the progressive vision of entities like MOITT and Ignite.

Meanwhile, the DigiSkills initiative aims to train a million people in the future of work using technology. Building on Pakistan's standing among the top five providers of online freelancers, DigiSkills intends to equip the youth and students in particular to tap the full potential of the online job marketplace. In doing so, individuals would be able to earn a decent living, while the envisioned benefits for the macro economy include the creation of new job opportunities, financial inclusion, and foreign exchange in the form of IT export remittances.

As for the private sector, it has already shown a lot of dynamism in the ICT space. A number of Pakistani entities, including startups and more established firms, have made inroads in the global arena and received recognition for their accomplishments. The next frontier is for such firms to scale up and expand their footprint in a sustainable manner, both domestically and abroad. Given the resilience they have already displayed thus far, this aspiration appears well within reach.

[39] This may be achieved by modifying relevant clauses of the Special Economic Zone Act 2012.
[40] The NICs were launched in Islamabad, Lahore, Peshawar, Karachi and Quetta, in a six-month period between December 2017 to May 2018.

On a final note, the country's education system also needs an overhaul. All too often, stakeholders across the board express dissatisfaction with the quality of graduates. The shortcomings are perhaps more acute in technology institutes, where the curriculum needs to be frequently updated in order to equip students with the rapidly evolving needs of the market, regardless of whether they end up serving as employees or launch their own startups. The skillset needed to excel in a number of jobs in the future will be profoundly different from what was required before; indeed, in some cases, certain jobs may not have even existed a decade earlier. To this end, curriculum development and revision is another space where public-private partnership may be explored, so that the content is aligned with the needs of the private sector, with an eye towards both the domestic and global trends.