From Policy to Practice: A Critical Review of Digital Economy of Nepal

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Abstract

While accelerated by the corona virus disease 2019 (COVID-19) pandemic, significant digital disparities revealed on education, health, and other economic sectors between urban and rural areas. The digital economy, an information and communication technology (ICT)-reliant model, is increasingly considered as a high growth potential source compared to the traditional, sluggish economic environment. Digitalization is an essential tool for improving supply chain efficiency and stimulating aggregate demand to help break the Malthusian vicious cycle trap. This paper aims to explore and analyze the current status of the digital journey and its potential for socio-economic transformation within the economy of Nepal. The study employed a qualitative research methodology. The research is primarily based on a review of literature, including national and international policy research papers, journal articles, and theories. The author also utilized information gathered from Key Informant Interviews (KIIs) with thematic experts on ICTs, economy, and policy discourses. The paper concluded that Nepal has made progress in expanding telecommunication infrastructure and digital payment systems, supported by the '2019 Digital Nepal Framework (DNF)'. However, this progress is undermined by a persistent digital divide caused by infrastructural gaps, low digital literacy, and external sector vulnerabilities. The slow pace of digital transformation is attributed to fragmented governance, conflicting regulatory practices, and weak policy coordination. While digital foundations are improving, Nepal must adopt a consolidated institutional transformation approach, supported by strong and visionary leadership, to successfully bridge infrastructural gaps, reform governing policies, and foster digital skills for a rapid economic growth and development.

1. Introduction

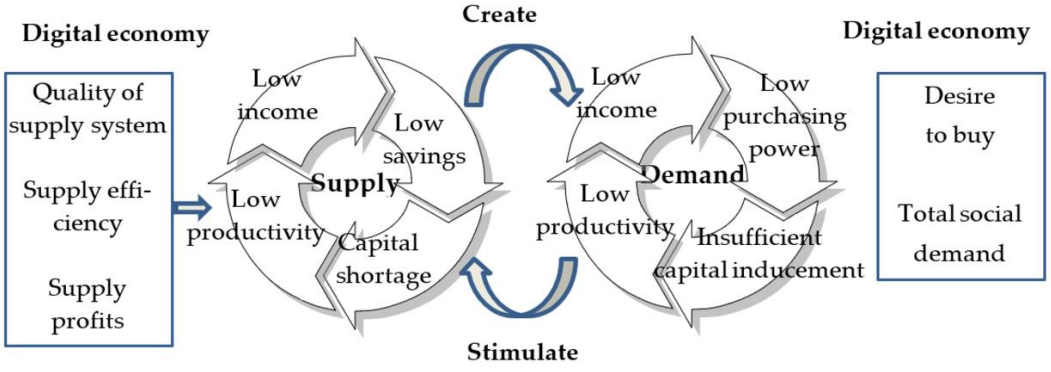
From the more recent international experiences, Nepal can explore the immense opportunities and socio-economic transformation from and changing lives and societies with unprecedented speed and scale. Therefore, the digital economy basically improves infrastructure, innovation, employment impacts, governance and partnerships for the Sustainable Development Goals (SDGs) (UNDP, 2023). Digital economy is a rising economic model which relies on ICT and new technologies across the industry sectors and society. (Feijao & et. al, 2021). So, digital economy from a macroeconomic perspective is a concept of a holistic overview that encompasses digitally and technologically enhanced systems or with internet penetrated production, distribution, and consumption of goods and services. As a result of the emerging technologies and innovation, the optimization on demand and supply side penetration of an economy rapidly with a higher level of coverage (Yang & et. al, 2022). The focus during the 1990s when the internet services had just begun was more focused on how emerging digital channels impact consumers and businesses. The differences between a traditional economy and a digital economy come down to paper and manual processes versus emerging technology adapted systems, physical products versus digital products and services, brick-and-mortar versus ecommerce, and cash versus cashless payments.

The existing macroeconomic contexts of Nepal hardly gains an effective growth rate, while the digital economy has a high potential growth with a revised vision, strategies and investment policies. The situation underscores the need for digital strategies to enhance the domestic supply and improve on the potential supply for meaningful economic transformation. The nature of some industries requires a full transformation in its operation, process and business models to leverage digital technology. The COVID-19 pandemic further accelerated the adoption of digital solutions in business, education to health sectors, leading to a surge in startups focusing on telemedicine, online education, and e-commerce. Despite this progress, significant disparities exist between urban and rural areas regarding access to digital technologies and services. Digitalization basically is built on the foundation of competition and transparency. Several questions are with us. What is the status of emerging digital technology adoption to propel growth in Nepal? Is digital technological adoption ready to leverage and disrupt the economy of Nepal? Is it in the process-oriented industries or product-oriented economy or where else? Why should Nepal develop the digital capabilities, take multiple initiatives and scale up its successful initiatives and new business model with low sunken cost? How should industries and businesses make a good start? Is it by improving their customers' experience or offering of digital products/services or digitizing the internal functions and processes basically in the B2B models? Why should private sector firms strengthen their digital capabilities with a degree of disruption to improve their most crucial digital priorities? This paper basically tried to explore and analyze the digital journey in the economy of Nepal.

2. Review of Literature

For advancing digital economy, three different regulatory and governance approaches are well known models: (a) direct intervention by the support of national political goals and strict regulations as developed in China, (b) strong regulations with the protection of fundamental rights and public values as framed by European Union, and (c) light regulatory framework as practiced by USA (UNCTD, 2025). The common factors among these prescribed models require coordinated investment approaches in governing policies, digital infrastructure, data governance, digital skills, and entrepreneurship development.

The intervention on the digital economy breaks the vicious circle of Malthasian trap from the perspective of the supply and demand side of the economy (Reference figure-1). Enhancing the quality of the supply chain by the digitalization processes and halting the cycle of poverty trap, the production and supply chain efficiency improve. On the other hand, a digital economy with a higher level of purchasing power and aggregate demand stimulates the demand side. (Yang & et. al, 2022)



Source: Borrowed from Yang & et. al, 2022

The 2019 pandemic accelerated digital adoption across the global economies and underlying sectors. The rapidly growing connectivity is surged with fiber broadband subscriptions and mobile data usage across the globe isn't with a homogeneous rise but with diverse business applications and demographics. It didn't only turn productive sectors of economies into teleworking, distance learning, e-commerce, and emerging technologies, but also created a digital divide, challenges on cybersecurity, and different levels of policy responses. Therefore, the way forward is to focus more on inclusive access, robust data security, and data governance to build up a resilient governance in the economies. (OECD, 2020)

According to the definitions and frameworks of the International Telecommunication Union (ITU), Digital Cooperation Organization (DCO), United Nations (UN), and G20, the forms of interoperability, secure data, and inclusive infrastructure and access are the foundational part of the digital public infrastructures (DPIs). Basically, they help governments and private sectors to leverage the baseline DPI frameworks, digital platforms, and digital networks and enable for digital service and transactions and empower society with economic opportunities and public service delivery and drive economic progress. The DPIs are crucial for creating innovation and efficiency for resilient digital economies, reform governance, advance the technology, and integrate the global markets. Successful DPI connects people to generate economic opportunities in social inclusion, education and health care services, and creates spillover effects across sectors. Meanwhile, some challenges of developing DPIs are related to regulatory and legal issues, a large investment in infrastructures and inclusive transformation, interoperability and technical issues, data sovereignty, privacy and data security, etc. (DCO, 2025).

Nepal can better decisively adapt to the SMS service model from Rwanda to digitized governance service for rural public or learn a model of Estonia to provide online service for its citizen by using the national identity card and connecting creatively to small and medium scale entrepreneurs (SMEs) by Facebook commerce /mobile payment system for their different needs in various contexts. Having the majority of population below 30 years of age, Nepal can take demographic advantage of exporting digital services to global business communities. (Dhakal, 2025) Having a look at other South Asian countries, Nepal can draw lessons from India's Aadhaar-enabled payment system and the Unified Payments Interface (UPI), which have significantly improved financial inclusion and facilitated the digitalization of various sectors.

The digital adoption in banking and finance is primarily driven by demographic factors like gender, age, education, and occupation, with higher adoption seen among males, middle-aged adults, and those with higher education. Key predictors of adoption include perceived ease of use, convenience, credibility, and perceived usefulness. To increase adoption, financial institutions should focus on simplifying interfaces, improving security, and tailoring solutions for specific user segments like professionals and tech-savvy individuals, ensuring their platforms meet evolving user expectations and promote wider accessibility. (Kandel & et. al, 2024)

A thorough review of structural impediments attributable to policy implementation gaps along with a fine tuning of the governing policies, evolving technological paradigms such as the AI, blockchain, analytics, and Industry 4.0 can build up a future digital journey of Nepal and improve the transformative potentials ICT and digital technologies (Chaudhary & et. al, 2021). Therefore, it is said that the 21st century is being shaped by code, algorithms, and digital networks. The speed, scale and impact of the digital economy moves faster than the traditional economy. So, this shift from a traditional economy to a digital economy is equally important not only to the rich nation but also for the underdeveloped countries like Nepal.

3. Methodology

This study relied on the qualitative research methodology. The author reviewed the underlying theories, national and international policy research papers, journal articles, etc. to evaluate the contexts of the digital economy of Nepal. While discussing the underlying facts, emerging and contemporary issues, gaps and key challenges, thematic analyses emerged on the basis of key trends and patterns to reduce the gaps and constraints and advance digitalization of the economy of Nepal. The paper is primarily developed on the review of literature and some KIIs with the thematic experts. In the KIIs, the author covered the ideas, information, and opinions shared basically by the thematic experts on ICTs, economy and policy discourses.

4. Results and Discussion

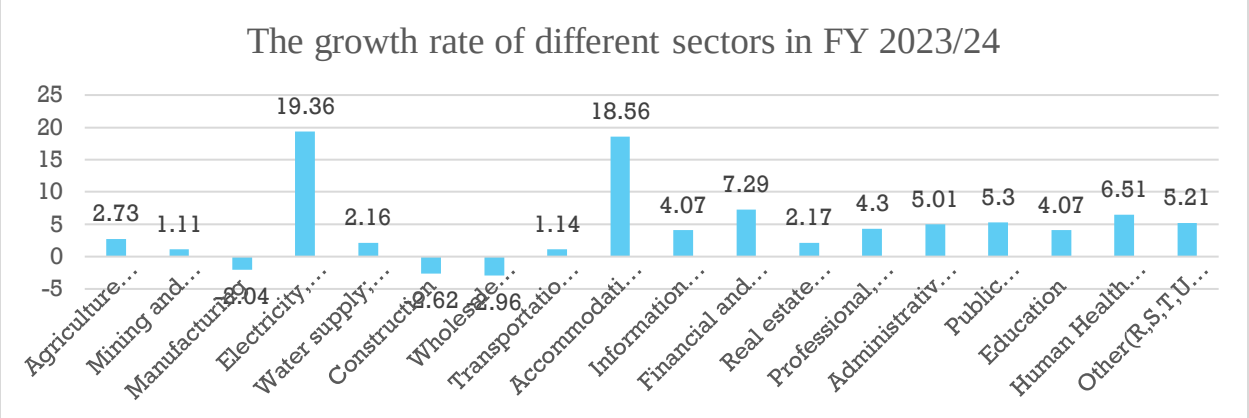
The whole results and discussion section is divided into the following different sub-sections:

4.1. Macroeconomic Contexts, Sectoral Status and Disruptions

Nepal's macroeconomic contexts in the last two decades show a sluggish business environment. The trade balance has persistent and large trade deficit trends - the import to GDP ratio is over 30 percent while export to GDP ratio is less than 5 percent. Similarly, the strength of Nepali currency against the USD is gradually deteriorating in the last few decades. The relative economic growth of Nepal compared to its immediate neighboring countries is also low and stable at 4 percent. All these macroeconomic scenarios indicate the external sector vulnerabilities in the last few decades. The status of total revenue while the government financing in the Republic Nepal is growing over the years, growth rate of M1 and M2, and inflow of foreign direct investment (FDI) inform that Nepal's economy is still in transition and not gaining a higher momentum by its resources and internal business environment in the last few years. The debt to GDP ratio is growing over time.



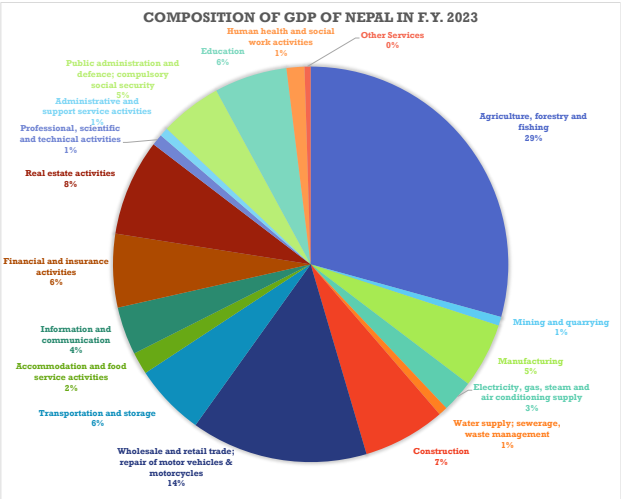
Source: Ministry of Finance, 2025 (Reference figures-2-6)

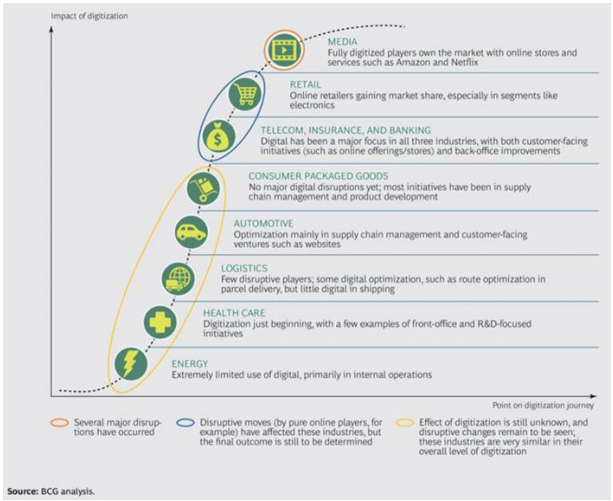


(Reference figure 7)

The sectoral growth rate of Nepal's economy in FY 2023/24 (Reference figure 7) shows that electricity, gas, and air conditioning supply had a standout performance followed by the accommodation and food services. The service sector domain such as the financial services, health, public administration had moderate growth rate, and the critical sector for job and productions such as the manufacturing, construction, and trade had negative growth rate. It indicates a warning sign and economic vulnerabilities caused by a shrink on domestic demand, higher level of cost of production, issues on the supply chain, and weak investment.

The situation is such that agriculture employs the most of the people, the service sector is generating GDP, and the growth potential is in industrial development (Reference figures-8 and 9). The inflow of remittance is balancing the trade deficit. The implications of monetary and fiscal policies aren't significantly creating transformative development cycles to gain momentum in the supply sides by the existing economic activities. So far the collaborative stakeholders of Nepal are able to educate its state mechanisms and people, and crystalize the digital vision, strategies and policies, the digital transformative approach will gain the high potential to drive Nepal's economy through the DPIs.





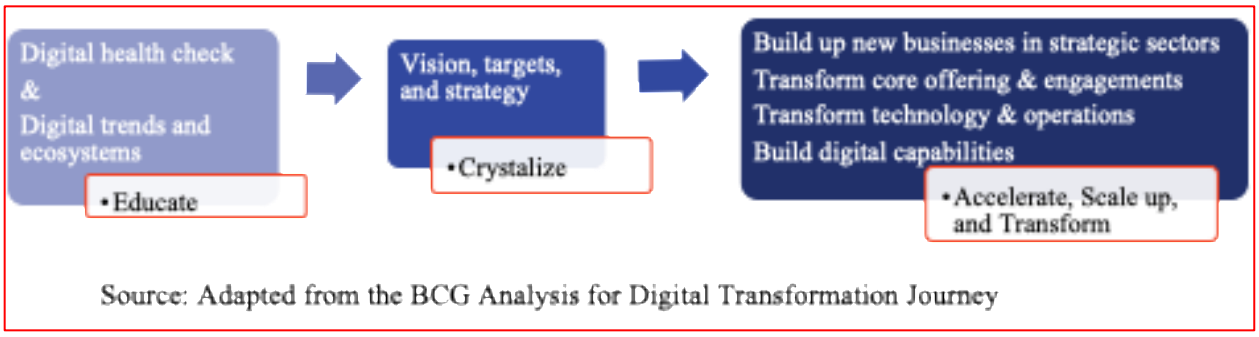
(Reference figure-8 and 9)

As presented by the Boston Consulting Group (BCG), the impact of digitalization across the various industries presented in assets structure by the opportunity of automation, optimization and cost reduction strategies and value creation by a shift in business models, disruptions of traditional players, and new market entrants that generates revenue (by subscription and data), profit, and the competitive business dynamics. (Reference figure- 8)

4.2. Vision, Targets and Strategy

To harness digitalization process for socio-economic growth in Nepal, Government of Nepal (GoN) launched a 1-8-80 governance model - '2019 DNF' to target eight priority sectors - agriculture, health, education, energy, tourism, finance, urban infrastructure, and digital foundation through 80 specific initiatives with an ambitious goal to generate NPR. 800 billion by 2022 (MoCIT, 2019). The GoN took different initiatives – the announcement of the digital decade 'IT Decade: 2024-2034' to create 1.5 million jobs and over 22 billion incomes in service exports. Meantime, GoN also promulgated Social Media Operation, Usage and Regulation Bill 2081; IT and Cybersecurity Bill, 2080 with a view to conduct the censorships. The political consequences invited the Gen-Z uprising. It indicates the dual practices and visionary issue of the GoN. While the need of the time is to conduct a thorough review of the '2019 Digital Nepal Framework (DNF)' and establish the measures for policy coordination to address the investment challenges on the critical infrastructures, refine the outdated laws including Telecommunication Acts 1997, envision on the data privacy, artificial intelligence and modern means are the concerns policy concerns of the time. The DNF is a comprehensive policy framework envisioned including the financial ecosystem to drive digital transformation with the initiatives such as the national payment gateway, credit ratings, mobile wallet services, digital payments, and development and promotion of e-commerce (MoCIT, 2019). The framework encourages private sectors for an adoption of open-source emerging technologies in the digital transaction to reduce the operational cost and improve efficiency by leveraging AI driven chatbot and blockchain technologies so that institutions can attract investors and streamline customers' service.

The vision and strategy of the digital economy to gain momentum in the supply side economy requires significant inputs including a strong leadership focused on regulatory environment reform with a large chunk of investment funds accessible for critical infrastructure development, data governance, and digital skills and digital literacy. While Nepal's economy is largely based on imports of goods and services from India and China, strategic investment and public financing for the digital initiatives to enhance the supply capacity of the economy is less observed in the last few fiscal years. The inflow of private sector investment to these initiatives also remained insignificant.

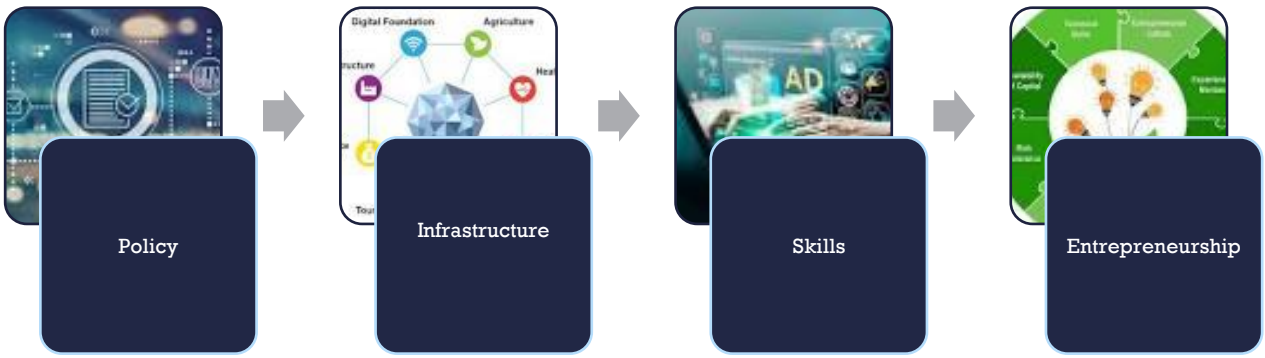


Source: Adapted from the BCG Analysis for Digital Transformation Journey

(Reference figure- 10)

The GoN hardly realized the poor digital health to move forward with poor infrastructures along with capital and skilled labor constraints are responsible for creating a huge digital divide in the rural area. Meanwhile, the efforts of the GoN to adapt to global digital initiatives and trends and reform the weak digital ecosystem by the means of educational practices to its different stakeholders remained weak on the digital transformative journey. The existing digital policy framework hardly breaks the core issues of administrative challenges. During the period of exercise, a weak political leadership with bureaucratic hurdles, institutional challenges, and capacity constraints remained the fundamental issues to expand digital foundations. As the focal ministry, The Ministry of Communication and Information Technology (MoCIT) is hardly crystalizing the agenda of the digital economy of Nepal. Therefore, policy formulating stakeholders of government entities should facilitate collaboration with the private sector entities to thoroughly revise the vision and policies of the digital economy (Reference figure-10 and 11).

As the way forwards, development of critical infrastructures and digital skills, reforming the existing governing policies and regulatory framework are largely responsible for breaking the trend of foreign direct investment (FDI) and collaborative partnership for digital solutions. Therefore, moving forward for the digitization process requires a strong and visionary leadership to overcome systemic challenges on governance, deep-seated administrative reform, and building up the robust and digital infrastructure resilience to reduce the digital divide.



(Reference figure- 11)

The scale up initiatives of ambitious firms improve their digital capabilities by acquiring digital talent through outsourcing measures and then build up internal capabilities to create start-up incubators through a joint venture or partnerships. Lead and sustain digital change then adapt to the strong change management processes for digital ventures.

4.3. Digital Infrastructures, Ecosystem and Investment

Though the expansion of telecommunication infrastructures, growth of broadband, mobile phone penetration, and cellular networks, the digital payments and e-commerce have an impressive growth, the meaningful applications of ICT and digital technologies to contribute to the sustainable development goals (SDGs) are yet to realize. Meantime, a large proportion of the population are still out of the ICT radar due to the slow pace of quality broadband penetration and telecommunication infrastructures. In lack of effective coordination and an integrated approach, competitive business environment and strengthening

governance for delivery results have not been gained by the strategic applications of information, communication, and digital technologies. (Chaudhary & et. al, 2021)

According to the Global Information Technology Report 2016 ranked Nepal at 110 positions out of 139 low-income group countries on the Network Readiness Index. The Environment Readiness Subindex (which measures the overall political, regulatory, and business and innovative environment contexts), Nepal. Similarly, the Readiness Index (which measures the overall infrastructure, affordability, and skills contexts)

According to the Nepal Telecommunications Authority's Annual Report of 2080/81, the broadband service density has reached 149.23%, reflecting significant growth in internet connectivity. Mobile device penetration is increasing, with affordable smartphones and expanding 4G and 5G networks improving internet connectivity, especially in rural areas. Nepal is actively working on implementing standards, interoperability, and regulatory frameworks for digital finance and investment.

Category	**Digital Infrastructure**	**Status in Nepal**	**Analysis & Implications**
Digital foundation and adoption	Registered websites / companies	56,286 websites; 166,781 registered companies; 40,000 commercial websites.	It shows a base level of formal digital presence, but commercial website penetration (24% of companies) indicates many businesses are not fully leveraging digital platforms.
	Core economic structure	Agriculture represents 24.26% of GDP (but it employs 43% of workforce).	It highlights a critical sector for digital transformation to boost productivity and bridge the urban-rural divide.
Physical and service infrastructure	Internet service and connectivity	Lack of high-quality internet in rural areas; still lacks reliable 4G/broadband/fiber.	This infrastructural gap is the root cause of the digital divide, limiting access to education, economic opportunities, and government services in rural areas.
	Broadband expansion and data centers	Conflicting objectives between expansion and development; projects like broadband and data center development are underway.	Investment is happening but faces coordination and prioritization challenges. Success is critical for enabling a national digital economy.
	Industrial IoT and smart machinery	Information not explicitly provided in context.	It is likely at a nascent stage, constrained by connectivity issues, cost, and low digital literacy in the industrial sector.
Human capital and literacy	Digital literacy rate	Stands at 31% nationally; much lower for women and rural populations.	A severe bottleneck exists. Even with infrastructure, low skills prevent people from using digital tools effectively, reinforcing inequality.

Category	Digital Infrastructure	Status in Nepal	Analysis & Implications
	Governance and education systems	Initiatives exist (smart classrooms, online platforms, biometric systems).	Implementation is often uneven. Digital tools in education can help raise future literacy but are currently hampered by the connectivity divide.
Governance, policy and investment	Digital governance and regulation	Conflicting objectives between innovation and control; policies on data privacy, cybersecurity, etc. are underdeveloped.	Creates uncertainty for private investors and foreign partners, stifling the investment needed to build the digital ecosystem.
	Macroeconomic and institutional context	Guided by DNF and periodic plans; digital economy model emphasizes policy coherence and rural infrastructure.	Vision exists but implementation is weak and sectoral. Strong, coordinated execution across government bodies is missing.
	Private sector investment	Hindered by regulatory uncertainty (taxation, startup rules) and infrastructure gaps.	The private sector is cautious. A clear, supportive policies and public-private partnerships are essential to drive growth.
Performance and divides	Global rankings (network readiness)	Historically low (e.g., 118/139 in 2016), scoring poorly on environment, readiness, usage, and impact.	Confirms systemic challenges across the board—not just infrastructure, but also the regulatory environment and skills.
	The digital divide	Manifested geographically (urban vs. rural), economically, and by gender and literacy.	Without targeted action on affordable access and literacy, digital development will increase existing inequalities.
	Digital economy model and vision	Comprehensive model exists; vision is ambitious but poorly implemented.	The gap between strategic vision and on-the-ground execution is a major barrier to realizing digital economic benefits.

The GoN has made efforts to digitize payments, promote mobile banking, and create a regulatory framework for electronic transactions further reinforcing the idea of a clear digital vision for Nepal's financial future. The collaboration between financial institutions, telecom operators, and fintech startups, along with government initiatives, reflects a comprehensive approach to integrating digital finance into the national economy expanding financial inclusion, empowering individuals, and supporting broader economic development (MoCIT, 2019).

Digital Public Infrastructure (DPI) is evolving in the financial and payment ecosystem in Nepal. The Nepal Rastra Bank (NRB) is developing regulations to ensure seamless operation of mobile banking, digital

wallets, and payment systems, enhancing interoperability across platforms. Digital payment gateways have become key players in this transformation, with platforms such as CellPay, eSewa, Fonepay, Khalti, PrabhuPay, and NamastePay driving convenience, user-friendliness, affordability, and accessibility in digital transactions. The NRB is integrating the financial service architecture for scalability, minimizations of cost and operation redundancies. In addition, the NRB is efficiently enhancing the national payment gateway and integrating digital payment channels for nationwide transactions with a security of digital transaction, conducting digital literacy activities to improve financial inclusions in the financial sector and leverage fintech industries by monetary policies (NRB, 2022). Digital platforms like eSewa, Fonepay, and MeroShare are making financial services more accessible, while the NCHL-ECC enhances the efficiency of cheque processing. Cybersecurity measures are being strengthened through regulations by the NRB. But an increasing interconnectedness of the financial system, driven by non-bank financial institutions, cooperatives, and fintechs, poses some systemic risks. Digital financial services have enhanced financial inclusion, but they also introduce cybersecurity, fraud, and infrastructure vulnerabilities that could undermine stability. While the adoption to mobile banking, digital wallets, and e-commerce platforms are growing, collaborative efforts should address the challenges related to regulatory frameworks, interoperability, low internet penetration, and digital literacy. While digitalization offers significant potential for accelerating growth in Nepal's finance and investment sectors, addressing infrastructure gaps, improving regulatory standards, and promoting digital literacy are essential for the successful implementation of ICT solutions.

The National Planning Commission (NPC), Ministry of Finance (MOF) and MoCIT have the mandates, authority, and access to formulate and implement the digital economic policies with a proper allocation of resources, public expenditure management, resource mobilizations, and strengthen public enterprises. The Nepal Telecommunications Authority (NTA) and the National Cyber Security Policy work to ensure digital infrastructure is secure. Similarly, the Security Board of Nepal (SEBON) and Nepal Clearing House work to create transparent regulatory frameworks for securities trading and digital transactions. The Trade Management System (TMS) connects investors directly to brokers and the Nepal Stock Exchange (NEPSE), allowing them to execute purchase and sale orders online, simplifying the investment process (G.C. and Dahal 2022). SEBON ensures interoperability among different financial systems. Nepal Development Finance Information Management System (DFIMS) is a comprehensive online platform operated under the MoF to enhance transparency and provide real-time insights through customizable reports, project and development partner profiles, and informative maps. By improving access to critical financial data, the DFIMS supports better planning, resource allocation, and oversight (DFIMS, MoF). The IT Bill is also in its development phase to enhance data protection and privacy standards in Nepal.

A few government-driven initiatives aimed at financial inclusion and digitization are fostering a startup ecosystem, contributing to job growth in both finance and digital investment sectors. Several incubation centers are being established with a focus on advancing digital finance and investment to provide startups with resources, mentorship, and networking opportunities to foster innovation. The expansion of digital investment platforms such as MeroShare and Nepse has led to increased demand for professionals in areas like investment analysis, blockchain development, and digital portfolio management.

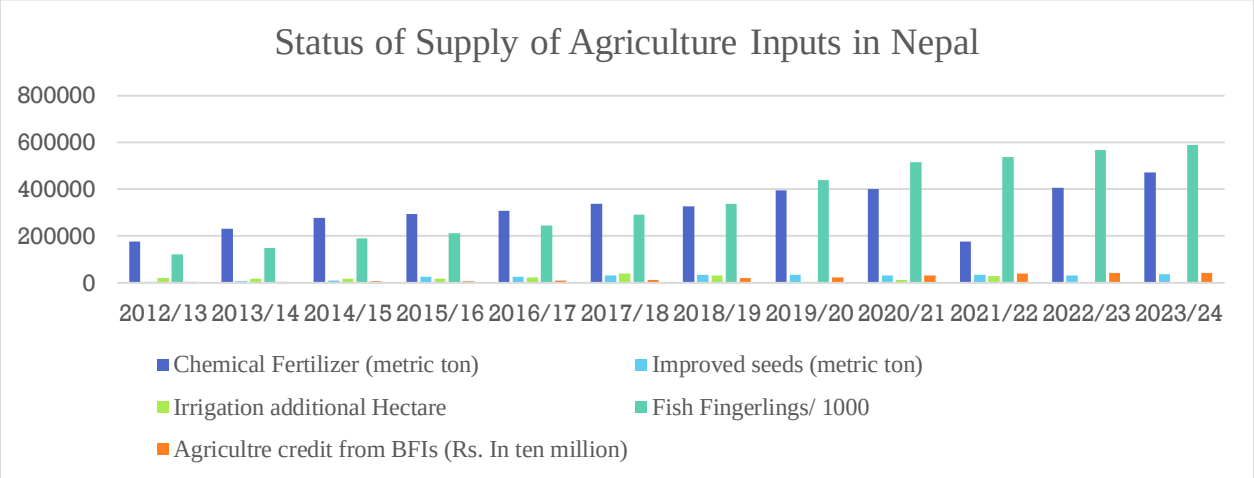
4.4. Digital Labor Force and Capacity Building Program

The digital skills training has two dimensions: The upskilling covers on teaching participants additional skills to complement the pre-existing skills, while reskilling includes teaching participants new skills which

is not necessarily to the pre-existing skillset or knowledge. Out of the total labor force of the age above 15 years, the proportion of the labor force participation rate is 38.5 percent and the employment to population ratio is 34.3 percent. In addition, the unemployed population is 11.4 percent. Similarly, nearly 0.4 million youths are the new entrants annually. (CBS, 2020) It shows a large share of this population needs to be equipped with upskilled or reskilled advantages for an increased productivity. The demand for digital skills is outpacing the supply, and the digital skills set directly impact businesses and foreign employments. As the digitalization and application of emerging technologies accelerate in an economy, demand for new roles sometimes specific ones emerge across the industries and digital skills. This poses a revised mode of education systems to prepare for the new market places and working environment. Meantime, digital and social inequalities affect opportunities to develop digital skills. A range of barriers that affect digital infrastructure and digital skills related to blockchain, cloud computing, AI and advanced analytics, big data and cyber security, reshape economic landscapes and efficiency levels in firms' outputs. (Feijao & et. al, 2021). The Central Department of Economics and Institute of Engineering (IOE), Tribhuvan University, and Kathmandu University, and affiliated colleges etc. have specialized courses in digital economy, fintech, and digital banking with a basic level information and approach on the digital skillsets. In addition, vocational short courses for preparation of digitally skilled workforce are highly demanding in the national and international labor markets. So it is high time to jointly organize such capacity enhancement programs by the public and private sector entities as some important measures to contribute to the digital economy.

4.5. Agriculture Sector

The GoN has made some efforts to improve farming productivity through various policy instruments including agriculture development strategy (ADS), but their progress has been limited due to traditional farming practices. Though the agriculture sector occupies a large proportion of the labor force (65%), most of them are with very few digital skills and are left ignorant of digital practices. Only 24 percent share of the GDP and 2.5 percent growth rate of agriculture sector in FY 2024/25, where a good majority of Nepali farmers are engaged in agriculture indicates a lower productivity of Nepali farmers.



Source: Ministry of Agriculture and Livestock Development, 2024, Ministry of Energy, Water Resources and Irrigation, 2024, Nepal Rastra Bank, 2024 # From public sector only

For the facilitation of production and distribution of seeds, 245810 Slip seeds has been distributed and 25.264 Metric Tonne Multiyear seeds of grass has been produced and distributed.

The proposed agriculture policies, plans and programs of GoN to transform Nepal's agriculture witnessed a slow growth and poor performance. The contexts of poor governance such as poor coordination, low institutional capacity and provisions, limited evaluation of activities, poor leadership and limited engagement of stakeholders are some of the reasons behind. Therefore, political stability and commitment of leadership, regular review of policies, and holistic approach with strong coordination and monitoring and evaluation should be ensured for agricultural transformation. (Khanal & et. al, 2020)

Nepal took a few but a very small initiatives like agriculture management information system (AMIS) to disseminate data and information on market prices, weather, and crop statistics to bridge the policy gap and public decisions, National Incubation Center and NARC knowledge management system (KMS) to advance traditional practices and disseminate agriculture research based information, digital payment gateway system (like e-Sewa, Khalti, etc.) to secure digital transactions, Nepal Wireless Networking Project (NWNP) to offer insightful information on weather, markets, and crops, mobile applications such as Smart Krishi/Krishi Guru/Kisan Call center to provide localized farming guidance, pest management, and need based solutions. The technologies and applications such as mobile network (3G, 4G, &5G), GIS, remote sensing, eHaat bazar and other private sectors' online trading platform to reduce the layer of intermediaries.

However, an improved access of digital infrastructures and information and communication system, a better practice of blended digital agriculture and technologies (such as mobile advisory service, drone assisted farming, blockchain supply chain), market linkages, advanced data security and privacy, and sustainable farming practices help them reduce the digital divide and improve on digital inclusion. An access to real time information on the market price, weather, pest, soil health, water, quality seeds and fertilizers, and other resources enable farmers to be informed and optimized on the farming practices and harvesting decisions. The use of digital practices helps farmers to connect with prompt buyers, sellers, and product and financial intermediaries promptly which then enhance their strategic business decisions, optimized production with minimized risks in general practices.

In the context of Nepal's agriculture sector, a few policy priorities for coordination such as farmers' education, roles of ICT and emerging digital technologies to reduce farming cost and maximizing products' revenues, leveraging technologies and investment funds through access to finance and investment funds are some important transformative approaches. Targeting information, investment, and technologies to high value products, climate resilient and organic farming, building post-harvest, and cold chain infrastructures add value through advisory apps, agri-tech information and investment, market platforms for exports, reduced post-harvest losses, and localized digital solutions. Similarly, educating and upskilling the agriculture workforce through mass digital literacy activities in local language, use of GIS, remote sensing, and data analytics in training youths at the academia, etc. are the agenda of digital agriculture transformation.

4.6. Industrial Sector

The establishments of enterprise are basically developed on import-based foundation and demand for a transformative approach to overcome the institutional challenges. As Nepal is an import-based economy, the digitization in supply to the side of Nepal's economy is less observed. Therefore, the industrial base of Nepal exists at a vulnerable stage. To take transformative initiatives, governments must take facilitative and collaborative cultures and transform the existing controlling measures in policy formulation to the digital strategies execution. The overwhelming effects of the emerging technology

augment occupations, rather than to automate the mechanization. Therefore, proactive policies are required to focus on job creation at the local and national levels. For this, strategic investments in the public infrastructures, public-private partnership, establishments of digital funds, and skills development programs will transform the industrial sector. The greatest impact of technologies is likely to be observed in the upper-middle-income areas due to a higher share of employment existing in clerical occupations. As clerical jobs are an important source of female employment, the effects are highly gendered. The industrial insights from the proactive digital policies should focus more on the import of capital and digital talent at the initial stage followed by a focus on job quality, ensure fair transitions, and should be designed based on dialogue and adequate regulation.

4.7. Service Sector

The service sector has the largest share of the GDP of Nepal. So, Digitalization of the service sector is the fundamental driver of inclusive economic growth and job creation in Nepal. But creating supportive policies for investment and start-up, building digital infrastructure, and offering digital skillset are foundational measures. The financial sector is mostly a digitized sub-sector by the increasing interconnectedness and effective governance model. It has demonstrated a role model DPI with collaborative efforts in the regulatory frameworks, interoperability and digital payment gateway mechanisms, and fintech digital platforms. The simplified investment process, professional investment analyst, and blockchain development on the sub-sector made it possible on the foundation of demographic advantages.

A striking example of ICT's impact on tourism that created an immense opportunity for tourism businesses. The issues on the information segregation, storage, and processing for communication with tourists is the best possible by the use of ICT frameworks. Therefore, the measures of ICT and digital technology offer a long-term-benefits for strategic and long-term goals. However, Nepal is unable to fully utilize ICT in the tourism industry. A vast majority of tourists (62%) discover Nepal through the Internet, while only a small fraction (2%) relies on traditional travel agencies. This highlights the critical role of the Internet in promoting Nepal as a tourist destination. Furthermore, a remarkable share (94%) of visitors to Nepal utilize ICT during their trip, underscoring the importance of having high-quality, informative websites to attract and serve tourists. Common uses of ICT by tourists include booking accommodations and flights, communicating via email, and accessing online information. A significant portion of tourists (over 50%) believe that ICT has reduced the cost of their trip to Nepal, while the remaining half perceive no change in cost (Shrestha & et al., 2021).

Compared with the public sector enterprises and entities, the growth value of digital service is more promising in private sectors' establishments. Therefore, GoN has made digital service export target for the digital decade. Use of digital technologies and ICT are increasingly adopted by individuals, business society, and governments. The global export of ICT has significantly grown up (Sarker, & et. al, 2021).

5. Conclusions

Nepal has made notable progress in expanding telecommunication infrastructure and digital payment system. This foundations of the digital economy are being improved in more recent years. However, there are some persistent digital infrastructural gaps that is responsible for creating the digital divide among a large proportion of population. The existing digital development and slow pace is the results of fragmented governance, conflicting vision in regulatory practices, and weak policy coordination.

The DNF provides a primary and poorly executed digital economy roadmap. The digital economic policies and strategies should be revised with a consolidated institutional transformation approach. In an incremental and iterative business model, thinking of transformative leadership can improve on technology and digital economy by taking a risk of failure of investment and willingness to invest on technology by acquiring digital talents to develop its digital capabilities. The speed of stakeholders and winning initiatives in the digitalization process matter a lot. Firms should assess their readiness with the quality data, IT architecture, capability on innovation, employees with digital skills on programming, and data analytics, IT implementation, transformative leadership and cultures. The size of workforce involved in agriculture sector is large enough but its share on GDP is disproportionately low despite the ADS indicates the systemic issues of the agriculture sector. Therefore, digital

The broadband penetration with modernizing the sectors with a sound development strategy facilitates GDP growth. Economic transformation through digital approach does not only demand for building the infrastructure, but also integrating the simultaneous execution of physical networks, digital skills, and collaborative practices.

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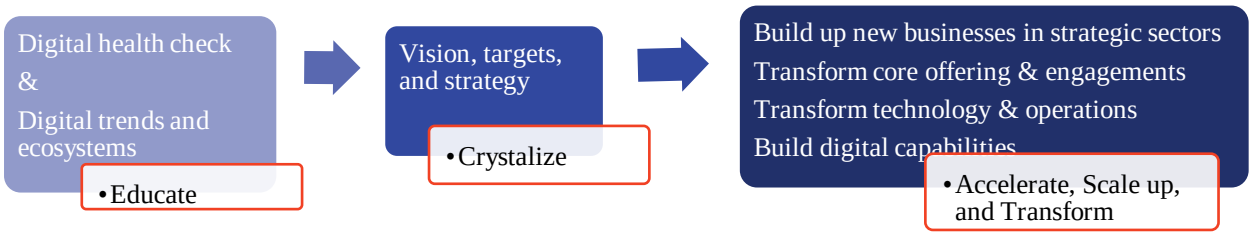
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Details	Status of Supply of Agriculture Inputs in Different Fiscal Year											
	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Chemical Fertilizer (metric ton)	176963	232198	278082	293628	307771	338599	327488	395905	400208	177506	407363	472280
Improved seeds (metric ton)	3669	7290	9151	24950	26550	30788	33998	33803	32911	33203	32242	37387
Irrigation additional Hectare	19561	19310	19310	18083	23263	41180	31636	3705	11128	29601	...	...
Fish Fingerlings/ 1000	121987	148501	191345	212355	244897	292000	339224	438628	516466	538742	569070	589673
Agricultre credit from BFIs (Rs. In ten million)	3153	5091	6516	7879.1	9004.1	13575.5	19345.7	22577.2	32420.1	38822.7	41466.0	41860
Source: Ministry of Agriculture and Livestock Development, 2024, Ministry of Energy, Water Resources and Irrigation, 2024, Nepal Rastra Bank, 2024 # From public sector only												
For the facilitation of production and distribution of seeds, 245810 Slip seeds has been distributed and 25.264 Metric Tonne Multiyear seeds of grass has been produced and distributed.												



Source: Adapted from the BCG Analysis for Digital Transformation Journey

Macroeconomic Indicators of Nepal

FY	Real GDP % Change	Agr. GDP % Change	Non Agr. GDP % Change	% Change (Inflation)	Import	Export	M1	M2	Exchange Rate	Total Revenue	Tax Revenue	Non Tax Revenue
2003/04	4.41	4.81	5.33	4.72	25.39	10.04	12.2	12.77	73.97	14.29	17.79	3.78
2004/05	3.23	3.5	3.24	3.99	25.36	9.96	6.64	8.34	71.05	12.5	12.31	13.14
2005/06	3.73	1.78	5.32	4.52	26.57	9.21	12.83	15.44	72.32	3.08	6.15	-7.28
2006/07	2.75	0.97	4.36	7.95	26.75	8.16	12.23	14.04	70.49	21.35	23.85	11.67
2007/08	5.8	5.82	5.88	5.89	27.21	7.27	21.64	25.25	65.02	22.7	19.72	35.46
2008/09	3.9	3.02	4.34	12.62	28.78	6.85	27.29	27.28	76.88	33.31	37.46	17.61
2009/10	4.26	2.01	5.39	9.6	31.38	5.1	7.96	30.21	74.54	24.06	36.51	-31.1
2010/11	3.85	4.51	3.64	9.56	28.98	4.71	4.83	12.22	72.27	11.45	10.92	16.17
2011/12	4.67	4.63	4.78	8.32	26.26	4.22	18.6	22.68	81.02	23.19	19.46	54.39
2012/13	3.53	1.31	3.97	9.84	28.56	3.95	14.37	16.37	87.96	21.13	22.43	12.72
2013/14	6.01	4.49	6.36	9.08	32	4.12	17.65	19.05	98.21	20.47	20.53	20.03
2014/15	3.98	1.2	4.63	7.21	31.96	3.52	19.7	19.91	99.49	13.81	13.93	12.97
2015/16	0.43	-0.08	0.04	9.94	29.66	2.69	18.49	19.53	106.35	18.75	18.3	21.95
2016/17	8.98	5.17	10.18	4.45	32.18	2.37	13.14	15.46	106.21	26.4	31.52	-9.12
2017/18	7.62	2.61	9.5	4.15	36.03	2.35	17.56	19.4	104.37	19.29	19.1	21.5
2018/19	6.66	5.16	6.9	4.64	36.76	2.52	8.55	15.76	112.88	14.16	12	35.4
2019/20	-2.37	2.43	-3.91	6.15	30.78	2.51	17.84	18.11	116.15	-4.33	-5.22	2.92
2020/21	4.84	2.85	5.21	3.6	35.38	3.24	22.82	22.69	117.87	17.91	24.29	-29.79
2021/22	5.63	2.35	6.54	6.32	38.59	4.02	-9.3	6.81	120.84	13.94	13.13	24.68
2022/23	1.95	3.02	1.98	7.74	30.13	2.94	-0.31	11.19	130.58	-10.22	-12.06	11.83
2023/24	3.87	3.35	3.36	5.44	27.92	2.67	-1.28	12.96	130.58	10.61	9.12	24.66
		3.28	4.28	5.44					136.04			

GDP GROWTH RATE (2023)	Number
Agriculture forestry and fishing	2.73
Mining and quarrying	1.11
Manufacturing	-2.04
Electricity, gas, steam and air conditioning supply	19.36
Water supply; sewerage, waste management and remediation activities	2.16
Construction	-2.62
Wholesale and retail trade	-2.96
TransportationandStorage	1.14
Accommodation and food service activities	18.56
Information and communication	4.07
Financial and insurance	7.29
Real estate activities	2.17
Professional, scientific and technical activities	4.3
Administrative and support service activities	5.01
Public administration and defence; compulsory social security	5.3
Education	4.07
Human Health and social work	6.51
Other(R,S,T,U) Group	5.21