Digital Economy and Fiscal Innovation: Implications for Fiscal Policy in Nepal

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Outline

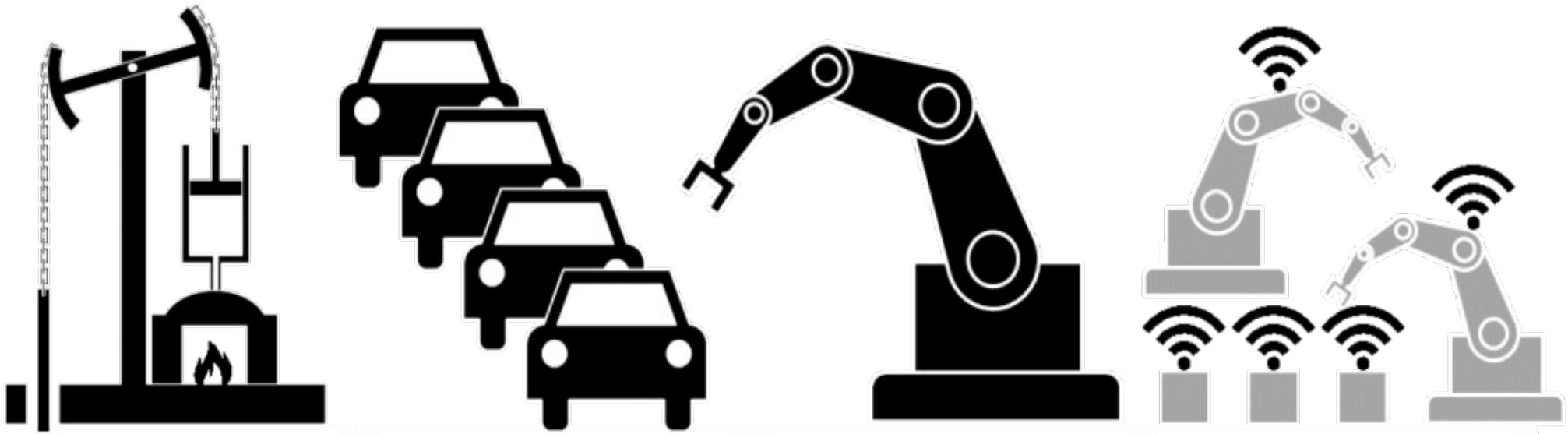
- Context setting: A run through Industrial developments
- IR4 and Digital Economy
- Digital Economy in Nepal - Strengths, Strides, and Structural Gaps
- Digital Economy, Financial Innovation and Fiscal Policy
- Way forward

Foundation of industrial revolution

The printing press (invented by Johannes Gutenberg around 1440)

- **Pre-industrialization era (1400–1700)**
- The printing press contributed to:
  - Spread of knowledge
  - Scientific revolution
  - Renaissance, Reformation
  - Growth of literacy and early capitalism

- https://www.interaction-design.org/literature/topics/the-fourth-industrial-revolution



1st	2nd	3rd	4th
Mechanization, water power, steam power	Mass production, assembly line, electricity	Computer and automation	Cyber Physical Systems

Industry 4.0 : a new era of development in which digital, physical and biological systems converge, fundamentally transforming industries, economies and societies.

Digital Economy- a product of 4th IR :

The World Bank: the digital economy is a new way of economic activity based on knowledge and digital technologies, where new digital skills and opportunities are formed for society, businesses, and the state.

Encompasses the use of ICTs across all economic spheres, and emphasizes the widespread diffusion and use of digital technologies throughout the economy

- **Creative Destruction** (Joseph Schumpeter) innovation disrupts old economic structures and replaces them with new, more productive ones. The **digital economy** - one of the strongest real-world manifestations of this process.
  - E-commerce → decline of traditional retail.
  - Digital payments → shrinking use of cash.
  - Online news → decline of print newspapers.
  - Currency notes → Crypto currency , CBDC
  - AI Algorithms replacing many jobs , receptionist, nurses, technicians

  Destruction (of outdated industries) is paired with creation (new digital platforms, new jobs, new markets).

- Digital economy → **accelerated creative destruction .**

Like the way UBB Flash drives or cloud storage offer greater capacity, faster speeds, and more convenience compared to the older, physical media, the traditional structure of economy can be transformed through the application of digital technologies..

Elon Musk : first principle thinking is a problem-solving approach Tesla, Space X…Digital economy

Digital Economy accounts for 15 percent of Global GDP and estimated to reach 30 percent by 2030!
The World Bank.

In UK Nurses charge BP.60 per hour,
AI Nurse BP. 9 per hour

AI Makes professionals more skilled too…..

- The thriving digital economy fuels job creation, foster innovations, and accelerates sustainable development
- Applying data driven IT solutions in non-It industries and building SMART INFRASTRUCTURES-
- Smart industry, smart agriculture, smart cities, and digital urban management, smart disaster management, smart mass transportation , smart grid, smart irrigation, smart governance

National Digital Economy Strategy, DE friendly governance and institutional mechanisms, policy, regulatory, and enabling environment, IT ecosystem, startup ecosystem and up-scaling – new and better jobs created ..Econ transformation
Promote fintech development, digital trade, e-commerce

- The share of global foreign investment in the digital economy has climbed from 5.5% to 8.3% over the past decade.
- Developing countries attract less than a third of greenfield investment in digital sectors, with 80% of projects in the Global South concentrated in just 10 economies.
- Core digital infrastructure and least developed countries remain largely bypassed
  - UNCTAD, 2025.

- Digital Economy: rewriting the rules of business and economy, expanding access to knowledge :
- The critical foundation: 4 Cs (the World Bank)
  - Connectivity: 68 percent world is connected ; gaps in speed, fast and reliable internet
  - Compute: AI chips, servers, data centers, and cloud services (73 percent of data center in developed countries ??)
  - Contact : locally relevant data , contain and models.. 45 percent websites are in English….
  - Competence : Training, education, skill ….huge divide..
- Small AIs….agriculture and education : in local language…so developing countries can leverage the benefits..practical and affordable solutions…

The impending issues of Nepali economy (The 16th Plan)

If the digital economy can do a creative destruction/structural transformation/productive capacity enhancement ?

A continuous slower economic growth, structural weaknesses, shrinking manufacturing sector, declining secondary sector, expansion of service sector without strong foundation of primary and secondary sector

Lower production and productive capacity

Consumption based economy, meagre export, ballooning trade deficit

Limited opportunity of internal employment and massive youth exodus for foreign employment

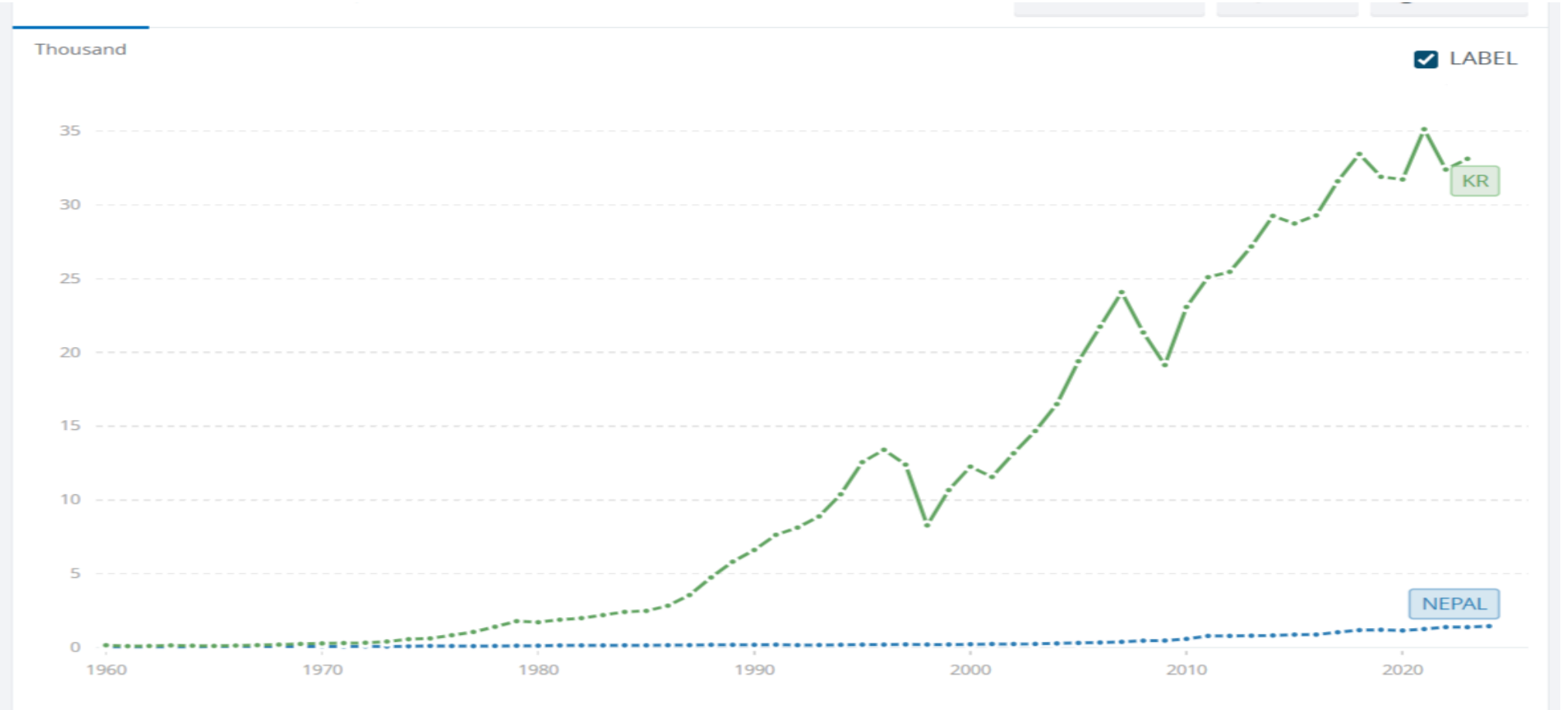
Weaker human resource development. Disconnected education and employment

Lacked infrastructures

Lacked reliable and secure ICT services

- Economic transformation is possible : lessons from South Korea
- During Park Chung Hee: first Five-Year Economic Development Plan (1962-1966), focused on developing light manufacturing sectors such as **garments, textiles, and human hair products**.
- 1970s: Catching the wave of automobile manufacturing, and heavy industries-
- The government directed massive investments, often through subsidized loans via national banks, and provided tax incentives and R&D support to the targeted chaebols to undertake these capital-intensive projects:
- If Nepal is around this period……Massive reserve, loanable deposit…proactive Governor and Finance Minister….emerging scope in DE

GDP Per Capita (Nepal Vs. South Korea)



- Can we turn the Digital Economy as Gen Z Economy???
  - Look at the root cause of Gen Z revolt?
  - Demographic dividend : 62 percent working age population
  - 42.5 Percent 16-40 years
  - 20 Percent 15-24 years age
- Massive Urbanization…the Young people prefer to live in the cities..
- Remittances : 50 times more than ODA…..Find instruments to invest it in Digital economy
- Growing private sector/business houses such as those Chaebols…
- Success story: such as the Hydropower sector..
- Borderless market opportunities….
- Growing Human capital
- Export oriented strategies- tax incentives..

Digital Nomads, Remote Works, Cyber Cafes in Mid-hill Highways …..

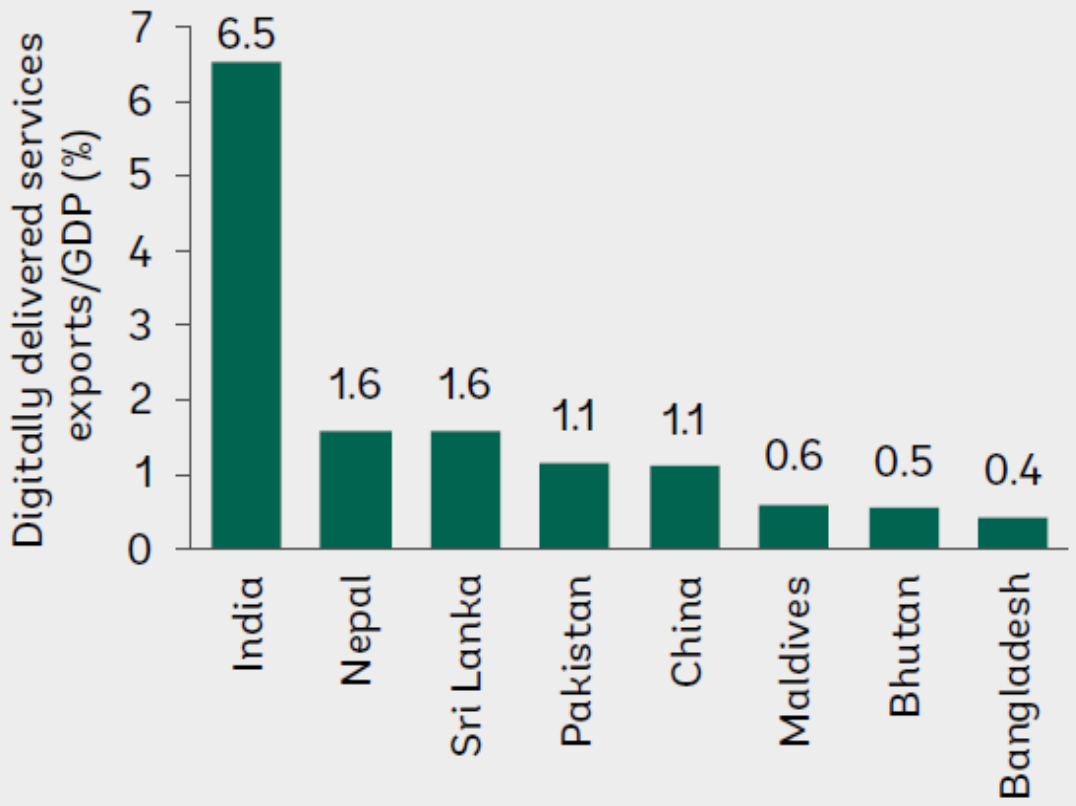
A Nepali company Fusemachines listed in NASDAQ

Invested by Global IME Bank, Dolma Impact Fund etc….

Can the Digital Economy become a savior of Nepal's snail paced economy?

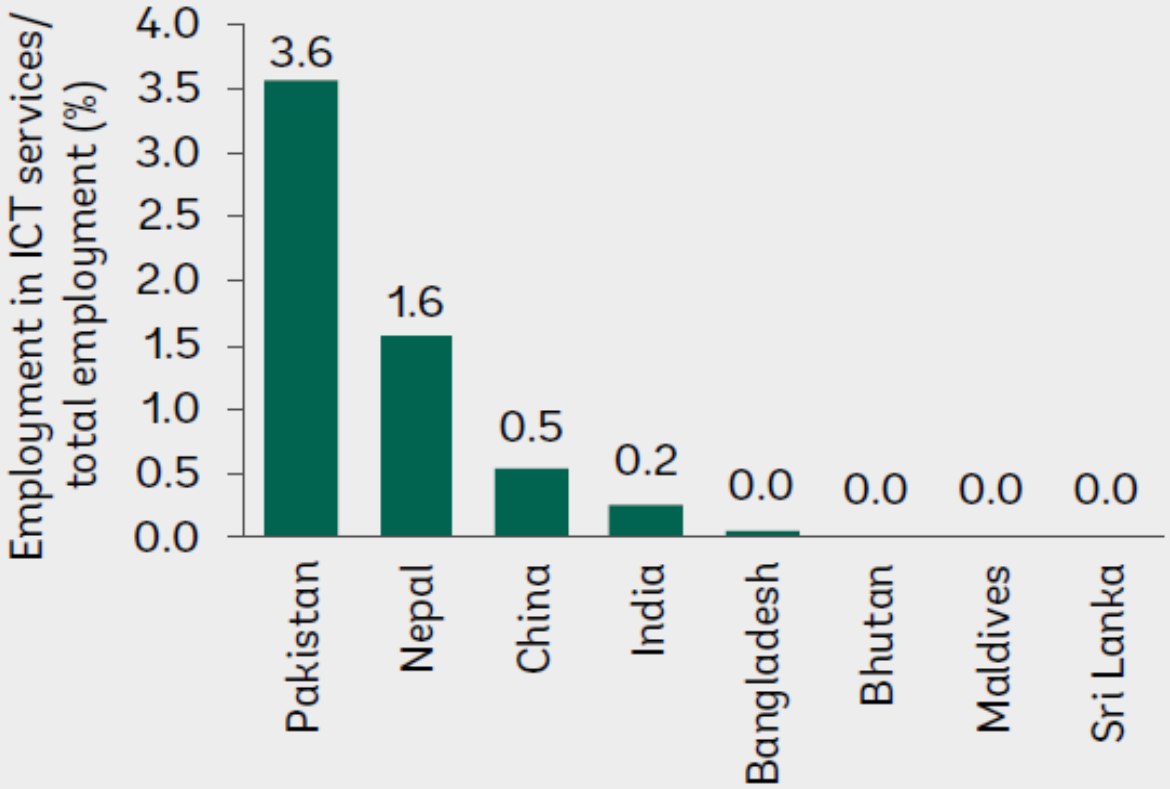
- Access to internet 69.2 percent to 90 percent by the end of 16th plan BS 2085/86
- Promotion of ICT sector as one of the emerging sectors - one of the transformative strategy of 16th plan
- Growth of ICT sector average 9.2 percent which is higher than 7.1 percent of 16th plan average growth target
- ICT sector in GDP in 080/81- 1.9 , to be reached 2.1 by 085/86.

Figure 5.2. Nepal is competitive in exporting digitally delivered services...



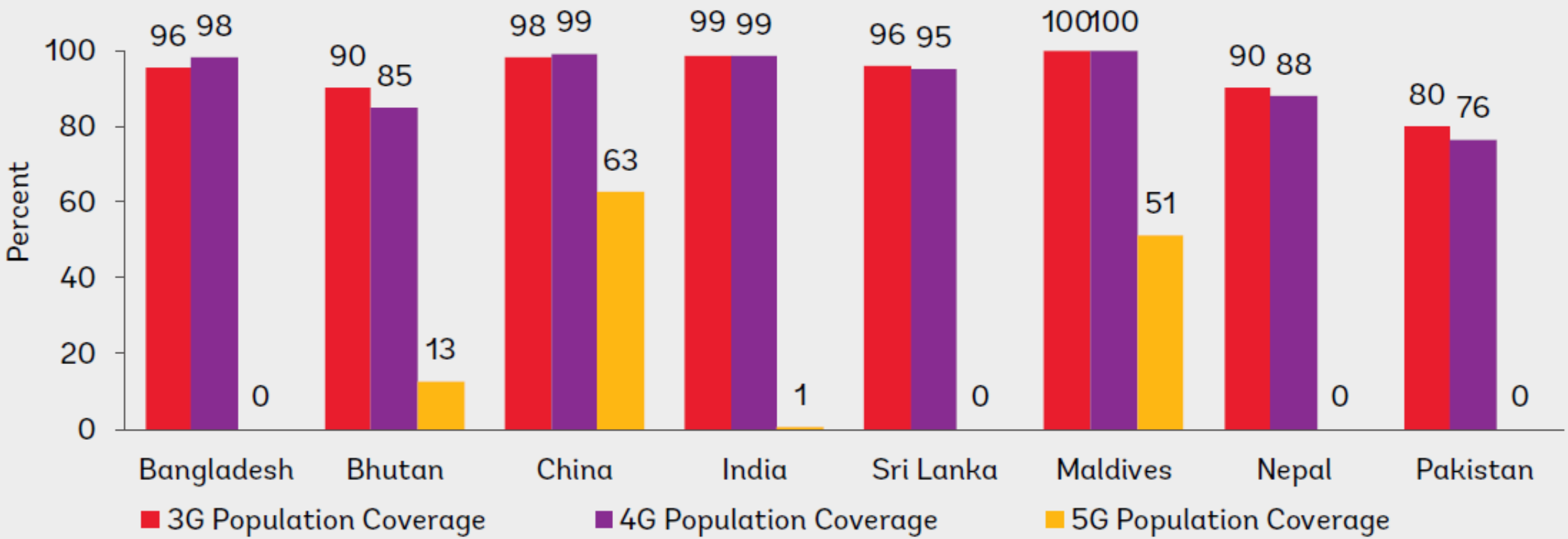
Source: UNCTAD and World Bank Staff calculations.

Figure 5.3. ... and employment in ICT services, while still small, is higher than in many peers.



Source: World Bank (2024a).

Figure 5.4. Mobile broadband network coverage has expanded...



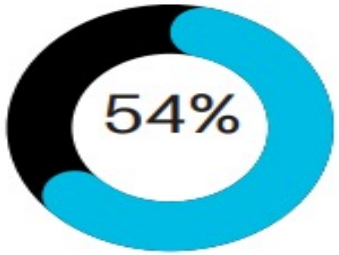
Source: https://www.mobileconnectivityindex.com/assets/excelData/MCI_Data_2024.xlsx.

Mobile Banking Dynamics

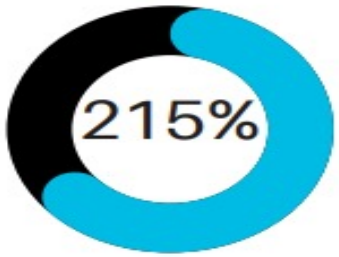
Mobile banking in Nepal has experienced notable growth from 2078 to 2081. The user base expanded significantly, with a substantial rise in the number of transactions. Additionally, both the average transaction value and the overall transaction value saw impressive increases, reflecting a growing dependence on mobile banking services in the region during this period.

509,778,827

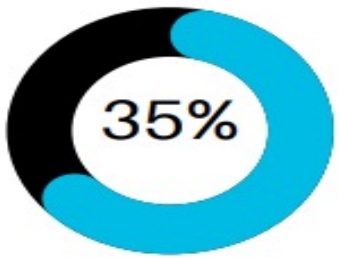
No. of Current Mobile Banking Users



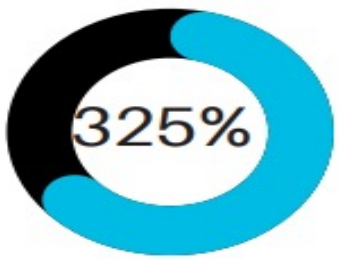
Increased number of users from 17.38 million to 26.76 million over the last 3 years.



Increased number of transactions from 162 million to 510 million over the last 3 years.



Increased average transaction value from 6099 to 8219 over the 3 years.

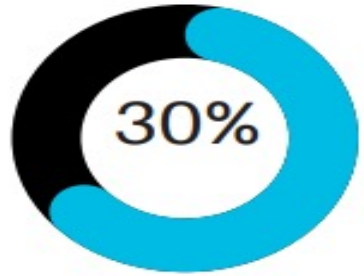


Increased transaction value from 987 billion to 4190 billion over the 3 years.

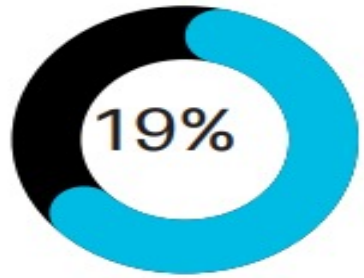
KATHMANDU FinteK

Internet Banking Dynamics

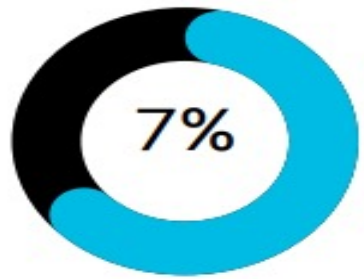
Internet banking in Nepal has seen a steady rise in adoption over recent years, driven by growing access to digital financial services. The user base has expanded significantly, reflecting increased trust in online banking platforms. Alongside this, the number of transactions has grown, indicating more frequent use of internet banking for everyday financial activities. The average transaction value has also risen, suggesting that users are increasingly comfortable with handling larger sums through these platforms. This trend aligns with the broader growth of mobile banking, which continues to play a key role in enhancing financial accessibility across the country.



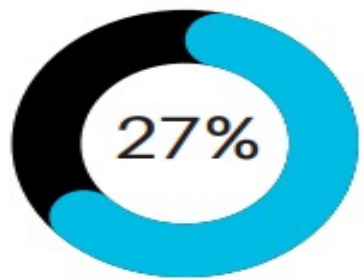
Increased number of users from 1.65 million to 2.14 million over the last 3 years.



Increased number of transactions from 3.36 million to 4.01 million over the last 3 years.



Increased average transaction value from 45986 to 48989 over the 3 years.



Increased transaction value from 154 billion to 196 billion over the 3 years.

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Where does the scope of digital economy lays for Nepal?

- IT/IT- enabled Services and software and services export
  - Over 500 + IT/software development companies + thousands of freelancers
  - According to IIDS Nepal's IT service export reached to around $515 Million in 2022.
  - Because IT services are 'weightless and borderless" –they let Nepal compete globally without geographical and infrastructural barriers

Table 3: IT services export 2020-2022 (USD million)

Year	IT companies		IT freelancers		ITeS freelancers		Total services exported	
	Amount	Growth (%)	Amount	Growth (%)	Amount	Growth (%)	Amount	Growth in %
2020	88	25.8	43.2	4.2	177.z1	-7.2	308.3	2.0
2021	111.5	26.8	52.7	21.9	149.7	-15.5	313.9	1.8
2022	20.31	80.5	69.6	32.0	244.5	63.4	515.4	64.2

Source: IIDS, 2023

Table 4: Contribution to GDP and forex reserve

Year	IT company		Freelancers		Total	
	GDP	Forex	GDP	FOREX	GDP	Forex
2020	0.3	0.8	0.7	2.0	1.0	2.9
2021	0.3	1.0	0.6	1.9	0.9	2.9
2022	0.5	2.2	0.8	3.4	1.4	5.5

Source: IIDS Nepal Study Report

Table 5: IT service export companies' revenue and investment in Nepal

Revenue generated by IT companies through IT service export (Million USD)				Investments made by IT companies. (Million USD)	
Year	Number of IT companies	Average revenue	Total revenue	Average investment	Total investment
2020	92	0.96	87.98	0.26	24.19
2021	97	1.15	111.53	0.33	32.05
2022	106	1.90	201.27	0.39	41.26

Source: IIDS Nepal Study Report

- FDI in ICT : DoI 2025:
- 080/81: 39 Firms/companies
- 081/82: (upto Jestha) : 313 F/C and investment commitment Rs.1573, 309, 200 or US$ 119 Million

10.4 Category wise FDI Commitment in Last 10 Years: (Commitment figure are in million NRs.)

Sector		AGRO AND FORESTRY BASED	ENERGY BASED	ICT BASED	INFRASTRUCTURE	MANUFACTURING	MINERAL	SERVICE	TOURISM	TOTAL
2081/82**	Projects	11	1	313	2	48	-	76	266	717
	Commitment	1446.00	25.50	1573.90	50.00	3122.05	-	30447.73	23944.26	60609.44
2080/81	Projects	10	3	39	6	51	2	167	261	539
	Commitment	475.00	13141.73	838.71	3380.00	4433.69	85.94	31153.71	16324.80	69833.58
2079/80	Projects	1	1	16	10	29	1	135	134	327
	Commitment	40.00	330.00	712.00	595.50	2490.00	267.00	15586.93	10697.08	30719.45
2078/79	Projects	4	1	7	8	51	-	98	125	295
	Commitment	600.00	56.20	520.00	1724.00	7914.40	-	23790.29	19401.55	54,158.94
2077/78	Projects	3	4	16	-	19	-	41	102	184
	Commitment	529.00	1546.12	3005.13	-	2689.06	-	5985.00	18418.51	32,072.82
2076/77	Projects	4	5	37	-	25	-	70	82	223
	Commitment	447.4	4978.78	7081.23	-	3265.43	-	11104.04	10928.94	37805.83
2075/76	Projects	17	-	25	-	62	2	108	131	345
	Commitment	403.29	-	654.48	-	6769.64	13.16	7105.78	10538.09	25484.44
2074/75	Projects	20	5	26	-	67	3	120	159	400
	Commitment	1936.00	36241.50	537.80	-	6845.97	3800.00	2240.84	4158.38	55760.49
2073/74	Projects	21	-	8	1	57	2	158	153	400
	Commitment	256.46	-	88.74	10.20	3825.79	38.50	4998.29	5988.49	15206.47
2072/73	Projects	22	4	-	1	50	-	145	126	348
	Commitment	297.30	1836.24	-	10.00	3172.95	-	7989.51	1948.33	15254.33

** 2081/82 (Till Jestha 2082)

- **Despite the success of ICT services, Nepal encounters significant challenges in producing and exporting ICT goods.** A key factor contributing to this issue is the low level of FDI in the sector.
- Nepal’s ICT goods exports remain minimal, while imports of these goods account for 4 percent of the country’s merchandise imports

-World Bank

Digital economy: Innovations and strides

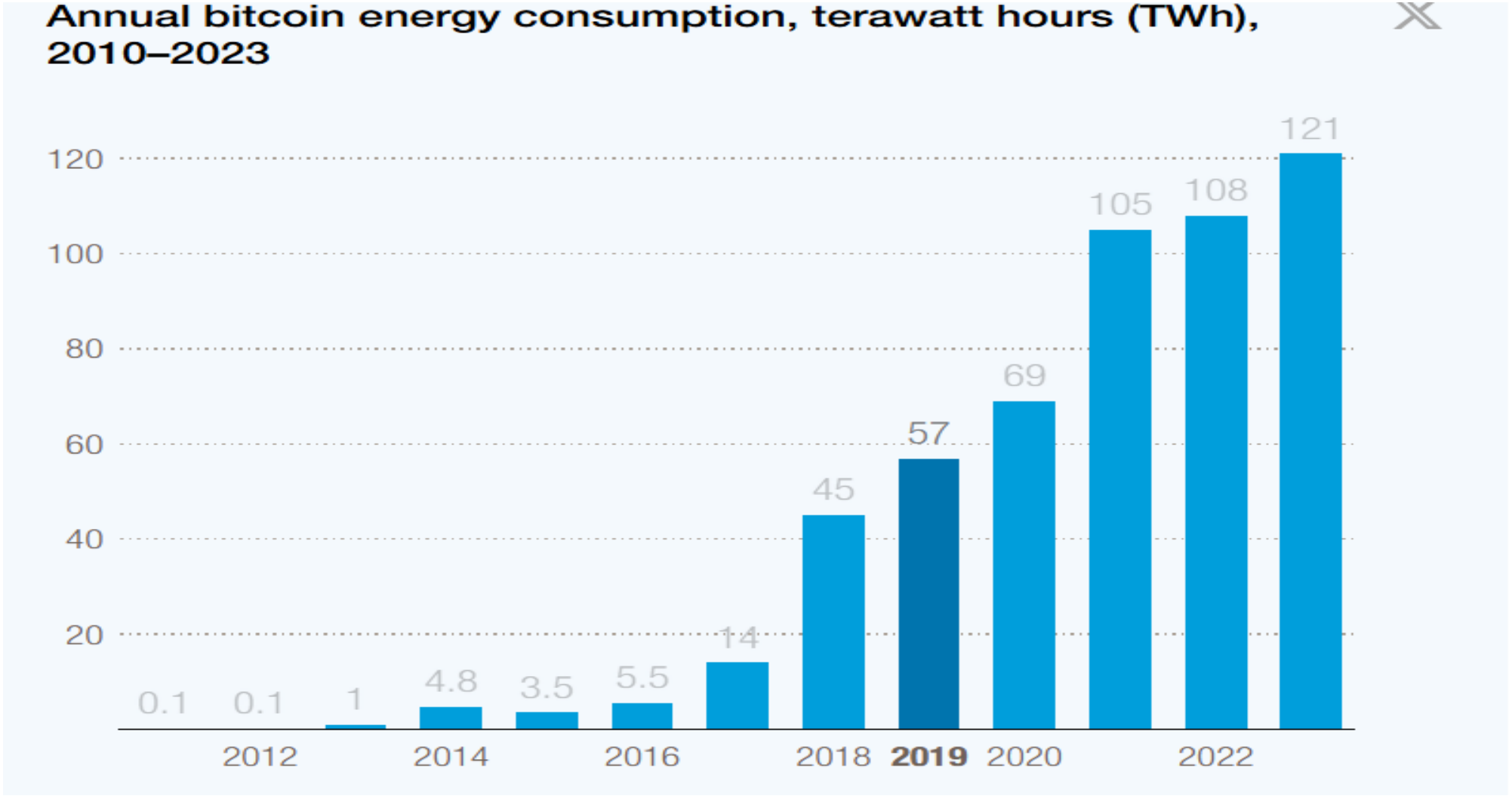
- **Digital –Financial services and Fintech**
  - **Digital payments, mobile banking, Connect ips, e-wallets, QR payments – even the groceries and small shops and street vendors accept QR payments**
- **Connect ips operated by NCHL: government-to-business (G2B) transactions and revenue collection**
- **RMIS by FCGO: electronic payments..federal, provinces , SuTRA**
- **Digital channels to disburse social security benefits, salaries, and other payments to citizens (G2P), helps reduce misallocation and corruption and ensures timely delivery of funds.**
- **Interoperability – National Payment Switch, NPS, NPG, PSP(Payment service providers**
- **Cross Border Payment through UPI (Unified Payment interface)**

One more opportunity for Nepal- green digitalization

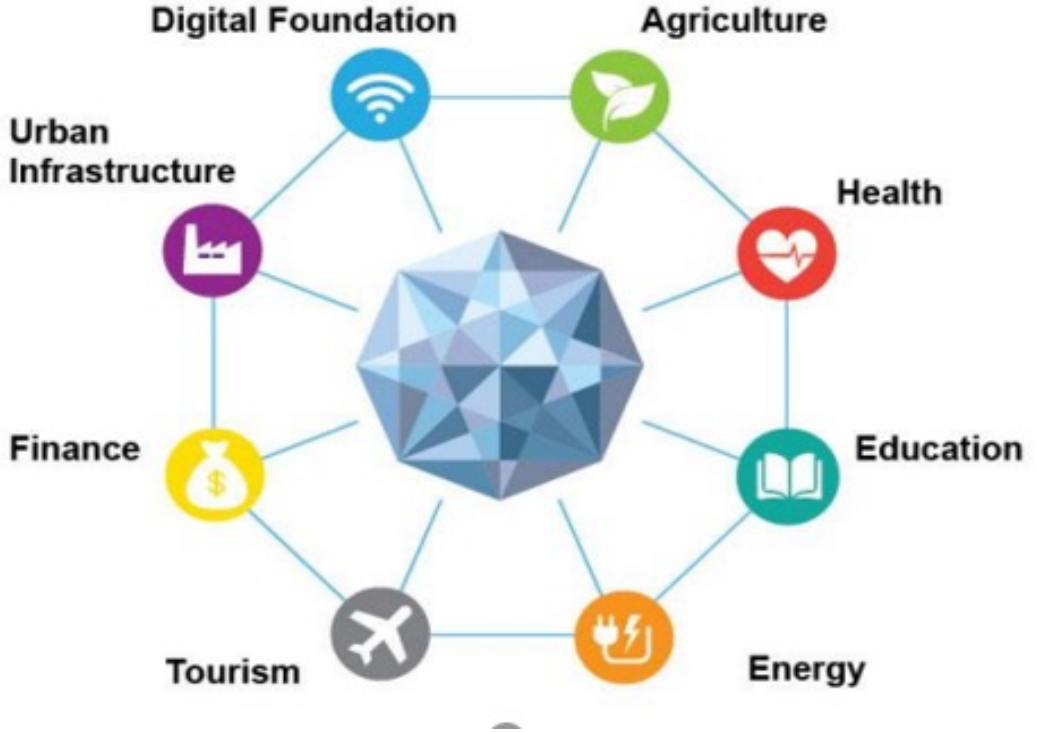
(UNCTAD Report 2024:)

- **Digitalization's increasing energy and water needs…….**
- **From 2018 to 2022, electricity consumption by 13 of the largest data centre operators more than doubled. Worldwide, data centres are estimated to have consumed as much energy as France in 2022 – 460 terawatt-hours (TWh) of electricity.**
- **Data centres in Singapore accounted for around 7% of the country's electricity demand in 2020, and in Ireland that share was as high as 18% in 2022.**
- **Cryptocurrency technologies are also energy intensive. Bitcoin mining's global energy consumption rose 34 times between 2015 and 2023.**
- **In 2022, Google's data centers and offices consumed more than 21 million cubic meters of water. Newer technologies, such as generative AI, also require more potable water for cooling servers.**
- **Rear earth minerals extraction ……???**

Can we leverage benefits from renewals and clean, green energy????



- E-commerce and Platform retails: Daraz, tiktok, foodmandu, Pathao,
- Digital Public Services : Nagarik App, National ID card, Online tax clearances , online applications/ registrations ..



- **Sectoral digital transformation (agriculture, health, tourism, education) : telemedicine, agri-marketplace, digital learning, tourism apps; Instagram, You Tube channels for marketing , news and views**
- **Digital agriculture services for farmers in Nepal include platforms like Geokrishi and Kheti- provide farmers with real-time information on crop management, market access,**
- **Financial tools like the Kisan Credit Card.**
- **Smart Grid Technology**

the Mechanized Irrigation Innovation Project (MIIP) Rautahat and Sarlahi by ADB

- The project will construct a network of approximately 500 deep tube wells with prepaid card systems to provide farmers with metered, on-demand water access, aiming to improve agricultural productivity and food security

- **Employment in ICT remains small, partly due to a significant skill gap**
- the ICT labor force remains small, accounting for only 0.35 percent of the total labor force in 2021.
- Only 0.16 percent and 2 percent of the population have completed education (intermediate equivalent and above) in the ICT and STEM fields, respectively
- **Based on the 2021 digital skill gap assessment,** Out of 134 economies assessed in the index, Nepal ranks 124th, lower than other South Asian countries…
- This shortage of skilled professionals, coupled with the outmigration of existing skilled workers, hinders the sector's growth and potential contribution to the economy

NTIS

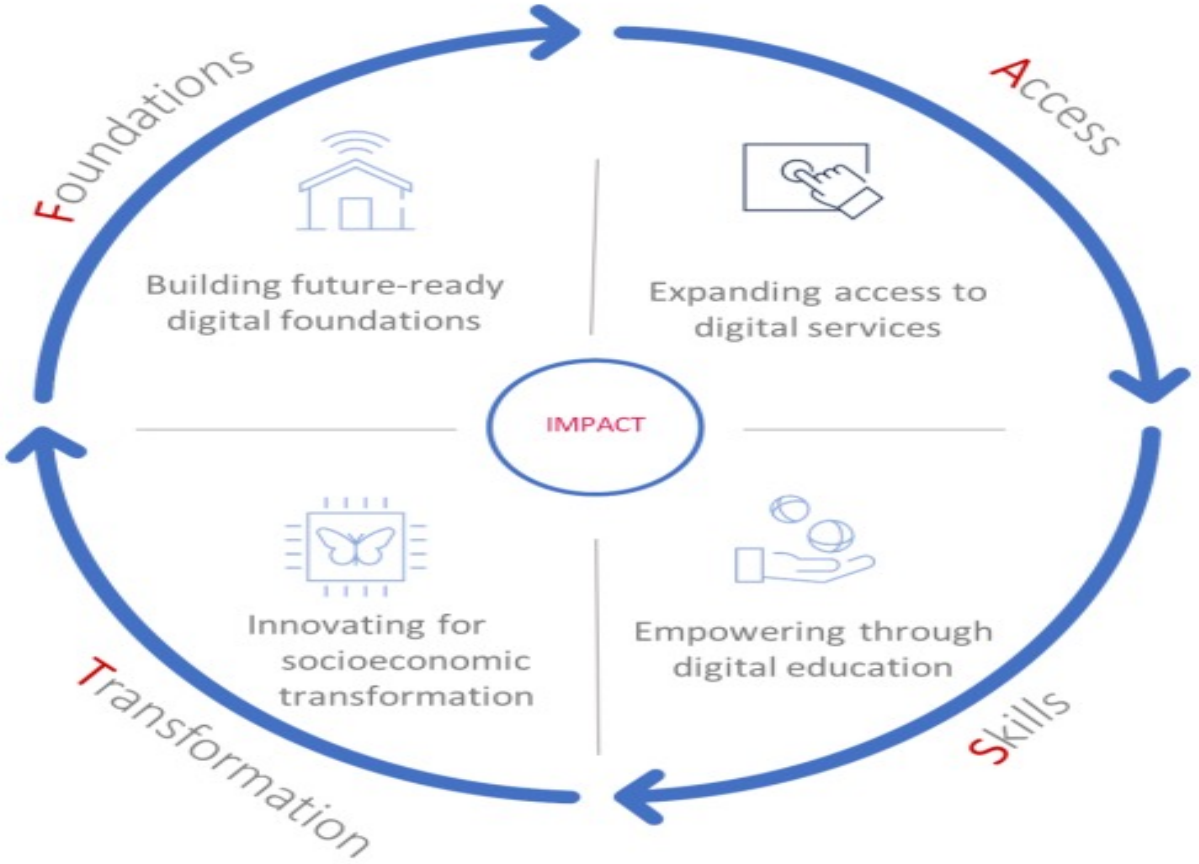
SWOT analysis: a step towards industry 4.0

Strength	Weakness
• Proactive policy framework • Low labor costs, dedicated, and English-speaking human resources • High speed data communication (HSDC) being planned • Appropriate climatic condition • Cyber law (ETA 2008) already enacted • Digital Nepal Framework, 2019 (2076) • National IT Policy, 2016 (2072) • The National Strategy on Development and Use of E-commerce in Nepal, 2019 (2076) • Satellite Policy, 2020 (2077)	• Poor Infrastructure and lack of standards • Lack of digital skills among workers • Lack of clarity regarding economic benefit • Lack of internal digital culture and training in organizations • Issues with receiving payment in foreign currency • Lack of IT research • Weak cyber security and data management • Insufficient funding and weak partnerships
Opportunity	**Threat**
• IoT-enabled features make it possible to monitor use, and after use • Increase life of machinery based on monitoring and predictive maintenance • Informed fact-based design decisions to improve utility of products • Prospects of FDI in implementation of Industry 4.0 • Possibility of smart and sustainable value-chain/ supply-chain development	• Ensuring data quality • Change management to address disruption in work nature • Lack of established procedures to evaluate intellectual property

POLICY RECOMMENDATIONS – BOOSTING THE DIGITAL SECTOR

	Recommendation	Fiscal Impact	Recommendation	Fiscal Impact
	Creating Opportunities			
Tier 1	Improve the regulatory environment.	● Low	Accelerate the development of digital public infrastructure.	● Low
Tier 1	Reform the RTDF.	● Low		
Tier 2	Make digital technologies more affordable.	● Low	Promote the transition to advanced net-works and technologies.	● High
	Creating Capabilities			
Tier 1	Expand digital skills.	● Low		

DNF 2.0 draft : FAST



Digital economy and fiscal innovation

- Fiscal innovation enhanced efficiency, data-driven policy making, and new revenue collection
- Can leverage big data and AI to gain real-time insights into economic activity, making more precise forecasting of revenues and targeted tax and expenditure policies
- Enhanced Public Financial Management (PFM): Digital solutions like Financial Management Information Systems (FMIS) automate processes (LMBIS, PLMBIS, SuTRA accounting, reporting), leading to greater efficiency, transparency, and accountability in managing public funds
- Promoting Broader Innovation: Fiscal policy, government investment in science and technology -a catalyst for digital economy- financial support and incentives for R&D and digital infrastructure

Albania: AI Minister for procurement, Diella, a female digital avatar

Way forward.....

- **Target the Digital Economy: beyond 2.1 Percent…. @ Global average of 15 percent . GDP growth target @7-8 percent …..WB revising @2.1 %?**
- **Post Gen Z Confidence building..Rebuilding by own sources.**
- **Increase investment in human capital development, –STEM**
- **Enabling environment, strategies, institutions, rules, and ecosystem building…**
- **Level playing field to private sector…Scale up investment in DPI, data security, expand digital literacy, digital inclusion**
- **Provide targeted incentive to private sector to invest in IT sector like provided in hydropower sector during the 2010s..**
- **Implement NTIS, High level reform Commission, DNF recommendations**
- **Let us not allow to premature de-digitalization like the premature de-industrialization….**

Comments, Questions ????