

Information Technology (IT)

Rapid expansion of information Technology (IT) is of crucial importance for economic growth because it enables various participants in economic and social life to have quick and easy access to information and knowledge. IT help companies to reduce cost of information and communication and improve their productivity. It also allow access to new markets, lower capital costs of financial markets. Moreover, the use of IT, in particular, Internet access, can promote entrepreneurial and small and micro business activities which in turn enhance sustainable economic development.

Ministry of Information Technology and Telecommunication (MoITT) is taking concrete steps for the adoption of latest IT tools for the improvement of national IT infrastructure that can be used to raise national productivity and growth.

IT Strategy

Pakistan's vision 2025 lay special emphasis on Knowledge economy. It is well understood that if Pakistan has to come out of its economic recession, it has to best utilize its youth bulge. Utilizing the 4IR technologies Pakistan economy can be transformed to digital economy. Through Digital Economy, GOP wants to ensure economic prosperity and citizen empowerment.

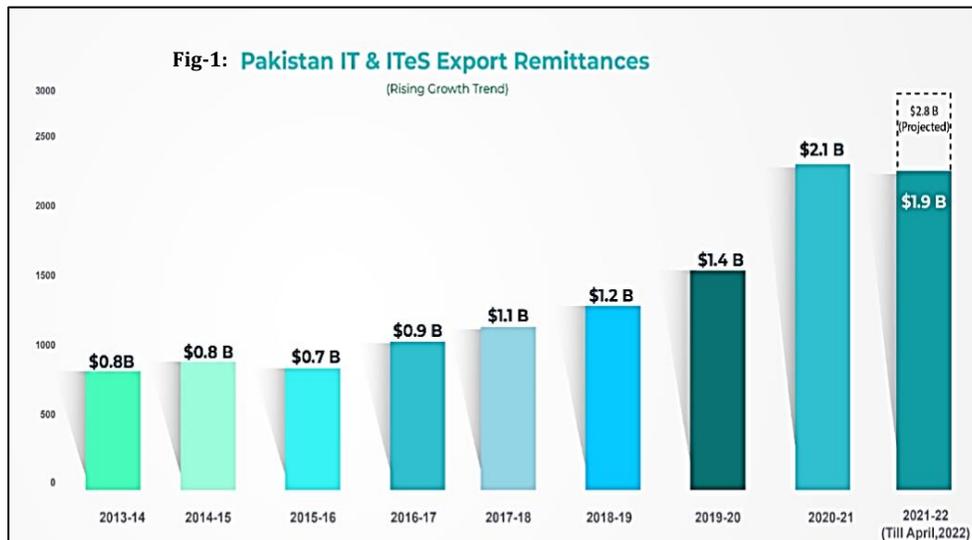
To achieve above objectives, MoITT has adopted a multipronged strategy that focuses on building the capacity of public and private sector besides establishing of requisite infrastructure and platforms. Key pillars of this strategy are:

1. E-governance
2. IT Infrastructure
3. Human Capital Development
4. Innovation and Entrepreneurship
5. IT/ITeS Development and Export
6. Fintech, E-commerce and Digital Platforms
7. Privacy and Security
8. Partnership and Collaboration

E-Governance remained the key pillar for MoITT's strategy to assist Federal Government in reshaping the governance structure. Through number of initiatives, MoITT successfully handheld the governance structure in various Federal Ministries/Divisions/ Organizations.

- ⦿ Access to Information
- ⦿ Equal Opportunity
- ⦿ Service Delivery
- ⦿ Informed Decision Making

Economic Growth can be targeted through the use of IT ecosystem which may provide enabling environment to business growth, help job creation and enhance citizen empowerment through E-governance.

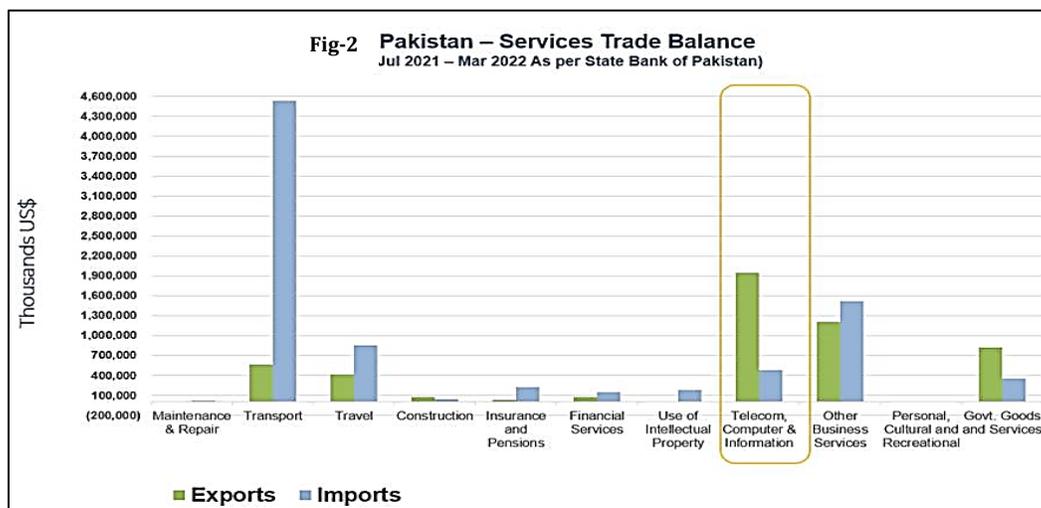


IT Exports & Earnings

According to the SBP data, IT exports during July-March FY2022 surged to US \$1.948 billion at a growth rate of 29.26 percent in comparison to US \$1.5 billion in the same period last year. These include telecommunication, computer and information services.

Trade Surplus of the IT Industry compared to the rest of the Services Sector

Pakistan’s IT Industry is the largest net services exporter with exports to 169 countries as reflected in Table 17.1.



Period	Net Exports	% of Total Exports	Total Exports-IT Sector
July-March FY2022	1.47	75.56	1.948
July-March FY2021	1.12	74.72	1.5

Source: Ministry of Information Technology & Telecommunication

Incentives for the Industry Growth

The MoITT supports all credible private sector initiatives aimed at bolstering the local IT industry and attracting foreign investment. Government realizes that it has an important role in terms of providing a conducive environment to IT industry through infrastructure and HR development. Government's incentives for IT industry include:

- a. 100 percent tax credit on export income from IT and IT-enabled services until 30th June, 2025.
- b. 100 percent tax credit on profits and gains derived by the IT start-ups for the tax year in which a start-up is certified by Pakistan Software Export Board (PSEB) and for the next two years.
- c. 100 percent equity ownership allowed to foreign investors, 100 percent repatriation of capital and dividends allowed, and tax holiday for venture capital funds till 2024.
- d. Growth Driven Financial Incentive on IT & ITeS export remittances: The main purpose of financial incentive scheme, is to encourage IT & ITeS export remittances through formal banking channels and improve reporting of export remittance receipts in correct IT & ITeS purpose codes, assigned by the State Bank of Pakistan. The government has allocated Rs. 4 billion to PSEB for the first ever financial incentive on IT & ITeS export remittances to be disbursed on the basis of export remittance receipts in FY2021.

Policy Intervention

1. Infrastructure Development

a. Establishment of Software Technology Parks (STPs)

STPs have been a major factor in facilitating IT & ITeS companies. There is a strong demand for STPs in the country due to the booming of IT industry. To meet the demand, STPs are being setup on public-private sector partnership basis. PSEB is also setting up STPs through conversion of unused buildings into state of the art STPs with particular focus on secondary and tertiary cities of Pakistan. This would expand Pakistan's tech eco system beyond Islamabad, Lahore and Karachi, thus contributing to the local economies through expansion of tech industry, export earnings growth and employment generation. As of December 2021, PSEB has 21 operational STPs with 1.25 million sqft of space serving 170 IT & ITeS companies.

b. Establishment of IT Park

A loan agreement was signed between Economic Affairs Division and EXIM Bank of Korea worth US\$ 158 million for establishment of Pakistan's largest IT Park in

Karachi. The total cost of the project is estimated at US\$ 186 million and would take 48 months to complete. The IT Park building would have 14 floors with a gross floor area of 106,449m² Park with latest state of the art facilities to ensure that IT companies can operate 24/7 providing services to clients around the globe. In addition to office space, the park would have software testing labs, business incubation centers, technology commercialization centers, exhibition halls, auditorium, day care center and other ancillary facilities.

Digital Economy Enhancement Project (DEEP)

Following initiatives are taken by National Technology Council (NTC) for digitizing the economy of Pakistan from Jul-December FY2022.

Pakistan Emergency Helpline (PEHEL-911)

On initiate of Prime Minister of Pakistan, a centralized service “PEHEL-911” has been envisaged wherein, it has been directed to launch Pakistan’s first toll-free helpline number that will be accessed by people of Federal, Provinces including AJK & GB. The citizens can report emergencies of all natures to this single helpline. The PEHEL-911 will be up front to existing major emergency helplines, i.e. Police 15, Rescue 1122, Fire Brigade and Motorway Police 130, etc. After maturity, all help lines will be merged in 911. This strategy has been framed to avoid existing helplines functions affected.

Inauguration of Disaster Recovery Centre for National Data Centre

Federal Minister for IT & Telecom virtually inaugurated the Disaster Recovery Centre (DRC) Lahore for National Data Centre (NDC) of National Telecommunication Corporation (NTC) on 31st December 2020. The new site is a full-fledged Data center which will not only work as back up for existing Data center facility but will also provide enhanced capacity for provision of cloud-based services to Government of Pakistan with advanced features and security.

Financial Performance

(i) Profit & Loss

Particulars	2016-17	2017-18	2018-19	2019-20	2020-21 (Un-audited)
Revenue	3,252.42	3,234.15	3,558.25	4,084.35	4,228.96
Operating Cost	3,265.91	3,623.21	3,877.48	3,930.46	4,282.70
Operating Profit/(Loss)	-13.49	-389.06	-319.24	153.89	53.74
Other Income	338.85	465.62	379.78	358.13	336.35
Profit/(Loss) before bank charges	325.36	76.56	60.54	512.03	282.6
Bank Charges	8.4	7.6	8.2	8.26	7.76
Profit/(Loss) before Taxation	316.96	68.96	52.35	503.77	274.85

Source: National Telecommunication Corporation

(ii) Detail of Data Centre Revenue

Revenue	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	Total
Data Centre Revenue Including VDS	32.7	38.95	183.8	232.62	315.16	483	1,286.23

Source: National Telecommunication Corporation

(iii) Average Revenue Per Users (With Out STC)

Particulars	As on 30-06-2017	As on 30-06-2018	As on 30-06-2019	As on 30-06-2020	As on 30-06-2021
Telephone Connection	122,659	121,464	119,935	120,765	120,477
DSL/EVO Connection	22,004	25,443	27,354	29,350	27,665
Total	144,663	146,907	147,289	150,115	148,142

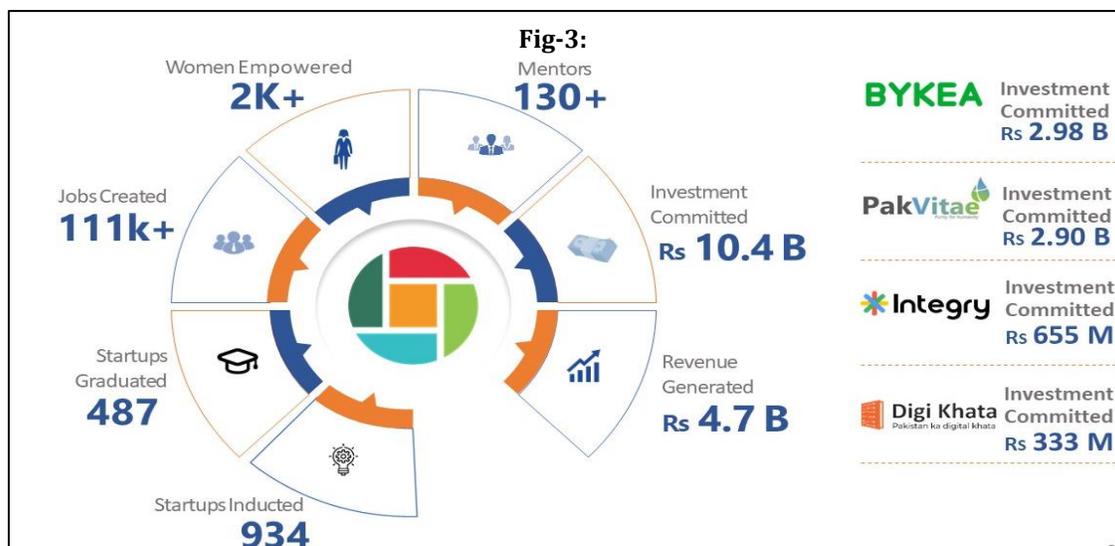
Source: National Telecommunication Corporation

IGNITE (National Technology Fund)**Innovation and Entrepreneurship in ITS****National Incubation Centers**

The critical role played by startups in economic growth, job creation, financial inclusion, reducing the income divide, and building a knowledge economy, Ignite under the auspices of MoITT, launched a program to build a network of National Incubation Centers (NIC). IGNITE has successfully established 5 National Incubation Centers (NIC) in Federal Capital and all Provincial Capitals of the Country. From July-December FY2022, more than 930 startups have been inducted in five NICs (Islamabad, Lahore, Peshawar, Karachi & Quetta). RFPs of the two new NICs in Faisalabad and Hyderabad have been published and these NICs will be operational by the end of FY2022.

Overall Achievement

Overall achievements can be seen in Figure 3.



Achievements during July to December FY2021

Applications Received	2373
Startups Inducted	126
Startups Graduated	24
Female Founders	30+

Source: IGNITE

NICs have been Declared a Champion Project by ITU:

International Telecommunication Union, a United Nations agency for digital tech, has announced IGNITE's National Incubation Centers as one of the champion projects in enabling environment category at World Summit on the Information Society Prizes 2021.

NIC Startup MyTM Wins Pitching Event at GITEX Future Stars:

- ⦿ 700+ startups took part in the competition in 12 categories in October 2021.
- ⦿ Only 24 startups made it to the final with MyTM being the only Pakistani Fintech Startup to win in the category of Creative Economy.

Following NIC startups/IGNITE projects raised funding in 2021 (Table 17.6):

Startup	Amount (USD)	Vertical	NIC
Digikhata	\$2,000,000	Fintech	NIC Islamabad
Walee	\$2,700,000	Marketing	Ignite Funded Project
Ailaaaj	\$1,600,000	Healthtech	NIC Islamabad
Integry	\$3,000,000	Middleware	NIC Islamabad
Total	\$9,300,000		

People's Development Programs**Digital Pakistan Cyber Security Hackathon 2021**

IGNITE, conducted Pakistan's first nationwide Digital Pakistan Cybersecurity Hackathon 2021, which was aimed in improving cybersecurity readiness, protection, and incident response capabilities of the country by conducting cyber drills at the national level. There were 3 preliminary rounds in Islamabad, Lahore, and Karachi. Teams were competed in five categories including application exploitation, mobile device exploitation, network attacks and exploitation, operating systems exploitation, and speed programming. A total of 1176 teams registered for the hackathon including university students, freelancers, professionals, and hackers from all over the country, out of which 475 teams were shortlisted for qualifier rounds in Karachi, Lahore, and Islamabad followed by the final competition in Islamabad. Cash awards of Rs 6 million were given to the top 3 teams in 5 categories in a grand finale event in Islamabad.

National Grassroots IT Research Initiative (NGIRI)

The program is aimed to promote R&D and Innovation at grassroots level by providing financial support to selected Final Year Projects (FYP) of undergraduate students, enrolled in IT related disciplines of public and private sector institutions. Disbursements

of Rs. 201 million have been made against 3,929 approved FYP. Whereas, disbursements against approved 978 FYPs of NGIRI FY2021 are under process. Program highlights from 2012 to 2022 are summarized in table 17.7.

Table 17.7: National Grassroots IT Research Initiative (NGIRI)

Program Year	Participating Institutes	FYP Submitted	FYP Approved	FYP Funded	Disbursements (Rs. In million)
2011-12	68	785	272	272	15.27
2012-13	78	1,017	418	418	31.78
2013-14	72	1,247	430	430	25.13
2014-15	75	1,324	436	436	29.59
2015-16	76	1,166	512	360	18.14
2017-18	89	1,623	569	439	21.45
2018-19	136	2,124	815	677	30.72
2019-20	156	2,832	1,042	857	29.02
2020-21	159	3,417	1,155	978	In Process
Total	-	15,535	5,649	3,929	201

Source: IGNITE

NGIRI FY2022 has been launched on December 2021 and last date to submit FYP is 2nd May 2022.

Universal Service Fund (USF)

USF programmes can be categorized into two broad categories:

1. **Voice and Highspeed Broadband Data Services:** It focuses on establishment of infrastructure and provision of voice and highspeed broadband data services to the unserved and underserved mauzas across the country. Under different variations of this programme coverage is also being extended on unserved Road segment along National Highways & Motorways and to the tourist locations.
2. **Backhaul Services:** Backhaul services focuses on laying of Optic Fiber Cable up to the unserved Tehsil Headquarters/ Union Councils and major towns and to establish points of connectivity (Nodes) which can be utilized by telecom operators for expansion of their services.

NG-BSD for Tourist Destinations

This new initiative has been launched to provide quality voice and enhanced data services at the underserved tourist destinations thereby enhancing the user experience in these tourist locations. USF is continuously identifying such locations and designing/launching appropriate projects. In FY2022, 2 projects worth ~ Rs. 2 billion have been awarded targeting 27 tourist destinations and 154 Kms of unserved access roads in the districts of Mansehra, Abbotabad, Swat and Upper Dir.

Next Generation BSD Program for National Highways and Motorways:

It is a new program, an evolved form of BSD program that has been launched in current Financial Year. The program targets unserved road segments of the National Highways and Motorways across the country. A continuous assessment of unserved road segments

is being done by USF. As of now, approximately 2,400 Kms of unserved road segments have been identified. A salient feature of this program is National Roaming that facilitates computers to get seamless coverage irrespective of the originally subscribed networks. These will be first of their kind projects to offer this facility in Pakistan. In FY2022, 2 project contracts worth Rs. 295 million have been awarded, targeting 133 Kms of unserved road segments on Motorways M3 & M5. Whereas, USF has completed provision of NG-BSD services along 1757.51 Kms of un/underserved road segments. Rs 6.4 billion have been disbursed in current FY for NG-BSD Projects including NH&MW.

Legislative Measures of ITS

Personal Data Protection Bill

In view of increase in Cyber crimes and growing importance of protection of personal data, the Ministry of IT and Telecom is in the process of finalizing a “Personal Data Protection Bill”. The Bill aims to provide security to all citizens and businesses against breach of data and has been submitted to the Federal Cabinet for approval by virtue of Rules 16(1)(a) and 27 of the Rules of Business, 1973.

Special Communications Organization (SCO)

1. During last 45 years of continued devotion, SCO has been able to extend comprehensive IT services to the people of the harsh terrain of AJ&K and Gilgit Baltistan. During this journey, SCO has always strived to further improve the C&IT eco system. Moreover, quality of C&IT services being extended to the local populace are comparable to those being provided in other parts of the country.
2. SCO extensive footprint has cutting edge innovative solution that has improved network coverage and capacity across different areas of AJK and GB by adopting the following strategy:
 - a. Expansion of 3G/4G cellular services in whole area of responsibility including KKH.
 - b. Compatibility/adaptability with futuristic 4.5/5 G techniques.
 - c. Migration from tradition DSL to Fiber to Home in major cities.
 - d. Setting up of Technical Training Institutes, Technology Parks and Incubation Centers to ensure digital inclusivity of under developed areas.
 - e. Transformation of legacy power systems with Hybrid/green energy system.
 - f. Undertake strategic communication projects like Pak-China connectivity.
 - g. Establishment of regional Data Centers to promote Digital Pakistan Vision.
 - h. Upgradation of transmission network to 100 G Dense Wavelength Division Multiplexing (DWDM) technology.

National Information Technology Board (NITB)

Digital Solution

NITB is committed to providing multi-layered technical support-backup to various federal and provincial departments by transforming them digitally.

Initiative	Injection into Economy
Automation of Cabinet Procedures	52 .0 million per annum.

A centralized portal powered by NITB to automate manual system for Cabinet agenda meetings with digital submission of summaries, agenda compilation and notification to ministries, along with approvals and other details.

Economic Indicators 2020-22

- i) Save 80 percent time and brings transparency by automation of agenda items of business process.

Initiative	Injection into Economy
Islamabad City app	0.70 billion per year approx.

An App developed by NITB ensures online provision of more than 40 government services including registration process of domicile, international driving permit, court cases, excise and taxation, arms license, etc.

Economic Indicators 2020-22

- i) 1.4 billion revenues generated through this app till date.
 ii) Transparency in citizen services.
 iii) Timely delivery of services.
 iv) Savings to exchequer by delivery of service at doorstep.
 v) 51,426 Jobs creation

Initiative	Injection into Economy
National Job Portal	Approx. 8 million saving per annum.

Developed by NITB, National Job Portal provides a centralized job portal for job hunters to have a chance to work with the Government of Pakistan Ministries and its attached department.

Economic Indicators 2020-22:

- i) Single window for all Government Jobs
 ii) 0.33 million registered users.
 iii) Saves exchequers by eliminating paper based apply and evaluation process.

Initiative	Injection into Economy
E-Office	600 million per annum.

An indigenous E-Government ERP/GRP is developed and being implemented in all the 40 federal ministries/divisions along with underlined 140 departments. E-Office is a complete back-office automation suite.

Economic Indicators 2020-22

- i) Up to 25 percent savings on POL
- ii) Up to 70 percent savings on annual stationery cost (approx. 600 million)
- iii) 100 percent Transparent, accountable system with executive dashboard for decision making.
- iv) 80 percent of time savings in process time.
- v) Increase government efficiency.

Initiative	Injection into Economy
Kamyab Jawan	39.4 billion Transparent distribution.

A youth-centric platform that ensures a smooth online process from submission of loan applications to provision of loan grants for the people of Pakistan under Prime Minister's Kamyab Jawan Program.

Economic Indicators 2020-22:

- i) 46.9 billion allocations.
- ii) 39.4 billion loan distribution to create entrepreneurs.
- iii) 5426 Jobs created.

All data publicly available at (<https://kamyabjawan.gov.pk/kjhome/dashboarddetails>).

1. Pass Track

- a) Pass Track app by the NITB, as part of Management for traveler coming over to Pakistan.
- b) It aids in recording and tracking of passengers' basic information. The application comes with scanning option of National Identity Card and Passport of Pakistan.

2. Think-Tank

Think-Tank Portal is developed for National Security Division (NSD), in which NSD will make/finalize national policies or decisions on the basis of data/queries provided to them.

3. SPPC Treaty Portal

SPPC Treaty Portal ID being developed for NSD in which all agreements and treaty with other countries are listed and also their status is shown.

4. FM Portal

FM Portal is a Complaint Management System for foreigners. Foreigners can file their complaints regarding foreign issues in this portal/application and track their status.

5. EAD Portal

EAD Portal is online portal for NGO's in which different NGO's register themselves for one year initially. After registering NGO's will be given a certificate, though they can perform their task and achieve their goals.

6. Bait-Ul-Mal Portal

Bait-Ul-Mal Portal is being developed for Bait-Ul-Mal Headquarter and its regional officers located across the country. The purpose of software/portal is to get registration of students, specially females of backward areas for technical education.

7. Demand Driven Industry Quality and Capacity Enhancement Program

This Project defines the Standards & Policies, Testing & Audit, Training, and Product Certification mechanism for government departments to conceive, plan, design, procure, develop or deploy and implement IT solutions. It will provide an adequate level of confidence that government IT/software RFP complies with minimum quality standards. It will also help local Industry to increase their level of quality and competitiveness to international standards.

8. President Initiative For Cyber Efficient Parliament (PICEP)

The major objectives of PICEP Project are to enhance the institutional capacities of the Parliamentary System including MoPA, Senate, and National Assembly (NA) to perform their functions. This shall be done through the use of IT with the help of the latest tools and technologies. This will also help Parliament to evolve towards a paperless environment with reduced carbon footprints.

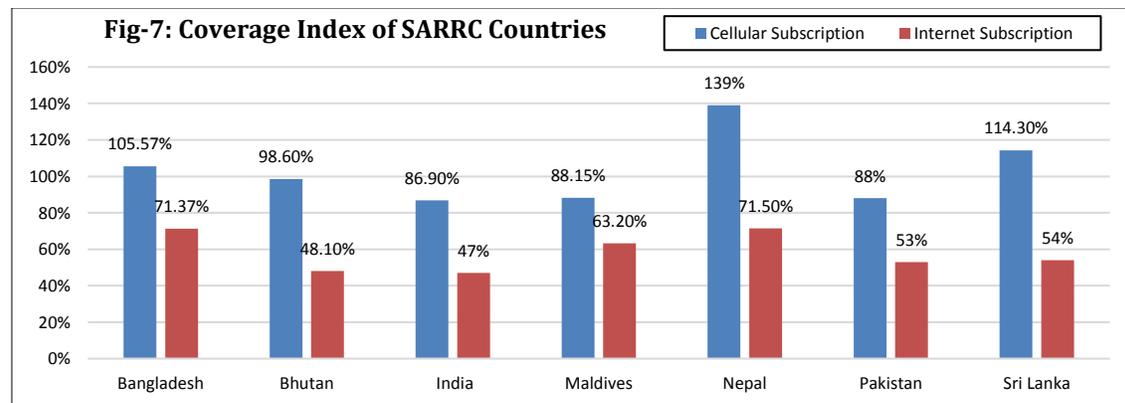
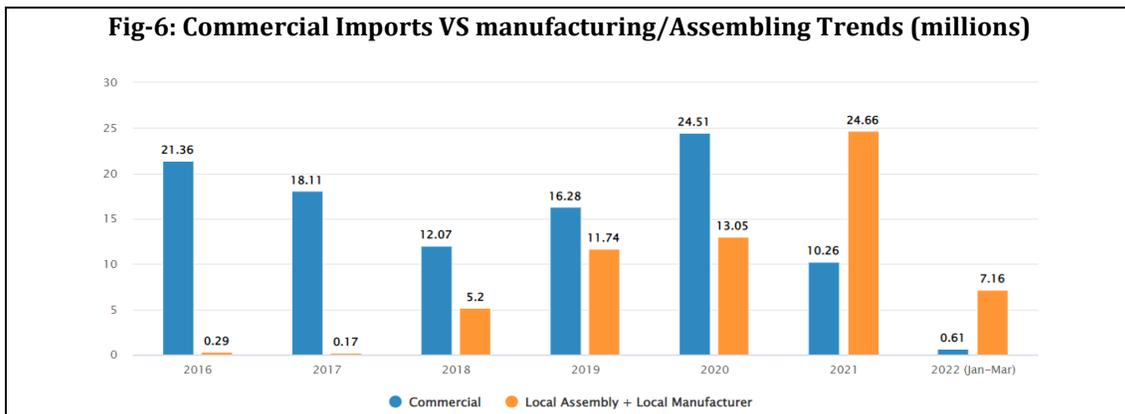
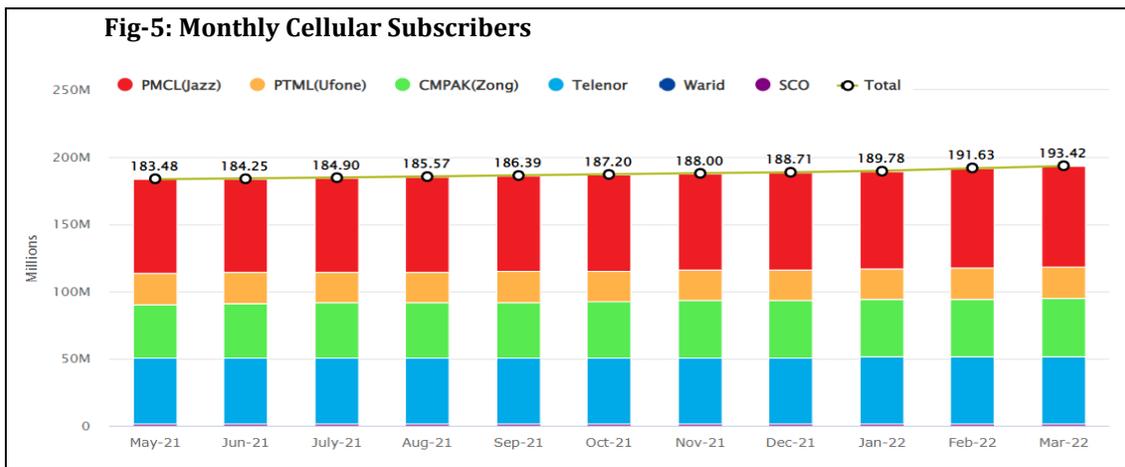
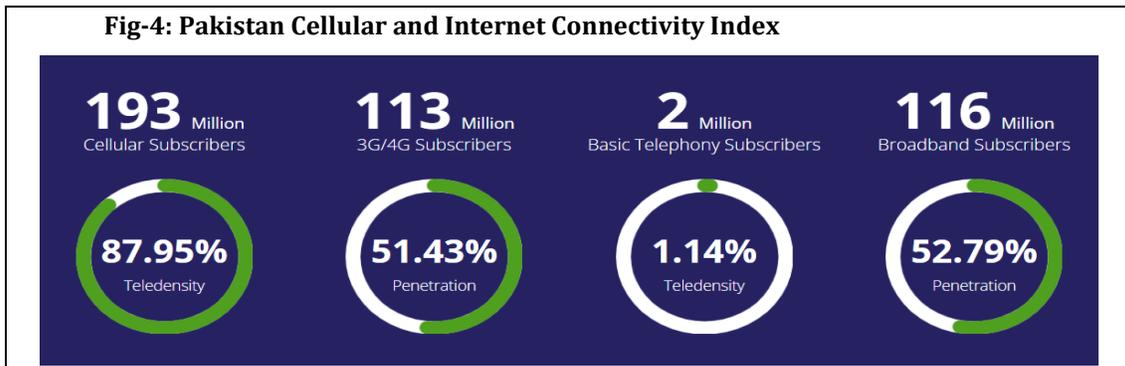
Telecom Sector Performance

The telecommunication sector being the frontrunner for Pakistan's economy over the last couple of years has played a pivotal role in the country's digitalization. International connectivity, bandwidth capacity, fiber footprint, and network redundancies are being improved to meet the ever-increasing demand for telecom and related services. In extending modern telecom services, conscious efforts are made to offer an effective governance and regulatory environment that would safeguard the interests of telecom users, service providers, investors, and the Government of Pakistan (GoP). Highlights of telecom sector performance during the period under review are provided below in Table 17.8.

	2017-18	2018-19	2019-20	2020-21	Jul-Feb FY2022
FDI (inflow)	288.5	235.5	763.3	202.3	107.9
Telecom Investment (Local)	860.8	677.8	1,128.7	1,093.9	822.2
Total	1,149.3	913.3	1,892	1,296.2	930.1

Note: FDI from Jul-21 to Feb-22 and Telecom Local Investment for the period of Jul-Dec 2021.

Source: State Bank of Pakistan, (FDI Inflow)



Telecom Sector Analysis

Telecom sector has emerged as one of the vibrant sector of Pakistan economy. Increasing revenues, growing investment and enhanced contributions to national exchequer are hallmark of the sector for many years now. During July 2018 to March 2022, telecom sector has attracted over \$6.1 billion FDI (inflow) by telecom players in Pakistan. FDI (inflow) in telecom during July to Feb FY2022 were \$107.9 million. Local investments made by telecom operators during July to Dec FY2021 reached to a significant amount of \$ 822.2 million. The main driver behind this investment is the mobile sector which has invested \$605.2 million during the period. In terms of overall investment (FDI & Local) in the telecom sector during July to Feb FY2022 crossed \$930.1million.

Telecom Contribution

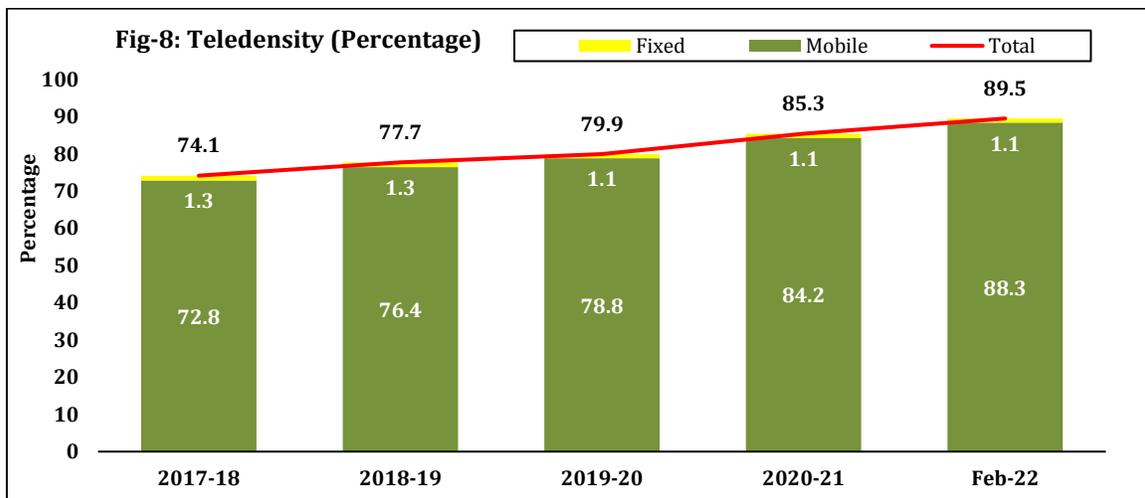
Telecom sector is a significant source of revenue generation for the national exchequer. During July to March FY2022, telecom sector contributed Rs 163.3 billion to the national exchequer in terms of taxes, regulatory fees, initial and annual license fees, activation tax, and other taxes.

Telecom Revenues

Telecom sector revenue during July to March FY2022 recoded at Rs 423 billion.

Teledensity

At the end of Feb 2022, total teledensity in the country reached to 89.5 percent, registering a growth of 3.23 percent during July to Feb FY2022. Cellular mobile segment was the main contributor towards overall growth in teledensity.

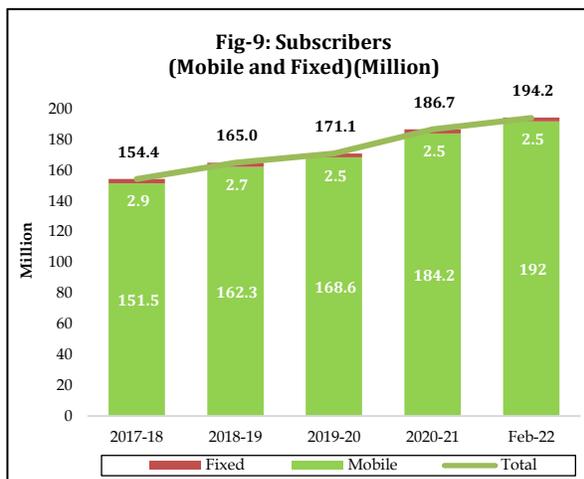


Subscribers

By the end of February 2022, the total number of subscriptions (Mobile and Fixed) in Pakistan reached 194.2 million. Net addition of 6.7 million subscribers has been reported translating into a growth of 3.64 percent during (July-Feb FY2022) which is a healthy sign.

Broadband Subscribers and Penetration

Broadband subscribers (mobile and fixed) have reached at 114.3 million at the end of February, 2022 as compared to 102.7 million in June 2021 which shows that on average, there have been more than 1.45 million subscriptions added to broadband networks per month during Jul to Feb FY2022. More coverage and reduced tariffs will further increase the pace of broadband subscription. The total broadband penetration (fixed and mobile) in Pakistan stood at 52.0 percent in February-2022.



Mobile Data Usage

Data usage by CMOs during July to Feb FY2022 (eight months) reached 5,674 Petabytes which is indicating a huge increase in eight months. In comparison with FY2021, data usage which was 6,855 Petabytes in 12 months.

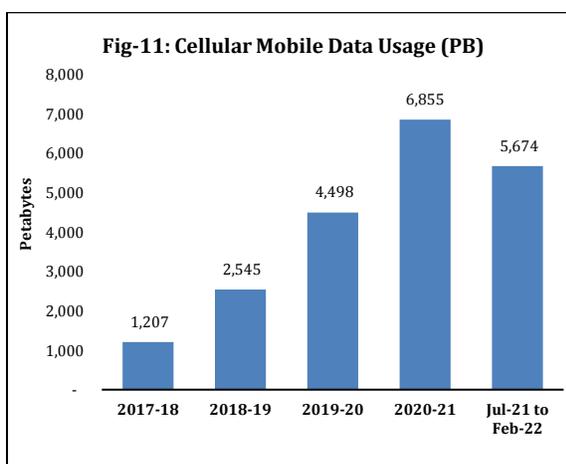
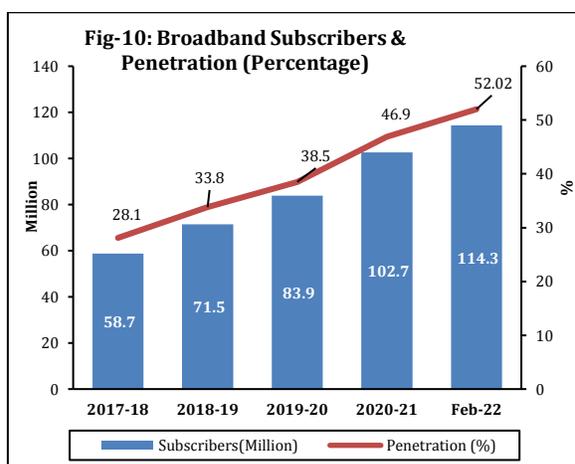


Table 17.9: Mobile Data Usage

(Nos)

Financial Year	Telephones (FLL & WLL)	Broadband Connections (Mobile & Fixed)	Mobile Phones
2014-15	3,931,296	16,885,518	114,658,434
2015-16	3,295,169	40,147,991	133,241,465
2016-17	2,986,310	44,586,733	139,758,116
2017-18	2,884,889	58,339,814	150,238,653
2018-19	2,574,937	71,026,087	161,021,628
2019-20	2,417,195	83,205,589	167,268,871
2020-21	2,540,102	102,699,967	184,249,899
Feb-22	2,540,254	114,341,302	191,625,904

Note: FLL and WLL Subscribers are till Feb-22 and provisional.

Source: PTA

Regulatory Activities

National Broadband Forum

Fiberization plays an important role in a world heading towards broadband technologies. In Pakistan, relatively lower speed of fixed broadband networks is causing staggered growth of broadband subscribers and lower Internet speed. To address this issue, PTA and Huawei Technologies Pakistan jointly organized a national broadband network forum themed 'Broadband for All,' where local and foreign stakeholders shared their insight on transformative technologies and viable solutions to challenges impeding broadband proliferation in Pakistan. In the forum Pakistan's Progress was linked to extensive digitalization of all sectors. The forum was followed by a panel discussion on challenges and issues confronting operators in the expansion of fiber networks across the country. The effectiveness of Fiber to the Home (FTTH) and wireless technologies for spread of broadband were highlighted in relation to different geographical areas. The private sector underlined the importance of Government support as efforts to improve the footprint continue. The broadband network forum was the first of its kind arranged by the regulator, and will now be convened on a regular basis to expedite broadband proliferation in the country.

Spectrum Auction in Pakistan

The process for cellular mobile spectrum auction teed off in September 2020. In accordance with timelines mentioned in the 'Information Memorandum (IM) for the spectrum auction for NGMS in Pakistan 2021', the opening of applications and sealed bid offers from prospective applicants was completed on September 9, 2021. PTML (Ufone) won the auction upon scrutiny of its submitted bid by PTA. Total spectrum won by Ufone is 9 MHz in 1800 MHz band, which is 70.3 percent of the total offered spectrum in the said band during the current auction. This addition will increase Ufone spectrum holdings from 6 MHz to 15 MHz in 1800 MHz band, thereby enhancing quality and increasing its coverage footprint for voice and data services. This auction has generated revenue of US\$ 279 million.

Spectrum Auction in AJ&K and GB

The first-ever cellular spectrum auction for Next Generation Mobile Services (NGMS) in AJ&K and GB successfully concluded at the PTA Headquarters on September 28, 2021. Two operators CMPak (Zong) and PMCL (Jazz) participated in the electronic auction for 1800 MHz band. After 18 rounds, Zong was declared winner of 10 MHz (2 blocks of 5 MHz) in 1800 MHz band against a price of US\$ 14.398 million. The spectrum sold in 1800 MHz band constituted 85 percent of the total offered spectrum in the said band for AJ&K and GB. Furthermore, Telenor, Ufone, and Zong also won 1.2 MHz in 1800 MHz band. Telenor Pakistan was declared winner in 2100 MHz band for a spectrum of 15 MHz against the set base price. The spectrum sold in 2100 MHz band constituted 50 percent of the total offered spectrum in the said band. The total revenue generated from the spectrum auction for AJK & GB stood at over US\$ 30 million. New licenses were issued to CMPak (Zong), Telenor Pakistan, and Pakistan Telecommunications Mobile Limited (PTML; Ufone) for the spectrum secured in the auction process for AJ&K and GB. The award of licenses for NGMS in the two regions will contribute towards strengthening

uninterrupted provision of better telecom services to the people of AJ&K and GB in line with GoP's 'Digital Pakistan' vision.

Mobile Termination Rate

In the review of 2019, Mobile Termination Rate (MTR) were fixed at Rs. 0.70 per minute from January 2020 onwards. Still on the higher side while benchmarking, the 2021 review of the MTR determined the rate to be at Rs. 0.50 for Jan 2022- June 2022, which will be further reduced to Rs. 0.40 for period of July 2022 to June 2023 and will be finally set at Rs. 0.30 from July 2023 onwards. PTA issued determination on above rates of MTR on November 24, 2021 and determined these MTR for Pakistan and AJ&K and GB for all types of calls (i.e. local, long distance and international incoming calls) terminated on mobile networks from other mobile networks or fixed networks.

4G Data Sites in Waziristan

PTA conducted a QoS survey in South Waziristan to check the status of telecom services. CMOs were asked to not only improve their services but also upgrade their 3G data sites. Accordingly, Jazz and Ufone which were providing 3G data services in South Waziristan, upgraded all of their 3G sites to 4G, allowing subscribers to enjoy high-speed data services. PTA is continuously following up with CMOs to install more sites in the area so that better voice and data services can be extended to subscribers in line with the vision of the Prime Minister of Pakistan.

National Telecom Computer Emergency Readiness and Response Team (NTCERT)

In its role as a regulator, PTA has been mandated to establish sector-level cyber security capabilities i.e., the National Telecom Security Operations Center and the National Telecom Computer Emergency Response Team Threat Intelligence Center (NTSOC/NTCERT) to safeguard critical telecom infrastructure and to contribute to combatting cyber security threats at the national level. In line with its legal, regulatory, and official mandate, PTA established sector-specific NTCERT in 2020 for coordination with the industry on cyber security and threat intelligence. To automate the CERT processes, a web portal was established in early 2021 for two-way coordination with the industry. The licensee can utilize this portal to share security information, threat intelligence information, and incident/data breach related information, etc.

Table 17.10: PTA Internal NTCERT Advisories

Year	Q1	Q2	Q3	Q4	Total
2018-19	9	11	9	10	39
2019-20	11	9	10	10	40
2020-21	11	14	12	11	48
2021-22	8	9	8	-	25
Total	39	43	39	31	152

Source: PTA

The following steps have been taken as part of NTCERT functioning so far (Table 17.20).

- As part of local advisory services of Telecom CERT, PTA's cyber security team issued approximately 152 security advisories and more than 160 security alerts to telecom

operators on latest cyber threats and vulnerabilities.

- ◎ The portal's secure access was shared with all licensees. Many telecom operators are currently using the portal for threat intelligence information exchange, security readiness, and compliance.

Device Identification, Registration and Blocking System (DIRBS)

Table 17.11: Commercial Imports Trends

Calendar Year	Commercial Import + Local Manufactured Quantity (million)
2016	21.60
2017	19.80
2018	17.20
2019	28.02
2020	38.06
2021	34.92
2022 (Jan-Mar)	7.76

Source: PTA

Following is the impact of DIRBS on the status of blocked, banned, and barred devices in Pakistan:

- ◎ 29.18 million fake/replica mobile devices blocked.
- ◎ 175,000 International Mobile Equipment Identity(IMEI) devices (reported stolen) banned.
- ◎ 880,780 IMEI devices identified as cloned/duplicated against 5.28 million MSISDN barred on networks.
- ◎ Local manufacturing in 2021 surpassed the finished device import for the 1st time in countries history

Local Assembly and Manufacturing Trends

Table 17.12: Local Assembly and Manufacturing Trends

Calendar Year	Local Manufacturing Quantity (million)	DIRBS Impact	Job Creation (approx)	No. of Companies
2016	0.3		200	3
2017	1.7		600	3
2018	5.2		3000	9
2019	11.7	Increase by 125% from 2018	8000	11
2020	13.1	2.16 Million 4G Smart Phones assembled in Pakistan	600	3
2021	24.7	10.06 Million Smart Phones Manufactured in Pakistan	2,000	30
2022 (Mar)	7.16	2.83 Million 4G smart Phones Manufactured in Pakistan	22,000	30

Source: PTA

DIRBS has created a level playing field for all entities in Pakistan, resulting in establishment of local assembly plants. In view of the successful development of this industry, PTA issued MDM Regulations, 2021, in accordance with the Mobile

Manufacturing Policy issued by GoP in June 2020. The policy offers incentives including tax exemptions, etc., for all entities that establish manufacturing plants in Pakistan.

As many as 30 local and foreign companies both stand alone and joint ventures have obtained 10-year MDM authorization from PTA and have established manufacturing plants for the purpose. Leading brands including Samsung, Xiaomi, Oppo, Vivo, Nokia, Techno, and Infinix, ZTE, among others, have established their plants in Pakistan. Local manufacturing has enabled smart phone manufacturing in Pakistan, created job opportunities in skilled areas, and promoted affordability for consumers. Table 17.12 provides a summary of local manufacturing and its impact on job creation, and reliability of locally manufactured 4G phones.

Complaint Management System

PTA received 165,610 complaints against Mobile, ISPs, Basic Telephony (fixed line) and Wireless Telephony (WLL) during the 9 months period FY 2021-22 with 97.7 percent of the complaints being addressed. Approximately 30 percent of the consumer complaints against CMOs were related to fraudulent Call/SMS reporting.

Service Type	Total Complaints	Addressed Complaints	Redressal/Disposal %
Mobile	158411	154,816	97.73
Internet	3,714	3,637	97.93
FLL	3,344	3,302	98.74
WLL	141	134	95.04
Total	165,610	161,889	97.7

Source: PTA

Pakistan Citizen Portal

Prime Minister of Pakistan inaugurated online mobile Application named Pakistan Citizen Portal (PCP), respond in the specific timeline to address their PM Office is overseeing the progress on the Pakistan Citizen Portal (PCP). PTA is in receipt of complaints through PCP since November 12, 2018. To handle these complaints, a dedicated section is available and working to resolve the complaints from concerned telecom operator/licensee on top priority. Status of complaints is given Table 17.14.

Total Complaints Received	61,066
Total Complaints Resolved/ Addressed	60,123
Redressal/ Disposal %	98.4%
Positive Feedback/ Satisfaction %	60%

Source: PTA

Raids on Illegal Gateways

To curb the menace of grey traffic (illegal call termination), PTA with the support of FIA carried out a number of successful raids across Pakistan. During Jan–Dec FY2021, as many as 08 raids were conducted, leading to confiscation of 18 illegal gateways and

arrest of 02 persons, against whom further proceedings in the court of law are being carried out by FIA.

Conclusion

The latest information system helps a country integrating domestically and globally by enhancing its capacity in the areas of fast internet access, software development, app development, adoption of technological gadgets, and digitization of economy. Modern IT infrastructure is the corner stone for realizing economic development because it improves access to information, connectivity and ameliorate entrepreneurial efficiency and growth.
