Bridging Pakistan's Digital Divide

PRAC POLICY RESEARCH & ADVISORY COUNCIL

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Introduction

Digitalization has become a driving force behind economic growth and innovation worldwide, revolutionizing how industries operate and society's function. The COVID-19 pandemic has accelerated this digitalization trend, significantly increasing the adoption of advanced technologies across the globe. In Pakistan, this shift has sparked a transformation in its digital landscape. Pakistan's largely cash-based and informal economy has begun to show momentum toward digital payments, digital identity integration, and fintech-led financial inclusion. With a population of 241.5 million (Census, 2023) and nearly 67% under the age of 30 (PES, 2025), Pakistan holds a significant demographic potential, which, if leveraged effectively, could propel its digital economy.

However, despite this advantage, the contribution of digital technologies to Pakistan's GDP remains underwhelming, at just 1.5% (Asian Development Bank, 2025), compared to India's 10.5%, reflecting a substantial gap between the country's digital potential and its economic output. This underperformance is compounded by multiple challenges, such as limited internet access, outdated infrastructure, fragmented policy execution, weak coordination, and a cash-based economy, which hinder the growth of key sectors of the economy.
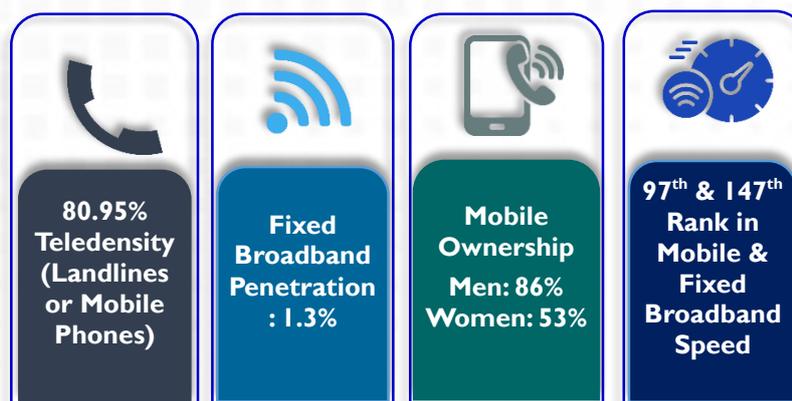
Pakistan's Digital Economy

Rs. **1.5% of GDP**

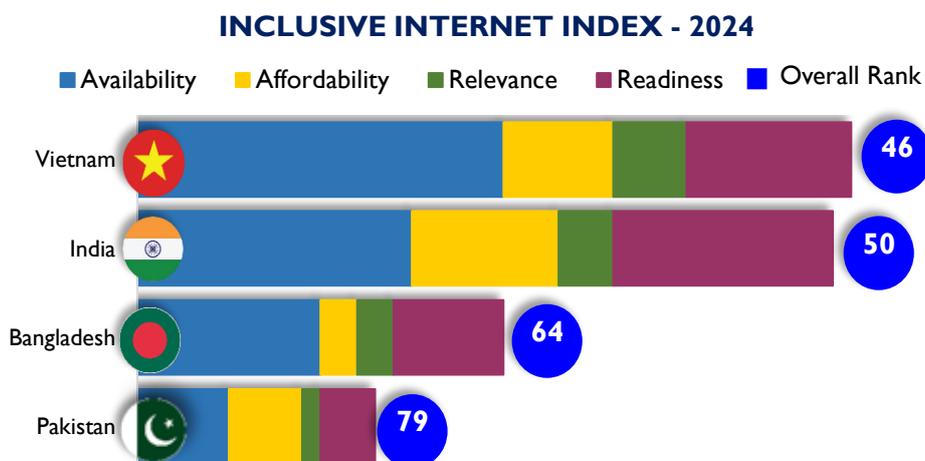*Source: Asian Development Bank 2025*

Internet access and its usage in Pakistan remain limited, with 58.4% total broadband penetration, but only 1.3% fixed broadband penetration, below the South Asian average (2.4%)[11]. Meanwhile, 54.8% of the population has mobile broadband access. The digital landscape in Pakistan also reflects a gender divide in mobile ownership: 86% of men own a mobile phone,

Figure 30: Snapshot of Pakistan's Digital Infrastructure

80.95% Teledensity (Landlines or Mobile Phones)

Fixed Broadband Penetration : 1.3%

Mobile Ownership Men: 86% Women: 53%

97th & 147th Rank in Mobile & Fixed Broadband Speed

Source: Asian Development Bank (2025), Pakistan Telecommunication Authority (PTA) and SpeedTest.net

compared to just 53% of women. The country also ranks 100th globally in broadband speed. According to the UNDP's Digital Development Index (2024), nearly half of Pakistan's districts (60 in total) are categorized as having low digital development, with 38 districts classified as having very low digital development. These indicators highlight not only accessibility issues but also significant gaps in affordability, reliability, and quality of digital services compared to other Asian countries, see figure below.

Figure 31: Inclusive Internet Index: Comparison of Selected Regional Countries

INCLUSIVE INTERNET INDEX - 2024

Availability   Affordability   Relevance   Readiness   Overall Rank

Vietnam — 46
India — 50
Bangladesh — 64
Pakistan — 79

Data Source: United Nations

According to the Karandaaz Financial Inclusion Survey (K-FIS) 2024[12], Pakistan's financial inclusion has risen to 35% (up from 14% in 2017), reflecting modest gains. However, financial literacy remains low, only 22% in 2024, up from 14% in 2017. These statistics are well below the targets set under the National Financial Inclusion Strategy (NFIS) of 75% inclusion by 2028. Pakistan's digitalization drive represents a pivotal structural shift with far-reaching socio-economic implications. Without addressing binding constraints, such as the digital infrastructure deficit, rural-urban disparities, digital gender divide, and low fixed broadband

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[11] Nakhoda, A. (2023). Digital divide: Opportunities for economic growth. The Express Tribune. Available at: https://tribune.com.pk/story/2427626/digital-divide-opportunities-for-economic-growth
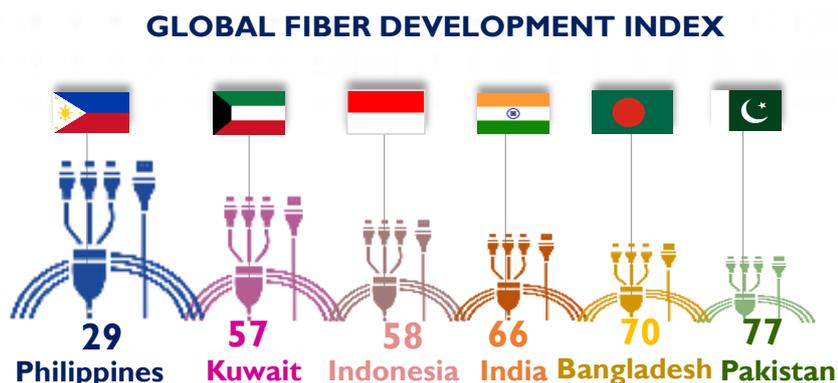[12] Karandaaz Financial Inclusion Survey (K-FIS 2024) Portal. Available at: https://portal.karandaaz.com.pk/category/karandaaz_financial_inclusion_survey_insight/2014

penetration, Pakistan risks deepening existing inequalities rather than leveraging digital transformation as a catalyst for productivity, fiscal strengthening, and inclusive growth.

Priority 1: "Improve Digital Structure and Services to Support a Techno-Economy"

In the current digital era, stable internet access has become a fundamental necessity. However, Pakistan's fiber-optic infrastructure remains underdeveloped, as reflected by its 77th ranking out of 81 countries in the 2024 Global Fiber Development Index (FDI), compared to regional peers like India (66th), Bangladesh (70th), and Indonesia (58th). The national average for internet access in Pakistan is 32.27%, with urban areas at 47.76% and rural areas at 23.32% (UNDP, 2024). This urban-rural divide exists in digital infrastructure, cellular ownership, and even the quality of the internet. In addition to

Figure 32: Pakistan's Ranking on Fiber Development vs Peers

GLOBAL FIBER DEVELOPMENT INDEX

| 29 | 57 | 58 | 66 | 70 | 77 |
| Philippines | Kuwait | Indonesia | India | Bangladesh | Pakistan |

Data Source: OMDIA

these, the digital sector faces various challenges in the development of digital infrastructure, as summarized below:

Slow Policy Response & Spectrum

Pakistan's slow adoption of advanced technologies has delayed transitions from 3G to 5G (initially planned for 2022). This issue is compounded by inefficient 5G spectrum pricing, which is twice the regional benchmark and linked to dollar-based fees, making telecom companies vulnerable to rupee instability. These costs now account for 20% of revenues, putting significant pressure on both the telecom sector and the broader digital economy.[13]

Exorbitant Sectoral Taxes

Telecommunication Sector remains one of the heavily taxed sectors in Pakistan and facing multiple modes of taxation & levies: Federal Taxes (29% Corporate Tax, 10% Super Tax, 15% of base tariff as Advance Tax, 4% Minimum Tax, 2% of revenue in Universal Service Fund (USF), 0.5% of Gross Revenue in Annual License Fees) and Provincial (19.5% Sales Tax on Services[14]). According to GSMA & ADB (2025), Mobile users in Pakistan face a 30-33% combined tax on recharges, increasing consumers' costs and contradicting Pakistan's Digital Economy vision. While most phones in Pakistan are imported, locally produced phones are predominantly low-end 2G devices (38.5%). Since 2022, local production has declined, whereas a promised 3%

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[13] Rana, S. (2025). Auction delay risks $25b IT exports. *The Express Tribune*. Available at:
https://tribune.com.pk/story/2565709/auction-delay-risks-25b-it-exports
[14] Standard Rate is 19.5% in all four provinces. KPK and Balochistan allow lower rates in certain cases; residential broadband is exempt.

R&D allowance for local manufacturers remains unmet. Despite Provinces charging higher taxes than on any other service, they contribute minimally to the development of the digital sector in terms of investment in infrastructure and encouraging digital use (ADB, 2025).

Policy Inconsistency

The telecommunication sector's survival relies on capital-intensive and long-term investment. However, unpredictable tax and regulatory policies hinder this sector's growth, hindering investment particularly in the infrastructure side. This may be a key reason for the ongoing exit of foreign investors such as Telenor Group.

Infrastructure Bottlenecks & Disruptions

Multiple charges and permissions for laying fiber-optic cables (Right-of-Way), along with 5%-15% duties on telecom infrastructure equipment, hinder broadband growth. Flood damage and security disruptions further complicate network development. Despite 97.6% household electricity access, 31.1% receive less than 16 hours daily, with 11% facing 14+ unscheduled outages per week, and 80.8% experiencing 4–14 outages lasting over 2 hours weekly.[15]

Internet Speed & Quality Challenges

Pakistan faces a persistent challenge in internet service quality due to bandwidth limitations. While top nations average speeds over 100 Mbps, Pakistan struggles with 20-30 Mbps, well below the global average of 90-100 Mbps, reports Speedtest.net.[16]

E-Governance in Pakistan: Pakistan ranks 136th in the 2024 UN E-Government Development Index and Category B in the World Bank's Government Tech Maturity Index, behind India's Category A. Despite improving from 153rd in 2020, progress lags behind countries like Bangladesh and Vietnam. To close this gap, Pakistan needs policy reforms to accelerate digital transformation.

Figure 33: Internet Adoption in Pakistan's Government

Data Source: UN E-Government Knowledgebase

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[15] Insights from World Bank's Pakistan Energy Access Survey 2024
[16] The News, (2025). Pakistan's internet monopoly chokes growth: Wispap. *The News*. Available at:
https://www.thenews.com.pk/print/1287460-pakistan-s-internet-monopoly-chokes-growth-wispap

Pakistan has the fifth-largest youth population globally, with significant growth in youth-led businesses driving economic change, though challenges persist. A key issue is the lack of a standardized definition for startups across regulatory bodies. The table below highlights discrepancies in startup criteria, such as FBR considering companies up to 10 years old as startups, while SBP limits it to 5 years. Additionally, turnover limits vary, with some regulations focusing on the tech sector while allowing other sectors under specific conditions.

Table 6: Comparison of Startup Criteria Across Key Regulatory Frameworks in Pakistan

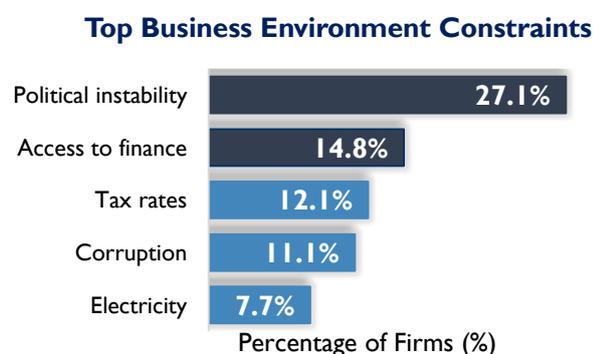|	Companies Act, 2017	Income Tax Ordinance, 2001	State Bank of Pakistan (SBP)
Time Limit	Up to 10 years	Commenced on or after July 1, 2012	Up to 5 years
Turnover Threshold	Less than PKR 500 Mn in each yr since incorporation	Less than PKR 100 Mn in each of the last 5 years	Small: PKR 150 Mn Medium: PKR 150-800 Mn
Other Requirements	Innovative companies with high growth potential	- Focus on tech-driven products/services - Registered with PSEB	
Eligibility for Non-Tech Companies	Applicable to other companies notified by the Commission	Requires Board and Federal Minister approval	

Data Source: Companies Act 2017, Income Tax Ordinance 2001, State Bank of Pakistan
Note: *PSEB = Pakistan Software Export Board, Mn = Million*

Startups in Pakistan struggle to grow due to macroeconomic instability and limited access to finance, with 27.1% and 14.8% of firms citing these as major barriers (see figure on the right). Despite a surge in funding in 2021-2022, the 2023 downturn has pushed startups back to pre-COVID levels due to market unsustainability, though signs of rebound are emerging. Within this challenge, female startups face greater funding challenges than male-led ones, highlighting the need for targeted measures to support women's entrepreneurship.

The Government- initiated Pakistan Startup Fund (PSF), launched in 2024, is a positive step, but it faces criticism for its limited reach and ineffectiveness in attracting venture capital. Local VCs are limited in activity, and liquidity constraints and uncertainty over profit repatriation deter foreign VCs. The PSF often acts as a last-resort investor, contributing only 10%-30% of the total investment from a VC. With formal institutions like banks reluctant to extend credit to high-risk startups, the funding landscape remains ineffective in supporting growth (Ahmad, 2024). Under the Companies Act 2017, Startups are also obligated to follow similar financial reporting and compliance standards, such as audits and disclosures, regardless of their size, causing unnecessary delays in deal closures (Invest2innovate, 2025). The existing 100% tax exemption for the first three years for new IT

Figure 34: Top Challenges cited by Businesses in Pakistan and Startup Funding in Pakistan

Top Business Environment Constraints

Constraint	Percentage
Political instability	27.1%
Access to finance	14.8%
Tax rates	12.1%
Corruption	11.1%
Electricity	7.7%

Percentage of Firms (%)

Data Source: World Bank Enterprise Survey 2022

startups registered with PSEB is a positive step. However, these companies often struggle during their mid-development years and require continued fiscal support, especially during times of economic hardship.

According to the Pakistan Software Export Board (PSEB), 43 Software Parks have been established across major cities in Pakistan[17] to support IT/ITeS companies and expand the country's digital landscape. However, the Karachi IT Park, the largest of its kind, is still in its initial stages,[18] having been approved in 2021. Similarly, the Islamabad IT Park is also under development.[19]

Figure 35: Top Challenges cited by Businesses in Pakistan and Startup Funding in Pakistan

Total Startup Funding in Pakistan ($Million)

2019	2020	2021	2022	2023	2024
$47	$64	$352	$355	$74	$43
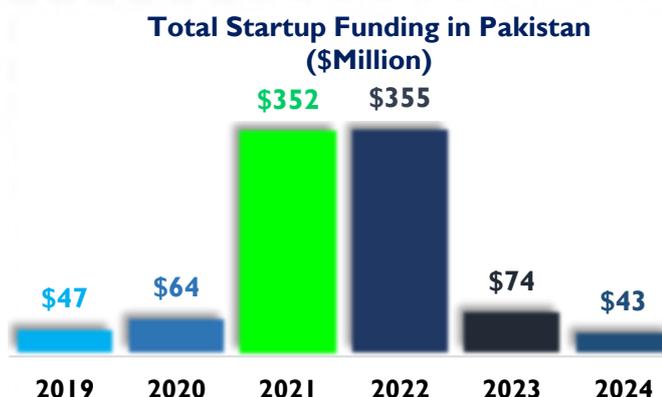
Data Source: Invest2Innovate, Pakistan Startup Ecosystem Report

Priority 3: "Develop Training, Skill Building, and Promote Freelancing"

Pakistan's ICT sector has experienced significant growth in recent years, becoming one of the fastest-growing sectors of the economy.[20] IT services are the largest contributor to total service exports, reaching $3.8 billion in FY25, accounting for 45.4% of total service exports. Following closely are other business services (including legal, management, and technical consulting), which reached $1.7 billion, with a 9.2% year-on-year growth, making up 20.1% of total service exports in FY25.

Payoneer ranks Pakistan as the fourth-largest freelancing country and consistently places it among the top countries for outsourcing.[21] High unemployment and an ailing economy have led to a shortage of full-time jobs, pushing many people to opt for remote and flexible work. While Pakistan's IT sector contributes 3.04% to GDP (PES, 2025), it faces a significant skills gap. The P@SHA Skill Gap Survey 2022 highlights shortages of skilled human resources in software development, cybersecurity, cloud computing, and data analytics. Despite 72,000 annual CS/IT graduates, many lack industry-relevant skills due to weak academia-industry linkages, resulting in only 18.3% securing employment. Graduates also often lack practical soft skills, such as communication, teamwork, and problem-solving, leaving them unprepared for the workforce. The government-initiated DigiSkills and E-rozgar programs are positive steps in equipping individuals with freelancing skills, but their content and courses need regular updates to remain relevant. Freelancers in Pakistan face major challenges due to unethical compensation, delayed payments, and unfulfilled contracts, highlighting the need for strong government support in payment protection and contractual accountability.

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[17] Business Recorder. (2024). Government to establish 10 IT parks by next year: IT Ministry. *Business Recorder*. Available at: https://www.brecorder.com/news/40304707/government-to-establish-10-it-parks-by-next-year-it-ministry.

[18] Ali, K. (2025). National Assembly committee reprimands PTA over slow internet. *DAWN News*. Available at: https://www.dawn.com/news/1955925

[19] The Nation. (2025). 80pc work completed on Islamabad IT Park. *The Nation*. Available at: https://www.nation.com.pk/17-Nov-2025/80pc-work-completed-islamabad-park

[20] Pakistan Telecommunication Authority: Available at: https://www.pta.gov.pk/assets/media/ict-ind-moit-220716.pdf

[21] Top 10 Freelancing Countries by Payoneer. Available at: https://www.payoneer.com/resources/business/top-10-freelancing-countries/
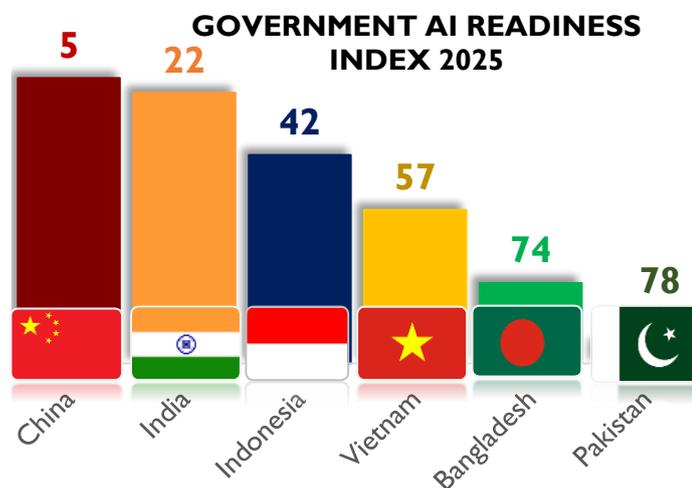
The lack of reliable payment gateways like PayPal remains a major barrier for Pakistani freelancers. This limits their potential in the global market, as they face higher transaction costs through alternative methods.[22] PayPal relies on a large user base and operates on lower margins compared to competitors like Payoneer and Skrill. These low margins, combined with high regulatory costs and stringent customer due diligence, make entry into Pakistan difficult. To operate as an Electronic Money Institution (EMI) under State Bank of Pakistan (SBP) rules, companies must meet high capital requirements and go through a three-stage license approval process, making entry both costly and time-consuming (PIDE, 2021). Despite these challenges, the freelance economy in Pakistan has the potential to significantly contribute to the country's GDP, empower youth and women, and drive the country toward a more diversified digital economy.

Priority 4: "Develop an Artificial Intelligence Framework"

While AI is revolutionizing economies and transforming development globally, countries are working together to develop ethical and legal guidelines for a safe, traceable, and transparent use of the advanced technology. In 2021, the EU developed the world's first AI Law[23] - a risk-based classification framework that can be used in different applications, overseen by people. India has just announced its AI Governance Guidelines 2025, based on seven principles to foster cutting-edge technology in the country.[24] UAE AI Strategy 2031 lists 12 principles to guide companies to deploy AI tools aligned with societal values and regulatory framework (KPMG, 2025). Pakistan is ranked 78th on Oxford Insights' Government AI Readiness Index 2025, lagging behind regional peers such as China (5), India (22), Indonesia (42), Vietnam (57), and Bangladesh (74).

Although Pakistan has launched a National AI Policy in mid-2025, Pakistan's ethical and legal AI framework remains underdeveloped. Though the policy is ambitious in its objectives, it lacks clear direction. Overlapping jurisdictions, such as between HEC and MOITT, are a concern (PIDE, 2025). While the policy identifies priority sectors for AI adoption, no specific measures or projects have been announced. Additionally, weak coordination between provincial IT departments remains a huge concern. Despite some progress, AI education in Pakistan is still not

Figure 36: Pakistan's Ranking on Government AI Readiness Index versus Peers

GOVERNMENT AI READINESS INDEX 2025

China 5, India 22, Indonesia 42, Vietnam 57, Bangladesh 74, Pakistan 78

Data Source: Oxford Insights

formalized in degree programs, though federal and provincial-level certificates and training programs do exist. The UNDP emphasizes that AI's rapid evolution requires global

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[22] Abbasi. W. (2025). Pakistan's IT start-ups, freelancers struggle with payment barriers despite record exports. Arab News. Available at: https://www.arabnews.com/node/2623262/pakistan

[23] European Parliament. (2025). EU AI Act: first regulation on artificial intelligence. Available at: https://www.europarl.europa.eu/topics/en/article/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence

[24] AI Data & Analytics Network. (2025). India unveils new AI governance guidelines to encourage responsible adoption. Available at: https://www.aidataanalytics.network/data-science-ai/news-trends/india-unveils-new-ai-governance-guidelines-to-encourage-responsible-adoption

cooperation on governance norms to ensure equitable benefits. Many initiatives, such as the National AI Council and the National AI Fund, are still under development.

Priority 5: "Enhance Cybersecurity Capabilities"

Developing countries like Pakistan face mounting cybersecurity challenges that directly affect national security, economic stability, financial markets, and social well-being. With digital assets, including databases, networks, software, hardware, and intellectual property, becoming central to both public and private operations, the risks of ransomware, data breaches, cyber-espionage, and service disruptions have grown significantly. While Pakistan has laid the groundwork through its National Cyber Security Policy 2021, Pakistan Cyber Emergency Response Team (PKCERT), and related Acts, its cybersecurity landscape remains fragmented across multiple agencies, and limited inter-agency cooperation. The establishment of a Cybersecurity Authority and the Cybersecurity Act are in progress, but implementation of the Cybersecurity Policy remains a key challenge (Kashan *et al.*, 2022).

While the ITU Global Cybersecurity Index 2024 ranks Pakistan within its Top Tier (Tier-I: Role-Modelling) with a score between 95-100, it still lags in technical and cooperation pillars (see figure below). Pakistan saw a 17% increase in cyberattacks in 2023[25] and a 35% rise in cybercrimes in 2025[26]. While the Cybersecurity Act and Cybersecurity Authority are in development, Pakistan's cybersecurity infrastructure remains underdeveloped, particularly with emerging technologies like AI and IoT, and a shortage of skilled cybersecurity experts.

Figure 37: Pakistan's Standing on Global Cyber Security Index
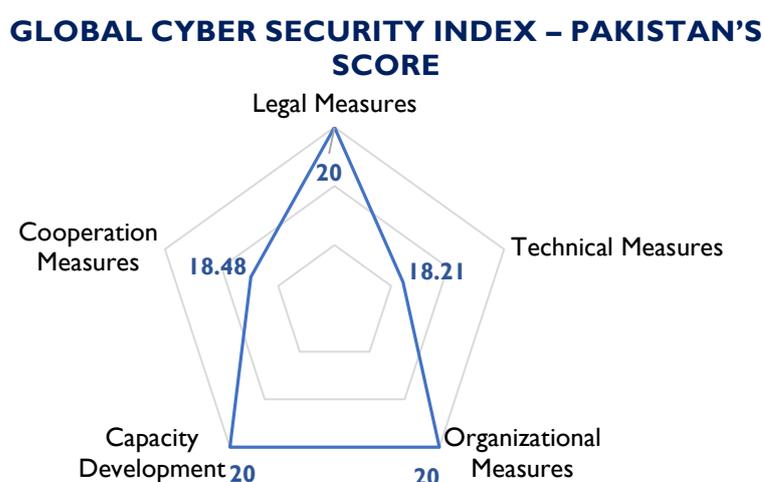
Data Source: International Telecommunication Union (ITU)

With the State Bank of Pakistan (SBP) planning to regulate cryptocurrencies, strengthening cybersecurity infrastructure and cooperation is critical for Pakistan's future. However, without cohesive regulatory efforts and skilled professionals, achieving comprehensive protection

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[25] Rizvi, J. (2024). Pakistan sees 17pc rise in cyberattacks in 2023, but still low in region: Kaspersky. *The News.* Available at: https://www.thenews.com.pk/print/1159347-pakistan-sees-17pc-rise-in-cyberattacks-in-2023-but-still-low-in-region-kaspersky.
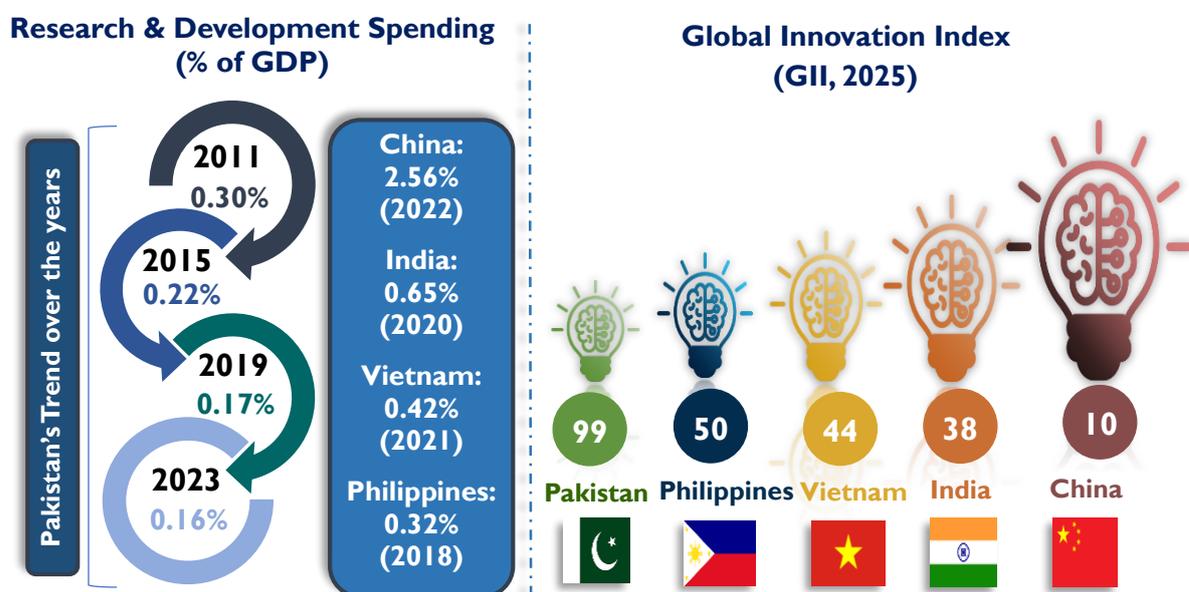
[26] Hussain. B. (2025). Cybercrime surges 35% in Pakistan in 2025 amid govt's push for cryptocurrency legalization. *Business Recorder.* Available at: https://www.brecorder.com/news/40388687/cybercrime-surges-35-in-pakistan-in-2025-amid-govts-push-for-cryptocurrency-legalisation

remains a pressing concern. The National Cybersecurity Policy was due for review every three years, but the delay has left it outdated amid evolving cyber threats.

Priority 6: "Reorient Science, Technology, and Engineering to the Economy"

Pakistan's position in the Global Innovation Index (2025) highlights its slow progress in fostering innovation compared to regional competitors. Ranked 99th globally, Pakistan has seen a decline in its innovation score over the years: 88th (2023), 91st (2024), and now 99th (2025). In contrast, countries like China (ranked 10th), India (38th), and Vietnam (44th) have made significant strides, reflecting their stronger emphasis on Science, Technology, and Innovation (STI) policies. Pakistan's innovation landscape remains underdeveloped in comparison to its neighbors. India's rapid technological advancements and China's leading position in innovation underscore the need for Pakistan to revamp its R&D strategies, invest in education, and encourage academia-industry linkages.

Figure 38: R&D Spending as % of GDP & Pakistan's Standing on GII

Research & Development Spending (% of GDP)

Pakistan's Trend over the years

- **2011** 0.30%
- **2015** 0.22%
- **2019** 0.17%
- **2023** 0.16%

China: 2.56% (2022)
India: 0.65% (2020)
Vietnam: 0.42% (2021)
Philippines: 0.32% (2018)

Global Innovation Index (GII, 2025)

- 99 Pakistan
- 50 Philippines
- 44 Vietnam
- 38 India
- 10 China

Data Source: World Bank and World Intellectual Property Organization (WIPO)
(Recognized by the UN as a guiding reference for Science, Technology and Innovation Policies)

This stagnation is mirrored in the country's declining R&D spending, which has decreased from 0.30% of GDP in 2011 to just 0.16% in 2023. This downward trend is concerning for Pakistan, as it risks hindering the country's ability to develop cutting-edge technologies, drive industrial innovation, and improve global competitiveness. The lack of adequate funding for R&D could undermine efforts in critical sectors, where innovation is essential to address national challenges and improve living standards.

Priority 1: "Improve Digital Structure and Services to Support a Techno-Economy"

- **Expand Digital Infrastructure:** Expand ICT infrastructure, particularly in rural areas, through fiber optic networks by providing incentives in unserved and underserved areas. Strengthen public-private partnerships to improve international gateways and foster competition. Streamline financial and regulatory Right of Way barriers to enhance digital infrastructure and ensure internet reliability.

- **Expedite Spectrum Auctions & Rationalize Taxation:** Expedite spectrum auctions to prevent further economic losses. Develop a rationalized spectrum policy with reasonable costs, delink fees from the dollar, and streamline interest payments. Rationalize telecom sector taxes, duties on mobile recharges, and infrastructure equipment to improve digital affordability.

- **Provincial Contribution & Quality Assurance:** Ensure provincial governments actively contribute to developing digital infrastructure and promoting the digital economy by offering subsidized digital services in schools and educational institutions. Incentivize adoption of Minimum Broadband Speed Standards to match global benchmarks within a phased timeline (e.g., 2–3 years).

- **Modernize Public Sector Functions:** Integrate digital technologies at all government levels to improve efficiency, transparency, and service delivery. This will streamline operations, reduce administrative bottlenecks, and enhance citizen engagement.

Priority 2: "Develop Startup and Funding Ecosystem"

Facilitate Startup Growth

Harmonize startup definitions across all regulatory bodies including SBP and FBR, simplify early-stage reporting requirements, and provide subsidized financial, legal, and IP support to enhance the growth of startups.

Incentives for IT Exporters

Introduce a 5-year tax holiday or reduced tax rates for the 4th and 5th years of operation. Provide a 5% cash incentive for IT exporters to boost the sector's growth and competitiveness.

Accelerate IT Park Development:

Expedite the establishment of IT parks to support the growth of the IT sector, aiming to raise IT exports to US$10 billion over the next 10 years.

Support Female Entrepreneurs

Encourage banks to provide funding specifically to female-led startups, addressing gender disparities and promoting inclusivity in the entrepreneurial ecosystem.

Priority 3: "Develop Training, Skill Building, and Promote Freelancing"

- **Mandate IT/Digital Literacy in Educational Institutions:** Integrate mandatory IT and digital literacy courses into all educational levels and update outdated computer/IT

syllabi in primary education to include advanced IT subjects. This will equip students with the necessary tech skills for the future workforce at all educational levels. Additionally, offer scholarships for women pursuing studies in IT, engineering, and other technology-related fields to encourage gender equality in the digital workforce.

- **Tax Incentives for IT Training & Research Investments:** Provide tax incentives for companies that invest in IT training programs and technology research, incentivizing private sector engagement in building a skilled workforce.

- **Expand Vocational Courses in Emerging Fields:** Introduce more vocational training in areas like software development, IoT, cybersecurity, data analytics, AI Tools, Cloud Computing, Big Data, and blockchain to remain competitive in the global digital economy.

- **Introduce Legislation for Freelancer Rights:** Introduce legislation for Freelancer Rights to guarantee social security benefits, and Contract enforcement mechanisms (via PSEB or provincial IT boards), extend incentives to other business services such as legal consultancy and other business services.

- **Simplify Regulatory Framework for International Payment Gateways:** Streamline regulations for international payment gateways, such as PayPal, making it easier for businesses and freelancers to conduct cross-border transactions.

- **Link Bonuses/Research Grants to Faculty-Industry Partnerships:** Tie bonuses and research grants to faculty-industry collaborations, encouraging academic researchers to focus on practical, market-relevant research.

Priority 4: "Develop an Artificial Intelligence Framework"

- **AI Framework Guidelines:** Develop an AI – Ethical Framework, aligned with global practices, to promote transparency accountability, and fairness across industries, social media, and academia.

- **AI Adoption into Education:** Update curricula to integrate AI and advanced technologies across all disciplines. Introduce AI and related fields as core subjects or degree programs in universities, ensuring students are equipped with the skills needed for the future workforce.

- **Adopt AI in Public Sector Governance:** Leverage AI for planning, budgeting, real-time monitoring, and data-driven decisions in government systems.

Priority 5: "Enhance Cybersecurity Capabilities"

- **Upgrade PakCERT:** Expedite the formation of a national cybersecurity body to strengthen coordination among departments and provide a unified national response framework.

- **Align Regulations:** Align cybersecurity regulations with FATF, IMF, and IOSCO standards, join international alliances like APCERT, and establish a framework for inter-agency coordination.

- **Develop Cybersecurity Expertise:** Train officials, build cybersecurity skills, foster public-private partnerships (PPPs), and enhance global collaboration.

Priority 6: "Reorient Science, Technology, and Engineering to the Economy"

- **Prioritize Key Economic Sectors:** Enhance research and development funding as % of GDP and focus R&D funding on priority areas such agro-processing, clean energy, healthtech, ICT, and manufacturing.

- **Government-Supported Pilot Projects:** Launch government-backed pilot projects in key sectors and leverage the Export Development Fund to provide subsidies and research-based grants, fostering innovation and growth.

- **Integrate Science, Technology, and Innovation (STI) into Industries:** Establish innovation hubs, foster public-private partnerships, and develop a comprehensive Industry 4.0 adoption plan in collaboration with provincial governments to drive technological advancement and industrial growth.

TARGETS/ OBJECTIVES	CURRENT STATUS	CRITIQUE/ GAP
DIGITAL PAKISTAN POLICY 2018		
• Promote ICT across all sectors. •	• Digital Economy: 1.5% of GDP. • Financial Inclusion stands at 35% (2024), up from 14% (2017).	• Lack of clear roadmaps, time-lines, & resource commitments. • Overlapping governance bodies and insufficient infrastructure focus, particularly on internet speed and bandwidth availability. • Negligible role of provinces in digitalization.
• Boost IT exports & remittances.	• 81% Growth in ICT Exports & 30.0% Growth in Remittances	
• Establish IT Parks and enhance digital literacy.	• 43 Software Parks have been established. • Karachi and Islamabad IT Parks are still underdevelopment.	
• Advance e-Governance at all levels.	• E-Government Development Index (EGDI, 2024): Pakistan (136), Bangladesh (100), India (97), the Philippines (73), Vietnam (71), & China (35).	
• Improve Pak's ICT ranking.	• ICT Development Index Ranking 2024: Pakistan (137), India (133), Bangladesh (129), Vietnam (72).	
NATIONAL SCIENCE, TECHNOLOGY & INNOVATION (NSTI) POLICY 2022		
• Set up the Monitoring Unit, the Steering Committee, & implementation plan.	• No official committees/ plan exists.	• Lacks a unified roadmap or monitoring framework. • No linkage to Industry 4.0. • Limited private sector engagement.
• Promote startups, technology transfer & Strengthen research funding agencies.	• Innovation & Startup Funds established, but HEC's PSDP Funding has been cut: Rs 60Bn (FY24), Rs. 39 Bn (FY26). • Venture Capital: $355M (2022), dropping to $43Mn (2024) & $73.2 Mn (till Q32025).	
• Strengthen national STI governance and coordination b/w federal, provincial, and sectoral institutions.	• Global Innovation Index: Pakistan ranked at 88th (2023), 91st (2024), and now 99th (2025).	
CYBER SECURITY POLICY 2021		
• Establish NCERT to coordinate cybersecurity efforts & strengthen cybercrime laws and regulations.	• Fragmented Wings under Different Ministries.	• Coordination among different departments is missing. • Lack of Clear & Concrete Implementation Strategies. • Periodic commitment to review the draft has not been made yet.
• Build public–private partnerships.	• GCI Ranking (Tier –I: 40 Countries): Among countries with 95-100 score (2024); weak in Technical & Cooperation.	
• Develop a cybersecurity workforce.	• National Center for Cyber Security (NCCS) Cybercrime Investigation Agency (NCCIA) &	

TARGETS/ OBJECTIVES	CURRENT STATUS	CRITIQUE/ GAP
	were established in 2018 and 2024, respectively.	
• Raise cyber awareness & drive R&D-based solutions.	• Low awareness among people, especially in rural areas.	
NATIONAL AI POLICY 2025		
• Formulate an AI Ethical Framework aligned with the UN.	• No National AI Council established yet.	• The absence of an ethical framework for AI results in a lack of a comprehensive structure to guide its implementation effectively
• Establish the National AI Council to oversee implementation.	• National AI Fund (NAIF) proposed, yet not established.	• The absence of a robust framework limits fairness, transparency, and accountability in AI systems.
• Train 1Mn AI Graduates (by 2027), 5+ National AI Centers (during 2026-28); 2000 Patents in AI-led Projects (by 2026).	• Less than 10% of the workforce is skilled in AI. • No current programs for the public sector awareness of AI.	

NCERT = National Cyber Emergency Response Team, GCI = Global Cyber Security Index

Sources: ADB's Report (2025) titled "Pakistan's Digital Ecosystem", Karandaaz Financial Inclusion Survey 2024, State Bank of Pakistan, UN E-Government Knowledgebase, Business Recorder (2024), ITU's ICT Development Index.

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