Poverty Alleviation Through Information and Communication Technology

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Abstract:

The Information and Communication Technology (ICT) sector plays a pivotal role in driving socio-economic development in Pakistan, aligning with the goals of Vision 2025 and the Digital Pakistan Policy 2018. ICT encompasses a broad range of technologies that facilitate information dissemination, critical to economic competitiveness and poverty alleviation. Pakistan's ICT industry has shown remarkable growth, with exports surpassing US $3.5 billion in recent years. However, challenges such as policy fragmentation, digital skill gaps, high service costs, and limited inclusion of marginalized groups persist. Strategic reforms—ranging from digital connectivity expansion, skills development, public-private partnerships, and tax rationalization—are recommended to harness ICT's full potential. By addressing systemic barriers and fostering inclusive growth, ICT can serve as a transformative tool for poverty reduction, innovation, and global market integration, especially for Pakistan's predominantly young population.

Key words: *CT Development, Digital Inclusion, Poverty Alleviation, Pakistan Vision 2025, ICT Policy Reform*

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Introduction

Information and Communication Technology (ICT) commonly refers to newer technologies such as computers, the internet, and phones. It is also believed to incorporate media such as radio, television, and libraries due to their role in the transmission of information. The Information Society represents an era in which productivity and competitiveness for firms, regions, and countries depend more than ever on information. The creation, processing, and dissemination of information are the most significant economic activities in today's global economy. In his works of 1969, Peter Drucker identified knowledge as the foundation of the modern economy and noted a shift from a goods-based economy to a knowledge-based one. ICTs have been the leading enabler of this transformation. In accordance with Pakistan Vision 2025 and the Digital Policy of Pakistan 2018, the ICT industry is targeted to reach a size of $20 billion by 2025. Pakistan's ICT sector is one of the fastest-growing sectors of the economy. According to the State Bank of Pakistan, during the fiscal year 2020–21, Pakistan's IT exports increased by 47.4% and crossed the US $2 billion milestone for the first time in the country's history, compared to US $1.44 billion in the fiscal year 2019–20. IT exports further grew from US $2.1 billion to approximately US $3.5 billion in the last fiscal year. The IT industry in Pakistan is burgeoning, and the government is taking proactive steps for its continued growth. These steps include increasing the number of IT graduates from 25,000 to 50,000, establishing software technology parks in large and second-tier cities, improving access to capital for IT companies, reducing tax disputes, enhancing financial structures, and facilitating the listing of IT firms on the stock exchange.

Statement of the Problem

Pakistan introduced its first 'Digital Pakistan Policy' in 2018, aimed at bolstering the IT industry by building a digital ecosystem. Further advancing this agenda, the 'Digital Pakistan Vision' was launched in December 2019 to enhance connectivity, improve digital infrastructure, increase investment in digital skills, and promote innovation and technical entrepreneurship. However, ICT is still in a developmental phase in Pakistan. Total revenue from the sector remains at only US $3.5 billion—much lower than anticipated and below the industry's potential. As the World Bank and the UN aim to end extreme poverty by 2030 and boost shared prosperity, critical questions arise:

Can ICT contribute meaningfully to these goals? Where is the supporting evidence? How can we systematically address challenges and opportunities? What is needed to realize ICT's full potential? Given Pakistan's high poverty index, a comprehensive analysis of the ICT sector's performance is essential to evaluate policy gaps and recommend optimal strategies based on regional best practices.

Scope

This study aims to analyze the Information and Communication Technology policy framework in Pakistan and evaluate its impact on poverty alleviation. The study will also examine international best practices and devise a strategy to tap into the vast potential of ICT for the socio-economic upliftment of underprivileged populations in Pakistan.

Literature Review

Pakistan has developed modern information systems that support both domestic and global integration by enhancing capabilities in high-speed internet access, software development, application creation, and the digitization of the economy. A modern IT infrastructure is a cornerstone of economic development, as it improves information access, connectivity, and entrepreneurial efficiency and growth.

The World Bank (WB) has estimated that poverty in Pakistan increased from 4.4% to 5.4%, with over 2 million people falling below the poverty line. The poverty rate stood at 39.3% in 2020–21, projected to remain at 39.2% in 2021–22 and possibly decline to 37.9% by 2022–23. Additionally, 40% of households faced moderate to severe food insecurity.

Pakistan's economy has grown slowly over the past two decades. Annual per capita growth has averaged only 2%, which is less than half the South Asian average, due in part to inconsistent macroeconomic policies and underutilization of investment and exports to drive growth. Although output growth is expected to recover gradually, sectors employing the poorest, such as agriculture, are likely to remain weak, meaning poverty may stay high. The future is digital. ICT can become a powerful tool for poverty alleviation and help society transition to sustainable consumption patterns. To realize this potential, the government and its development partners—including aid agencies, local businesses, and civil society—must make ICT a key part of broader, smarter strategies to eradicate poverty and promote equitable and sustainable development. Pakistan has outlined comprehensive policy frameworks, such as the Digital Pakistan Policy 2018, Digital Pakistan Vision 2019, and National Science, Technology, and Innovation Policy 2021 (Awan, Shafique, Ahmad, & Bashir, 2022).

While these documents provide a clear roadmap, like many policy initiatives, they suffer from poor implementation due to various challenges discussed in this paper.

Research Methodology

For this study, qualitative research methods have been adopted, relying mainly on secondary data. The research team visited the Khyber Pakhtunkhwa Information Technology Board (KP ITB) and interviewed Dr. Ali Muhammad (Managing Director) and Mr. Shakir Ullah Khan (Director of Operations). Visits were also made to the National Incubation Centre, KP, where Mr. Asim Ishaq Khan (Project Director) was interviewed. Additional interviews were conducted with Ms. Tania Aidrus, former head of the PM's Digital Pakistan Initiative, and Mr. Mir Anwar, Director General (Technical) at BISP, Islamabad. Secondary data were collected from online books, journals, reports, and other internet sources. Analyses—including SWOT, situational, legal, institutional, impact, and gap analysis—of ICT policy formulation and implementation were carried out. Recommendations have been framed based on a Logical Framework provided at the end of the report.

Organization of the Report

This study is divided into five sections. The introduction is followed by the statement of the problem, scope of the study, and literature review.

- **Section I** explains the linkage between ICT and poverty alleviation and conducts a situational analysis of government policy initiatives for economic digitization.
- **Section II** analyzes the institutional and legal aspects of job and economic digitization by public and private sectors and compares ICT initiatives across the four provinces.
- **Section III** presents a gap and impact analysis of policy initiatives hindering ICT sector growth.
- **Section IV** outlines regional and international best practices and lessons learned.
- **Section V** proposes practical recommendations for poverty alleviation and economic revitalization through technological interventions.

Linkage between ICT and Poverty Alleviation and Situation Analysis

The World Bank defines extreme poverty as living on less than US $1.90 per day and estimates that 9.2% of the world's population lives in poverty. In contrast, the United Nations defines poverty as the denial of choices and opportunities, a lack of basic capacity to participate effectively in society—not having enough to feed and clothe a family, no access to schools or clinics, no land to grow food or a job to earn a living, and no access to credit.

In Pakistan, the Planning Commission estimates poverty based on the Cost of Basic Needs (CBN) approach, setting the poverty line at Rs. 3,757.85 per adult equivalent per month. According to this methodology, 21.9% of the population lived below the poverty line in FY2019, compared to 24.3% in FY2016, based on the latest Household Integrated Economic Survey 2018–19. Poverty has declined in both rural and urban areas, with a poverty headcount of 11.0% in urban areas and 28.2% in rural areas (Pakistan Economic Survey, 2021–22).

The World Summit on the Information Society (WSIS), held in Geneva (2003) and Tunis (2005), along with the Copenhagen Declaration and the Tunis Commitment, recognized ICTs as key tools in eradicating poverty and unemployment. They emphasized the importance of building a people-centered, inclusive, and development-oriented Information Society—where everyone can create, access, utilize, and share information and knowledge—empowering individuals, communities, and nations to reach their full potential, promote sustainable development, and improve quality of life (UNDESA).

ICT components—including radio, television, telephone, computers, mobile phones, and the internet—play a vital role in poverty eradication. Cost savings and speed are among the primary benefits of ICTs. For instance, sending 10,000 pages of text from Mozambique to the U.S. via email yields 83% annual savings compared to using fax (Kenny, 2002).

While studying the linkage between ICTs and poverty alleviation, the main propositions are that "information leads to resources; information leads to opportunities that generate resources; access to information leads to access to resources; and access to information leads to access to opportunities that generate resources. In an Information Society, the information-poor have also become the resource-poor." (Flor, 2001)

The "technological paradigm" of poverty is most relevant to this study. It states that the primary cause of poverty is the lack of technological know-how in the developing world. Its premise is based on the observation that Western nations are wealthy because they employ modern technology in agriculture, industry, transportation, telecommunications, and health. It also argues that the developing world can solve many of its problems by adopting new technologies.

ICT can be applied to various sectors of poverty alleviation. Satellites and drones can provide essential agronomic information to farmers, improving yields and boosting incomes. Mobile supply chain platforms can help companies conduct business with thousands of farmers across wide areas while providing them with agronomic advice and other information that can improve crop quality. Many applications also provide market pricing information, helping farmers sell their crops at higher prices, thereby improving their incomes and livelihoods. Entrepreneurs in remote and hard-to-reach locations can use e-learning platforms to access training and business advisory services. Smart contracts based on blockchain/Distributed Ledger Technology (DLT) can be useful tools in developing countries, serving as immutable, distributed (no single point of failure) digital ledgers for transactions and contract information. Mobile banking offers the poor access to financial services without transaction costs and without needing a traditional, physical bank.

Cell phones provide access to medical information otherwise unavailable to impoverished populations. A recent Ghanaian project, for instance, targets pregnant women who lack access to information on healthy fetal development. Mothers receive weekly, automated messages on inexpensive mobile phones, designed to counter superstition and pregnancy-related myths (Balgobin & Dubus, 2022).

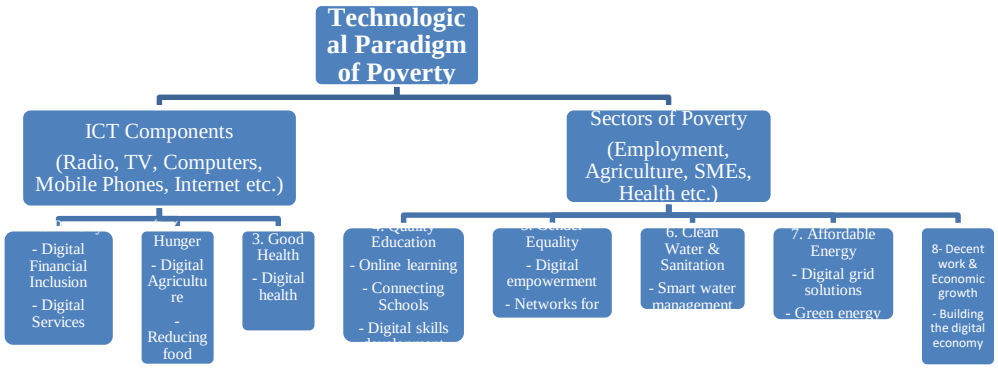
Many children, especially disadvantaged girls in rural areas, have limited access to education. Furthermore, the schools available often struggle with poor-quality teachers and limited resources. However, new technology—such as solar-powered computers and projectors—allows students to participate in real-time, interactive lessons with quality educators. Ghana recently launched its first interactive distance learning project, Making Ghanaian Girls Great!, with support from the British Department for International Development, as reported by Ghana Web. This program uses new technologies to provide educational access that was previously impossible.

Natural disasters such as tsunamis and earthquakes disproportionately affect the rural poor, who are often unaware of imminent danger. Mobile phones can be used to alert them of impending disasters, giving them time to reach

safety. Bangladesh, one of the country's most at risk for natural disasters, has implemented a mobile alert system to save lives.

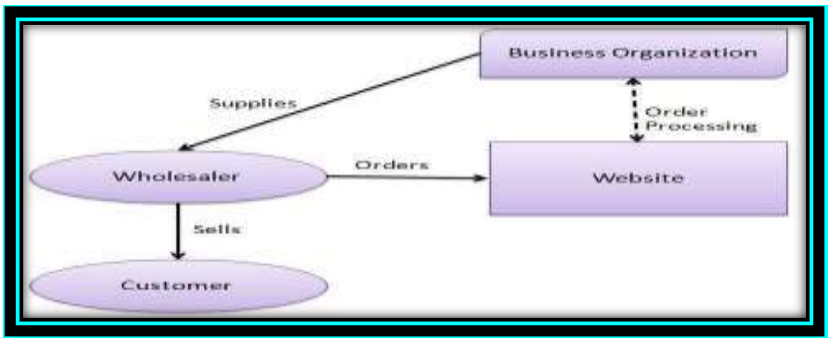
Access to energy enables people to work their way out of poverty, pursue education, and improve their health. New technologies such as solar and hydro power can provide energy access without the need for costly power plants. Even simple innovations—like fireless cookers that use stored heat—can save poor households both time and money.

The first use of ICT for rural development was the World Bank's Communication Technology for Rural Education (CTRE) Project, which began in 1975. It utilized a network of community radio stations based in state colleges and universities in the Philippines to support rural education (Lechman & Popowska, 2022). For governments, the most important application of ICTs in poverty alleviation is data. Poverty data can be collected, processed, and analyzed using various ICT tools. The most effective linkage between ICTs and poverty is Poverty Mapping, which utilizes GIS to geographically identify impoverished areas, enabling policymakers and decision-makers to direct spending more effectively.

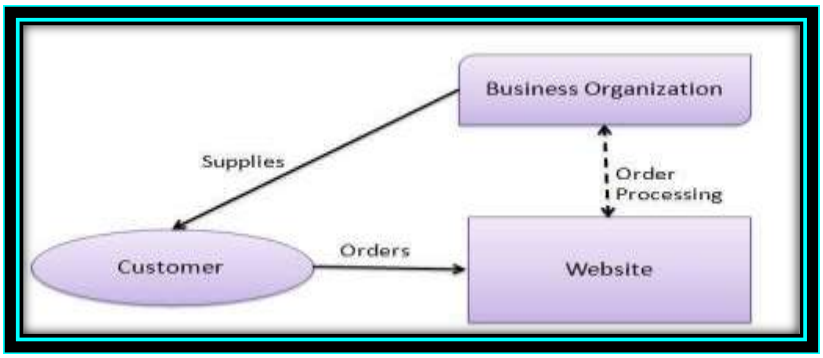


E-commerce business models can generally be categorized into the following categories:

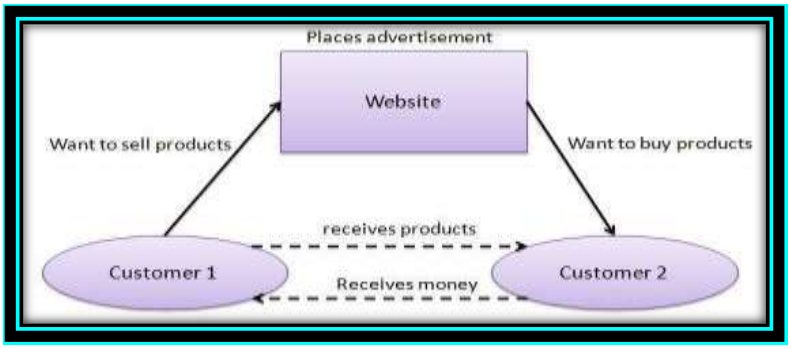
i. Business - to - Business (B2B)



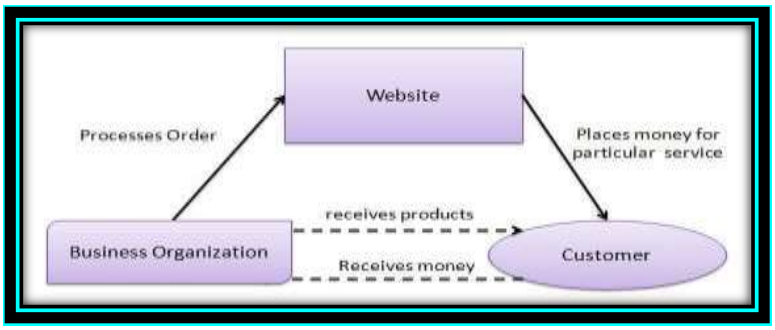
ii. Business - to - Consumer (B2C)



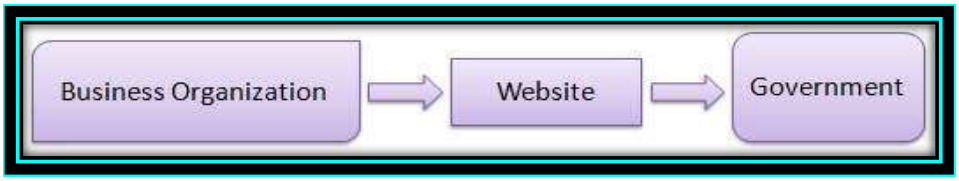
iii. Consumer - to - Consumer (C2C)



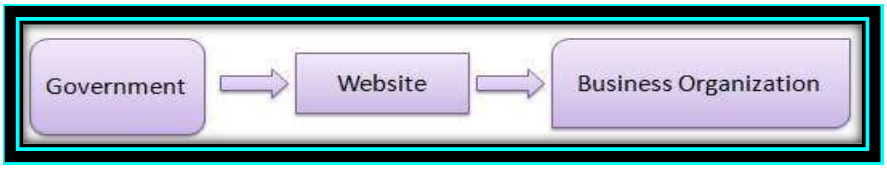
iv. Consumer - to - Business (C2B)



v. Business - to - Government (B2G)



vi. Government - to - Business (G2B)



vii. Government - to - Citizen (G2C)

Situation analysis of the policy initiatives of the government for ICT interventions and digitization of economy of Pakistan.

As per the Rules of Business, 1973 of the Government of Pakistan, Ministry of Information Technology is mandated to initiate policies and develop plans for the IT & Telecom sector (IT & T, 2022). The Ministry of IT & Telecom is implementing various policies and laws to develop ICT sector as follows: -

1. Pakistan Cloud First Policy, 2022
2. Policy Directive for Renewal of PMCL Cellular Mobile License, 2022
3. Policy Directive for the Auction of next Generation Mobile Services (NGMS) Spectrum in Azad Jammu & Kashmir And Gilgit Baltistan for improvement of Mobile Broadband Services, 2021
4. Policy Directive for the Auction of Next Generation Mobile Services (NGMS) Spectrum in Pakistan for Improvement of Mobile Broadband Services, 2021
5. National Cyber Security Policy, 2021
6. Public & Private Right of Way Policy Directive, 2020
7. Rolling Spectrum Strategy 2020-2023
8. Digital Pakistan Policy , 2018
9. Telecommunications Policy, 2015
10. NTC Service Regulations, 2015
11. Policy Directives Regarding "Spectrum Auction for Next Generation Mobile Services in Pakistan" (including 3G and advanced Generations), 2013
12. Pakistan IT Policy & Action Plan, 2000
13. Mobile Cellular Policy-2004 (Revised-2013)
14. Broadband Policy, 2013
15. De-Regulation Policy for Telecom Sector-2003(Revised-2013)
16. Amended USF Rules, 2013 (June 2007)
17. ICTRDF – SRO, 2013
18. Telecom Reorganization Act, 2012
19. USF Policy, 2012
20. Telecom Deregulation Policy, Broadband Policy, Cellular Policy, 2012
21. NICT R&D Fund policy, 2012
22. R&D Fund SRO, 2012

A SWOT analysis of the above policy interventions is provided below for situation analysis.

STRENGTHS	**WEAKNESSES**
1. Political will & intention 2. All policies aimed at developing ICTs 3. Responsive to needs and requirements 4. Application linkages with other sectors 5. Step towards integrated economy 6.	1. Slow implementation 2. Focus on telecommunication mostly 3. Lack of required infrastructure 4. Accessibility issues 5. Lack of IT skills 6. Women & disabled person targeted initiatives are very few
OPPORTUNITIES	**THREATS**
1. Possible applications on many sectors **2.** Generation of revenues **3.** Employment generation 4. Skill development 5. Transparency and good governance 6. Enabling environment for women & differently abled 7. Harmonization & National development 8. Access to international digital markets	1. Political instability 2. Lack of resources to implement policies 3. Cyber Crimes/security 4. Technological gap between Pakistan and developed countries 5. International Sanctions & Embargoes

The SWOT analysis of the above policy interventions reveals that there is a strong political will for developing the ICT sector and interventions are responsive to the swift change of technology. Policies also address the cross-sectoral linkages to effectively deliver outcomes. Significant opportunities are observed including employment, revenue generation, skills development, transparency, good governance, inclusion of the women and differently abled persons; and most importantly the possibility to integrate federating units.

However, weaknesses are evident in the policy interventions including slow implementation, lack of infrastructure, non-accessibility of the poor, gaps in IT skills and that these policies mostly cater for telecommunication sector. The biggest threat for these policy interventions is political instability that hinders continued implementation after regime change. Hacking and cyber security threats are common occurrences while the huge technological gap between developed countries that are leading the information revolution poses a threat of quantum leap as compared to developing countries in terms of ICT benefits.

The following table provides a situation analysis of the Digital Pakistan Policy, 2018 initiatives, the goals to be achieved and the outcomes.

Policy initiative	**Goals**	**Responsible Ministry**	**Situation Analysis**
Infrastructure Development	Software Technology Parks National Incubation Centers IT Incubators Tele centers Wireless Broadband	Ministry of IT & Telecom	- 84% mobile penetration - 44% internet usage - Fixed Broadband penetration at 1% - Mobile Broadband penetration at 43% -Lowest mobile service rates - High broadband rates - 112th in speed of connectivity (145 Countries) - 14 software technology parks
Human Resource Development Entrepreneurship, R&I, Freelancing	Structured Gap Analysis Program Digital Skills Trainings -	Ministry of Federal Education & Professional Training	- World Economic Forum's Global Competitiveness Index (GCI) for 2019 ranks Pakistan 132 of 140 economies in terms of skills - 8 % population uses computers - under-35s generated 77% of the revenue in 2019
E-Governance	Integration of Databases e-Procurement e- Government G-Cloud	Ministry of Interior (NADRA) Ministry of Planning, Development and Reform Ministry of IT & Telecom	153rd in the UN e-Government Development Index, 2nd last in the South Asian Region - Strong Database System = NADRA - Weak linkage of Provinces with central database
E-Agriculture	Agriculture Information Portal Geographical Information System (GIS)	Ministry of National Food Security & Research	- GIS solutions for Agriculture by SUPARCO - Precision agri-solutions by startups (drone usage, smart tube wells) - Training of farmers

Policy initiative	Goals	Responsible Ministry	Situation Analysis
	IT Trainings for farm extension workers ICT Capacity Building of Agriculture institutions and farmers		
E-Justice	Automation of Courts Provision of online forms Online dispute resolution	Ministry of Law & Justice	- E-Court system at Superior judiciary level -
E-Energy	Smart Meters Smart Grids	Ministry of Water and Power	- Smart meters by DISCOs
E-Commerce	E-Payment Gateway E-Commerce E-Commerce Policy/framework IT enablement of logistics operator	State Bank of Pakistan Ministry of IT & Telecom Ministry of Commerce	- Digital payments only account for 0.2% of Pakistan's ~100 billion transactions. - Less than 5 % Merchant acceptance of electronic payments - absence of other digital financial products such as insurance, savings, investments and credit. - lack of a Unified Payments Interface (UPI) - lack of sufficient data protection and authentication mechanisms
Software Exports	Venture Capital Funds Accelerators International Events & Marketing campaigns Incentive Programs Placement of Business	Ministry of IT & Telecom - Ministry of Finance, Revenue, Economic Affairs, Statistics and Privatization - Ministry of IT & Telecom	- More than 7,000 IT companies are contributing about USD 2.6 billion to the economy - USD 1.44 billion in FY20 - E-commerce in Pakistan is also rapidly expanding and is now a PKR 230 billion market annually

Policy initiative	Goals	Responsible Ministry	Situation Analysis
	Development experts Training Tax Treatment of software Industry		
Cloud computing & big Data	Database Integration Cloud based citizen services Capacity building in big data	Ministry of Interior (NADRA) Ministry of IT & Telecom	- Central Database = NADRA - No linkage with other registries - Security concerns for database misuse
ICT for Women & GIRLS	Training, Capacity building Application Development	Ministry of IT & Telecom	- Gender and cultural norms limit uptake of digital payments - 77.5 % IDs for females - evidence of greater adoption of national IDs by women after G2P social safety net payments - 1020 women funded by Ignite
ICT Education	ICT Curriculum Early childhood coding programs E-Portals	Higher Education Commission (HEC) Network Accessibility Ministry of Federal Education & Professional Training	-44 % of government high schools and 38 % of private high schools have computer labs in rural areas (with internet connectivity at 33 percent and 35 percent respectively), while in urban areas, the proportion is 85 percent and 80 percent respectively. -IT curriculum at elementary & high school level.

Legal Analysis

The digitization initiatives in Pakistan encompass numerous ICT interventions. The ICT Development Index (IDI) is an index published by the United Nations International Telecommunication Union, based on internationally agreed-upon information and communication technology (ICT) indicators. This makes it a valuable tool for benchmarking the most important indicators for measuring the information society. The IDI is a standard tool that governments, operators, development agencies, researchers, and others can use to measure the digital divide and compare ICT performance within and across countries.

The ICT Development Index is based on 11 ICT indicators, grouped into three clusters: access, use, and skills. Pakistan's last ICTD ranking in 2017 was 148 out of 159 (World Bank, 2022).

Constitutional Provision Regarding Poverty

Article 38 (a & b) of the Constitution of Pakistan states that the State shall promote the social and economic well-being of the people to reduce disparity in income and earnings among individuals, including persons in various classes of the service of Pakistan.

Pakistan Telecommunication (Reorganization) Act 1996

The Telecommunication (Reorganization) Act was promulgated in 1996 with the purpose of reorganizing the IT sector in Pakistan. Under the Telecom Reorganization Act 1996, the Pakistan Telecommunication Authority (PTA) was established in January 1997 to regulate the establishment, operation, maintenance, and provision of telecom services in Pakistan.Policy Vision The Government of Pakistan (GOP) strives to improve the quality of life and economic well-being of its citizens by ensuring the availability of accessible, affordable, reliable, universal, and high-quality ICT services. The GOP strongly believes in the mass adoption of emerging digital technologies and innovative applications to enable cross-sectoral socio-economic development and transformation of economic activities, governance models, social interaction, and the achievement of sustainable development goals.

Institutional Analysis

In order to promote sustainable development in all spheres of life, information and communication technology is being utilized for poverty eradication on a war footing through the implementation of the Digital Pakistan Policy 2018 across various federal and provincial ministries and departments. Given the involvement of a broad spectrum of agencies, it is appropriate to align them with their specific roles and responsibilities. These responsibilities and assignments are being proposed as part of this policy for clarity and effective implementation.

Policy Initiatives	**Key Areas**	**Lead Ministry Federal/ Provinces**	**Facilitating/ Executions Ministries/ Department/Bodies**
Legislation	➢ Intellectual Property Rights - ➢ E-Commerce Policy/framework ➢ Data Protection & Privacy (Ministry of Information Technology, 2018)	➢ Ministry of Commerce, IT, - Law & Justice	Provincial Law Departments
Infrastructure (Software &Hardware) Development	✓ Infrastructure Development ✓ Software Technology Parks - Ministry of IT & Telecom ✓ National Incubation Centers ✓ IT Incubators ✓ Tele centers ✓ Wireless Broadband	Ministry of IT & Telecom	Provincial IT Boards and IT Departments.
Human Resource Development Entrepreneurship, R&D, Freelancing	➢ Digital Skill Trainings ➢ ICT for Girls Program ➢ Internship ➢ IT Incubators ➢ Seed Funding and Startups ➢ Awareness Program	Ministry of IT & Telecom & Education and Training	Pakistan Poverty Alleviation Division and Provincial Education & Industries, IT Boards and IT Departments.
E-Agriculture	➢ Agriculture Information Portal ➢ Geographical Information System ➢ IT Training for farm extension workers ➢ CT Capacity Building of Agriculture institutions and farmers	Ministry of National Food Security &Research	Ministry of IT &Telecom & Provincial Agriculture Departments
Branchless Banking and Microfinance Banking	➢ Structured transformation of the credit and savings for rural populations ➢ provide financial services to poor and marginalized clients including small and landless farmers ➢ establish Service Centers providing credit facilities exclusively to women. ➢ Though the savings, loans and other banking facilities available to all small entrepreneurs	• State bank of Pakistan • Ministry of Interior • Ministry of IT • Pakistan Software Export Board	Telecom & Provincial IT Boards and Home Departments

Policy Initiatives	Key Areas	Lead Ministry Federal/ Provinces	Facilitating/ Executions Ministries/ Department/Bodies
Poverty Alleviation	➢ Ehsaas Program	• PPAS Division	• Federal/Finance, Interior/NADRA IT & Telecom Education Commerce/TEVTA, Health • Provincial Home Education, Agriculture, Auqaf, Finance, Industries and Commerce Health

The National Information Technology Board

In Pakistan, the public departments and the Ministries needs dedicated consultancy and technical guidance to productively fulfill their primary purposes. It is not in the interest of the government to have ineffective public organizations. On 11th August 2014, Pakistan Computer Bureau (PCB) and Electronic Government Directorate (EGD) were merged to form the National Information Technology Board (NITB) established by the Ministry of Information Technology and Telecommunication (MoIT). The NITB aims to address the operational challenges with regard to information technology of all government departments and Ministries. NITB specializes in key automation, design, development, and implementation of robust IT technologies to promote the e-governance culture in all public departments and holistically develop plans, technologies, and infrastructures to boost the performance of the public sector (IT & Telecom, 2022).

Policy Objectives

To become a strategic enabler for an accelerated digitization ecosystem that expands the knowledge-based economy and spurs socio-economic growth.

A key goal of the Digital Pakistan Policy is to create a digital ecosystem with the infrastructure and institutional frameworks necessary for the rapid delivery of innovative digital services, applications, and content. This policy represents a shift away from a piecemeal approach toward a holistic technology strategy clearly focused on ICT as a broad enabler of every sector of socio-economic development.

Sectoral Digitalization: Promote the use of technology in education, health, agriculture, and other key socio-economic sectors. Encourage the use of ICT in public schools and ensure they are online and making a meaningful impact on the current education ecosystem in a phased manner.

E/M-Commerce: Enhance the current market size of e/m-commerce. According to some estimates, the market has enormous growth potential due to the exponential increase in broadband subscribers—from 3.7 million in 2013 to over 44.3 million in 2017, and continuing to grow. With these trends projected to persist, overseas investments in e-commerce are expected to rise. Promote e-commerce by providing an enabling environment where Payment Service Providers (PSPs) and Payment Service Operators (PSOs) can operate, establish effective platforms, and elevate e-commerce activities in Pakistan to the next level.

Youth, Women, and Girls Empowerment Using IT: Youth and women represent roughly 60% and 49% of the population, respectively. Ensuring that women and girls have equal access to ICTs will help reduce inequalities and support gender inclusion.

Major Policy Interventions

The National Information Technology Board (NITB) facilitates federal ministries in the successful implementation of e-governance programs aimed at improving information and service delivery, efficiency, and transparency. E-governance is the integration of Information and Communication Technology (ICT) into government systems to make processes more efficient, accessible, and convenient. Pakistan is gradually moving toward the implementation of e-governance to increase the reach and quality of public information and services, using ICT in a simple, economical, and cost-effective manner.

Comparative Analysis of the ICT Initiative in Four Provinces of Pakistan

SECTOR	PUNJAB	SINDH	KHYBER PAKHTUNKHWA	BALOCHISTAN
Policy framework	Punjab IT Policy 2018	Sindh Cloud Policy	KP Digital Policy	-Balochistan Digital Policy 2021 -The digital government of Balochistan Policy 2008
Institutional Set up	Science and Technology & IT Department PITB	Science and Technology & IT Department SITB	Science and Technology & IT Department KPITB	Science and Technology & IT Department BITB
ICT Intervention in Public Sector	-Adoption of Digital Policy -Digitization of various Government Departments - Establishment of IT Parks - Establishment of 16 incubation centers	-Adoption of Digital Policy -Digitization of various Government Departments - Establishment of IT Parks - Establishment of 61 incubation centers	Adoption of Digital Policy -Digitization of various Government Departments -Establishment of IT Parks -Establishment of 22 incubation centers	Adoption of Digital Policy -Digitization of various Government Departments -Establishment of IT Parks *(in pipeline)* -Establishment of 14 incubation centers
ICT Intervention in Private Sector	250 startups	160 startups	198 startups	20 startups
Revenue generated from startups	Rs.0.486 bn	Rs.0.86 1bn.	Rs.0.345bn.	Rs.0.077bn.
Job generated	1,349	91,180	1,769	456
Training imparted	777,867	276,355	105,074	12,683
Investment in incubation centers	Rs.3.103bn.	Rs.3.063bn.	Rs.0.522bn.	Rs.0.058bn.

Impact Analysis

This section provides an impact analysis of the government's policy initiatives for the digitization of the economy and the use of ICT for business purposes in the context of poverty alleviation in Pakistan.

Incentives for Industry Growth

The Ministry of Information Technology and Telecommunication (MoITT) supports all credible private sector initiatives aimed at bolstering the local IT industry and attracting foreign investment. The government recognizes its important role in providing a conducive environment for the IT industry through infrastructure development and human resource enhancement. Government incentives for the IT industry include:

a.100% tax credit on export income from IT and IT-enabled services until 30th June 2025.
b. **100% tax credit** on profits and gains derived by IT start-ups for the tax year in which a start-up is certified by the Pakistan Software Export Board (PSEB), and for the subsequent two years.
c. **100% equity ownership** allowed to foreign investors, **100% repatriation** of capital and dividends permitted, and a **tax holiday** for venture capital funds until 2024.
d. **Growth-Driven Financial Incentive** on IT & ITeS export remittances: The primary objective of this scheme is to encourage IT & ITeS export remittances through formal banking channels and improve the reporting of export remittance receipts using the correct IT & ITeS purpose codes assigned by the State Bank of Pakistan. The government allocated Rs. 4 billion to PSEB for the first-ever financial incentive program on IT & ITeS export remittances, disbursed based on export receipts in FY202.

Financial Impact Analysis

- IT exports reached $1.948 billion with a growth rate of 29.26% compared to $1.5 billion in the previous year (2020–21).
- EXIM Bank of Korea invested $158 million in infrastructure development.
- $930 million in FDI and local investment.
- Ignite has established 930 start-ups across 5 National Incubation Centers (NICs).

- User base grew by $194 million, representing an increase of 3.64%.
- The IT sector contributed approximately Rs. 163 billion in taxes to the government.

Ehsaas Program

ICT is playing a significant role in poverty alleviation through data management. A prime example is the **Ehsaas Program**, a social safety initiative for the underprivileged. Approximately **17.3 million beneficiaries** are receiving about **Rs. 210 billion** via biometric verification using the NADRA platform. A mobile application is used for registration and to inform targeted individuals about payment collection.

Other programs operating under the umbrella of the Ehsaas Program and utilizing ICT platforms include:

- Ehsaas Kafalat
- Ehsaas Tahaffuz
- Ehsaas Nashonuma
- Ehsaas Waseela-e-Taleem
- Undergraduate Scholarship Program
- Women Empowerment Initiatives
- Ehsaas Interest-Free Loans
- Ehsaas Amdan
- Individual Financial Health Support

Private Sector Intervention

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

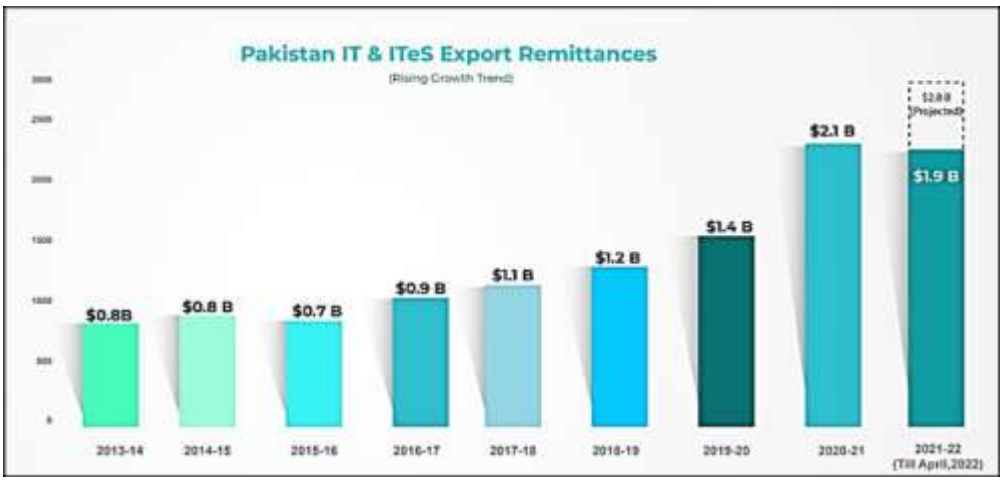
Source: Economic Survey Pakistan 2021-22

Startup	Amount	Investment	Jobs created
Darewro	Rs.72.78 Mill	Rs.66.6 Mill	292
Tutor Gateway	Rs.1.34 Mill	Rs.50.6 Mill	154
Bera	Rs.30.3 Mill	Rs.11.0 Mill	55

Source: Progress report NIC Peshawar 2021-22

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.



Source: Economic Survey Pakistan 2021-22

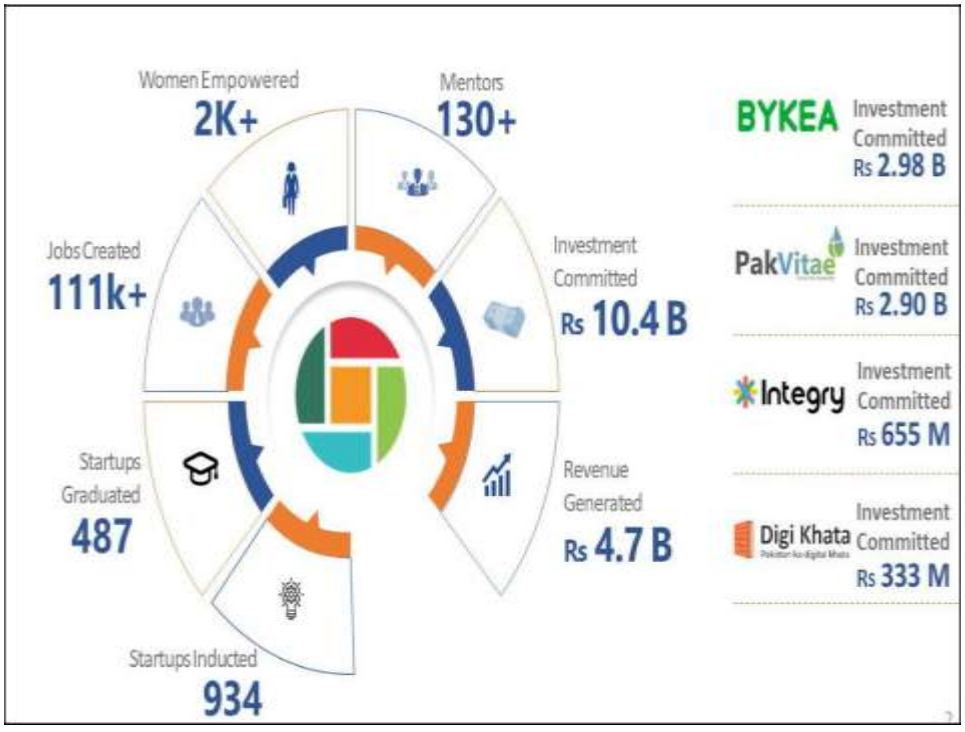
Governance Impact Analysis

National Incubation Centers

Recognizing 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. 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 on NICs can be seen in the following figure: -



E-Office

An indigenous E-Government ERP/GRP has been developed and is being implemented in all 40 federal ministries/divisions along with 140 subordinate departments. E-Office is a complete back-office automation suite.
i) Up to 25% savings on POL
ii) Up to 70% savings on annual stationery costs (approx. Rs. 600 million)
iii) 100% transparent, accountable system with an executive dashboard for decision-making
iv) 80% time savings in process time
v) Increased government efficiency

National Job Portal

Developed by NITB, the National Job Portal provides a centralized platform for job seekers to find opportunities with Government of Pakistan ministries and their attached departments.
i) Single window for all government jobs
ii) 0.33 million registered users
iii) Rs. 8 million in savings

Kamyab Jawan Programme

A youth-centric platform ensuring a smooth online process from loan application submission to disbursement under the Prime Minister's Kamyab Jawan Program.
i) Rs. 46.9 billion allocated
ii) Rs. 39.4 billion in loans distributed to create entrepreneurs
iii) 5,426 jobs created

Broadband Subscribers and Penetration

Broadband subscribers (mobile and fixed) reached 114.3 million at the end of February 2022, compared to 102.7 million in June 2021, indicating an average addition of over 1.45 million subscriptions per month during July–February FY2022. Greater coverage and reduced tariffs are expected to further accelerate broadband adoption. Total broadband penetration (fixed and mobile) in Pakistan stood at 52.0% in February 2022.

E-Governance

Various digital grievance redressal portals exist at both national and provincial levels, helping citizens report issues related to government services.

Examples include:
a. PMDU – at the national level
b. PMRU – at the provincial level in Punjab & Khyber Pakhtunkhwa
c. Complaint portals of various departments/organizations (e.g., NADRA, DISCOs, etc.)

Citizens, including those from low-income groups, use these digital platforms to resolve grievances related to Ehsaas/BISP stipends, price control, over-billing, healthcare, education, and other poverty-linked issues (Ahmad, Khan, & ul Haq, 2022).

Gap Analysis

This section identifies gaps in institutions and policies aimed at using ICT effectively for poverty alleviation in Pakistan.

Issues Related to the Financial Perspective

i. Regulatory policies by the State Bank of Pakistan and other regulators are not conducive to attracting FDI. These constraints inhibit entry, utilization, and exit of funds for foreign investors in startups/VC firms in Pakistan.
ii. Foreign Exchange Manual clauses restrict Pakistani tax residents from acquiring shares in foreign companies without SBP consent.
iii. Commercial banks lack understanding of the startup investment ecosystem, creating a communication barrier between SBP and investors/startups.
iv. Excessive regulatory requirements are causing local companies to register abroad.
v. Regulations prevent locally registered funds from partnering with international funds.
vi. A central database for startups and investors is needed to facilitate visibility and collaboration.

Gap Analysis in Information and Communication Technologies

1. Lack of trained human resources with marketable skills and innovative capacity
2. Universities producing low-value graduates (only 10–15% of universities produce quality graduates)
3. Lack of specialized training and quality vocational institutes compliant with regional/international standards
4. Inadequate access to computing and internet facilities in schools
5. Weak industry-research-academia linkages, leading to an absent research ecosystem

6. Underutilization of the National ICT R&D Fund and Universal Services Fund (USF)
7. Low IT export volumes
8. Small, dispersed software companies with limited overseas presence
9. Lack of institutional mentorship for entrepreneurs, limited IT incubators and structured guidance
10. Limited access to venture capital, angel funding, and crowdfunding
11. E-government still in early stages, with minimal emphasis on e-services
12. Weak e-governance institutions needing restructuring
13. No incentives to retain IT professionals in the public sector
14. Financial constraints delaying basic IT infrastructure projects
15. Low priority for public sector e-services due to poor back-office automation
16. Absence of a legal framework for sustaining long-term e-governance
17. Lack of procurement standards for hardware/software in the public sector
18. Minimal use of IT in domestic trade and commerce
19. No national e-payment gateways for open e-trading
20. No PKI available for mass-level e-trading activity
21. Cyber laws not aligned with international standards, hindering e-commerce adoption
22. Limited local/regional language applications and content, affecting understanding and productivity
23. Negligible local computer hardware industry; unfeasible hardware manufacturing environment
24. Women and differently-abled persons are being overlooked

Regional and International Best Practices

ICT employment refers to individuals working in the Information and Communication Technology (ICT) sector. This is measured as a percentage of total business sector employment. ICTs are generating new job opportunities and helping address global unemployment.

For example, mobile app developers can access over 500 million Apple app store users. Online employment marketplaces help approximately 12 million people globally find work, connecting them with employers. Platforms like Babajob (India), Duma and M-Kazi (Kenya), and Souktel (Middle East and North Africa) use mobile and internet-based tools to serve low-income communities (Asongu & Odhiambo, 2022).

ICTs are also facilitating new, flexible forms of employment and remote work. ICT helps create two primary job categories:
I. ICT core jobs – e.g., online contracting and micro-work platforms
II. ICT-enabled jobs – broader sectors enhanced through digital tools

Conclusion

1. ICT applications have a direct linkage with poverty alleviation.
2. Adopting the technological paradigm of poverty, ICT is the only solution for the socio-economic uplift of the poor.
3. A comprehensive policy based on financial inclusion adaptation is required.
4. The dichotomy in policy formulation and implementation between the federal and provincial governments needs to be addressed.
5. 65% of Pakistan's population is below 30 years of age, but a very low percentage is equipped with digital skills that could be used for poverty alleviation.
6. Broadband infrastructure in underprivileged areas is a key requirement for bringing the poor closer to opportunities for uplifting their lives.
7. The involvement of universities with public and private ICT institutes for R&D is essential to develop skills that meet technological advancements.
8. There are cultural and social limitations on women's participation in economic activities, and they have limited access to ICT technologies.
9. There is no mechanism to mainstream differently-abled individuals, and therefore they are unable to make positive contributions.
10. Subsidies spent on unconditional financial help through Ehsaas/BISP create dependency on state resources that could otherwise be utilized for skill development leading to employment.
11. The traditional education system lacks the quality of innovative thinking, which inhibits our youth from effectively competing in the international technology market.
12. Access to ICT enables poor people to make informed decisions that are beneficial for themselves and for society.
13. The cost of ICT services is high in comparison with regional countries.
14. The application of ICT to enhance agricultural productivity, which is our major economic source, is still in the planning and implementation phases.
15. Pakistani youth are involved in local business models through startups due to the non-availability of international platform recognition.
16. Various institutions are working in their own domains, resulting in non-utilization of central data for the redressal of grievances of the needy.

17. There are very few PPP model projects in the ICT sector with specific applications for poverty alleviation.

Recommendations

Short Term

1. Revised targets for digital connectivity, duly distributed among federal and provincial governments, need to be defined.
2. Regulations for broadband cost reduction should be based on cost-benefit analysis.
3. Enhanced coordination among different government departments to identify opportunities to boost competitive pressure in the market.
4. Consolidate government systems into a common shared infrastructure through NADRA.
5. Integrate the NADRA database with other digital services after fulfilling legal requirements.
6. Enhance private sector involvement in investment in e-solutions for startups through NICs.
7. Increase basic digital skills training programs for illiterate or untrained populations through NITB and provincial IT Boards.
8. Select educated individuals from the Ehsaas database and provide them with ICT training to help them earn an independent livelihood.

Medium Term

1. Align the local regulatory regime with international best practices. Regulatory burdens should be relaxed and simplified—for instance, avoiding redundant verification, notarization, and paperwork.
2. Make market intelligence on sectoral growth indicators (e.g., education, health, fashion, retail, e-commerce, etc.) readily available for startups. The SBP, finance ministry, telecom companies, and other relevant data-driven organizations can support this.
3. SBP and FBR should contribute to the SECP Startup Portal to facilitate startups and investors on all matters relating to the startup ecosystem and regulations.
4. Promote the use of Urdu and other local languages by encouraging the availability of IT content and applications in Urdu, preferably with a voice interface, to increase technology adoption among the poor.
5. Enhance the quality of IT-related human resources by introducing both domestic and international certifications such as PMP, OCP, MCP, etc.

Long Term

1. Rationalize taxation on telecommunication services, devices, and startups.
2. Develop stronger collaboration and coordination between federal and provincial governments.
3. Adopt an open data initiative.
4. Expand national financial literacy programs, focusing on women and social minorities.
5. Accelerate the digitization of government payments.
6. Enable better access for startups to private sector finance, including the development of a digital credit scoring registry and improved access to VC funding.
7. Increase the use of technology in education.
8. Define a comprehensive mechanism for the identification of critical infrastructure.
9. Enhance the supply of cybersecurity skills through formal and informal education channels.

Logical Framework Matrix for Poverty Alleviation Through ICT

INPUTS	ACTIVITIES	OUTPUTS	OUTCOMES	IMPACT
Govt. Policies & Interventions Political Support	Coordination b/w Federal and Provincial Govts. Legislation of related laws Office Automation solutions PPP Collaborations Seminars, Workshops, Campaigns on Print & Electronic media	Integrated digital systems Acts, Rules & Regulations Paperless E-Govt. system Projects with ICT application Increased awareness	Cohesive databank with access by all stakeholders Uniformity in application of ICT E-Governance Increased Access, Quality, and Affordable Digital Connectivity Knowledge to avail opportunities	**POVERTY ALLEVIATION**

HR, Financial & Technical Components

INPUTS	ACTIVITIES	OUTPUTS	OUTCOMES	IMPACT
Human Resource **Financial Resources** **Technical support from National & International partners**	**Planning & Development** **Training & Mentorship** **Identification of targeted ICT sectors** **Budgetary allocations (Foreign + Local)** **Need assessment in targeted areas** **Collaborative projects**	**Digitally skilled workforce** **Availability of indigenous ICT professionals** **Digital infrastructure development** **Availability of financial resources** **Availability of Technologically advanced assets**	**Increased availability of Digitally Competent Workforce and Digitally Literate Citizens** **Reduced reliance on foreign experts & cost savings** **Increased Access, Quality, and Affordable Digital Connectivity** **Efficient Project & financial Management Increased Access and Usage of Financial Services** **Increased Number of Digital Solutions Firms and Firms using Digital Technologies or Digital Business Models**	**POVERTY ALLEVIATION**

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