

Information Technology in Nepal: History and Current Status

Bishnu Prasad Khanal

Central Campus, T.U., Kirtipur

Corresponding Email: bishnu.khanal@tu.edu.np

Abstract

This paper provides a comprehensive analysis of the evolution and present state of Information Technology (IT) in Nepal, tracing its roots from introducing the first electronic calculator in 1961 for census calculations to its current role as a significant contributor to the national economy. Convergence of Information Technology has reshaped various sectors in Nepal, from banking and commerce to education and media. This study outlines key milestones in the evolution of IT, such as the establishment of Nepal Bank Limited's computerized systems, the rise of digital media, and the increasing use of online services across different industries. It also delves into government policies and the role of the private sector in accelerating IT adoption. This study utilizes a mixed-methods approach, combining quantitative analysis of IT export growth with qualitative insights into government policies and the socio-economic impacts of Nepal's IT sector. By exploring the historical context and evaluating the current challenges and opportunities in Nepal's IT sector. This paper offers recommendations for sustaining and expanding the growth of IT as a catalyst for development. The findings highlight that continued investment in IT infrastructure and improved policies can further boost Nepal's economic growth, innovation, and education.

Keywords: Information technology, policy, economy, media, revenue

Historical Context

The first use of computer technology in Nepal was for census measurement. Though it was brought by the government of Nepal, private companies played a greater role in the development of the technology. Large hotels and travel agencies mainly started using computers to replace their typewriters. The 1990s were the start of the opening of private institutions. As reported by the Information and

Communications Technology (ICT) Frame, the government did not have a larger role in the development of Information Technology in Nepal. (Aryal, 2019)

Muni Bahadur Shakya is widely regarded as one of the pioneer computer scientists of Nepal. Shakya reportedly built Nepal's first microcomputer. It was a desktop computer, which was a typewriter with a maze of transistors, microchips, and circuitry attached to it, and had a television as its monitor. He created the Devanagari script which was used to display Nepali font on a computer for the first time. It was used to display the first sentence of the then-national anthem (Shriman Gambhir) (Baidar, 2021).

In 2001, the Government of Nepal established the National Information Technology Center (NITC) and Government Integrated Data Center (GIDC), which marked the beginning of a new chapter in information and communication technology. Although initially created to record data for government offices, ministries, and departments, it quickly became a gateway to developing and expanding ICT infrastructure (Shrestha, 2023).

Introduction

The world is rapidly changing with the advancement of information technology, almost every aspect of the world is seen to be integrated with modern information and communication technologies. From hospitals to restaurants, computers are being used to efficiently manage businesses. McLuhan (1962) introduces the concept of the "global village" by stating that "The new electronic interdependence recreates the world in the image of a global village (p.31)." Today, his idea has become a reality and Information Technology has transformed the world into a global village, connecting everyone with access to the internet. It has made it possible to have business spanning multiple nations regardless of boundaries. It has rapidly impacted the global economy. It has changed the way humans interact with each other by introducing concepts like social media. Digital marketing has changed the way companies advertise their products. This rapidly growing technology did not have a name in its earlier days.

During the 1950s, there was no term to describe the new, the now more familiar, technology. To overcome that issue, the writers of the Harvard Business Review (HBR), coined the term "Information Technology" to describe the rapidly developing technological advancement. The term coined since has been used widely to describe the computer technology world. It was predicted to have a far-reaching impact on managerial organizations. (Leavitt & Whisler, 1958). Their prediction came out to be true as it can be seen in today's time.

Computers now rule the way we store and retrieve data. From stock trading, Aircraft Flight Control Systems, inventory management, and accounting to simple tasks like listening to music, and watching movies, everything is now done with computers. They have changed the way they manage data and replaced paper accounting (Haidar, 2021).

Nepal introduced computers in the country for the first time for population census calculation. In 1961 AD, 'Facit', an electronic calculator was used for calculating the census of Nepal. The calculator took about 6 Years and 6 months to calculate the census. Then, IBM 1401, a second-generation mainframe computer was used for the same purpose in 1971 AD. (Techsansar, 2019). However, in the 1930s, the largest university in Nepal, Tribhuvan University (TU), had already established a Technical Training Institute under it. Then in 1972 AD, the institute was reformed into the Institute of Engineering (IOE) which has now been producing engineering technicians and engineers for more than 80 years (IOE, 2021).

Since, its first entry in Nepal, information technology has evolved and impacted various sectors. Looking at the current economy of Nepal, information technology has now become one of the major revenue-generating resources, accounting for over 40 percent growth per annum in e-commerce in 2023 (Shrestha, 2023). In 2022, Nepal exported a total of USD 515 million worth of IT services to various countries, which represented a growth of 64.2% since 2021. This data shows that the IT industry has become a significant revenue-generating sector (IIDS, 2023).

This article explores the current status of the technology and its historical roots in Nepal and the key stakeholders responsible for its development. It tries to analyze the policies and measures taken by the government for IT regulation in Nepal. Understanding the situation of information technology can help analyze the impact it imposes on Nepal's economy.

The objectives of this article are to explore the history and evolution of Information Technology (IT) in Nepal, to examine the key government policies and laws that have influenced the development of IT, and the current status of IT in Nepal.

Methodology

This study employed a mixed-methods approach, combining quantitative analysis of IT export growth using data from IIDS and qualitative analysis of government policies. It involves the use of secondary research data such as

academic papers, peer-reviewed journal articles, books, and analyst reports, while primary sources are used in the study of government policies such as Information Technology Policy, 2057, newspapers, and articles.

The qualitative approach was chosen to provide an in-depth understanding of Nepal's IT sector, private sector contribution to IT, and socio-economic impacts of IT, whereas the quantitative approach was chosen to analyze the contribution of IT in Nepal's economy, with a specific focus on IT export growth.

By combining these approaches, the study provides an in-depth understanding of the evolution of the IT sector in Nepal, and how it has been influenced by government policies and private sector efforts, while quantitatively assessing its impact on the economy.

Milestones in the IT Industry in Nepal

Nepal Television (NTV)

NTV was the first television broadcasting in Nepal. After returning, from the UK, the then King Birendra Shah initiated the project under the sixth development plan (1980-1986). Under the project, NTV was started in 1985 A.D. It faced significant challenges since Nepal had lack of skilled manpower, equipment, and technological infrastructures. Despite these challenges, NTV ran successfully and soon other channels like Image Channel and Kantipur TV emerged ending NTV's monopoly (Dhungel, 2018).

The start of television broadcasting supported the development of information technology in the country. It marked the beginning of the digital broadcasting of news and other programs in Nepal.

First Online Newspaper

The first online newspaper in Nepal was The Nepal Digest which started in February of 1992. It was published in the U.S. and It was especially famous among the Nepalis residing in America providing information about what was happening in Nepal (Upadhyaya, 2003). In 2021, it was reported that Nepal had over 2,325 online news portals. It can be seen there has been a rising trend in the online presence of Nepali media which directly contributes to the development of information technology in the country (Onlinekhabar, 2021).

The online news portals have helped information flow to the masses in a short amount of time. And their number is increasing as discussed above. This growth reflects the increasing online presence of Nepali media and directly contributes to the development of the country's information technology sector.

Banking Sector

With the establishment of Nepal Bank Limited (NBL), the banking sector of Nepal formally started. It was the first bank in Nepal and still exists to this day. It was established in Kartik 30, 1994 (November 15, 1937 A.D.) and inaugurated by King Tribhuvan along with the contemporary Prime Minister Juddha Shumsher Jung Bahadur Rana. When it was formed, computers were not yet used in the bank. This meant the transaction and records needed to be managed manually. The official website of NBL calls this a “brick-and-mortar” structure. It reports that it was converted into a “click-and-order” model with the start of the use of information technology in banks. In 2048 B.S., NBL started its computerization process using the YBPASS system in its main branch. The Financial Sector Reform Program of 2001 led to the bank using the PUMORI financial system, an accounting software system created by Mercantile Office System Pvt. Ltd. This sealed the use of computers in the banking sector (Nepal Bank, 2017).

These actions played a critical role in modernizing banking practices and accelerating IT adoption in the financial industry. Manual accounting can result in human errors which are being avoided by the digital systems. The adoption of digital system increases efficiency and reduces errors in accounting in the financial industry.

Brief Overview of Policy and Regulation

Telecommunications Act and Regulation (1997)

The first Telecommunications Act of 1997 marked the beginning of the regulation of information technology in Nepal. The act was formed during the reign of His Majesty King Birendra Bir Bikram Shah Dev. The act established the Nepal Telecommunications Authority which was to oversee and regulate telecommunications services. It was created to be an independent body. The main acts of the authority included issuing licenses, monitoring services, setting standards, and protecting consumer interests. After getting a license, the telecommunications service providers must adhere to the policy, otherwise, they'd be faced with penalties or even revocation of the license (Nepal Telecommunications Authority, 2021). If

there was a dispute between customers and license holders, the NTA would act as a mediator (Nepal Telecommunications Authority, 2021). It opened the pathway for regulating the new sector that was emerging and provided the groundwork for further regulations that would be made in the future.

First IT Policy (2000)

The first IT Policy of Nepal was formulated in the year 2000 AD with the vision of placing Nepal on the global IT map within five years (Government of Nepal, 2019). The document explaining the policy emphasizes that it is required for the sake of the national economy. The policy explains that it was made to make the general public aware of information technology and create employment opportunities. According to the official policy document, expected to establish a National Information Technology Centre, increase the use of computers in the private sector, introduce computer science education in schools, gradually use the technology in all governmental activities, and so on. The policy was also expected to increase the export of IT services from Nepal to 10 billion rupees within the next 5 years of its formulation (Government of Nepal, 2019).

The policy was an ambitious one as it can be seen that only after 20 years of its formulation, in 2020, according to the data provided by IIDS (2023), Nepal exported IT services worth approximately 10 billion rupees, after adjusting for inflation. This shows that while the policy set ambitious targets, its impact took longer to realise highlighting the challenges of implementing large-scale IT development in a developing country.

National Information and Communication Technology Policy (2015)

The policy was formulated in 2015 A.D. with the vision of transforming Nepal into a knowledge-based society through the effective use of ICT (Information and Communications Technology). It highlights collaboration between government and private sectors for the effective development of infrastructure and service delivery. The policy areas include Human Resources, ICT in Education, Access and Content Development, ICT for Government service innovation and good governance, and 17 others (Ministry of Information and Communication, 2015). It describes the restructuring of relevant ministries and regulatory bodies for effective policy execution. Overall, this policy served as a foundational document for guiding Nepal's ICT strategies toward achieving broader socio-economic objectives while addressing contemporary challenges within the sector.

Electronic Transaction Act

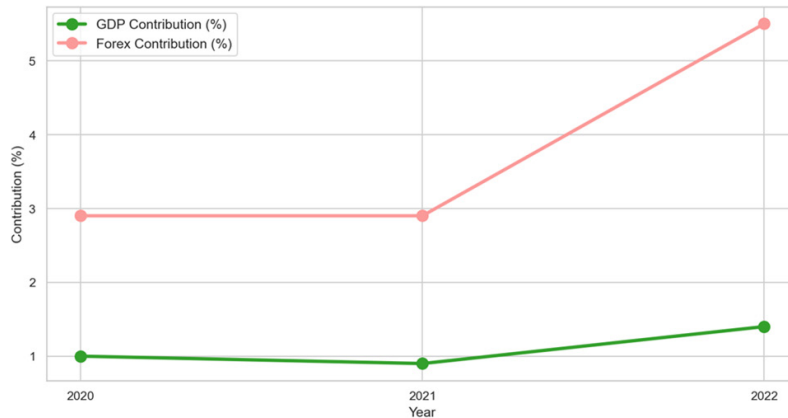
The Electronic Transactions Act of 2063 B.S. establishes a legal framework for electronic transactions. The act aims to provide legal recognition of electronic records and digital transactions ensuring their authenticity, integrity, and security in electronic transactions across Nepal. It formally defines terms such as “Electronic Record,” “Digital Signature,” “Certifying Authority,” and “Computer System” and others which are crucial for understanding the Act’s provisions. It ensures that documents created and maintained according to the Act have the same legal standing as traditional written documents. It sets out a regulatory framework for appointing a Controller to oversee authorities who issue digital certificates for validating electronic signatures. Overall, the act is a comprehensive legislative framework formulated with the vision of facilitating secure electronic transactions by legally binding electronic records and signatures.

Information Technology (IT) Bill 2019

The IT Bill of 2019 was a rather controversial bill due to concerns about freedom of expression, privacy, and the rights of marginalized communities. The policy covered a wide range of issues from e-commerce, tech innovation, and cyber security to cyberbullying (Body & Data, 2021). The policy expected to develop, promote, and regulate the sector which had been done by the Electronic Transaction Act of 2008 (Center for Media Research Nepal, 2020). The bill also proposed the creation of an Information Technology Court, raising concerns about government influence over judicial independence. Even with so many concerns about the lack of clear definitions and security issues, the bill was eventually passed in February 2019 (Amnesty International, 2020). The IT policy did not receive good feedback from the public and media. Also, the Information Technology Court that was proposed in the policy has not been implemented as of now in Nepal.

IT in Nepal’s Economy

This section explores key data and trends that illustrate the impact of the IT sector on Nepal’s economy, highlighting its contributions to GDP, foreign reserves, and overall employment growth. The study uses the data of the Institute for Integrated Development Studies (IIDS).

Figure 1*GDP and Forex Contribution (in % 2020-2022)*

Source. IIDS 2023

This figure shows the contribution of IT services to Nepal's GDP and foreign currency reserves (Forex). According to (IIDS, 2023), the IT sector's GDP contribution rose from 1% in 2020 to 1.4% in 2022. The contribution to foreign reserves jumped from 2.9% in 2020 to 5.5% in 2022, underlining the growing importance of IT exports in stabilizing Nepal's foreign currency reserves.

It shows that the IT sector in Nepal has shown significant growth from 2020 to 2022. The trend shows the IT sector's role in diversifying the economy and reducing dependence on traditional sectors. It suggests that further investment and policy support could help in IT growth and economic stability.

Figure 2*Growth in Numbers of Freelancers (2017-2022)*

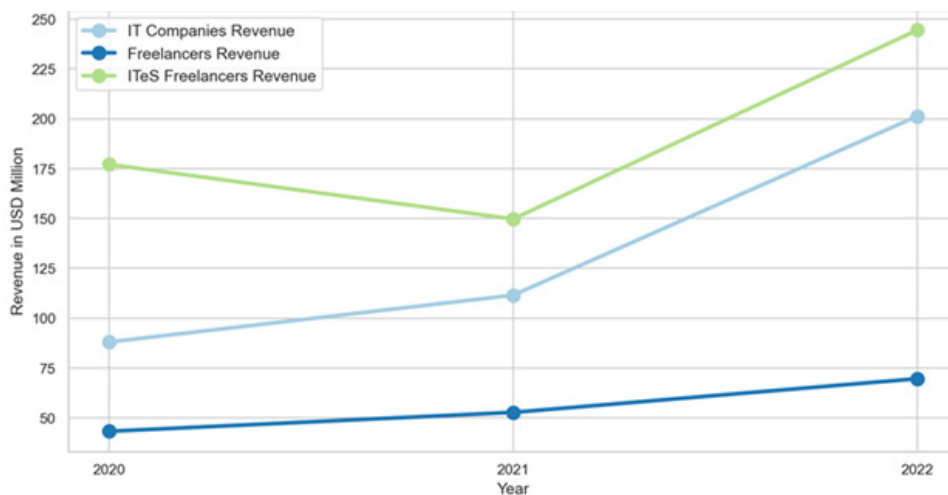
Source. IIDS 2023

This figure highlights the trend of the number of freelancers engaged in IT service exports from Nepal between 2017 and 2022. According to (IIDS, 2023), the number of freelancers grew from 27,560 in 2017 to 66,509 in 2022, highlighting the rising interest in freelancing as a career path.

The figure emphasizes a positive growth trend, with a sharp rise in 2022. The sharp rise suggests that there was an increase in demand for IT services and global opportunities for Nepali freelancers. The trend shows the growing role of freelancing in Nepal's economy.

Figure 3

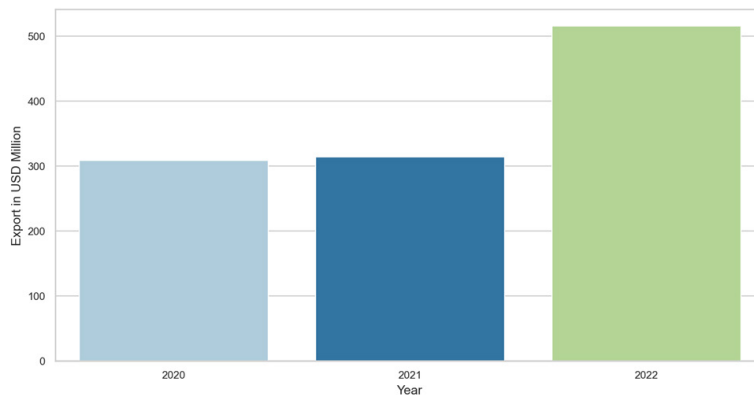
Revenue Growth by Category (2020-2022)



Source: IIDS 2023

This figure compares the revenue growth of three categories: IT Companies, Freelancers, and IT Freelancers over the 2020-2022 period. According to (IIDS, 2023), IT companies showed the largest growth, increasing from USD 88 million in 2020 to USD 201.3 million in 2022 (80.5% growth). Freelancers and IT Freelancers also saw significant growth, with a notable rise in 2022.

The figure emphasizes the contribution of all three categories to Nepal's expanding IT service exports. The strong performance across all categories suggests a thriving IT export ecosystem and that there are increasing opportunities in both structured companies and the freelance market.

Figure 4*Total IT Service Export Growth (\$ in millions)*

Source. IIDS 2023

This chart shows the rapid growth in total IT service exports from Nepal between 2020 and 2022. According to (IIDS, 2023), The value of IT exports surged from USD 308.3 million in 2020 to USD 515.4 million in 2022, representing a significant increase of 64.2%.

This highlights the growing role of the IT sector in Nepal's economy. The increase in export suggests that Nepal is gaining a competitive position in the global IT market.

Artificial Intelligence

Artificial Intelligence (AI) is an emerging field in every sector of development of the country, millions and billions of dollars of investment are being poured into developing the AI-based system in every country. Research and development on AI are being done rapidly all over the world. So, investing efforts, ideas, and resources in this field is speeding up. Various companies and AI startups are emerging (Jha & Yadav, 2022).

Nepal has seen a rise in emerging technical talent, with a large number of engineering and IT students graduating every year. In the context of Nepal, efforts on AI at the policy level have not been seen much yet but there are various AI-based technologies in the sectors of health and banking which show that Nepal is not lagging in technological advancement. One of the most prominent examples in Nepal in the context of AI development can be taken as Naulo Restaurant of Kathmandu which has recruited five robot waiters under the slogan of, 'where the food meets technology' designed and manufactured by Paaila Technology, a company in Nepal

based on robotics and Artificial Intelligence. Also, Naulo Restaurant is the first digitized robotic restaurant in South Asia (Jha & Yadav, 2022).

Artificial Intelligence has now become a part of our daily life. Everyone should be made aware of its pros and cons as there can be harmful use of AI as well. The Government should take a stand to aware people and businesses about the use and challenges of using AI. However, the threats of AI should not hold the country back from utilizing its significant benefits.

Discussions

According to the latest data by (Kemp, 2024), the internet penetration rate in Nepal is 49.6 percent at the start of 2024. It indicated 15.40 million people using the internet, and 37.47 million users were using cellular mobile connections; it amounts to 120.6 percent of the total population of Nepal (Kemp, 2024). It indicates that the use of information technology has rapidly increased over the years. Looking at the data for 2022, according to (IIDS, 2023), the IT service export industry in Nepal was valued at approximately USD 515 million. It showed a growth of 64.2% from the year before. This meant that IT service exports accounted for 1.4% of Nepal's GDP and 5.5% of the foreign exchange reserves in 2022.

The gaming industry in Nepal has also seen significant development. High-speed internet is one of the direct causes of this phenomenon. Youths of Nepal have participated in various international online gaming tournaments and have started earning money by live-streaming gaming content on YouTube (Giri, 2024). This has definitely created an income-generating opportunity for the youths.

The use of information technology in education has also significantly increased. It has especially increased after the COVID-19 pandemic. Schools and colleges started online classes with platforms such as Zoom, Google Meet, and Microsoft Teams. Online exams and assessments started to become more common in Nepal resulting in some colleges even offering online classes after the end of lockdown due to the pandemic. The start of Nepal Open University (NOU) in 2016 marked the significant use of IT in education. According to the university's website, its purpose is to expand access to higher education to mass people who are unreached to conventional higher/tertiary education (NOU, 2019). Nepal has adopted IT in the education sector to a significant extent.

The study examines the role of private sectors like large hotels and travel agencies in introducing technologies such as typewriters which further helped in the adoption of technology in Nepal. The rise of fintech solutions such as Fonepay and ConnectIPS can be seen as a positive indicator of the growing trust of Nepal towards information technology. It can be seen that information technology has evolved positively in Nepal.

With regards to the policies made to regulate the technology, the Information Technology Bill 2019 has some strong points and can replace of Electronic Transaction Act 2008. However, the policy lacks clear definitions on topics such as “improper” or “offensive” online content which makes it susceptible to vague interpretation. It also has the potential to violate the freedom of speech due to its imposition of harsh penalties, including imprisonment and heavy fines, for social media posts deemed defamatory or against “national interest”.

Conclusion

The entry of Information Technology in Nepal happened out of necessity for calculating census data. Looking at the past and the present, it has significantly developed and has had a huge impact on Nepal’s economy. It can be seen that policymakers were aware of the impact this technology was having on the world and in Nepal, however late than other countries, and made various policies to govern the use of this technology. It can be seen that public and private companies contributed a lot to the development of information technology. Pioneer engineers like Shakya helped Nepal get ahead in technology development. Banks and other sectors started using computers for easier data storage and retrieval. Now, as computers are in everyone’s life, they are used for personal and professional purposes.

Despite its late start, Nepal has made impressive progress in IT infrastructure and services, including the rise of freelancing and the outsourcing industry, which contribute to the national economy. Additionally, the sector has become a significant factor in education, especially during the COVID-19 pandemic, enabling remote learning and digital literacy. However, challenges such as limited access to advanced technologies, gaps in regulatory frameworks, and the need for more comprehensive education and training programs remain. The start of the AI age might make it challenging for Nepal to govern its harmful use. However, better policies can make it effective, efficient, and safe to use these technologies for the development of Nepal.

References

- Amnesty International. (2020, January 16). *Nepal: Information Technology Bill threatens freedom of expression*. <https://www.amnesty.org/en/latest/news/2020/01/nepal-information-technology-bill-threatens-freedom-of-expression/>
- Aryal, M. (2019, March 16). Information Technology in Nepal: the beginning. *ICT Frame*. <https://ictframe.com/a-very-short-history-of-information-technology-in-nepal/>
- Baidar, A. (2021, August 24). Meet Muni Bahadur Shakya, a pioneering Nepali computer scientist. *The Record*. <https://www.recordnepal.com/meet-muni-bahadur-shakya-a-pioneering-nepali-computer-scientist>
- Body & Data. (2021). Information Technology (IT) Bill 2019 From a Feminist Lens (Policy Paper summary). *Body & Data*. https://bodyanddata.org/wp-content/uploads/2021/09/Policy-Paper_IT-Bill_Final-compressed.pdf
- Center for Media Research Nepal. (2020, January 15). Review of the Information Technology Bill 2019. *Nepal: Media Policy Hub*. <https://mediapolicy.org.np/2020/01/media-policy-reviews-recommendations/2329/>
- Dhungel, P. (2018). *Evolution and revolution of TV broadcasting in Nepal*. www.academia.edu. https://www.academia.edu/41045170/Evolution_and_Revolution_of_TV_broadcasting_In_Nepal_EVOLUTION
- Giri, R. (2024, January 29). The rising popularity of online gaming. *The Kathmandu Post*. <https://kathmandupost.com/art-entertainment/2024/01/29/the-rising-popularity-of-online-gaming>
- Government of Nepal. (2019). *Information Technology Policy, 2057 (2000)* (policy paper). Asian and Pacific Training Centre for Information and Communication Technology for Development. <https://www.unapcict.org/sites/default/files/2019-01/Nepal%20Information%20Technology%20Policy-%202057%20-2000.PDF>
- Institute for Integrated Development Studies. (2023). *Unleashing IT: advancing Nepal's digital economy expanding jobs and exports*. <https://iids.org.np/images/publications/bc1q2jjl7eafeja8tlnrdhrvxkga39a4699luvmr2.pdf>
- Institute of Engineering. (2021, March 28). *About institute of Engineering*. <https://ioe.tu.edu.np/>
- Jha, J., & Kumar Yadav, A. (2022, February 10). How is artificial intelligence changing the world? What Nepal should do to tap it? *Nepal Live Today*. <https://www.nepallivetoday.com/2022/02/10/how-is-artificial-intelligence-changing-the-world-what-nepal-should-do-to-tap-it/>

- Kemp, S. (2024, February 23). Digital 2024: Nepal. *Data Reportal* – Global Digital Insights. <https://datareportal.com/reports/digital-2024-nepal>
- Leavitt, H. J., & Whisler, T. L. (1958). Management in the 1980s. *Harvard Business Review*. <https://hbr.org/1958/11/management-in-the-1980s>
- McLuhan, M. (1962). *The Gutenberg Galaxy: The Making of Typographic Man*. University of Toronto Press.
- Ministry of Information and Communication. (2015). *National Information and Communication Technology Policy*. Dhulikhel Municipality. <https://dhulikhelmun.gov.np/sites/dhulikhelmun.gov.np/files/documents/ICT%20policy%20Nepal.pdf>
- Nepal Bank Limited (2017, November 16). *NBL Technology Transformation*. <https://www.nepalbank.com.np/personal/nbl-technology-transformation>
- Nepal Telecommunications Authority. (2021). *Telecommunications Act, 2053 (1997)*. Public-Private Partnership Resource Center. <https://ppp.worldbank.org/public-private-partnership/sites/default/files/2021-09/Nepal%20Telecommunications%20Act%202053%20%281997%29.pdf>
- NOU. (2019, May 28). *About Nepal Open University*. Nepal Open University. <https://www.nou.edu.np/about-nou>
- Onlinekhabar. (2021, February 18). Nepal has over 2,325 online news portals now. *OnlineKhabar (English News)*. <https://english.onlinekhabar.com/nepal-has-over-2325-online-news-portals-now.html>
- Shrestha, S. (2023, May 15). Nepal's booming IT sector. *myRepublica*. <https://myrepublica.nagariknetwork.com/news/nepal-s-booming-it-sector/>
- Techsansar. (2019, September 5). History of Computers and Information Technologies (IT) in Nepal. *TechSansar.com*. <https://techsansar.com/computer-history-nepal/>
- Upadhyaya, G. R. (2003). *Internet ra Nepali media*. Martin Chautari and Center for Social Research and Development. <https://www.martinchautari.org.np/storage/files/internet-ra-nepali-media-gaurav-raj-upadhyaya.pdf>