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**NEPAL
INFRASTRUCTURE
SUMMIT 2024**

Driving Sustainable Development
through Strategic Investment

Built and Trust with



12 - 13 September 2024

The Soaltee Kathmandu

Digitalization, ICT, and Technology Integration in Enhancing Infrastructure Sector Development in Nepal

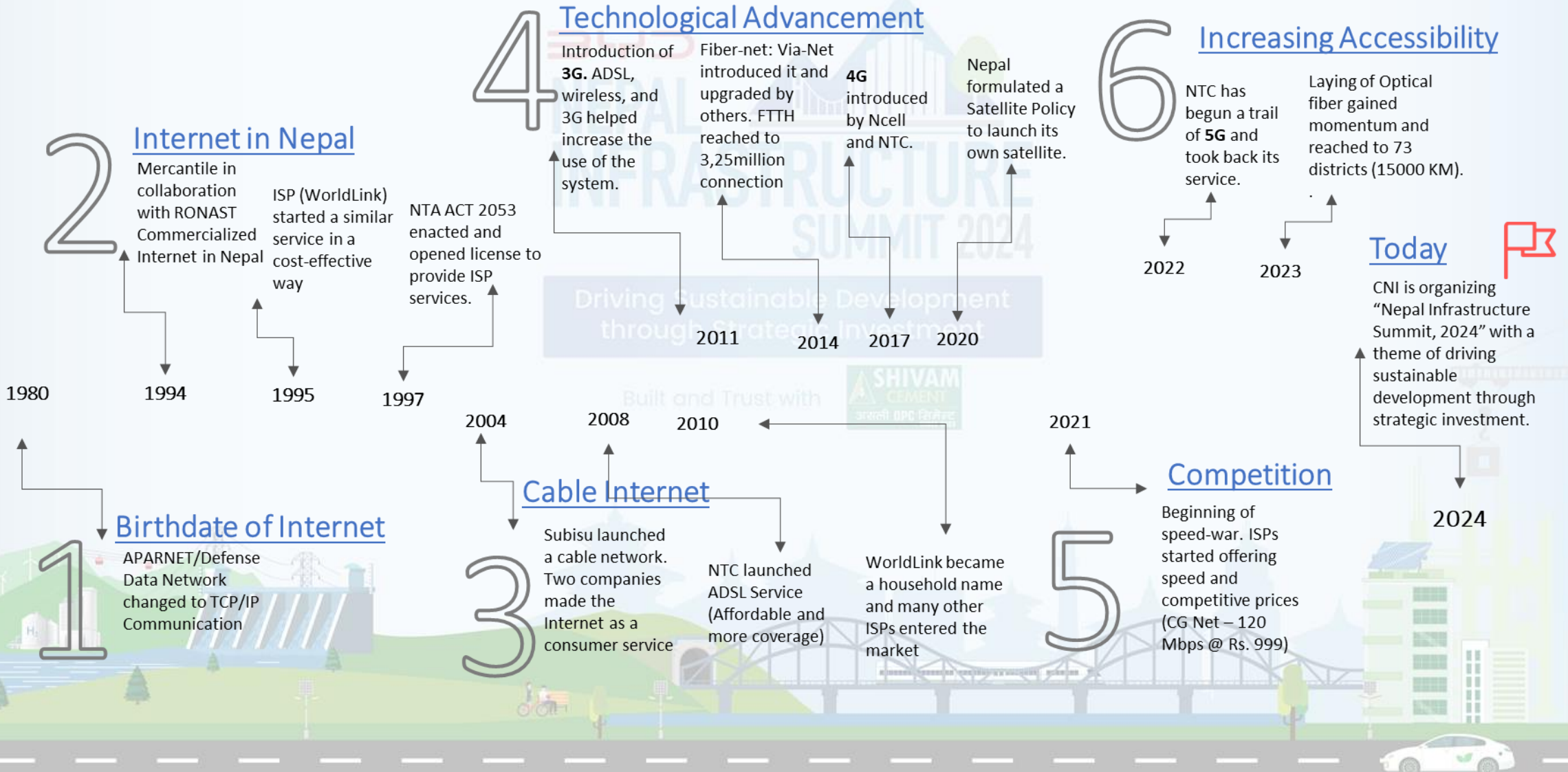
Dr. Kishore Dhungana

Academician





OUR HISTORY OF INTERNET



Driving Sustainable Development through Strategic Investment



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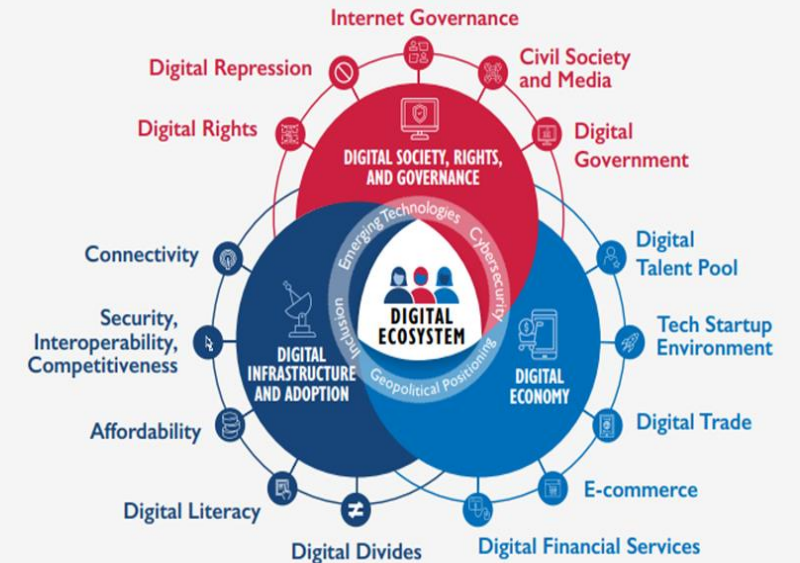


Digital Infrastructure and Ecosystem



- The digital ecosystem is a complex network comprised of

- Regulatory Bodies
- Telecommunication and Internet Service Providers
- IT-enabled Services
- Data Centers and Cloud Services
- Cybersecurity Institutions and
- IT professionals



Source: Digital Ecosystem Framework 2022, USAID

- The ecosystem also includes growing sectors like e-governance, e-commerce, and financial services, supported by a pool of IT talent and increasing digital literacy among general users.

- To fully realize the potential, we must address challenges in infrastructure, cybersecurity, and digital literacy while fostering an environment conducive to innovation and growth.

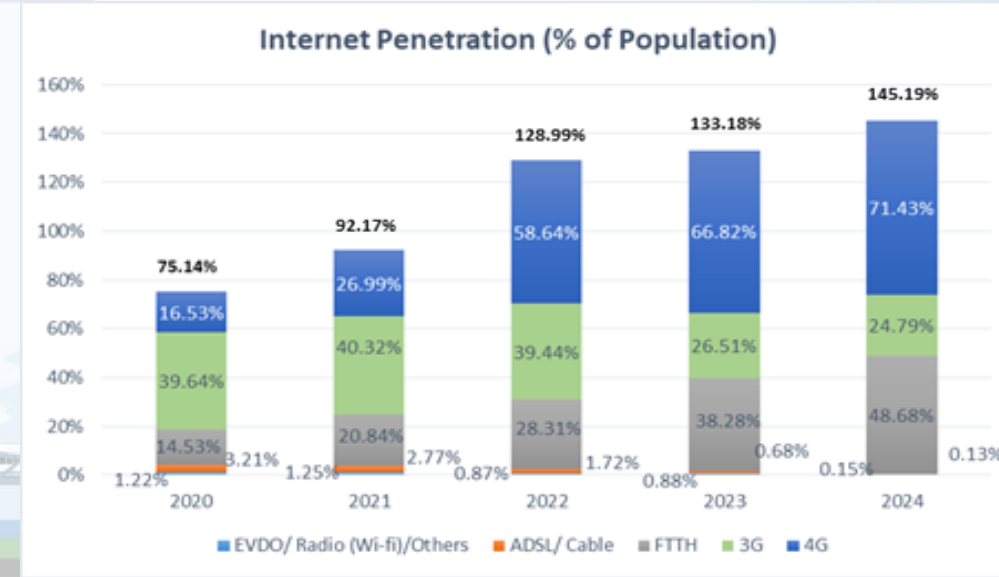
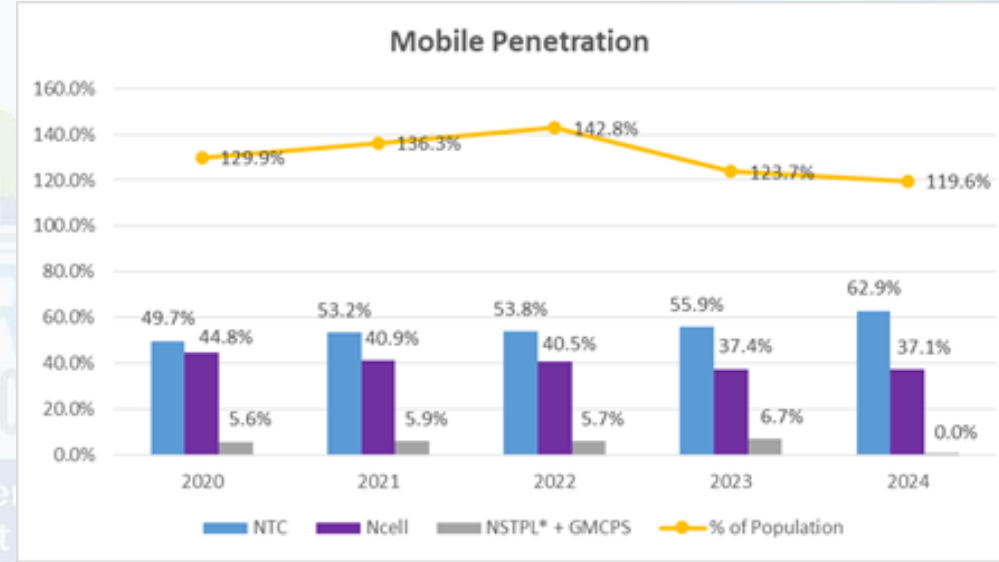


Existing Status of Digital Infrastructure



Connectivity (Internet and Mobile Penetration)

- With growing private sector involvement driving mobile service coverage to **119%** of the population by 2024.
 - Mobile broadband dominates with 66% of connections, while fixed broadband has risen to 34%.
- The total access to the internet reached **145%** of the population.
 - There is rapid growth in mobile broadband access, which reached 96.22% of the population in April 2024 from 56.18% in 2020.
 - The growth in the use of 4G network services is on the rise; with 16.53% in 2020, the number of subscribers has reached 71.43%.
- Access to electricity has considerably increased, from **30% in 2000 to 95% in 2023.**





Existing Status of Digital Infrastructure



IT-enabled Services (ITeS)

• Digital Governance

- All 753 local governments and seven provinces are now capacitated to use IT as a tool.
- Implementation of the Government Integrated Office Management System (GIOMS) is in progress.
- Nagarik App: 62 government services are linked (up to April 2024).
- National ID: Data collection (64 districts), Print (3 million), and Distribution (422K)

• E-Commerce

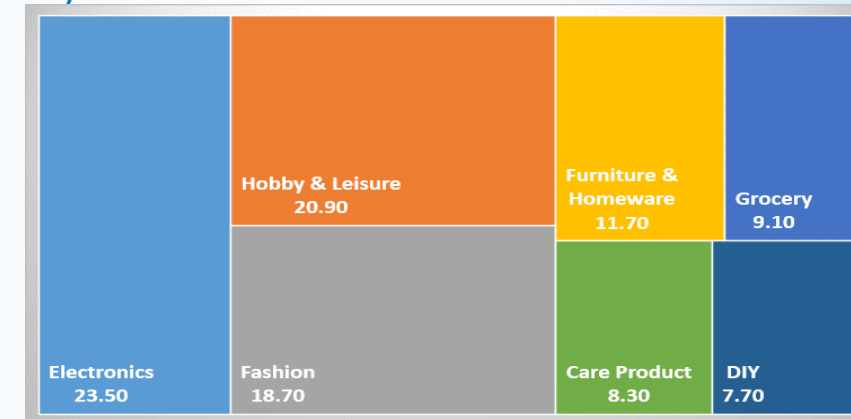
- Has witnessed rapid growth after COVID-19
- Nepal is the 75th largest market for e-Commerce
- A predicted revenue of US\$695.0 million by 2024.

• Financial Services

- The most digitized sector in the context of Nepal.
- In a 4 year (2019-2023), there is a growth of wallet users (267%),
- Internet banking (429%), Mobile banking (1810%), and QR payments (9048%).

• ICT Service Export (BPO and other services)

- IT service exports reaching USD 515.4 million in 2022, driven by over 106 IT export companies and 66,509 freelancers.
- Improved digital infrastructure and a skilled workforce offer significant advantages, yet Nepal struggles to fully leverage the IT sector's potential due to various export challenges.



Source: e-commerce market in Nepal, ECDB



Interconnection of Digital Technology with other Infrastructure Sectors



- Digital technology is intricately linked with various infrastructure sectors, significantly enhancing their development and operational efficiency.
 - **Agriculture:** real-time data to optimize farming practices.
 - **Health:** telemedicine and IoT devices
 - **Education:** e-learning and digital tools, particularly in remote areas.
 - **Energy Management:** smart grids and meters, supporting renewable integration.
 - **Tourism:** digital marketing, online platforms, and AR/VR.
 - **Financial Services:** digital payments and mobile banking.
 - **Urban Planning:** Geographic Information Systems (GIS) for smarter city management,
 - **Transportation/Logistics:** digital platforms and GPS technology.
 - **Disaster Management:** early warning systems for better crisis response, and
 - **Manufacturing/Trading:** operational efficiency from ERP systems and digital innovations.





Nepal's Position in the Global IT-related Indices



• Network Readiness Index (NRI)

- In the 2023 NRI report, Nepal ranked 114th out of 134 countries, with an index value of 33.73.
- This position highlights significant gaps compared to leading economies such as the USA (1st, 76.91) and China (20th, 67.31).

• E-Government Development Index (EDGI)

- Nepal currently ranks 125 out of 193 countries with 0.5117, the top ranking Denmark (0.9717) and India (105th, 0.5883).
- The 16th Plan of Nepal aims to achieve a score of 0.600 in 5 years.

• Government AI Readiness Index

- Ranked at 150th out of 193 countries with 30.77, USA (1st with 84.80 score) while Bhutan is on 114th position with 36.88.
- MOCIT has prepared a concept paper on the usage of AI, which will guide the subsequent formulation of a national AI policy, strategy, and legal framework in alignment with international benchmarks

• Global Cybersecurity Index (GCI)

- Nepal is in the 94th position with 44.95 scores in GCI index in 2020
- The Index shows that Nepal is performing well in legal measures (15.61/20) and has the lowest performance in cooperative measures (4.26/20).

• Inclusive Digital Economy Scorecard (IDES), UNCDF

- The IDES shows Nepal's progress from 46% in 2020 to 54% in 2022, reflecting steady improvement, still in the early stages of expansion.
- This scorecard evaluates countries based on policy and regulation, infrastructure, innovation, and skills.



Development Initiatives and Governing Guidelines



• Digital Nepal Framework 2019

- Strategic blueprint for digital economy development across eight key sectors: digital foundation, agriculture, health, education, energy, tourism, finance, urban infrastructure. Outlines 80 initiatives to foster socioeconomic growth and address sector-specific challenges.
- Emphasizes technology, infrastructure, entrepreneurship, public-private partnerships (PPP), and skill development.
- The roadmap provides guidelines on implementation, including specific initiatives, indicators, outcomes, timeframes, and the roles of various agencies and stakeholders.

• Digital Nepal Acceleration Project, The World Bank

- Government of Nepal and the World Bank signed a \$140 million agreement to support DNF implementation from March 2023 to July 2027.
- Focus areas: expanding broadband access, enhancing digital skills, improving digital services for marginalized groups.
- The project is undergoing restructuring, with the possibility of full financing cancellation. The World Bank and the Government of Nepal are working on a new US\$60 million initiative called "**Digital Star**" in response to the failure of the DNA project.

• The Sixteenth Plan (2081/82 - 2085/86)

- Emphasizes integrated infrastructure development and IT expansion. It includes adopting 5G and broadband services, improving cybersecurity, and creating a skilled IT workforce.
- It aims to implement the Digital Nepal Framework, enhancing data security, and developing digital platforms.

• Fiscal Year Budget 2081/82 pertaining to the ICT sector

- Launch of Information Technology Decade (2081-2091) to establish Nepal as an IT hub.
- Targets: generate Rs. 3 trillion in ICT exports, create 1.5 million jobs.
- Initiatives: revise DNF, develop IT parks, upgrade data centers, improve broadband access for underserved communities.



Digital Technology in Physical Infrastructure Development



- In designing, planning, and project implementation, the physical infrastructure sector can apply many modern techniques.
 - Global Positioning System(GPS) and Geographic Information System(GIS)
 - helps in managing resources and scheduling by providing real-time updates on the construction sites
 - Building Information Modeling (BIM) and Computer Aided Design (CAD)
 - create intricate 3D representations of infrastructure projects and structures
 - Project Management Software and Solutions
 - facilitate the efficient management of resources, budgets, schedules, and communication
 - Digital Twins
 - Virtual copies of real assets. Helps to simulate and monitor building processes in real-time, which aids in the early detection and resolution of problems
 - Drones, Robotics, and IoT & Sensor Devices
 - Helps in managing risky and routine jobs
 - Artificial Intelligence (AI), Machine Learning, and Data Analytics algorithms evaluate past data to forecast project results, allocate resources optimally, and detect possible hazards.



Challenges and Opportunities



Challenges

- Nepal's digital infrastructure development has several challenges despite notable progress
 - High infrastructure costs
 - Regulatory barriers
 - Limited access to international bandwidth purchase
 - Investment availability and returns
 - Limited skilled workforce
 - Low digital literacy and language barrier

Opportunities

- Despite challenges, it presents several opportunities across various sectors
 - Economic growth through tech startups,
 - Export of IT services (BOP, IT engineering)
 - Improved education via digital tools,
 - Enhanced healthcare access, and
 - Efficient government services (E-Governance)
 - Business efficiency and productivity
 - Sector-specific advancements

- **Leveraging emerging technologies (AI, IoT, 5G technologies, Robotics and Automation, Edge Computing)**

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Way Forward and Recommendations

- Engage stakeholders to shape digital policies.
- Accelerate government digitalization efforts.
- Improve internet access affordability, support IT startups, and strengthen infrastructure investment.
- Improve IT-based education to boost Nepal's competitiveness
- Embrace global trends to harness opportunities for sustainable growth in the digital economy.
- The businesses are recommended to adopt a “digital-first-strategy” rather than digitalizing on a piecemeal basis.

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Thanks

Dr. Kishore Dhungana
Seekers Solutions P. Ltd.
9851008687
kdhbaluwatar@gmail.com

