


DIGITAL
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NEPAL'S DIGITAL ECOSYSTEM: STAKEHOLDERS' CONSULTATION AND ANALYSIS

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Executive Summary

This study aims to support Digital Frontiers/[South Asia Regional Digital Initiative](#) (SARDI) in their ongoing stakeholder analysis and outreach in Nepal’s digital landscape. SARDI works to improve digital connectivity in the South Asia region, and to strengthen the private sector’s participation in digital policy debates to enhance the enabling environment for a digital economy that supports the region’s inclusive economic development. More specifically, this study aims to update a Nepal Stakeholders’ Analysis that SARDI conducted in 2020 and to inform new activities starting under the USAID/Nepal Mission.

This study reviewed the 2020 Stakeholders’ Analysis, the [Trade and Competitiveness Activity](#) program description, SARDI’s Nepal scoping study from 2021, and other documents as deemed relevant by SARDI and USAID Nepal. The review focused on gaps and updates that make this Nepal Digital Ecosystems Stakeholders’ Analysis more current. More specifically, this Stakeholders’ Analysis update is significant because of a number of key developments since the 2020 study:

- In June 2022, the World Bank approved US\$ 140 million (NPR 18.3 billion) for the [Digital Nepal Acceleration Project](#) (DNAP). The project aims to implement the ambitious [Digital Nepal Framework](#) (DNF)—the Nepal government’s prescribed blueprint for Nepal’s digital leapfrogging that had remained in limbo since its inception in 2019. This was a significant development that ignited new hope among ecosystem stakeholders.
- As with any other part of the world, the COVID-19 pandemic significantly influenced Nepal’s digital ecosystem by altering digital business models, infrastructure, access to technology, outreach, and adoption practices, e.g., the adoption of fintech-aided digital payment wallets.
- The ecosystem has seen more private sector equity investors join, thereby changing investment mechanisms and patterns.
- The draft Cybersecurity Policy 2021 was introduced for public review and input. Although not finalized, this draft represented a crucial development that informed many elements of the ecosystem.

The key findings and recommendations summarized below result from analysis of data and information derived from a comprehensive desk review¹ and interviews with twenty key informants.² These are discussed in greater detail in Chapter 4 of this report.

Key Findings and Recommendations

Human capital: The lack of skilled human capital remains Nepal’s biggest constraint to keeping up with global digital development. Most Nepali graduates in the digital sector prefer to migrate abroad, and the ones that stay back are increasingly coopted within a “gig economy.” The [Nepal Economic Forum](#) defines a gig economy as an evolving business model that offers “access to workers with specialized skills and flexibility who can cater to different types of work ranging from technical projects, professional services, physical delivery, ride-sharing services, and small microtasks.” Study respondents emphasized the need for various forms of innovative collaboration between government, industry, and educational institutions to enhance the talent

¹ Refer to Annex 1 for the Desk Review

² Refer to Annex 2: Stakeholders Consulted

pool required for digital development. For example, there is the immediate need to remove the cap on the number of students that can enroll in Nepali educational institutions offering information and communications technology (ICT) degrees to produce more graduates that meet digital industry standards and have a strong potential to embody managerial/soft skills. There is also scope for private sector actors to provide bridging courses that match the skills of these new graduates with current digital industry requirements. And, crucially, government educational offices at all levels need to review school curricula to identify ways to incorporate basic digital literacy from the primary level onward.

Private sector role and partnerships: The government needs to be oriented to think and act in alignment with Industry 4.0—the concept that envisions a revolutionary convergence of computerized technology and industry. This requires private sector effort in educating public and political leadership at the highest levels on the importance of private sector roles and partnerships in Nepal’s realization of Industry 4.0. This effort can be led by domestic Nepali representative bodies like the [Federation of Nepalese Chambers of Commerce and Industry \(FNCCI\)](#), [Computer Association of Nepal \(CAN\)](#), [Robotics Association of Nepal \(RAN\)](#), or Digital Chautari—an informal social media-based platform that hosts an enthusiastic community of Nepali citizen (non-state) players in the digital sector.

Institutional and organizational arrangements need to be increasingly reformed for more private sector participation in digital development conversations, partnerships, and practices. Policies around private sector engagement in the digital sector need to recognize the economic growth potential that the private sector possesses, while ensuring ethical boundaries surrounding digital inclusion, access, security, privacy, intellectual property rights (IPR), fair competition, monopoly, and undue political influence, among others.

At the provincial and local levels, there is scope for governments to outsource services like the application for and delivery of passports, National ID cards, drivers’ licenses, citizenship documents, and tax certificates, among other public services, to the private sector. For example, all municipality taxes could be paid, with a small fee, through a private sector Payment Service Provider (PSP) like [eSewa](#) or [Khalti](#). At the local level, the government could promote the concept and practice of pre-vetted private sector kiosks as service provision hubs for accessing all public information and services. This would boost digital entrepreneurship by allowing small and medium-sized enterprises (SMEs) to serve as one-stop shop access for all public services. Such PSPs would be certified by the government for meeting regulatory requirements and standard protocols.

Credit ratings of businesses and individuals need to be centralized into one master database linked to business operators’ unique National ID (NID) cards. For example, India digitized around the “Aadhar Card,” a 12-digit unique individual identification number which served as proof of identity and address for Indian citizens. It now helps with credit rating-based lending for individuals and SMEs, improving investors’ risk-taking appetite, and stimulating a shift away from collateral-based lending.

Strategic private sector engagement with local governments in the research and design of appropriate digital tools to address local challenges has the potential to serve as a game-changer. However, such engagement needs to be approached such that it builds partnerships characterized by trust, ownership, and sustainability. An approach that allows private sector innovators to become embedded within local systems (e.g., health, education, and agriculture) for a sustained period of time would be useful for educating, empowering, and inspiring action

on the part of local governments. There were practical examples, discussed later, that demonstrated how such an approach helped to build trust, capacity, and ownership for these initiatives.

Digital literacy remains a significant barrier. Many Nepali women, for example, engage in small-scale cottage industries that either remain small, or go out of business due to lack of digital promotion and marketing. Innovative digital literacy campaigns can promote the uptake of simple digital tools that enable entrepreneurship among specific groups that include women and girls, students, persons with disabilities, low-income households, populations vulnerable to climate change, and prospective small business owners. Said campaigns would also help address contemporary challenges to democracy, including digital informational integrity.

Women in digital: Organizations like the [Federation of Women Entrepreneurs Association of Nepal](#) (FWEAN) need to be supported in their efforts to maintain professional databases with actionable data on women entrepreneurs in Nepal. Such data will be important to drive uptake of digital tools among women entrepreneurs assessed as ready to adopt digital technologies to enable their business processes.

Alliance for Digital Nepal: This study recommends further exploration with digital ecosystem actors to ascertain genuine and organic interest for the proposed Alliance for Digital Nepal and what roles it can have in business promotion, government engagement, and policy advocacy and oversight, with very specific terms of reference for action. Possible roles can include oversight of the implementation of the DNAP to ensure that work performed on Nepal's digital ecosystem is timely, of high quality, and ensures equitable access; the identification and promotion of more ecosystem role models; the promotion of policies and practice that ensure access to finance for digital initiatives; the promotion of platforms and mechanisms for networking; the identification of business opportunities in the digital value chain; and the forging of partnerships and alliances.

The policy advocacy agenda could include pursuing and researching constituency policy interests, promoting ease of access to digital capacity enhancing opportunities, lobbying to lower cost of investment in digital businesses through means such as tax incentives, promoting investment for improved revenue and employment generation within the digital landscape, and promoting affordable Internet as a fundamental right to address the digital divide.

Putting digital at the center of Nepal's economy: Nepal's economy needs to move away from its overdependence on remittance from migrant laborers. The global digital economy offers an alternative pathway. While the DNF serves as Nepal's digital strategy and the DNAP as its operational plan, Nepal needs to envision a strategic framework to connect to the global digital ecosystem and the global digital value chain.

This framework could be supported by a comprehensive study that explores the political economy of Nepal's digital sector, one that demonstrates a vision for the future that transcends two main factors that sustain the status quo: a persistent "lack of imagination" and a conformity bias. Further, this framework could guide necessary reforms to Nepal's digital infrastructure and adoption and its digital society, rights, and governance.

Nepal's federal budget for fiscal year 2023-24 released on May 29, 2023, reflected positive signs of sectoral advocacy leading to improved political understanding of, and commitment for moving towards a digital economy. While 'promotion of a digital and green economy', is listed as

one among ten budget priorities, the following policy provisions are further indicative of that shift³:

- A minimum of 1% of total capital budget to be dedicated to research, innovation, and invention, with an additional NPR 1 billion (US\$ 7.5 million) reserved for a separate fund, with necessary laws, to support research, innovation, and invention;
- The 'Kathmandu Incubation Centre' to be established to promote a start-up ecosystem that embraces innovation and entrepreneurship; Private Equity and Venture Capital (PEVC) firms incentivized to invest in start-ups; and NPR 1.25 billion (US\$ 9.3 million) set aside to support start-ups;
- No fees to establish a new company or increase capital of an existing company; and register with a minimum paid-up capital of NPR 100 (less than US\$ 1) only;
- Necessary arrangements to be made for "Country Credit Ratings";
- An "Infrastructure Fund" to be established to enable private investors to finance infrastructure projects through Public-Private Partnership (PPP) tools, such as the Hybrid Annuity Model (HAM) and Viability Gap Funding (VGF); and
- Hedging facilities to be made available for foreign investors.

Additionally, the budget provisions for up to 10% of foreign exchange earned to be utilized to make off-shore procurements and payments, easing direct procurement of goods and services needed to advance the sector; waives the minimum threshold for foreign direct investment (FDI) in tech businesses (this stood at US\$ 20,000 until recently); and allows Nepali tech businesses to hire and pay foreign consultants (earlier visa and other restrictions existed).

While these are significant developments, it remains to be seen how these provisions play out in reality.

Trust: A palpable lack of trust between ecosystem stakeholders and their clients has been observed as a key factor hindering prompt adoption of digital tools and services. This calls for immediate and concrete trust-building measures, which will include tangible improvements in the quality, security, and reliability of digital services and products. Meanwhile, the adoption and application of well-recognized, standardized quality management systems, principles, and practices can propel rapid adoption and uptake of digital goods and services. These measures will boost overall sectoral integrity.

Cybersecurity: Nepal ranked 94th of 182 countries on the [Global Cybersecurity Index](#) 2020, and data protection and privacy remain a key challenge and area of focus in the country. Efforts therefore need to focus on the realization of a sound cybersecurity policy and regulatory framework that is cognizant of international best practices on data protection and instruments like the EU's [General Data Protection Regulation](#) (GDPR). Such efforts also need to envisage a significant role for private actors in improving data protection in Nepal. The Cybersecurity Policy currently in the process of development offers the space for multi-stakeholder engagement as well as for the inclusion of provisions that integrate international best practices into the Nepali context.

³ https://pkf.trunco.com.np/files/publications/1685541119_PKF_%20TRU%20Budget%20Highlights%202080-81_final.pdf

Infrastructure: Nepal lacks sufficient infrastructure for data centers, content delivery networks (CDNs), and Internet exchange points that ensure data security and privacy⁴. For example, Internet exchange infrastructure that currently only exists in the capital, Kathmandu, needs to be expanded to the country's seven provinces. A coordinated approach that establishes both public and private data centers throughout Nepal will ensure harmony, standardization, and interoperability within Nepal's growing digital infrastructure systems.

Standardization and system integration: Digital public services can become more uniform and easier to access when ministries, departments, and government services go through a systems integration that enables the safe sharing of information and data. To support an effective systems integration, digital infrastructure expansion planning should be collaborative, and focus on sharing existing [Nepal Electricity Authority](#) (NEA) and [Nepal Telecom](#) resources with private sector stakeholders.

With regards to the public sector's role in this process, an organized plan for upskilling public officers, data collectors, and data managers is necessary to upgrade and reform the administrative capacity of government offices; this will facilitate vertical collaboration across the federal, provincial, and local tiers of government and horizontal collaboration across sectoral ministries, divisions, and departments.

Preparation for the innovative use of emergent technology: While our society is experiencing a rapid technological revolution, Nepal has an observed limitation around its capacity for innovative use of emergent technology, —particularly the ability to generate ideas that can create value and uncover utilities from new technologies. Blockchain is an example of a technology that could create significant value-add once promoted within Nepal, as it could help bring in a much-needed element of trust to digital transactions. Meanwhile, cutting-edge artificial intelligence, machine learning, and robotics technologies have vast potential to revolutionize crucial sectors like education and healthcare. There is, however, the need for a paradigm shift within Nepal regarding the potential of emerging digital technologies: to see them not as mere platforms that enable the exchange of information, but as resources that offer the space for exchange of value. Nepal needs to be prepared—in terms of knowledge and skills, policy and institutions—for this unprecedented digital revolution.

Policy: Nepal's labor laws and public procurement laws and guidelines need to be reformed to take into account the special characteristics and needs of the digital sector. This can help overcome barriers posed by conventional public procurement guidelines that do not factor in the benefits of digital innovations or, conversely, account for the risk of failure associated with digital innovation.

Further, the Digital Nepal development indicators should inform digital-focused allocations in annual budgets at federal, province and local levels. This is key to securing the necessary investments to expand digital infrastructure to provinces with rural populations. Digital businesses and services in these provinces depend on uninterrupted and reliable electricity

⁴ An Internet exchange point (IXP) is a physical location through which Internet infrastructure companies such as Internet Service Providers (ISPs) and CDNs connect with each other.

supply; hence, digital development in large part relies on government incentives for companies to expand electrical coverage into rural areas.

Placing Nepal's Digital Ecosystem in Context

At a very fundamental level, a digital ecosystem consists of a network of stakeholders, competing businesses, products and suppliers, applications, and third-party data services interconnected in a digital space. With an understanding that no single ecosystem participant can survive in isolation, the goal is to guide Nepal's shift from a "control and centralize" approach to a mindset of "combine and co-create" so that the country's digital ecosystem can thrive. This calls for stakeholders to have an awareness of the ecosystem itself and to understand the role of the other actors within it. A mature ecosystem would be one where stakeholders are able to address fundamental challenges through established processes, standardized in terms of institutional and stakeholder roles and responsibilities, to the extent that they are even able to handle emergency situations. Study respondents agreed that Nepal's digital ecosystem is evolving, albeit slowly, toward this objective.

Each digital ecosystem has its roots in the process of digitalization of goods and services that led to a digital economy. The [Berlin Social Science Center](#) (WBZ, its acronym in German) research group "Politics of Digitalization" at the Berlin Social Science Center, argues for a deliberate and comprehensive examination and evaluation of strategies, competencies, and practices that contribute to the governance and regulation of digitalization and its consequences for society; such a process informs an understanding of how contemporary societies can shape their transformations to digital. This argument underpins the importance of a political economy approach to examining and analyzing stakeholders in a nation's digital ecosystem, a project of crucial importance as digital resources—and data to a large extent—have surpassed crude oil as the most valuable resource available to humans. Nepal's governance of this high-value resource, along with its institutional constraints and development trajectories, shape and define its digital ecosystem and the stakeholders within.

A political economy approach also allows for an analysis of the political dimensions of cooperation and contestation associated with digital resources, and for the information and knowledge emanating from the process to inform policy and programming. This study attempts to identify stakeholders in Nepal's digital ecosystem and analyze how cooperation and contestation among these ecosystem actors plays out. In most cases, the most prominent and consequential digital ecosystem relationships are those between the government and private sector. In Nepal, contestation borne out of a lack of mutual understanding of domain and role and limited vision resulting from a lack of imagination and confirmation bias have led to a void of trust between the public and private sectors. As such, there is an inherent lack of understanding of the existing resources in the ecosystem, and the potential for their optimal sharing and utilization—a lack of understanding that persists even as there are positive examples on display just across the border in India.

This study, through desk review and stakeholder consultation, identifies the following stakeholder actor categories that make up or significantly influence Nepal's digital ecosystem, along with their presumed relevant responsibilities:

- Federal Government—for policy leadership and coordination
- Provincial and Local Governments—for enabling adoption at local levels
- Private Sector Businesses—for catalyzing innovation and entrepreneurship
- Social Enterprises—for leading digital adoption for social/public good

- Civil Society Groups—for ensuring a level playing field through digital equity, inclusion, and access
- Academia/Educational Institutions—for developing human resources and leading pertinent research
- Investors, including Banks, Private Equity Firms, and Venture Capitalist Firms—for ensuring promising and innovative ideas are supported during the building of a digital economy, and
- Donors/Development Partners—for ensuring equitable distribution and flow of resources for environmentally sustainable and equitable digital development; and for promoting international standards and best practices in e-governance.

Each actor category can be further broken down, e.g., the Private Sector would comprise of:

- Multinational/Corporate Businesses
- Micro, Small, and Medium Enterprises (MSMEs)
- Start-ups—Incubators, Accelerators, etc.
- Investors – Banks, Private Equity Investors, Venture Capitalists

Although this study will not follow the USAID Digital Ecosystem Framework⁵ in analyzing digital stakeholders, it will be interesting to observe how the various actors discussed as stakeholders of Nepal’s digital ecosystem fall within three overlapping pillars of USAID’s framework: Digital Infrastructure and Adoption; Digital Society, Rights and Governance; and Digital Economy, and the four topics that cut across, namely: Inclusion, Cybersecurity, Emerging Technologies, and Geopolitical Positioning.

⁵ <https://usaid.gov/digital-development/digital-ecosystem-framework>

Progress and Challenges for Nepal

A digital ecosystem can thrive when appropriate steps are taken toward the development of a digital infrastructure, a digital society overseen by good governance, and a vibrant digital economy. This section looks at progress made against these three indicators, among others, and the challenges that impede Nepal's digital transformation.

Progress: Nepal witnessed significant rise in mobile and Internet penetration in recent years. According to Digital 2023 Global Overview Report, Nepal had 42.78 million active cellular mobile connections as of January 2023.⁶ As this figure is 139.2 percent higher than the country's population (30.72 million), the data is indicative of how many Nepalis subscribe to more than one mobile connection. Likewise, the country had 15.85 million Internet users, pointing to an Internet penetration rate of 51.6 percent. This was well-aligned with Nepal's [Fifteenth Five-Year Plan](#) target of 100 percent Internet access by 2044. Meanwhile, the country had 12.6 million social media users in 2023, constituting 41 percent of the population.

According to a 2022 survey of media trends in Nepal, 90 percent of Nepalis above 18 years of age owned mobile phones, 67 percent of which were smartphones with mobile data capabilities that allow Internet access.⁷ These figures will likely surge with increased penetration of 4G signal networks in Nepal and the lowering of data package prices, pointing to the potential for a rapid uptake of digital financial services over the next five years. However, despite this overall increase in Internet and cellular mobile connectivity, significant digital divides exist between urban and rural populations, with poor quality of service outside of urban areas.

Internet service providers in Nepal depend on the 3,000 kilometers of optical ground wire (OPGW) network infrastructure owned by the Nepal Electricity Authority. Through this infrastructure, internet services have reached more than 18,000 schools and health posts in 74 of Nepal's 77 districts. The [Nepal Telecommunications Authority](#) (NTA), the country's telecom regulator, authorized Nepal Telecom to implement 5G infrastructure, and the company has in turn begun the process of laying 6,000 new kilometers of fiber optic cables in the country. NTA claims that it has, thus far, connected over 60,000 government facilities to the Internet across Nepal, including health posts, local government offices, ward offices, and schools, among others.

In November 2021, NTA granted Nepal Telecom permission to trial 5G on the 2600 Mhz spectrum. After multiple delays, including those caused by the 2022 general elections, a new trial scheduled for January 2023 was also postponed for lack of mobile phones that supported 5G on the 2600 MHz frequency band. Although the trial as currently envisioned will rely on a non-standalone (NSA, a term for a 5G network in an experimental stage) architecture on the existing 4G network, it may eventually need to shift to a standalone 5G network infrastructure with its own dedicated base station. NTA plans to trial the network in at least one location in each of the country's seven provinces, including major metropolitan areas like Kathmandu, Pokhara, Biratnagar, and Birgunj.

⁶ <https://datareportal.com/reports/digital-2023-nepal>

⁷ <https://www.nepalitimes.com/banner/nepals-interface-with-information/>

While 5G offers advanced capabilities of improved latency and reduced power consumption, these advantages cannot be accessed without the time-consuming and costly development of 5G infrastructure. Therefore, ICT expert Manohar Bhattarai, a respondent in this study, points to the need to rapidly identify business cases that can adopt 5G technologies; this would help justify the case for 5G-related expenditures. The fact that the trial has been delayed for lack of users with 5G-compatible devices calls for nuanced review of the country's adoption readiness, the availability of devices that use 5G for a commercial purpose, and the network's pricing. In a country like Nepal, where even 4G connections are not yet widely affordable, commercial deployment of 5G will become extremely challenging if the concerned authorities do not consider revising mobile data pricing.

Nepal has witnessed an annual 20 percent growth in its ICT sector, which contributes 2.22 percent of its GDP. While the government has committed to double growth figures in the next two years, most stakeholders suggest an annual growth target of 20 to 30 percent to be more appropriate. The sector makes up 5.6 percent of Nepal's total imports each year, equivalent to approximately US\$ 520 million (NPR 69.3 billion). As with other sectors, the trade deficit is significantly high, pointing to the need for the ICT sector to be promoted as a major Nepali industry that contributes to the economy and boosts employment.

Each year, about 7,500 ICT graduates enter Nepal's market, though it remains unclear how many gain relevant employment or how prepared they are to meet industry needs; most respondent stakeholders opined that there was a large gap between skills possessed by fresh graduates and those required by industry. Further, Nepal struggles to retain skilled workers for public or private sector employment positions that can bolster the ICT sector, as many Nepali ICT graduates prefer to migrate abroad and the ones that stay in Nepal are increasingly coopted within the local "gig economy," deploying their skills on a variety of smaller technical digital projects.⁸ The gig economy is seen to attract an increasing number of Nepali millennials and college students, especially those who prefer part-time work. With regards to the digital ecosystem, a large proportion (43 percent) of Nepal's online freelance workforce is engaged in software and technology development, representing a large pool of potential ICT talent.

In 2019, the Nepali government envisaged the Digital Nepal Framework (DNF) to promote the utilization of digital assets in economic growth and to seek solutions to societal challenges. With a vision of enabling Nepal's access to the global economy, the DNF outlines digitalization as a key to fulfilling priorities in eight sectors:

- Digital Foundation: Digital Connectivity, Digital Skills, and Digital Governance
- Agriculture
- Health
- Education
- Energy
- Tourism
- Finance, and
- Urban Infrastructure

Although the DNF was launched in 2019 by the Ministry of Communication and Information Technology (MoCIT), it only gained traction in 2022 when MoCIT announced the Digital Nepal

⁸ <https://nepaleconomicforum.org/the-gig-economy-in-nepal/>

Acceleration Project (DNAP) with a total project cost of US\$ 180 million (NPR 23.6 billion), of which US\$ 140 million (NPR 18.3 billion) was to be invested by the World Bank.⁹ The project aims to expand access to broadband Internet in rural areas, improve the capacity of individuals to engage in the digital economy, and to enhance the foundations for digital government, including the establishment of capacity and mechanisms for e-signatures, the development of a cybersecurity regulatory framework, and increased capacity of existing data centers. The implementing agencies include the [Nepal Department of Information Technology](#) (DOIT), MoCIT, the [National Information Technology Center Nepal](#) (NITC), and the Nepal Telecommunications Authority.

A two-day [Digital Nepal Conclave](#) was organized in June 2022 by the [ICT Foundation Nepal](#) to bring together government and private sector stakeholders. The conclave was a culmination of digital dialogues in all seven provinces—and a process that resulted in the development and publication of a book titled “Digital Province Outlook.” The process and the outcome were meant to guide digital development in all Nepali provinces by connecting actors and stakeholders at the local, provincial, and federal levels, by pushing policy agendas aligned with the DNF, and by promoting dialogue around emergent technologies and associated challenges.

Challenges: Despite these recent developments, there are multiple challenges that need to be addressed for Nepal to fully benefit from digital development. For example, in the first week of 2023, the [Internet Service Provider’s Association of Nepal](#) issued a press release threatening disruption of Internet services; they alleged that the NEA had cut ISP Internet wires under the guise of “wire management,” unilaterally hiked rent on infrastructure like electricity poles and OPGW that ISPs depended on, and disrupted electrical supply to ISP data centers and operational points. While NEA, in response, alleged that these actions were the result of ISPs not paying rental dues for using NEA infrastructure, the ISPs denied this assertion. This situation serves as an exemplar of the fragile collaboration between public and private stakeholders in Nepal.

Going forward, it can be assumed that the DNAP will address some of the challenges related to digital infrastructure, policy regulation, and human capacity. Nonetheless, this report discusses existing challenges drawn from desk review and stakeholders’ consultations, which are broadly categorized as follows:

- **Infrastructure for Digital Public Services:** Despite the launching of digital public services like the *Nagarik (Citizen) App*, the [Nepal National Single Window System](#) (NNSW), a digitization system for land revenue data, and the [National ID card](#) (NID), among others, inadequate capacity and incompetent handling of installed technologies continue to pose barriers for service seekers. Much remains to be achieved in terms of the institutional and infrastructural preparedness necessary to deliver quality and reliable digital public services.
- **Human Capital:** The lack of skilled human capital in Nepal remains the biggest constraint to keeping pace with global digital development. The mismatch between skills among ICT college graduates’ skills and industry requirements, the preference among new graduates to migrate abroad, and the emergence of a growing gig economy have been discussed in this report. The strain on human capital in the digital realm is further aggravated by the government policy to assign a cap/quota limit on the number of students that Information and

⁹ [Ministry of Communication and Information Technology \(mocit.gov.np\)](#)

Communication Technology (ICT) education providers in Nepal can enroll. This provision is biased as it applies only to colleges that operate under Nepali university boards and not to those affiliated with university and college boards from abroad. Stakeholders oppose the logic that waiving the cap would diminish the quality of output. They argue that such a view fails to recognize existing infrastructure and faculty strength of competent providers—parameters for the government to assess as a regulator. Healthy competition driven by accreditation standards of a quality assurance system overseen by a government regulator, would enhance quality and regulate the cost for such education, they argue. A critical mass exists in the sector, stakeholders assert, that is willing to be governed by government regulation combined with sector-led self-regulation. It would also reduce the burden on foreign currency reserves being drained by students needing to travel abroad for related studies, they contend. Even if the government wishes to continue with a quota system, the numbers that different colleges can enroll should not be uniform. It should be based on the capacity of the education provider, based on objective criteria determined by the sector and effective evaluation.

- **Private Sector Participation:** The government’s reluctance to forge partnerships with private sector providers to expand public services remains a matter of concern. While this hinders the rapid development of digital infrastructure, especially in remote and rural areas, it also stymies growth and upskilling in trained human resources.
- **Digital Exclusion:** In Nepal and elsewhere, digital exclusion manifests in unaffordable Internet and/or digital public services, the digital divide, digital illiteracy, and a lack of digital access due to geography, gender, poverty, and other forms of marginalization.
- **Health:** Digital technology facilitates telehealth videoconferencing with healthcare providers and e-learning on healthcare topics as means to address concerns about healthcare access, affordability, and quality for all citizens. The COVID-19 pandemic necessitated online health consultation services and the scaling up of Nepal’s digital health information management systems, resulting in increased digital healthcare service availability. However, as Nepal’s most remote areas suffer from a lack of Internet connectivity, there is scope for enhanced uptake of digital tools and services.
- **Education:** Digital technologies can enrich teacher training, teaching-learning practices, and educational outcomes which in turn affect the quality of human capital and the economy. The COVID-19 pandemic encouraged a rethinking of teaching-learning, with the [Ministry of Education, Science and Technology](#) (MoEST) introducing a guideline for facilitating student learning by alternative means and, *an e-learning app*. However, *a lack of widespread and reliable Internet access and online learning material has rendered online learning less effective*.
- **Energy:** There is scope for customer-centric digital solutions and the implementation of smart transmission and distribution networks that can reduce energy costs. The Nepal Electricity Authority has stepped up relevant efforts, however, procedural delays in serving remote areas remain a challenge.
- **Urban Infrastructure:** Digital technologies can enhance key urban services like water management, solid waste management, public transportation, and traffic management. However, the government’s provision of online services has been inadequate, as evidenced from the recent problems faced by service seekers attempting to procure “smart” driver’s

licenses from the Nepal Department of Transport Management.¹⁰ This service delay compounded by poor broadband connectivity at the provincial and local levels.

- **Agriculture:** Nepali farmers have access to agricultural information through mobile applications, but reach of these tools is limited due to digital illiteracy and poor rural Internet access. In his blog,¹¹ Kailash Karki asserts that there is further need for adequate discussion around farmers' capacity to use mobile applications, suggesting that local governments set aside budget for building basic digital skills while initiating such debates and dialogues.
- **Tourism:** Digital campaigns offer opportunities for marketing and selling Nepal as an attractive destination to tourists and for developing human capital and providing job opportunities. However, the growth of this sector is hampered by digital inadequacies, such as the inefficiency of visa kiosks at the Tribhuvan International Airport, that need to be addressed.
- **Fintech:** With the growth of initiatives like the [national payment gateway](#), digital credit ratings, mobile wallet services, digital payments, and the development and promotion of e-commerce, Nepal's finance sector has seen rapid and efficient digitalization in recent years. According to data published by the Nepal Rastra Bank (NRB)—Nepal's central regulatory bank—an average of over three million transactions per month occurred through [Connect IPS](#)—a single payment platform that allows customers to link their bank accounts to enable payment processing, fund transfers, and bill payments. Likewise, data showed an average of 13.5 million mobile banking transactions, 13.3 million mobile wallet transactions, and 1.7 million QR code-based payments made each month. However, some remark that Connect IPS, which is a government-operated digital wallet service, has an unfair competitive advantage over similar private provider offerings. Stakeholders urge the government to focus on facilitating service standardization and quality, rather than directly provide services that the private sector could provide more effectively.
- **Cybersecurity:** Cybersecurity is of particular concern in Nepal, as overall technical and infrastructure capacity is still poor. Nepal does not yet have a formal cybersecurity policy and regulatory framework, although a draft was circulated for opinion in 2021. In the meantime, data security and privacy concerns deter uptake of financial technologies suppress appetite for foreign direct investment (FDI).
- **Policy Incentives for Local Entrepreneurs:** Nepal lacks sufficient policy incentives, subsidies, and rebates for burgeoning digital and ICT businesses and for established companies to adopt digital tools and technologies. This needs immediate rethinking to enable the entry of relevant small and medium-sized enterprises (SMEs) in the formal economy.
- **High Initial Investment:** Initial investment costs are very high for digital and ICT-focused businesses, discouraging the uptake of digital tools and technologies. As a result, sectoral investment lags and employment growth is underwhelming.
- **Lack of entrepreneurial preparedness:** At the startup level, there is often a lack of necessary preparation for project inception, human resource management, financial and business planning, scale-up and growth projections, alternative scenario planning, competition and alliance-building, and market analysis. Many entrepreneurs globally share these shortcomings, and those in Nepal's digital entrepreneurship sector are no exception.

¹⁰ <https://myrepublica.nagariknetwork.com/news/hundreds-of-service-seekers-suffer-as-transport-office-server-breaks-down/>; <https://myrepublica.nagariknetwork.com/news/problem-with-smart-driver-s-license-due-to-technological-error/>

¹¹ <https://www.rabinsxp.com/article/digital-nepal-framework-needs-a-successful-digital-ecosystem-but-what-about-programs/>

- **Gig Economy Grey Area:** Nepal's "gig" economy generally caters to foreign clients who outsource work to Nepali workers, meaning that these workers contribute less value to the local digital economy. These gig businesses and workers instead drive-up revenues for offshore businesses, and due to the gig economy's informal "grey" status it is difficult to quantify these revenues.
- **Conventional and Conservative Public Procurement Mechanisms:** Said mechanisms are not favorable to Nepal's rapidly evolving digital businesses. While local governments are generally willing to engage with digital providers to solve local challenges of governance and public service delivery, conventional higher-level procurement mechanisms remain a challenge for digital businesses to comply with.
- **Government Investment:** At all levels of government, investment in digital development is inefficient; often, expenditures are either redundant or too fragmented to make an impact.

Discussion, Findings, and Recommendations

POLICY ENVIRONMENT

Opinions around policy for enabling digital ownership and development in Nepal remain scattered. While many respondents believed that policy has never been the problem, there were those that rued the lack of specific policy that could positively contribute to the digital sector, including those related to cybersecurity and privacy. Meanwhile, other respondents contended that digital entrepreneurs could even stand to benefit in the absence of policy that governs such work.

Manohar Bhattarai, former Vice-Chair of the powerful and ostensibly independent High-Level Commission for Information Communication Technology (HLCIT) in Nepal and a leading ICT and information economy expert, opined that Nepal suffers from policy fatigue. According to him, there is no dearth of relevant digital policy; what holds back Nepal's digital sector—as compared to those of its regional counterparts—is the country's lack of commitment to “walk the talk” and fulfill existing policy. As an expert involved in the development of the Digital Nepal Framework, Bhattarai asserted that the framework serves as comprehensive policy guidance. However, he suggested periodic policy review and reforms to consider rapid changes as global technologies move towards Industry 4.0, the “fourth industrial revolution” which sees digital convergence between technology and industry.

“We do not have the luxury to say we are not ready, because our neighbors [India and Bangladesh] are, and they will quickly grasp the opportunities that we cannot take.”

MANOHAR BHATTARAI

Niraj Khanal at Antarperana, a company that mentors Nepali entrepreneurs, asserted that digital entrepreneurship often happens in a policy vacuum, where entrepreneurs have more freedom to experiment with new and innovative ideas.¹² Khanal said that there is the question of what comes first—innovation or policy—and gave the example of e-Sewa,¹³ now Nepal's leading digital wallet, which survived for eight years in the absence of related policy. Had e-Sewa waited for operational approval via policy, they may have achieved very little.

Some respondents remarked that policy-related challenges also stem from a lack of understanding of digital business models at the policy-making level. Sonika Manandhar from Aloi, a blockchain-based financing platform for small informal sector businesses,¹⁴ explained how there was initial confusion surrounding Aloi's business model. Aloi's software platform connects small businesses to banks and financial institutions (BFIs) and digitally monitors loan expenditure and repayment through verified merchants and deposit points. However,

¹² <http://startupsnepal.com/investors/profiledetail/217-Niraj%20Khanal?investor=1>

¹³ <https://esewa.com.np/#/home>

¹⁴ <https://aloi.global/>

Manandhar explained that Aloi was incorrectly perceived by the government as providing—instead of merely facilitating—banking services. Further, as Aloi operates on the blockchain, the government believed the company was engaging in cryptocurrency trades prohibited by Nepal's central reserve bank, the Nepal Rastra Bank (NRB). Aloi therefore needed to explain its business model to NRB, which subsequently led to NRB's recently release of Digital Banking Guidelines that do not require Aloi and similar companies to acquire banking or digital wallet operating licenses.

Aloi's blockchain-based model supports the entire credit assessment/lending/ loan utility/repayment cycle and will continue to evolve it, laying the groundwork for the arrival of other stable and reliable fintech businesses. The company's efforts at working with NRB to involve them in its "sand-boxing," process for testing disruptive tech and innovations that do not fall within a sector governed by existing legislation constitutes an approach that can be promoted and applied to interactions with other government policy agencies. According to Manandhar, while NRB's tech department has been responsive during Aloi's engagement, a potential challenge facing other companies is that NRB may not devote resources to resolving every corporate proposal submitted.

Policy gaps around foreign direct investment, repatriation of investment, and the ease of access to foreign currency for offshore value-add transactions, remain a concern. Although the government reduced the FDI minimum threshold of NPR 50 million (US\$ 380,000) set in 2019 to NPR 20 million (US\$ 152,000) in 2022, respondents have called for an elimination of the FDI threshold for the ICT sector—as successful startups in the sector have been known to arise from very humble beginnings.

Meanwhile, the demand for tax holiday policies for digital businesses was raised at the Digital Nepal Conclave held in June 2022, where assembled parties called for a separate Public Procurement Act to be established for the ICT industry. Such policies were cited as necessary for realizing the vision outlined in the Digital Nepal Framework and for Nepal's digital economy to leapfrog and keep pace with its neighbors.

Respondents also pointed to policy gaps associated with the rapid adoption of the Internet of Things (IoT)—a cloud-based technology that facilitates communication between a network of Internet-connected devices; there is apparently a lack of policy to regulate and secure frequency spectrums that different devices operate on. Many respondents argued that the government often hampered innovation by stepping outside of its regulatory role. The digital National Identity (NID) development was cited as an example, with respondents pointing to ways the government's efforts at project management had backfired, and how the project could have been accomplished more efficiently and cost-effectively had it been outsourced to the private sector. The major challenge respondents identified lies with influential individuals and organizations convincing the government to undertake such monumental digital development projects and using the projects as an opportunity to secure lucrative contracts for the associated hardware and software.

Recommendations:

- Policy needs continual revisitation and reform to prevent the government from getting into operational digital development roles; such involvement constitutes conflict of interest, as the government also has a regulatory role.

- It is common for government service providers to postpone the delivery of public services, citing server outage or technical difficulties. This is an area that policy needs to be addressed with urgency, as such services should be allocated to the private sector. With proper regulation and oversight, private sector providers can be held accountable for quality, security, and timeliness of service provision.
- While the government issued a draft cybersecurity policy in 2021, it lacked standard policy provisions for data protection and privacy, and the enshrinement of citizens' digital rights. There is an urgent need for the private sector and civil society to engage with government on the development of these policy provisions and related laws. Subsequently, existing relevant laws will also need revisiting to ensure that they are in harmony with these policy provisions.
- There is also the need for a clear framework for policy jurisdiction and coordination between the three tiers of governments. This should include defined responsibilities for the management of data centers in provinces and for resolving issues around inter-operability and cybersecurity.
- Regulatory challenges and policy gaps can dissuade foreign direct investment into the digital sector. Regulatory provisions need reforms to streamline foreign direct investment—As Nepal's digital development plans may not take off without it.
- Private sector actors need to increasingly educate and involve related government offices and officials in sand-boxing innovative technologies. This will help clear regulatory barriers for digital and ICT startups.

BUREAUCRATIC PREPAREDNESS

The government's affinity for projects that involve large-scale public procurement poses a challenge to the process of digitalization as it discourages the private sector's role in serving the government. The setting up of the National Information Technology Center,¹⁵ which features the Government Integrated Data Center (GIDC), is an example. Established at the federal level, the GIDC's role is to provide Internet-related services like data storage, shared computing resources, email access, and website hosting to all government ministries and departments, who are in turn connected to the data center through a high-speed network.

Although providing security for government networks and data was the ostensible justification for the new GIDC, respondents sensed an ulterior motive—the scope for commission through large-scale procurement. Respondents asserted that the GIDC offered nothing that private sector Internet and web and cloud storage service providers would not have been able to provide in an alternative situation, with the government overseeing security protocols and arrangements to support private service delivery. Such an arrangement would have not only been less expensive, but it would have helped stimulate Nepal's private sector digital businesses. Respondents also claimed that challenges associated with the smooth operation of data centers in all Nepali provinces were due to a lack of digitally-capable human resources to run the data centers; this is a consequence of the government's haste to procure capital goods without giving adequate thought to domestic human resource limitations.

Nepal's procurement mechanism also presents challenges for private sector actors that approach the government with innovative ideas for addressing local challenges. Respondents

¹⁵ <https://nitc.gov.np/>

indicated that the government lacks a mechanism for recognizing and procuring digital innovations and, particularly, there is a lack of a fast-track mechanism that side-steps lengthy bureaucratic processes that can hamper timely implementation. Digital innovation also calls for incubation and acceleration of digital ideas, a co-creative process that demands flexibility and understanding that the process can be experimental and may not deliver intended results. The government is not always ready to get into such a relationship. Respondents also feared that the government would take note of a proposed digital solution but then engage with another provider to deploy it—a provider who would not have the competence for effective implementation. Other respondents related accounts of the government officials asking businesses to modify project ideas in ways that would suit the officials' electoral prospects.

On the whole, Nepal has an unfortunate lack of large-scale bureaucratic preparedness required for the digital transformation of public services. This is evident in the poor infrastructural preparedness for the roll-out of initiatives to provide digital services like registration for the National ID card (NID), new passports, citizenship certificates, and drivers' licenses. Respondents noted that, even when there is the provision to register online for these services, websites may fail to load or crash due to high server demand. These are recurring phenomena, as reported in the media or articulated by frustrated digital service-seekers on social media. A recent attempt to log into the website of the Information Security Response Team Nepal—NPCERT¹⁶—the body tasked with promoting security awareness across industry, academia and, public sector returned a notification that read "One or more of this website's certificates are invalid, so we can't guarantee its authenticity."

This lack of institutional preparedness has led to a digital ecosystem that has certain elements in place but is far from mature in terms of a balance between service quality and availability, accessibility, and affordability. Priced at two percent of the gross national income (GNI) per capita, Internet in Nepal is among the most expensive in the region as compared to average income. Going forward, crucial elements of the ecosystem like infrastructure and data security need thorough re-examination.

The lack of bureaucratic preparedness has also brought to the fore the challenges associated with the political economy of digitalization. For example, Nepal's Province 1 took the initiative to design a digital strategy with the support of the auditing firm PricewaterhouseCoopers. This strategy envisaged a new mechanism for online vehicle registration renewal in the province. However, vehicle registration renewal is among the biggest revenue generators in Nepal, and the ICT Advisor to the then-Prime Minister intervened and brought the province's vehicle registration renewal mechanism back within federal purview and forcing Province 1 to rely on the federal government's Department of Transport Management for online registration renewal services.

Respondents said that grey-area confusion around constitutionally mandated jurisdictions are often taken advantage of, with powerful businesses exploiting the lack of specific regulation pertaining to service digitalization being a fairly recent phenomenon.

Recommendations:

¹⁶ <https://npcert.org/>

- Public officials at federal, provincial, and local levels need to be continually engaged and oriented on the benefits of using appropriate digital tools and how they could make public service delivery more effective. Only then will they become more accepting of partnerships with private sector actors.
- Policies need to address grey-area confusion of constitutionally mandated jurisdiction in order to better prepare public officials to select effective digitalization processes.
- Any increased preparedness on the part of public officials for the uptake of digitalization has to be accompanied by adequate infrastructure development.
- Public procurement procedures, especially those concerned with digitalization of public services, need to be simplified.

DIGITIZATION EFFORTS BY LOCAL GOVERNMENTS

Efforts by local governments to digitize have primarily been supported by and/or led by non-governmental agencies, including non-profits and private sector actors. Most respondents in this study said they were increasingly engaged with local units (municipalities),¹⁷ with digitization projects at various stages—advanced, slow, or restricted to pipeline. The status of each project depended on the commitment of both elected and civil service actors in the respective municipality’s government. Some of these digitization projects include the [Data for Development](#) (D4D) project, whose outcomes included the design and testing of an integrated information and data management system in the Tulsipur municipality and the development of integrated profiles in six other municipalities. Working with the National Disaster Risk Reduction and Management Authority (NDRRMA), USAID’s Tayar Nepal project (implemented by DAI) supported the development of the [Building Information Platform Against Disasters](#) (BIPAD) portal in 14 municipalities, as part of the national Disaster Information Management Systems.

NAXA,¹⁸ a youth-led Geo-ICT service provider company, designed the Nepal Waste Map for Cleanup Nepal¹⁹—a communication and data platform for government, private sector, and civil society to collaborate for waste management. The Nepal Waste Map (now called “Safa [Nepal](#)”) developed for the Birgunj and Tulsipur municipalities, is a web-based dashboard and mobile application that allows municipalities to analyze waste-related data, provide waste management information, and enable citizen reporting for eco-friendly waste management. Building off these technologies, geo-tracked garbage trucks fitted with weighing machines for segregated waste helps the Birgunj municipality better manage bio-degradable and non-degradable waste.

Aloi has oriented the Panauti municipality on the deployment of digital token money and sees the potential for the municipality utilizing this technology for the disbursement and tracking of its multiple grants. The inherent challenge facing this is that local governments are often bound by tender and procurement regulations that make the process for forging partnerships for technology sharing and transfer long and cumbersome. Another challenge lies in the municipality’s preference to de-prioritize working with private sector digital service providers, like

¹⁷ Nepal has 753 local units, or Palikas, which are categorized as metropolises (6), sub-metropolises (11), municipalities (276) and rural municipalities (460). They will collectively be addressed, in this study, as municipalities or Palikas, and they constitute the lowest tier of government. These municipalities are distributed across seven provinces, which make up the middle-tier of Nepal’s federal governance system. The highest tier is the federal government.

¹⁸ <https://naxa.com.np/>

¹⁹ <https://cleanupnepal.org.np/nepal-waste-map/>

Aloi, that have sectoral specialization in favor of a larger partner that can facilitate the comprehensive digitalization of services.

A key learning with respect to engaging with local governments was related to the approach taken—respondents said that the more effective approach was one that offered the space for co-creative design along with the government, as opposed to proposing a ready-made solution. For example, the D4D project experience demonstrated the importance of collaborating with federal, provincial, and local governments, private sector, and civil society actors in a process that builds trust among stakeholders while enabling the design of the solution.

This study reaffirms the fact that a rushed approach to digitalization will not enable stakeholder ownership and trust and will not lead to sustainability. Such an approach will, more often than not, fail to provide home-grown examples of successes. Respondents reiterated that many local government officials will not have sound understanding of how digital technologies can help solve local challenges or ease local public service delivery bottlenecks in health, education, agriculture, and disaster preparedness, among other sectors. Without an understanding of the tangible benefits (in the form of home-grown examples) that these technologies offer, officials will be wary of engagement. An approach that educates, empowers, and inspires action on the part of local actors needs to be adopted, thereby building local trust, capacity, and ownership in digitalization projects. This approach will also boost digital literacy for local actors, and ultimately enhance digital adoption throughout Nepal. The implementers of the D4D project witnessed considerable local interest and ownership for the Statistical Literacy Guideline developed by the National Planning Commission (NPC) and the Central Bureau of Statistics (CBS) to strengthen digital literacy knowledge and skills among sub-national governments. Said enhanced ownership among sub-national governments for the guideline was attributed to the home-grown examples that the publication included.

Recommendations

- There is scope for provincial and local governments to work on outsourcing services like the application for and delivery of passports, NID cards, drivers' licenses, citizenship documents, and tax certificates, among other government services, to the private sector. For example, all forms of municipality taxes could be paid and processed, for a small fee, through a private sector provider like e-Sewa or Khalti.
- The government should promote the implementation and use of vetted, private sector operated digital kiosks as service provision hubs for citizens to access government information and services at the local level. This will boost digital entrepreneurship while providing ease of access through a one-stop shop for all government services. The government should provide standardization guidelines and certification for kiosk providers.
- As the government of the capital city—and the largest urban center in Nepal—the Kathmandu Metropolitan City (KMC) governing office should establish a digital research and innovation center that develops digital solutions for challenges around water supply, solid waste management, public service provision, and healthcare and education, among others.

IMPLEMENTING THE DIGITAL NEPAL FRAMEWORK: DIGITAL NEPAL ACCELERATION PROJECT

With eight sectoral pillars and 80 projects, the ambitious DNF was launched in 2019 as a blueprint for the utilization of digital assets to contribute to economic growth and address

societal challenges. It was only in 2022 that it gained traction when MoCIT announced the US\$ 180 million Digital Nepal Acceleration Project (DNAP), supported by a US\$ 140 million World Bank contribution.²⁰ The DNAP includes the following core components:

- Expand access to broadband
 - Promote rural broadband Internet access and use
 - Improve international connectivity
- Improve capacity of individuals and businesses to engage in the digital economy
 - Execute digital literacy development program
 - Develop advanced digital skills of individuals
 - Support digital businesses
- Enhance the foundations of digital government
 - Enhance the digital trust ecosystem
 - Improve data center capacity
 - Implement selected digital services

More specifically, the DNAP aims to support regulatory and policy reforms to reduce costs of network deployment and maximize the efficiency of public investments, mobilize private sector investment in municipalities not yet connected by optical fiber, and enhance digital adoption through demand-side interventions. DNAP expects to secure more affordable, higher quality, and more resilient international connectivity through development of a virtual landing station (VLS) in Nepal and competitive capacity procurement. Lower international connectivity costs are expected to have positive downstream impact on all market segments, including improvements in content and service delivery and improved access for Nepali businesses to global digital resources and markets.

The DNAP aims to enhance digital literacy among specific groups like women, students, persons with disabilities, low-income households, populations vulnerable to climate change, and small businesses. It targets 1,500 individuals from these groups for instilling advanced digital skills to enhance their employability in the ICT sector. Likewise, to support digital businesses, the DNAP envisages an incubation and acceleration program, prospects for the development of an IT park to attract international and private sector investors, and a digital economy that supports innovative digital entrepreneurship.

To enhance the digital trust ecosystem, the DNAP foresees a single certifying authority—the Office of Controller of Certification (OCC)²¹—possessing the sole official license to issue digital signature certificates to certifying authorities throughout Nepal and take responsibility to support a government awareness campaign on the opportunities and benefits of digital signatures. To this end, the DNAP aims to support the OCC to prepare for an external audit and acquire global certification, which would in turn allow certifying authorities to issue SSL certificates locally. Additionally, the DNAP aims to establish a national cybersecurity center in adherence with global standards and accompanying policies and procedures for cybersecurity and personal data protection. Further, this project envisages the setting up of a Security Operations Center

²⁰ [Ministry of Communication and Information Technology \(mocit.gov.np\)](https://mocit.gov.np)

²¹ <https://occ.gov.np>

(SOC), a Network Operations Center (NOC) and a Cybersecurity laboratory (which will include capabilities for digital forensics examinations) with an accompanying training center.

Finally, the DNAP harbors ambitions of Nepal serving as a data hosting or cloud service-providing country through the development of appropriate policy frameworks that support the development of green, resilient, and secure data centers and cloud services for public service delivery. It also envisages enhancement of the government's existing data centers and cloud service capacity. The biggest specific challenge for DNAP, cited by a knowledgeable respondent, was the lack of human resources for operating the data centers in all seven provinces.

However, prevailing criticism of the government's vision for implementing the DNAP is rooted in the lack of a multi-sectoral approach that includes the private sector, as visualized by the DNF. Respondents rued how DNAP is currently envisaged as a MoCIT project and how that public sector focus is counter-productive to building out a vibrant digital ecosystem. Respondents added that MoCIT leadership of the project may fail to devote adequate focus to the design and delivery of digital goods and services in the education, health, agriculture, tourism, finance, energy, and urban development sectors. This, respondents fear, could perpetuate the status quo of Nepal's various sectors working in silos. As evident from the DNAP plan discussed above, the only areas where the DNAP clearly identifies a role for the private sector is in the enhancement of digital literacy and the establishment of data centers and cloud storage facilities.

Additionally, respondents feared that formally industrializing ICT in Nepal may spark domain conflict between MoCIT and the [Ministry of Industry, Commerce and Supplies](#) (MoICS). Ideally, respondents asserted, the process of ICT industrialization would go forward through the DNAP and should be guided by a multi-sectoral governance mechanism of MoCIT, MoICS, and the National Planning Commission.

Some respondents rued the lack of an independent high-level multi-sectoral mechanism similar to HLCIT in the past, even while they acknowledged its limitation as a facilitative coordinating body that lacked executive function. Speaking at the 2022 Digital Nepal Conclave, the then-Prime Minister's IT Advisor disclosed that the government was in the process of forming a new high-level commission under the leadership of the Prime Minister to solve problems in the digital sector. However, respondents feared that this body may be yet another high-level commission that fails to drive the digital transformation process forward. The challenges are known, they assert, but what is needed is leadership to drive the implementation. A recurring refrain among respondents was "Nepal does not have the luxury to lose time." However, since the 2022 Digital Nepal Enclave, the country's government has changed and a new Prime Minister has taken power; now, stakeholders wait to see which digital initiatives the new government will prioritize.

Nepal waited for three years from the formal launch of the DNF in 2019 for the World Bank Loan to finance the DNAP in 2022. Nepali stakeholders questioned this delay, considering that adequate funds for digitalization initiatives (some US\$ 168 million, or NPR 22.162 billion) lay unused in the Rural Telecommunication Development Fund (RTDF) as of FY 2018-19. The RTDF was initiated 26 years ago as a provision of the Telecommunications Act of 1997, whereby licensed telecommunication and Internet service providers contributed 2 percent of their annual income to the fund each year. The purpose of the fund was for the NTA to develop, extend, and operate telecommunications services in rural areas as per government policy. Starting in 2019, the NTA utilized a portion of the funds to undertake two projects: the

“Information Super Highway Construction” project, and the “Broadband Access Network” project. The former aimed to connect Nepal’s 77 district via optical fiber, while the latter endeavored to improve broadband Internet access in rural areas. With these well-meaning efforts in mind, respondents argued that the RTDF should have been the go-to resource for fulfilling the DNF, rather than an external World Bank loan.

In his keynote address at the 2022 Digital Nepal Conclave, then-MoCIT Secretary Dr. Baikuntha Aryal shed light on a simple challenge that the DNAP aimed to address—a lack of standardized digital signature rules among the Nepali government made it difficult for government offices to authenticate digital documents they received from one another. Secretary Aryal therefore emphasized the need for digital standardization among and between various levels of government, ministries, departments, and offices as a necessary foundation for Nepal’s ongoing digital transformation. He also expressed commitment to standardize the digitalization of public services from all federal offices by the close of the Nepali fiscal year²² (mid-July 2023). Likewise, he emphasized the need to rapidly develop local human resource expertise in the digital sector.

EVOLVING BUSINESS MODELS AND INVESTMENT ENVIRONMENT

A number of factors, discussed below, have led to a hybrid business model for digital businesses in Nepal in that they cater to both local and foreign markets.

Nepal’s local market for digital businesses is small. Additionally, Nepali entrepreneurs need to compete with Chinese and Indian products and services, which can be of a higher quality, yet come at a lower price, given those countries’ competitiveness in global markets. Further the Nepali investor ecosystem is still nascent and lacks the homegrown success stories and the elements of trust important for drawing in more capital. Additionally, the cost of capital, as determined by bank interest rates, is very high in Nepal.

COVID-19 opened the doors for online businesses and provided opportunities for talented local developers—including coders and programmers—to be hired by foreign companies that pay much higher wages than Nepali companies. This has resulted in a dearth of trained personnel for local companies, depleting the labor market of already scarce technical human resources. Such outsourcing has also spurred local businesses to look for international clients, giving rise to a hybrid business model that continues to cater to the local market, but depends on offshore contracts for sustainability. Respondents shared knowledge of more and more Nepali companies registering internationally, to allow offshore fund parking for business purposes and to overcome the challenges of transferring money out of Nepal.

While this international/local business model allows for sustainability of digital businesses, it disadvantages those that wish to cater exclusively to the local market, or those that are registered and pay taxes locally. Meanwhile, there was speculation among respondents that offshore registration and trading limit the entry of foreign currency into the country and decrease internal tax revenues, both of which adversely affecting Nepal’s economy. The growing dominance of the hybrid model also makes it difficult for exclusively local businesses to attract quality human resources. Local digital businesses complain that they now serve as “training

²² The Nepali fiscal year runs from mid-July to mid-July each year, corresponding to the month of Asadh, the 3rd month on the Nepali calendar

platforms” that help launch careers for people who then move to companies with an international business arm; many respondents agreed that this was not the case before the COVID-19 pandemic.

Local businesses now need to compete with established foreign businesses with sound investment volume, better technology, and the ability to absorb intermittent shocks associated with doing business in the unstable environment that characterizes Nepal. For example, the home-grown Nepali ride-sharing platform Tootle recently became obsolete after Pathao, a similar service from Bangladesh, operationalized in Nepal; meanwhile, Nepali e-commerce platform [SastoDeal](#) struggled to compete with a larger Singaporean competitor called Daraz. These case studies illustrate why sustainable business models backed by assured finances are so important for the success of Nepali digital businesses. The future of these businesses will depend on the performance of a mature and sector-diversified investor ecosystem in Nepal.

Nepal’s investor ecosystem, although relatively nascent, is evolving quite rapidly. In 2018, [Business Oxygen](#) (BO2), [Dolma Impact Fund](#), and [True North Associates](#) were among the few private equity (PE) and venture capital (VC) organizations operating in Nepal. After Nepal’s regulator—the Securities Board of Nepal (SEBON)—formulated the Specialized Investment Fund Regulation for PE and VC funds in Nepal in 2019, Global Equity Fund became the first licensed PE fund based in Nepal. Global Equity Fund is now preparing to launch its inaugural fund, the US\$ 25 million (NPR 3.2 billions) Laxmi Impact Growth Fund, prioritizing investment in Nepali sectors including clean energy, education, healthcare, agriculture, hospitality, e-commerce, and logistics management. Broadly, a review of existing literature points to three types of private equity funds now operating in Nepal. The first type is foreign-based funds focused on Nepali businesses, such as Dolma Impact Fund, BO2, and [One to Watch](#). Dolma Impact Fund, also in this category, operates from Mauritius and provides FDI in Nepali companies. The second type of fund includes investment companies that invest in various enterprises. [Team Ventures](#), an example of the second type, constitutes of a group of individuals that come together to register an investment company that invests in different companies; these companies are not regulated by SEBON. The third type includes institutional funds, like Global Equity Fund, which are licensed and regulated by SEBON. Merchant banks have also now joined the fray, having acquired PE licenses to operate in Nepal. Respondents opined that over the next five years more funds will follow and enter Nepal to challenge conventional banks and their models. [Prabhu Capital](#), a leading Nepali merchant bank, is now a member of the Nepal Private Equity Association (NPEA)²³ recently formed with the goal of promoting access to alternative financing for SMEs and for advancing innovation, entrepreneurship, and job creation. Its activities include policy advocacy and lobbying, networking and training, and research. To bridge the gap between supply and demand, NPEA offers a “[Deal Sharing Platform](#),” a portal helping companies raise capital and non-financial assets by linking them to potential investors and funders, while also and helping said investors and funders identify suitable companies to invest in.

NPEA membership levels include **Regular** and **Associate**, both of which are available to active local and international PE investors, fund managers, and development financial institutions (DFIs); and an **Individuals** level, open to individual investors in the entrepreneurial ecosystem, including small-ticket angel and private investors. Membership is varied, including fund managers ([Aadhyaanta](#)); PE and VC legal advisors ([Pioneer Law Associates](#)); chartered

²³ <https://www.nepalpea.org/>

accountant firms ([PKF TR Upadhyaya and Co.](#)); and cloud-based accounting solutions providers ([ME10](#)). Members also include existing PE and VC firms like Accelerator Nepal, BO2, Dolma Advisors, One to Watch, Team Ventures, True North Associates, [Kriti Venture Fund](#), [Tele Ventures](#), [Safal Partners](#), and Global Equity Fund. If the breadth of membership in NPEA is anything to go by, one can be hopeful that the investor landscape in Nepal will soon drive profound investment into the digital sector. However, while the arrival of more structured PE and VC institutions does offer some respite from the high cost of capital resulting from the high lending interest rates of BFIs, they are often only willing to invest in traditional and proven businesses, such as, hydropower or hospitality businesses, and less willing to invest in “riskier” digital businesses. That is one reason why the entrepreneurial ecosystem in Nepal has failed to stimulate the digital sector to the level many stakeholders had hoped. It remains to be seen whether emerging PE and VC funds will break away from more conventional investment approaches and extend capital to innovative Nepali digital startups and scaleups.

Recommendations:

- India digitized around its “Aadhar Card,” system that serves as proof of identity address for Indians and helps credit-rating-based lending for individuals and SMEs. Nepal needs to learn from this and institutionalize its NID cards as a basis for credit rating.
- Nepal operates on established principles of a free market. However, policies need to support and secure local SMEs, especially those in the digital sector, to avoid the establishment and interference of sectoral monopolies.

CYBERSECURITY AND DIGITAL RIGHTS

Digital products and services require extremely high levels of standardization, compliance, and cybersecurity provisions, especially when they are produced for offshore clients. Some Nepali businesses in the digital industry were found to be [SOC2](#) compliant—having acquired a voluntary compliance certification from the American Institute for Certified Public Accountants (AICPA) signifying their trustworthiness in handling and managing consumer data. This serves as an example of how Nepali businesses have developed and possess the capability to meet the most stringent of compliance requirements.

Compliance with standards and industry best practices gives confidence to the client, but also protects businesses against threats, attacks, and data breaches. There are Nepali cybersecurity focused organizations like Bhairab²⁴ and Eminence Ways²⁵ that performing penetration testing, meaning they carry out an authorized simulated cyberattack to test corporate system security. NRB regulations now require all Nepali banks to have an Information Security Officer (ISO) to look into the integrity of core banking software, ensure client data protection, and ensure data back-up. Banks also need to comply with [Payment Card Industry Data Security Standard](#) (PCI-DSS), a 13-point compliance checklist.

Recommendations:

²⁴ <https://vairav.net/>

²⁵ <https://eminenceways.com/>

- Many government services are now digitalized, including NID, drivers' licenses, passports, tax payment, and land registration. The government needs to act immediately on addressing data privacy and security issues through policy and institutional arrangements.
- Security needs to encompass all interfaces, not only Internet-related vulnerability. Security considerations should take into account process interface security, especially as AI-based system automation works on multiple connected devices.
- System digitization comes with the associated risk of system collapse. Automated periodic back-up of information and data and provisions for off-site storage is important. Data centers that can secure the integrity and quality of data from multiple sectors need to be set up with urgency.
- It is not clear as to which government body oversees cybersecurity. Policy and legal frameworks need to assign distinct cybersecurity roles and responsibilities at the federal, provincial, and local levels.
- Likewise, there is a lack of clarity about which authority oversees the process of digitization and keeps a record of what records and processes have been digitized and what will be digitized in the next five years. The government should focus on clarifying these roles, which likely involves outsourcing end-user data points to credible private sector actors.
- While safe citizen information collection for NID purposes is guaranteed by law, there is no specific law that governs or serves as the basis for collection of personal information by the Nagarik App.²⁶ This needs to be addressed immediately.
- No law currently exists for making public or private entities responsible or liable for public data security. This needs to be addressed.
- Nepal needs to promote provisions for protecting Nepali citizens' data and privacy against big tech company overreach, like the General Data Protection Regulation (GDPR) does for EU citizens.
- There is currently no law that protects the digital right of citizens to use Free Open Source Software (FOSS), despite the [Nepal ICT Policy 2015](#) advocating for the right to FOSS to be protected.
- Provisions for cybersecurity should not impinge on the digital rights of individuals. Provisions within Nepal's draft IT Bill, for example, need to be reformed to ensure that they do not curb citizens' rights related to freedom of expression and access to information; overall, these provisions need to be facilitatory as opposed to control-oriented.

SYSTEMS AND INTER-OPERABILITY

- Decisions around enhancing availability and access to public services can be most effective when they are based on evidence. When it comes to promoting informed decision-making across government, civil society, and the private sector, Nepal's challenges can be listed as follows:
- There are approximately nine sectoral systems (e.g., the integrated health information management system or IHIMS, among others) that generally operate in silos and are not able to exchange data and information between one another.
- These systems have a federal base, which means that currently IHIMS data feeds up to a federal system that promotes management decisions at the Department of Health Services at the federal level. These systems need reconfiguration to allow data and information

²⁶ <https://nagarikapp.gov.np/>; The Nagarik App aims to integrate all government services within a single app.

access at the provincial and local levels now that these levels have become increasingly autonomous in comparison to the previous dispensation.

For example, young Nepali students seeking an education loan will need to provide all personal information on the loan application, even though they may have already provided that information to the Internal Revenue Department to acquire their Permanent Accounts Number (PAN) card; or to another bank as part of their Know Your Client (KYC) scheme; or to acquire a driver's license; or to have access to her/ his National ID card; or to get a passport, for that matter. This inefficient multiplication of efforts derives from a lack of an integrated data management system that has resulted in multiple systems that don't communicate with or inform one another.

There is the need for strengthening data and information ecosystems at the provincial and local spheres to enable decision-making that address local development challenges, and to enable service provision, especially those related to civil registration and vital statistics (CRVS) at the local level. While data-based planning was introduced in Nepal's 13th national five-year plan, the current (15th) five-year plan includes the partially realized vision for an open-data policy.

Accordingly, efforts are underway towards this end, through projects like the UKAID-supported D4D.²⁷ Implemented by [The Asia Foundation](#) in partnership with Open Knowledge Nepal^{[[OBN](#)]} among others, the D4D²⁸ integrate disparate sectoral data-sets through a cloud-based application programming interface (API). Organizations like Digital Rights Nepal^{[[DRN](#)]} worked in tandem to draft a Data Management Policy and Guideline—a framework for the effective and secure management of data and information by local governments. Meanwhile, [The Provincial and Local Governance Support Program](#) (PLGSP)—a multi-donor-supported government mechanism—²⁹ utilize data and information for improved evidence-based local governance.

The e-Government Commission—a high-level recommending body—is working with the [Office of Prime Minister and Council of Ministers](#) (OPMCM) and the [Central Bureau of Statistics](#) (CBS) on policies for standardization of technology and interoperability.

Recommendations:

- Interoperability of data systems should remain a goal. However, that could be a priority after the challenges of cybersecurity and service continuity have been addressed. Operational guidelines need to include provisions that will ensure uninterrupted around-the-clock digital service provision.

ALLIANCE FOR DIGITAL NEPAL

The concept of an Alliance for Digital Nepal was first floated as a key recommendation in the Stakeholder Analysis conducted by SARDI in 2020, and then in USAID's Digital Ecosystem Country Assessment for Nepal (DECA) released in 2020—both studies being conducted as part of the Digital Frontiers project. The DECA recommendation, for example, envisaged the Alliance

²⁷ <http://www.d4dnepal.org/>

²⁸ <https://opendatanepal.com/>

²⁹ <https://digitalrightsnepal.org/>

for Digital Nepal to establish a multi-stakeholder Internet affordability working group and to enable inclusive and interoperable disaster risk management systems.

These recommendations and the preceding discussions point to the need for remaining policy-ready or policy-vigilant to adapt rapidly to rapidly changing technologies. This has, however, remained a perennial challenge for Nepal. The idea is to remain flexible to legislation review and reform as tech or tech-enabled businesses evolve. Tootle, the ride-sharing business, was an example of how the absence of legislation came back to hamper their work. While they started operations through the use of an app that people could use to hire rides with local private motorcycle owners, they were asked to close their business for lack of a law and mechanism for integrating and collecting tax per ride. There is the need to educate and advise policy actors and this is a private sector role, one that the Alliance for Digital Nepal can fulfill. Another challenge lies with moving towards a shared infrastructure model where service providers can save on investments, ultimately reducing the cost of the final product or service inadvertently passed on to the end-user or consumer. This needs concerted policy advocacy as the Nepal Telecommunications Authority—a semi-government agency that controls infrastructure for digital development and growth—remains perennially averse to sharing infrastructure built through government spending. Once again, this is a cause that the Alliance for Digital Nepal can further through collective bargaining and negotiation.

Additionally, there is the need for such an alliance as an advocacy and oversight body that can demand and seek accountability from the government on, and in response to, their policies and programs. This recommended Alliance should remain cognizant of the reality that most stakeholders in the digital ecosystem remain wary of multiple panel discussions that fail to lead to any kind of solution-oriented action.

“We will be happy with small micro-level wins that are tangible—visa support, support with employee retention strategies etc.,—than big macro-level targets that take ages to produce results. Let us build ecosystems that guarantee impact in the form of Digital Public Goods and the promotion of the open-source concept ad products.”

RUCHIN SINGH, MANAGING DIRECTOR – [RUMSAN](#)

Recommendations:

- Explore the idea of an Alliance for Digital Nepal with sectoral representatives, like the NPEA, [Robotics Association of Nepal](#) (RAN), and the [Computer Association of Nepal](#) (CAN), among others.
- Design goals and activities for the Alliance with identified short-term and medium-term outcomes, as the lack of short-term impact could be counter-productive.

WOMEN IN DIGITAL

The Federation of Women Entrepreneurs' Association of Nepal (FWEAN) presents a captive network of 3,000 women entrepreneurs (or women-owned and/or led SMEs) associated with 59 chapters across Nepal, mainly with businesses in agriculture, handicrafts, trade, and tourism. The discussion here comes from an interview with the Executive Director at FWEAN and is presented as a case representative of the challenges and opportunities for women in Nepal's digital sector.

The challenge in promoting digital tools and techniques lies with adoption, stemming from a general lack of digital literacy. Although digital skills improved during and after COVID-19, digital activities were mainly limited to online virtual meetings, trainings, and workshops. Although many members of the public are now able to log into and meet via Zoom—old habits die hard—and if given the option many would prefer meeting in person. This is because a majority of the women in the FWEAN network are elderly and averse to engaging with tech. Such hesitation requires a massive literacy drive in Nepal that promotes a cultural shift of sorts.

FWEAN operates WinBiz, an e-commerce site that currently connects over a hundred members of its community—mostly SMEs, along with some larger businesses. Its main area of work lies around advocacy for access to finance for its members in partnership with the [South Asia Watch on Trade Economics and Environment](#) (SAWTEE); capacity-building around digital financial literacy, digital marketing and e-commerce; and business development support through its business development center, a one-stop solution for women entrepreneurs (a paid service).

A pipeline project at the time of the interview was a partnership with [NABIL Bank](#) for assessing entrepreneur loan-worthiness using QR-code transaction volume. FWEAN is also pursuing the possibility of mining data through a financial record-keeping and management app that they have promoted among members, especially data around income, expenses, and cash-flow. This will help for future decision-making, training, and other purposes.

AGRICULTURE

Kathmandu-based organizations, like [Pathways](#), [Geokrishi](#), [Smart Krishi](#), and [Krishi Guru](#) utilize geo-tagged farm data to provide actionable information on crops, weather, fertilizer, and pest/disease management. They provide extension support through customized digital platforms (both web and apps) in the form of techniques and skills, crop health, choice of crops and enhanced productivity. They work with local municipalities to support extension services through agrovets, cooperatives, and agri-businesses, aligned with the Nepal [Agricultural Development Strategy](#) (ADS 2015-2035) vision of the Community Agricultural Extension Service Center (CAESC). Uptake of services, especially by active farmers, is tracked through geo-enabled apps, which in turn generate the data that these organizations analyze to provide actionable information.

[RUMSAN](#), a newer entrant in the Nepal market, uses and promotes the use of blockchain technology in agriculture. Although there are now more than a dozen apps currently being used in Nepal's agriculture sector, there is the need for more role models in the sector, more stories of success, and a wider network of users.

Digital ag-related service providers cite the lack of digital literacy and skills, especially as they venture to more remote and rural locations, as their biggest challenge. Pathways leads a digital

literacy drive through cascading training of trainers for farmers, working with local cooperatives (mostly women-led) through 108 e-Chautari platforms in specific locations in 25 municipalities that have connectivity and can provide access to farmers. These usually take the form of demand-based webinars aligned with the government's ADS vision. About 250 farmers join every day, with 15 to 20 percent demonstrating improved digital literacy. Cooperatives share that more youth than elders are attracted to their services.

These cooperatives also depend on the expert research skills of agricultural organizations and projects like the [International Maize and Wheat Improvement Center \(CIMMYT](#), for its acronym in Spanish), the [Center for Environmental and Agricultural Policy Research \(CEAPRED\)](#), [Heifer International](#), USAID's [Knowledge-based Integrated Sustainable Agriculture in Nepal \(KISAN\)](#) II project, and NARC, among others. Such research informs their support and advisory for farmers. Pathways claimed that the actionable information they provided led to a two metric ton production increase per hectare in the areas where they worked. Further, organizations like the [Federation of Nepali Chambers of Commerce and Industry \(FNCCI\)](#) serve as good partners for determining demand for agricultural products and their pricing.

Respondents in the sector claimed there is the potential for a digital ecosystem within the agricultural sector itself, starting from the provision of basic information, access to loans, extension services, market information, marketing and sales promotion, supply chain mechanisms, and payment and banking.

For example, [R&D Innovative Solutions](#) introduced the Kisan Credit Card product in 2021 which allows farmers to purchase agricultural inputs and farm tools from designated vendors. With the card, they are eligible for loans ranging from US\$ 190 to 1,500 (NPR 25,000 to NPR 200,000) from Mega Bank (with potential expansion to Nepal Bangladesh Bank and Global IME Bank) at a 3.58 to 4.48 percent interest rate with a five-year repayment period. The QR code on the card only permits procurement from select vendors, allowing for transactions to be recorded and providing a guarantee to the bank that the loan is being properly utilized. Linkages and partnerships with other market actors in the value chain could complete the ecosystem, offering immense business potential, especially if younger agricultural actors can be attracted.

The challenge for scaling the digital ecosystem in the agriculture sector lies with developing a sustainable revenue model, at least in the early stages of deployment, when it is too early to charge a fee from farmers. Currently, many agricultural businesses, including agrovets, survive on grants from the municipalities they work with. Pathways, for example, started off with an initial seed fund of US\$ 100,000 (NPR 13.1 million) from Feed the Future and is now in the process of conducting a valuation of their business and will possibly seek private equity investment; Pathways has received early indicators of interest from several funders but has yet to commit to any of them. Respondents pointed to the potential benefits of agrotech and fintech companies joining hands, highlighting the importance of fintech capabilities within the agriculture sector. However, fintech organizations are currently predominantly focused in Nepal's urban centers. Another challenge slowing financial inclusion for rural farmers is commercial banks' refusal to adhere to NRB regulation requiring that 10 percent of financing be devoted to rural areas; the banks instead prefer to pay fines for lack of compliance rather than extend banking facilities to rural areas that they feel do not offer sufficient profit incentives. Additionally, high interest rates for loans from commercial banks and financial institutions prevent financial inclusion for most smallholder farmers. Respondents did note, however, that two digital wallet companies, Khalti and [Sajilopay](#), are now extending their services in rural areas, and if they have success, it is likely that more will follow.

The government has undertaken farmer digital profiling, which is a good step, but far from adequate. It is also useful that agricultural ICT and digitalization initiatives now fall under municipality jurisdiction, meaning that discussions now take place with local governments, who are usually possess relevant technical skills—for example, the Janaki municipality in the Kailali district has eight agricultural officers, some of them with master’s degrees in agriculture—and more open to discussing digitalization ideas. This is encouraging, as it reflects the commitment of local leadership to agriculture. Unfortunately, as each agricultural officer is often burdened with multiple administrative duties, obtaining communication with these officers remains a perennial challenge. The district model, nevertheless, has worked well in the past, with the District Agricultural Development Office (DADO) serving a good purpose. However, respondents lament, this office has now been transformed into the “toothless” [Agricultural Knowledge Center](#) (Krishi Gyan Kendra).

Although the federal government runs an agricultural information management system—an effective platform for aggregating agriculture related data—the system is not interoperable with similar management systems in other sectors. This is a key challenge for Nepal, as discussed previously in this report’s “Systems and Interoperability” section.

The UK government-funded [Global Open Data for Agriculture and Nutrition](#) (GODAN) program provides a training course for agricultural actors in Nepal to securely handle open data and protect data integrity. The organizations consulted on the project helped integrate training modules on password protection, two-step authentication, and other security features that must be observed when handling open data. These organizations also mandated the signing of non-disclosure agreements to ensure the privacy and security of their proprietary data; Pathways, which assisted in implementation, claimed that they had signed non-disclosure agreements with 500,000 farmers.

As mentioned previously, MoCIT has been tasked with implementation of the DNF, and in the absence of a multi-sectoral framework like the erstwhile HLCIT, stakeholders in the agriculture sector, for example, will have difficulty engaging with MoCIT, and vice versa. This would hold true for other sectors lacking guiding frameworks, including health, education, and tourism. While MoCIT may be able to drive infrastructure penetration, as Nepal Telecom Authority falls within its purview, it will be challenged with promoting digital tools and services in the other sectors.

Recommendations:

- Nepal’s neighbor India operates the [Indian Farm Forestry Development Cooperative](#) (IFFCO), which began as a farmers’ owned fertilizer cooperative and now operates as an autonomous cooperative with initiatives in micro-finance, agro-insurance products, food processing, skills development, and the use of ICTs for knowledge dissemination for farmers across India. Nepal could benefit from organizing farmers into similar cooperative(s) through the extensive use of digital tools.
- India also runs tech-enabled advisories for apple farmers, an approach that can be replicated in Nepal, which has a similar climate, to make apple farming a viable business.
- There is scope for deploying affordable digital tools for a climate-smart approach to agriculture which promotes the optimal use of resources; options include using low-cost tech to determine soil moisture or improve overall productivity among smallholder farmers.
- There is scope for partnering with organizations like the [International Water Management Institute \(IWMI\) Nepal](#) on contingency planning tools, e.g., collaborating with a competent

entity that could help with crop management during droughts, or with the [International Centre for Integrated Mountain Development](#) (ICIMOD) on using digital tools for eco-friendly farming.

- Partnerships with Nepali research centers, including those within the Agricultural University of Nepal, need to be explored to assess deploying new digital tools and techniques in agriculture.
- There is scope for an ecosystem of digital entrepreneurs providing solutions for seed quality, weather, optimizing extension services, soil quality, tech support for production, and value chain and supply chain support; this sector's needs also provide excellent scope for private sector to work with local governments.
- Partnerships with private sector actors that can elevate government programs need to be fully encouraged. For example, the government's ongoing subsidy for seed producers is a successful program that digital entrepreneurs have scope to support through basic training, digitization of seed balance sheets, and the digital recording of demand and supply for seeds.

HEALTHCARE

Nepal faces key challenges that threaten the growth and modernization of its healthcare sector: the country has inadequate technical facilities (electricity and Internet), transportation in-country is difficult, and a shortage of skilled workforce and supportive policies. However, because of its rugged terrain and remote location, Nepal is ideally positioned to be an innovation sandbox for digital healthcare solutions and services that can contribute to a strong Nepali digital health ecosystem. For all of its challenges, Nepal also has opportunities it could capitalize upon, including the potential to leverage digital tools to educate and train students to be the next generation of health practitioners and to increase public awareness of healthcare initiatives.

A comprehensive case study titled *Digitalizing Nepal's Health Sector*³⁰ offers valuable insights into the challenges and progress made thus far in the digitalization of Nepal's health sector. It offers an analysis of key learnings which emphasizes (1) how the introduction of OpenHIE [framework](#)—included in key policy and strategy documents such as the [National e-Health Strategy 2017](#)—supported the overarching vision for a digital health ecosystem; (2) how the development of digital capacities, knowledge, and understanding among key health sector stakeholders proved crucial; and (3) how taking a systems approach to digitalization allowed for iterative learning.

Organizations such as Mavorion,³¹ the National Innovation Center,³² Cogent Health,³³ and Access Health International,³⁴ among others, spearheaded improved health outcomes in Nepal, especially during COVID-19, through appropriate tech innovation. These innovations included tele-medicine capabilities, the development of electronic medical recording systems through the leveraging of opensource health IT systems, and e-appointments at dozens of healthcare institutions in all seven provinces of Nepal.

³⁰ <https://health.bmz.de/studies/digitalising-nepals-health-sector/>

³¹ <https://mavorion.com/>

³² <https://nicnepal.org/projects/digital-health>

³³ <https://www.cogenthealth.com.np/>

³⁴ <https://fintechforhealth.sg/nepals-healthtech-innovations-opportunities-to-strengthen-rural-healthcare/>

As with other sectors, respondents described how challenges associated with doing business in Nepal is driving digital health service providers to sign more attractive offshore business contracts with foreign businesses. Respondents pointed to Nepal's informal work cultures and lack of respect for formal contracts as factors that render local clients unattractive to businesses. Meanwhile, the lack of funds resulting from an ongoing liquidity crisis has made accessing capital investment very challenging. Respondents therefore appreciated the fact that more private equity and venture capital investors are gradually institutionalizing in Nepal following SEBON's 2019 regulation change. It is worth noting that so far, these investors have been generally more willing to invest in hospital process support and medical consumer products with offshore sale potential.

Respondents related how digital health products and services require extremely high levels of standardization, compliance, and cybersecurity provisions, especially when they are produced for offshore clients. Mavorion developed a flagship product called Dolphin, a hospital information management system that features uninterrupted accessibility, cutting-edge security and compliance with international best practices, and automated data back-up and recovery. As such, Mavorion's handling of protected health information (PHI) data meets the compliance requirements of the U.S. [Health Insurance Portability and Accountability Act](#) (HIPAA). HIPAA defines security and privacy requirements for protecting sensitive patient information, addressing requirements for handling PHI and electronic protected health information (ePHI). All companies operating in the healthcare industry in the U.S., including cloud service providers who process ePHI for healthcare companies, must comply with HIPAA regulations.

Mavorion has also earned voluntary SOC2 compliance status for its trustworthy handling of PHI and other data. The Mavorion case is an example of how Nepali businesses in the health sector have developed the capability to meet the most stringent of compliance requirements.

Recommendations:

- The Nepali government needs to include leading private sector providers in healthcare services. For example, the U.S. government provides private sector access to the Singapore-based EGIS Healthcare Technologies for vital laboratory and blood bank informatics, as the company ensures stringent contractual and quality compliance. There is need to advocate for additional partnerships with private companies that meet the highest quality management standards.

TOURISM

The tourism sector has the potential to be one of the biggest game-changers for Nepal as it remains largely under-utilized, with the sector contributing only 6.7 percent of Nepal's GDP in 2022.³⁵ On the government side, the vastly under-resourced [Nepal Tourism Board](#) (NTB) has been entrusted the task of boosting tourism in Nepal. Very few private actors in the tourism industry utilize digital tools and means, as reported by members from umbrella organizations

³⁵ The World Bank: <https://www.worldbank.org/en/news/feature/2022/06/03/harnessing-tourism-to-enhance-the-value-of-biodiversity-and-promote-conservation-in-nepal#:~:text=The%20tourism%20industry%20contributed%20about,impact%20was%20US%24%202.2%20billion>

representing trekking, travel, and tourism enterprises (these inputs were provided as part of a separate study of which this researcher was a part). Digital security remains a challenge for such organizations, who generally engage external service providers for their digital needs.

Conversations with key people at NTB revealed that they did not have a separate IT or digital department or wing within their structure, even while they agreed having these in-house digital capabilities was important. While the current NTB website³⁶ is a huge improvement from its pre-COVID-19 iteration, a website is but one platform among the many digital options that exist today. Meanwhile, the website does not provide links to NTB's Facebook, Instagram, Twitter, and YouTube accounts, and among links provided for four external websites only one (Photo Nepal) was useful, while two returned warnings that said these were untrustworthy websites whose certificates were invalid. While TikTok and LinkedIn accounts mentioned by NTB respondents could not be traced from their website, they revealed that NTB avails cloud computing services from Amazon Web Services (AWS) and outsources periodic systems maintenance.

Respondents agreed that there is an urgent need to identify, diversify, and promote new products that demonstrate Nepal as an exciting, safe, and affordable destination, foreseeing a huge role for digital technology. The biggest challenge, respondents agreed, is budgetary constraints. The main sources of revenue for NTB are the NPR 100 (about US\$ 0.77) levied per tourist that departs Nepal via the Tribhuvan International Airport (TIA) and the proceeds from selling trekking permits. As such, NTB revenues remains contingent on the number of tourists coming to Nepal, which can fluctuate depending on multiple factors.

In an attempt to rebrand Nepal's culture, landscapes, wildlife, and diversity, NTB recently introduced a weekly-themed social media tourism promotion which is structured as such: #MythicalMonday, #TrekkingTuesday, #WellnessWednesday, #ThrillingThursday, #FoodyFriday, #SoothingSaturday, and #SustainableSunday. According to the NTB respondents, the concept of this campaign was to diversify Nepal's offerings as a tourist destination beyond its existing image as "the land of mountains and temples." As such, the thematic re-branding aims to sell Nepal to niche clients, for example, as a wellness destination for rejuvenation of the mind, body, and soul, highlighting the therapeutic allure of Nepal. Another example is the social media posts that entice birdwatchers by featuring the bird species native to Nepal and the migratory birds transiting the country, and rare species peculiar to Nepal. NTB also works with celebrities and social media influencers like Priyanka Chandola, an Indian travel vlogger who promotes single woman travel and has taken many trips to Nepal, and Nims Purja, a daredevil Nepali mountain climber who starred in a Netflix documentary film—*14 Peaks*—that also earned over one million views on the NTB website; this gave Nepali tourism a post-pandemic boost. However, the effectiveness of these promotions in terms of tourist arrival remains to be quantified.

This leads us to NTB's digital aspiration to record accurate tourism footprint data in Nepal, which could help ascertain the contribution of tourism to Nepal's GDP. Nepal currently uses data generated from departing visitors' surveys to ascertain tourism's contribution to GDP. As this is a voluntary requirement, only data from willing or consenting individuals can be aggregated. Data of those departing overland to India does not make it to the database, as is the case of data from domestic tourists. More recently, NTB has collected household data from

³⁶ <https://ntb.gov.np>

across Nepal to inform tourism's contribution to GDP. However, there can be questions over the reliability of such data.

“Current figures of tourism’s contribution to GDP fail to reflect the reality, as we lack reliable data.”

NTB OFFICIAL

The key to addressing this challenge, according to NTB officials, lies in the establishment of a [Tourism Satellite Account](#) (TSA) statistical framework in Nepal. The Organisation for Economic Co-operation and Development (OECD), which helped formulate the TSA, defines it as a “standard statistical framework and the main tool for the economic measurement of tourism.”³⁷ Also developed by the [World Tourism Organization](#) (UNWTO), the TSA uses tourism economic data generated from the following indicators: inbound domestic tourism and outbound tourism expenditure; internal tourism expenditure; production accounts of tourism industries; the Gross Value Added (GVA) and GDP attributable to tourism; tourism employment; tourism investment; government consumption; and non-monetary indicators.

An associated challenge lies with the lack of a Nepali digital payment gateway for securing offshore bookings. For example, most Chinese tourists pay for their Nepal trip to a Chinese travel agent via WeChat, which means revenue associated with these bookings never makes it into Nepal's economy as foreign currency. The same holds true for any tourists, domestic or otherwise, that pay with cash; those transactions go unrecorded. NTB believes that the establishment of a one-door Nepali platform—a domestic equivalent of booking.com, for example—would not only help generate accurate economic data related to tourism but would also help boost foreign currency reserves. As with any other sector, strategic sectoral decision-making depends on a sound database that can provide actionable information. As understood from the challenges discussed above, this is sorely lacking for tourism in Nepal.

Recommendations:

- There is ample room for improving the accuracy of data in the tourism sector through the use of emergent technology. Increasing the number of data points can improve reliability and also allow for cross-verification or triangulation. There is also need for overall data interoperability across sectors that would render data collection cheaper and easier.
- There is a need for a central Nepali digital tourism database and booking service; the procurement of which could be outsourced to private providers for a premium fee. However, this platform needs to be quality-managed to ensure that it becomes a trusted resource; earning customer trust must be the main incentive. Otherwise, customers will use other options.
- There are many foreign and local investors willing to invest in tourism. However, the Nepali working environment poses a challenge. The sector regulator—the [Department of Tourism](#)—needs to facilitate investment through schemes, incentives, and the strategic utilization of digital tools that promote ease of doing business in Nepal.

³⁷ <https://www.oecd.org/cfe/tourism/tourismsatelliteaccountrecommendedmethodologicalframework.htm>

- Building promotional alliances (government to government, as well as private sector to private sector) with other nations through the use of digital tools is a “low-hanging fruit” objective that is relatively simple to achieve. NTB recently initiated such contact with the government of the Maldives and is benefiting from knowledge sharing on elements of tourism including budget allocation and effective promotional schemes.
- International airports are key gateways to any nation. Ease of access to digital facilities in the airports for acquiring and paying for visas, for example, will have a positive impact on tourism. Nepal’s TIA will therefore need to improve its ATM and digital payment facilities.

FINTECH

Fintech occupies a significant role in the digital ecosystem, facilitating the movement of investments, payments, and returns/profits. Stakeholders at the Digital Nepal Conclave held in June 2022 asserted that Nepal had reached a “transition phase” in fintech innovation due to the government’s financial technology development-friendly policy. According to Neelesh Man Singh, CEO of [Nepal Clearing House Limited](#) (NCHL), the phenomenal growth in the sector is due to the government’s open policy on financial technology and private sector support. However, prominent private sector fintech actors like Amit Agrawal at Khalti³⁸ hold differing views.

Amit lauds policy intervention by the [Internal Revenue Department](#) (IRD) that made online billing compulsory for any business with annual transactions over NPR one hundred million, thereby bringing them within the fold of formal economy. He agrees that NRB played a key role in promoting digital payment systems, paving the way by providing operating licenses for more than two dozen Payment Service Providers (PSPs) or digital wallets, including e-Sewa, [IME Pay](#), [Prabhu Pay](#), [iPay Nepal](#), and Khalti. However, he questions the sustainability of these PSPs; with rising demand and competition for human resources in the digital sector post-COVID and the low overall business volume of Nepal, asserting that 20 of them will close down within two years’ time.

Amit laments the lack of a fair playing field when it comes to private sector PSPs competing with Connect [IPS](#)—a product offered by Nepal Clearing House, a public limited trading company under the guidance of the NRB. While the Connect IPS product was initially meant to facilitate and regulate private sector PSPs, it also offers direct services for the end consumer, in effect itself serving as a PSP. Additionally, while it remains exempt from the Merchant Service Fee (MSF) and Fund Transfer Fee (FTF) levied on private sector PSPs, it is common practice for government service providers like the Department of Transport Management or the Department of Passports to push any kind of fee to consumers, and the same would probably hold true for any fees that Connect IPS is ever forced to pay. Finally, while there is a transaction limit of NPR 25,000 for private sector PSPs, Connect IPS can facilitate the transfer of up to NPR one million. It is evident that, with Connect IPS, the government has become a competitor rather than a facilitator, and this is a major reason why Amit sees 20 PSPs closing down in in the next few years.

³⁸ <https://khalti.com/>. Khalti, after e-Sewa, is a leading digital wallet and payment gateway in Nepal.

Additionally, all major Nepali banks now have PSP licenses. While the country has a free market and anybody can do the businesses of their choice, banks are established corporate organizations with substantial resources. Private PSP actors contend that they invested in the innovation needed to set up the digital wallet business, build consumer literacy needed for the uptake of digital wallet services, and advocate for favorable policy. Hence, they see it as unfair that corporate entities with incomparable resources should step in at this stage and put private PSPs, who are basically SMEs, out of business. There should have been protection measures initiated by the government, they contend.

Other uses of fintech include grant transfer and utilization mechanisms based on blockchain technology. Organizations like Aloï facilitate loans from microfinance institutions (MFIs) to promote inclusive and green business financing, thereby supporting social or public interest causes. From a digital tech standpoint, Aloï's goal is to promote branchless and cashless banking to reduce operational (loan processing) costs and time for MFIs and facilitate loans in the form of digital tokens that can be used to procure goods and services at pre-vetted vendors.

This model ensures that SMEs needing small-size loans are linked to MFIs through a less bureaucratic loan disbursement process that also provides easy loan utilization monitoring. The digital tokens can be sent through a simple SMS, eliminating the need for a smartphone or Internet connectivity. This also overcomes digital literacy barriers so often associated with the use of tech solutions. Aloï's business model is built on the use of blockchain tech, which it uses to digitalize smart contract clauses, terms and conditions, and the due diligence process. As credit scores are still not common in Nepal, this technology helps in establishing trust between the MFIs and the entrepreneur seeking the loan. Repayment of loans is facilitated through periodic micro-deposits at designated cooperatives and tracked through software on a daily basis, enabling a higher loan repayment ratio. These transactions are recorded on the blockchain and are secured by use two-factor authorization and Advanced Encryption Standard (AES) encryption.

Recommendations:

- The digital ecosystem can thrive only when sectoral players are supported by the government to become sustainable. While competition is desirable, Nepal's market is characterized by a "herd mentality" approach where new entrants tend to follow others rather than explore new sectors and sub-sectors. For example, if one entrepreneur enters the online movie booking business, many others follow. The investor ecosystem needs diversification, i.e., the government should play a regulatory role in promoting diversification of sectors for BFI and private equity investors. Repeated investment in one sector/business idea will spawn too many entrepreneurial players in a tight market, leading to unhealthy competition and a decline in successful innovation.
- The government needs to provide more incentives (perhaps through tax rebates, for example) for businesses to go digital, bringing them into the formal economy and tax fold. As it stands, SMEs that operate through cash-based transactions, thereby bypassing the formal tax net, need greater incentive to make the switch. India, for example, waived its Merchant Service Fee to attract more merchants to make the switch to digital.
- Current policy restricts FDI into PSP businesses. This could stifle scale-up and diversification of fintech services. FDI into fintech should become an advocacy agenda item, as the government needs to be encouraged to provide FDI incentives.
- The government should move towards making all its service fees payable online.

- Development in fintech is closely linked to public trust in digital financial service platforms and providers. Public policy should ensure standards of cybersecurity are met, e.g., the [ISO/IEC TS 27100:2020](#) information security management systems, vulnerability assessment and penetration testing (VAPT), and NRB regulations, and policy should also prioritize public financial and digital literacy to prioritize the uptake of digital financial services. PSPs like Khalti, for example, have developed and disseminated more than 300 YouTube and TikTok videos to raise awareness and educate users.

ACADEMIA

The lack of sound technical skills and knowledge has been cited as the biggest barrier to the development of Nepal's digital ecosystem and digital economy. Respondents repeatedly emphasized that technical colleges and universities fail to prepare students to match digital industry needs. While institutions that work towards bridging such a gap are starting to come up in small numbers in urban centers like Kathmandu, Biratnagar, Birgunj, and Pokhara, the situation is quite dismal in semi-urban and rural areas. Educational institutions and non-profits focusing on upskilling have started offering short-term courses and makerspaces on coding, robotics, and design. For example, Deerwalk Institute of Technology³⁹ in Kathmandu offers a three-month course on Python in addition to a full-fledged Bachelor of Science, Bachelor of Computer Application and a Diploma in Data Analytics from its Computers Studies and Information Technology (CSIT) Department. Similarly, FuseMachines provides AI courses for enterprises, educational institutions, and governments.⁴⁰ However, even the very few graduates produced by these institutions fail to meet industry needs or help deliver the digital Nepal vision.

According to study respondent Narottam Aryal, president of King's College Nepal in Kathmandu,⁴¹ his university offers an integrated approach to digital skilling and innovative entrepreneurial development that is solution-oriented and results from an intense process of co-creation. This process promotes the involvement of multiple stakeholders that are affected by a certain practical challenge associated with the realities of Nepali communities that digital skilling can help address. He believes the development model long adopted by Nepal has created international dependency, while the entrepreneurship model he espouses encourages ideas, imagination, and innovation among homegrown stakeholders. His philosophy is that entrepreneurship with innovation comes from high-quality education through the development of mindsets and skills, rather than classroom-based theory and rote learning.

Aryal's focus is on reflecting the realities of local communities within Nepal's curricula, contending that textbooks from abroad do not do this. He believes this is why there is a disconnect between Nepali academia and industry that precludes the two from effective innovative collaboration. Therefore, there is a need for domestic industry to reach out to academia and educate the educators on industry needs, likewise, academia needs to be open to the concept of bringing industry champions into their classrooms. Industry experts need to be involved in curriculum and methodology design and development on a periodic basis, as digital technology changes so rapidly. For example, F1 Soft, the creator of the e-Sewa digital wallet,

³⁹ <https://deerwalk.edu.np/DWIT/>

⁴⁰ <https://fusemachines.com/>

⁴¹ <https://www.kingscollege.edu.np/>

recently worked with King's College to design data analytics courses and the BBA fintech curriculum.

“We are resource-rich but innovation-poor. We need to work to make our curriculum reflect the realities of our communities.”

NAROTTAM ARYAL, PRESIDENT, KING'S COLLEGE

Co-creation, as a practice that involves multiple stakeholders, needs promotion as means of addressing real problems in Nepali communities. When students are involved in a co-creation process, they develop real-world understanding of communities, cultures, contexts, communication patterns, and the principles of power and influence—skills difficult to teach in the classroom.

Recommendations:

- Invite digital industry experts into classrooms; involve them in curriculum design and development.
- Explore and find more internship opportunities for students within industry processes, ensuring that they work on projects that add value for industry.
- Explore and find internship opportunities for students within communities, working either with local governments, private sector, or NGOs on specific digital projects that address identified community challenges related to health, education, agriculture, and disaster resilience, among others. Theoretically, these internships could take the form of eight-week multi-disciplinary community immersion programs that involve phases of problem identification, co-creation, ideation, prototype design, testing, and taking the solution to scale—if practically possible.
- Explore opportunities for pairing of ICT students from Nepal with educational institutions abroad to enable an online learning process and, if possible, also enable exchanges. These opportunities should also consider opportunities for Nepali ICT students that study abroad and who wish to return and work in Nepal but are apprehensive about “starting from nothing.”
- Operate makers spaces in partnership with local governments, providing the opportunity for local students to engage in projects that aim to solve existing local challenges or address a local need. This will also provide the opportunity for local students and youth to work through the process from ideation, prototyping, testing, and iterating digital solutions. Practical projects could include exploring the prospects for electric vehicles in rural settings, developing credit rating systems to facilitate loan disbursement by BFIs or investors, or the incorporation of blockchain technologies in local businesses for improving security and customer satisfaction. This process should also support the understanding and creation of brand value for local products, thereby leading to independent entrepreneurship.
- Self-directed learning is not a cultural strength of Nepalis, hence mentoring and coaching within a co-creation model that involves stakeholders would be the most effective approach. Additionally, effective co-creation as a practice envisages a human-centered approach (incorporating human perspective and emotions) in process, product, service, and systems design that must be nurtured by stakeholders.

Conclusion and Recommendations

Findings and discussions in the previous chapter reveal how the digital ecosystem of Nepal, and the stakeholders therein, has evolved rapidly, especially during and after the COVID-19 pandemic. While the 2020 Stakeholder's Analysis made brief mention of the Digital Nepal Framework—Nepal's digital development blueprint which had just been published then—there has been significant progress hence. Most significant has been the launch of the Digital Nepal Acceleration Project, the US\$ 180 million project with a US\$ 140 million contribution from the World Bank, meant to kick-start the ambitious Digital Nepal Framework.

As in other parts of the world, the pandemic influenced and altered Nepal's digital ecosystem, including its business models and infrastructure. The period since 2020 has seen a rapid growth in private equity investors in the Nepal ecosystem, comparatively easing access to finance previously limited by the rigid lending patterns of conservative banks and financial institutions. Although debates around digital policy remain sidelined due to the perennial instability that characterizes Nepal's political landscape, a draft Cybersecurity Policy was launched in 2021, with the Ministry of Information and Communication (MoCIT) sharing the document and soliciting input from stakeholders.

Despite these positive developments, some of the challenges discussed in the 2020 Stakeholders' Analysis, continue to persist, broadly categorized under the following headings:

Public-private partnership:

- The primary challenge to digital development lies with the Nepal public sector's "zero-sum-game" mindset that fails to envisage the **private sector role and partnerships** in digital development. The government needs to be oriented to think and act in alignment with Industry 4.0, the now-in-progress global convergence of digitalized technology and industry. This requires private sector effort in educating political leadership and public officials on why private sector roles and partnerships are crucial for digital development. This can be done by representative bodies like the proposed Alliance for Digital Nepal or any other existing body that credibly represents the sector.
- There is increasing scope for **provincial and local governments** to outsource the facilitation and delivery of public services like passports, National ID cards, drivers' licenses, citizenship documents, and tax certificates. For example, all municipality taxes could be paid, with a small fee, through a private service provider (PSP) like e-Sewa or Khalti. At the local level, the government could promote the concept and practice of **private sector pre-vetted kiosks as service provision hubs** for accessing public information and services. The government could certify PSPs to ensure they meet regulatory requirements and standard protocols.
- The private sector approach to **local government engagement** should engender trust, ownership, and sustainability. Private actors should bear in mind that many local government officials do not have sound understanding of how digital technologies can help solve local challenges or ease public service delivery bottlenecks. Without an understanding of the tangible benefits that these technologies offer, officials will be wary of engagement. Further, a rushed approach will fail to provide home-grown examples of successes and failures.
- There is a considerable need for **governments at all three levels to work in an integrated manner** to collect and use data to address data gaps and lack of data quality. The private

sector should see this as an opportunity to upskill public officers, data collectors, and data managers at all three levels of government; the private sector can implement an **incentive scheme to attract government officials** to learn and adopt emerging digital technology and tools.

Digital and Soft Skills: Matching Industry Needs

- Increasingly dependent upon remittances from youths that travel abroad, Nepal's economy remains highly vulnerable to global political and economic disruptions. The global digital economy offers what many young Nepalis see as an alternative pathway. While the DNF serves as Nepal's digital strategy and the DNAP as its operational plan, Nepal needs to envision a **specific strategic framework to connect to the global digital ecosystem and the global digital value chain**.
- Meanwhile, a lack of **skilled human resources** hampers Nepal's digital development and its efforts at connecting with the global digital ecosystem. While the workforce's technical skills related to **digital/ICT** were identified as being insufficient, there is also a **lack of managerial and soft skills**. Governments need to review curricula to include basic digital literacy education from the primary levels onward. Likewise, there is the need for educational institutions and industry actors to collaborate on ensuring industry requirements are met by new graduates.
- There is scope for an innovative **digital literacy** campaign, as digital literacy remains a significant barrier to digital development. Such a drive needs to promote the uptake of digital tools and entrepreneurship among specific groups that include women and girls, students, persons with disabilities, low-income households, populations vulnerable to climate change, and small businesses. While engaging such groups in digital tech development could be a medium-term goal, catalyzing growth of digitally enabled businesses should be a short-term goal.
- Organizations like the Federation of Women Entrepreneurs Association of Nepal (FWEAN) need to be supported to be able to maintain a **professional database with actionable data on women entrepreneurs** in Nepal; such data and information will be important to build digital skills and drive uptake of digital tools among women entrepreneurs. There is the scope for **collaboration with colleges, universities, and educational institutions** to improve/upskill ICT-related human resources and advocate for the removal of quota systems for ICT degrees in colleges and universities.

Sector-wide alliance/network

- This study recommends further exploration with digital ecosystem actors to ascertain if there is a genuine and organic interest for the **Alliance for Digital Nepal** and what roles it can have in business promotion, government engagement, and policy advocacy and oversight, with very specific terms of reference for action.
- From an industry perspective, Nepal's digital offerings are primarily services, as opposed to goods, that can be categorized as either software development, business process outsourcing (BPO) and e-commerce. A role for the Alliance for Digital Nepal can be the promotion of **platforms and mechanisms for networking**—not merely for getting to know each other, but for finding business opportunities in the value chain and across the three service categories and for forging partnerships and alliances.
- Nepali digital businesses need to be competitive to claim a share of the international market. This is difficult as Nepal competes with digitally advanced countries like China, India, and

Bangladesh. The Alliance can link more young entrepreneurs to global and regional events that address this **lack of business competitiveness**.

- More **digital ecosystem role models** in both the public and private sectors need to be identified and highlighted to encourage more young people to pursue digital entrepreneurship. This can be an Alliance for Digital Nepal role and responsibility.

Digital Foundation/Infrastructure

- **Credit ratings** of businesses (mainly SMEs) and individuals need to be centralized around one central database linked to business operators' unique National ID (NID) cards. Nepal's neighbor, India, recently launched a similar digital scheme that tied credit rating to national ID (the "Aadhar Card"). This system now helps with the credit-rating-based lending process for individuals and SMEs and is helping lead a shift away from collateral-based lending in that country.
- Nepal needs sufficient **infrastructure** for connectivity access including data centers, content delivery networks (CDN), and Internet exchange points that ensure data security and privacy. The Internet exchange infrastructure that currently exists only in Kathmandu needs to be expanded to all seven provinces in Nepal. To be effective, digital infrastructure expansion planning should be a collaborative effort, focused on sharing existing [Nepal Electricity Authority](#) (NEA) and [Nepal Telecom](#) resources with private sector stakeholders.
- Nepal should prioritize **standardization and system integration** that makes public services uniform and easier to access; this can be achieved when ministries, departments, and government services go through a systems integration that enables the safe sharing of information and data.

Building Trust Among Ecosystem Stakeholders

- A palpable lack of trust was observed among ecosystem stakeholders and clients; remedying this calls for immediate and concrete steps toward **trust-building through improvements in service quality and reliability, digital security, and sectoral integrity**. Adoption and application of well-recognized quality management systems and principles and practices for standardization can propel rapid adoption and uptake of digital goods and services.
- As Nepal ranked 94th of 182 countries on the Global **Cybersecurity** Index 2020, data protection and privacy remain a key challenge and area of focus for the country's digital development efforts. Related to building sector-wide trust as discussed above, efforts need to include the realization of a sound domestic cybersecurity policy and regulatory framework that is cognizant of international best practices and instruments, similar to the EU's General Data Protection Regulation (GDPR).

Policy and Institutional Arrangements

- **Policy revisions** need to take into account rapid developments in the digital sphere, including the advent of AI and machine learning, Internet of Things (IOT), and robotics and drone technologies. Policy discussions and reform need to target practical utilization and implications of cutting-edge digital technologies in health, education, agriculture, disaster resilience, and entrepreneurship, among others, without being overtly deterministic.
- **Institutional and organizational arrangements** should increasingly be reformed **for more private sector participation** in digital development conversations, partnerships, and practices. Policies around private sector engagement in the digital sector need to recognize

the private sector's economic growth potential, while ensuring ethical boundaries surrounding inclusion; digital access, security, and privacy; intellectual property rights (IPR); fair competition and monopoly; and undue political influence, among others, are in place.

- Advocacy efforts, a proposed role for the Alliance for Digital Nepal, need to work towards **lowering the cost of investment in ICT businesses**, including through tax incentives. There is also the need to envisage policies that promote investment such that it becomes an important sector for revenue and employment generation and therefore a backbone for the economy.
- Nepal's **public procurement laws and guidelines need to be reformed** to take into account the special characteristics and needs of the digital sector.

Need for Credible Research/Studies

- There is the scope for **quality studies** that explore emerging technologies and their relevance to Nepal's social, political, economic, and cultural needs. An example is the Institute of Integrated Development Studies' (IIDS)⁴² ongoing study of thousands of Nepali youths who earn in foreign currency providing digital/IT services, exploring how much they earn, their contribution to Nepal's foreign currency reserves and the economy, and future opportunities and possibilities that such incomes can contribute to.⁴³

⁴² <https://iids.org.np/>

⁴³ <https://shilapatra.com/detail/102827>

Annex 1: A Desk Review to Analyze Stakeholders in Nepal's Digital Ecosystem

BACKGROUND

This desk review draws significantly from the following key documents/ reports:

- The Nepal Stakeholder Analysis Report (SARDI, 2020)
- The Report of the Scoping Study for Nepal that assessed Women's Participation in Nepal's Digital Entrepreneurship Ecosystem (SARDI, 2021)
- The Nepal Digital Ecosystem Country Assessment (Digital Frontiers/DAI, 2022)⁴⁴
- The Digital Nepal Framework (Ministry of Communications and Information Technology, 2019)⁴⁵
- The USAID Trade and Competitiveness Activity Description (2022)

The desk review points to the following categories that either make up the digital ecosystem of Nepal, or influence it significantly:

- Federal Government (from a policy standpoint)
- Private Sector
- Civil Society
- Academia/ Educational Institutions
- Social Enterprises
- Donors/ Development Partners

Each actor category can be further broken down, e.g., the Private Sector would comprise of:

- Multinational/ Corporate Businesses
- Micro Small and Medium Enterprises
- Start-ups – Incubators, Accelerators etc.
- Investors – Banks, Angel Investors, Venture Capitalists
- Digital Service Providers in Fintech, Digital Payment Solutions, etc.

The SARDI 2021 Scoping Study explored the i) regulatory environment, ii) social and cultural norms and mindsets, iii) entrepreneurial and collaborative culture, iv) mentors and role models for upskilling, v) investment and risk-taking culture, and vi) opportunities, in identifying the following thematic areas for stakeholders to engage in recommended activities:

- Networking and mentorship;
- Opportunities for growth;
- Influencing the regulatory environment;
- Data privacy and security; and
- Addressing social and cultural norms.

⁴⁴ <https://www.usaid.gov/digital-development/nepal-digital-ecosystem-country-assessment>

⁴⁵ <https://rb.gy/fouc64>

There is agreement that Nepal’s digital landscape/ sector, is still small, nascent, informal, but growing. To quote from the Nepal Economic Forum’s article published on May 11, 2022 – ‘How far has the Digital Nepal Framework come⁴⁶,

“The effective implementation of the ambitious Digital Nepal Framework and achievement of all 80 initiatives under the eight sectors, requires enhanced ICT infrastructure and qualified human resources.”

The emphasis is on ‘enhanced ICT infrastructure and qualified human resources’, both relying of course on an enabling legal and policy framework, beyond provisions within the Digital Nepal Framework (DNF). Both the government and private sector actors realize that the government cannot implement and achieve goals in the DNF without the support of the private sector, as the latter leads technological transformation in Nepal. Therefore, the government’s role lies in engaging the private sector in supporting infrastructure growth and promoting cybersecurity.

Digital economy and inclusiveness scores⁴⁷ of 47 and 46 respectively indicate that Nepal is firmly positioned in the early start-up stage of a digital economy, with ample room for inclusion of marginalized populations in both public and private sectors. Nepal was among four countries to pilot the Inclusive Digital Economy Scorecard (IDES) in 2020 – a UNCDF tool that identifies key market constraints to the development of an inclusive digital economy and assists with the identification of priorities for the same for public and private stakeholders.

AIM OF STAKEHOLDER ANALYSIS UPDATE

In the absence of concrete and credible information and data around the situation of the digital landscape of Nepal, a lot of scattered information exists. This review focused on the documents/ reports mentioned at the start, in looking at information gaps and updates that will make the Nepal Digital Ecosystems Stakeholders Analysis more current. More specifically, this Stakeholder Analysis Update is significant because of a number of key developments since the 2020 study:

- The World Bank’s earmarking of NPR 22 billion ((US\$ 17.5 million) for the Digital Nepal Acceleration Project has been a significant development in 2022, igniting new hope among stakeholders of the digital ecosystem of Nepal. The project aims to implement the ambitious Digital Nepal Framework – the prescribed blueprint for Nepal’s digital leapfrogging, that had remained in limbo since its inception in 2019.
- As with other parts of the world, the COVID – 19 pandemic has significantly influenced Nepal’s digital ecosystem, altering digital infrastructure, access to technology, outreach, and adoption practices, e.g. adoption of fintech aided digital payment wallets.
- The digital ecosystem has seen more private sector equity investors join, changing investment mechanisms and patterns.
- The draft Cybersecurity Policy 2021 was introduced for public review and input. Although not finalized, this is a crucial development that needs exploring.

As such, the secondary aim of this review will be to identify key stakeholder groups and individuals who can be approached in seeking the most current and credible information and

⁴⁶ <https://rb.gy/mx1srj>

⁴⁷ <https://www.uncdf.org/article/6856/inclusive-digital-economy-scorecard-ides-report---nepal>

data. The review will inform a stakeholder tracker (included as **Annex 1**) that will include a comprehensive list of the key actors in the ecosystem, while narrowing down those that will be approached for interviewing.

NEPAL'S DIGITAL CONNECTIVITY STATUS

As of January 2022, Nepal had a population of 29.95 million, of which 53.8 percent were female; 78.5 percent lived in rural areas; and 42.2 percent were between 13 and 34 years of age, with a median age of 25.8 years. Nepal witnessed a significant rise in mobile and internet penetration in recent years. According to Digital 2022: Nepal⁴⁸, Nepal had 11.51 million internet users in January 2022, an increase by 822,000 (7.7 percent) in a span of one year, and over 1.97 million households had internet subscriptions (NTA, 2022)⁴⁹. As such, Nepal's internet penetration stood at 38.4 percent of the total population; and it had 13.7 active social media users, representing 45.7 percent of the population.

According to GSMA Intelligence, there were 40.58 million cellular mobile connections in Nepal in early 2022, an increase by 1.5 million (4 percent) in the span of a year. Representing 135.5 percent of the population, this figure indicates how many subscribe to more than one connection.

According to the Sharecast Initiative Nepal's survey of media trends⁵⁰, 90% of Nepalis above 18 years of age owned mobile phones, of which 67% were smart phones with access to data internet. This uptake will surge with increased penetration of 4G signal and lowering of data package prices, pointing to a rapid growth in uptake of digital financial services in the next five years or so.

Despite the government's testing of 5G technology, challenges to digital inclusion exist in the form of affordability, digital divide, access, and digital illiteracy. Also, despite the launching of digital public services like the *Nagarik* (Citizen) App, Nepal National Single Window System (NNSW), digitization of land revenue office data, the National ID card, among others, inadequate capacity of installed technologies and incompetent handling, continue to pose barriers for service seekers.

SIGNIFICANT DEVELOPMENT ON THE DIGITAL NEPAL FRAMEWORK (DNF)

The DNF was envisaged by the government to guide the utilization of digital assets to contribute to economic growth, and to seek solutions to societal challenges. With a vision of enabling Nepal's engagement in the global economy, the DNS outlines the following eight sectoral priorities:

- Digital Foundation
- Agriculture
- Health
- Education
- Energy

⁴⁸ <https://datareportal.com/reports/digital-2022-nepal>

⁴⁹ <https://nta.gov.np/wp-content/uploads/2022/07/MIS-Baisakh-2079.pdf>

⁵⁰ <https://www.nepalitimes.com/banner/nepals-interface-with-information/>

- Tourism
- Finance and
- Urban Infrastructure.

The ambitious DNF was launched in 2019 by the Ministry of Information, Communication and Information Technology (MoCIT). It was only in 2022 that it attracted traction when MoCIT announced the Digital Nepal Acceleration Project with an investment of NPR 22 billion (US\$ 17.5 million)⁵¹. This investment from the World Bank includes 5 billion as business loans for the project. MoCIT anticipates spending a portion for internet expansion in rural areas by providing financial incentives to Internet Service Providers (ISPs) to develop weather-resistant high-speed broadband connectivity. The government also plans to invest in e-governance, in the form of e-signatures, a cybersecurity regulatory framework, and an increased capacity of current data centers.

The following paragraphs review the sectoral status of Agriculture, Tourism, and Fintech.

AGRICULTURE

Farmers are able to access agricultural information through mobile applications on the internet, but the reach is limited due to digital illiteracy and poor access to the internet. Through his blog⁵², Kailash Karki asserts how adequate discussion has not happened around whether farmers have the capacity to use mobile applications. He therefore suggests that local governments need to set aside budget for building basic digital skills while initiating such debates and dialogues.

TOURISM

Digital tourism offers multiple opportunities for marketing and selling Nepal as an attractive destination to tourists. In doing so, it provides avenues for developing human capital skills and providing job opportunities for Nepalis in tourism. However, efforts so far have been disappointing. The inefficiency of visa kiosk machines at the Tribhuvan International Airport have created, rather than solved problems, requiring tourists to carry USD 200 in cash to pay visa fees.

FINTECH

With initiatives such as the national payment gateway, credit ratings, mobile wallet services, digital payments, and the development and promotion of e-commerce, the finance sector has seen some of the most rapid and efficient digitization in recent years. According to monthly data published by the Nepal Rastra Bank - Nepal's central bank – an average of over 3 million transactions occurred through Connect IPS – a single payment platform that allows customers to link their bank account(s) to enable payment processor, fund transfer and biller payments. Likewise, data showed 13.5 million mobile banking transactions, 13.3 million mobile wallet transactions, and 1.7 million QR code-based payments being made on an average every month.

⁵¹ [Ministry of Communication and Information Technology \(mocit.gov.np\)](https://mocit.gov.np)

⁵² <https://www.rabinsxp.com/article/digital-nepal-framework-needs-a-successful-digital-ecosystem-but-what-about-programs/>

USAID'S DIGITAL ECOSYSTEM COUNTRY ASSESSMENT (DECA)

Aligned with USAID's digital strategy (2020-24)⁵³, the DECA identified opportunities and risks in Nepal's digital ecosystem to help the development, design, and implementation of USAID's strategies, projects, and activities in country. The aim was to support USAID Nepal's development and humanitarian assistance outcomes through the use of digital technology and strengthen open, inclusive, and secure digital ecosystems.

The Nepal DECA (2020) that included desk research, consultations with USAID/ Nepal technical offices, and virtual KIIs with stakeholders from civil society, academia, and the private and public sectors, explored Nepal's 1) digital infrastructure and adoption; 2) digital society, rights, and governance; and 3) digital economy. Key DECA findings that compared closely with findings that emerged from the 2020 Stakeholders' Analysis and 2021 Scoping Study, were as follows:

Nepal's digital ecosystem does not yet meet the needs of all Nepalis and runs the risk of falling further behind: The primary reason cited is the government's inability to maintain digital policies and solutions at pace with the digital needs of citizens, corresponding to rapid digital transformations. Key challenges include, among many others, lack of equitable access, internet penetration in remote areas, and safe and secure practice for the digitization of Nepal's economy.

Nepal failed to meet 2020 targets: Nepal formulated an ICT policy in 2015 when it adopted the 2015 constitution and embraced federal democratic governance. While the 2015 ICT policy and the subsequent DNF provided momentum to the uptake of digital technologies, broadband penetration measured in 2020 was only 35.4 percent of the population – well short of the ambitious five-year target of 90 percent. The government had also failed on its ambitious goal of making 80 percent of government services accessible online.

Poor cooperation, coordination, and collaboration across three tiers of government affects the government's capacity to understand, adopt, and execute digital policies. Political power continued to be centralized at the federal level, and there was confusion around the authority mandates of subnational governments. Government capacity and commitment across federal, provincial and local jurisdictions was imperative for effective policy implementation, information sharing, and data exchange, to in turn support open and interoperable IT systems. Challenges to Nepal's digital economy include outdated digital laws, a disconnect between planning and implementation, siloed government structures, high personnel turnover, limited understanding of cybersecurity and data interoperability, and a lack of coordination among key stakeholders.

Nepal has the most expensive internet in Asia, relative to income. Expanding connectivity and access to the nearly 80 percent of Nepalis that live in rural areas, will be key to achieving Nepal's goal of becoming a middle-income country by 2030. Accessibility and affordability will influence the digital divide and can make rural markets isolated, inefficient and stagnant.

The enabling environment for digital financial services (DFS) and e-commerce has improved in recent years, due to favorable policy changes and an uptick in mobile wallet

⁵³ https://www.usaid.gov/sites/default/files/documents/USAID_Digital_Strategy.pdf.pdf

offerings. However, Nepal's government policies fail to keep pace with new tech; additionally, the barriers associated with transportation and logistics hamper Nepal's e-commerce.

Increased DFS adoption in agriculture could boost financial inclusion and farmer productivity: Farmers' financial transactions follow different patterns than urban workers (e.g., high seasonal variability), pointing to the need for new business models that best meet their needs.

The COVID-19 pandemic has accelerated the adoption of digital services, making communication, e-commerce, digital payments, online work, and remote learning more essential than ever: Policies and investments in workforce, critical infrastructure, and cybersecurity, need to stay abreast with the shift towards a digitally literate and cashless society.

GESI: Intersectionality of digital inclusion includes a combination of barriers associated with gender, ethnicity, religion, geography, income, caste, and other factors. However, the most prominent among these barriers were income, geography, and gender. Social norms that hindered access to digital devices and the internet, and the ability to acquire digital and financial literacy exacerbated the digital divide.

According to the LIRNEAsia AfterAccess Survey⁵⁴, Nepali women were 19 percent less likely than men to own mobile phones; 27 percent women in comparison to 41 percent men, used the internet; and 27 percent women compared to 38 percent men used social media regularly, among working age mobile phone users. GSMA – an industry organization of mobile network operators worldwide – estimates that closing the gender divide in mobile internet use across low-and-middle-income countries could add an additional US\$ 700 billion to the global GDP.

This has significance for Nepal. As 28 percent of Nepal's workforce works abroad and as most migrant workers are rural men, the majority of Nepali farmers are women. The effective use of digital technology offers the potential for transforming Nepal's agriculture from a smallholder subsistence to a commercial model. However, this requires a major shift in social and cultural norms, facilitating women's access to digital connectivity, literacy, digital financial services, and their ability to significantly move beyond domestic chores.

Some successful digital initiatives include the RUSMAN Group, AgriClear – a finalist in the 2020 USCDF AgriTECH challenge (used blockchain to improve traceability in agricultural products), SmartKrishi (provides weather and market information for farmers); KISAN II works with 150 businesses – agrovets, cooperatives, traders, and rice millers, which serve more than 187,690 smallholder farmers across 25 districts in Nepal. Together with local partners, KISAN II has produced 86 community videos in Nepali and regional dialects, providing locally relevant information for agricultural production and marketing. As of July 2020, 90,931 farmers had viewed these videos, which provide them with critical information on how to diversify their crops and employ new tech.

DECA Recommendations

⁵⁴ <https://lirneasia.net/wp-content/uploads/2018/10/LIRNEasia-AfterAccess-Asia-Report.pdf>

- Build an ‘Alliance for Digital Nepal’⁵⁵
 - Establish a multi-stakeholder internet affordability working group
 - Enable inclusive and interoperable Disaster Risk Management systems
- Enable the private sector to enable last-mile digital finance
- Inform government understanding of and application of cybersecurity
- Unlock potential of e-commerce
- Catalyze increased digitalization in agriculture (by digitalizing ag value chains – digitally delivered extension services, digital payments, digital farmer profiles, and traceability systems; use of satellite data to develop affordable index insurance)
- Build highly skilled digital talent pool
- Bridge the gender digital divide (conduct gender-focused evaluation of current digital programs, digital literacy programs for newly elected female leaders, expanding rural connectivity to benefit female farmers, and promoting leadership opportunities for female science, technology, engineering, and mathematics (STEM) professionals)
- Strengthen and support Nepali civil society (enable a structured process of engagement between CSOs and gov to increase transparency in gov’s policies on digital governance and policing, unwanted surveillance, and cybersecurity)
- Advise on effective implementation of key e-gov initiatives, such as the national digital ID system
- Foster a culture of data-driven decision making

THE USAID TRADE AND COMPETITIVENESS ACTIVITY (UDHYAM NEPAL)

The *Udhyam* Nepal project is discussed here as it aims to increase global competitiveness of the Nepali private sector and unlock new sources of financing and investment for sustainable and inclusive economic growth; strengthen enterprises in targeted sectors with high potential for growth and employment creation, such as agro-processing, digital services, and tourism; and support the private sector to recover from COVID-19.

As such, the project looks to incentivize public and private sector actors across the ecosystem **to adopt new behaviors**, driving outcomes across three core Objectives:

- Increase access to market-based financial and nonfinancial services
- Increase productivity in sectors with high growth and employment potential
- Improve the investment climate and business enabling environment, especially for targeted sectors

Udhyam targets sales and competitive growth among 1,500 high-growth Nepali firms with greater access to finance (approx. \$175M in new investment), improved management practices, adoption of standards and technology, and inclusive human capital practices – supported by an investment and business enabling environment that is conducive to market entry and trade.

From a sectoral focus, *Udhyam* targets:

⁵⁵ Coincidentally, this was also a key recommendation in the Stakeholder Analysis conducted by SARDI in 2020. Both studies are part of the Digital Frontiers project

- **Agro-processing** – current focus is on coffee, tea and spices, including value crops sold in bulk with limited value-added processing/ branding
 - Recommendation – diversify beyond Indian market to the middle east, EU, US for high-end consumer products and triple the export value of selected crops through value-added and branding
- **Tourism** – decimated by pandemic with <10% firms even partially operational; under-developed, with over-dependence on low-end segments, with spend decreasing
 - Recommendation – develop ecotourism, cultural, religious circuits to increase arrivals through product development and marketing
- **Digital Services** – small, mostly informal sector with demand for cross-sector solutions. Constrained by brain drain, barriers to accessing finance, and foreign exchange restrictions
 - Recommendation – expand and diversify digital service offerings in selected verticals, e.g., e-payments, e-commerce, other fintech, e-government, and sector solutions like smart irrigation, supply chain management, e-tour guides etc.

KEY MARKET CONSTRAINTS

The following constitute key constraints to a thriving digital ecosystem in Nepal, as identified by the SARDI 2020 and 2021 studies, and discussed in one form or the other in sections above.

- Lack of government leadership for translation of vision and policies as articulated in the Digital Nepal Framework (DNF) 2019.
- Lack of incentives to adopt digital means – most organizations in the MSME sector operate within an informal economy. Going digital will require transparency, and in the absence of support and incentive, most are unwilling to make the switch. About 95% of the economy is still cash-based (SARDI 2020).
- Digital innovations in food delivery and ride share face lack of policy clarity – policy has failed to keep up with practice.
- Inadequate capacity of installed technologies and incompetent handling, continue to pose barriers for public service seekers.
- Strict foreign exchange regulations, lack of a foreign payment gateway, difficulties of repatriation, all restrict FDI.
- Lack of a clear cloud computing policy.
- Information and knowledge gap – stems from weak data privacy and protection measures.
- Internet infrastructure remain a challenge – government yet to treat internet as a business enabler, still thinks of it as a luxury – e.g., high taxes on ISPs.
- Nascent incubation and venture capital market – the FDI ceiling that was only recently (June 2022) brought down to NPR 20 million (approx. USD 160,000) from NPR 50 million (approx. USD 400,000) is still significantly high.

STATUS OF SMES IN NEPAL

According to Nepal's Industrial Enterprise Act's (2020) classification of firms by size (based on the value of their fixed assets), small firms typically have fixed capital up to NPR 150 million;

medium sized firms between NPR 100 to 500 million; and large firms exceeding NPR 500 million⁵⁶ (current exchange rate as per the Nepal Rastra Bank is NPR 127 to a dollar).

According to GD Pandey⁵⁷, SMEs in Nepal have a low capital base, poor access to technology, and inadequate knowledge and information on marketing and business opportunities. According to a study conducted by Nepal Rastra Bank (NRB) in 2019, additional challenges for SMEs in Nepal include high interest rates, large collateral requirements, bureaucratic and procedural hurdles, a lack of information, and inadequate institutional capacity, among other things⁵⁸. Other challenges include weak supply chain linkages, seasonal nature of businesses (thriving only during wedding or festival seasons), low capital and thin margins, rapid decline in demand due to COVID-19, and lack of awareness among entrepreneurs of government programs and incentives.

Despite these challenges, SMEs contribute significantly to Nepal's economy – around 22% to the GDP compared to 40% among emerging countries; and generate employment for 1.7 million as compared to 60% of total employment generated in emerging economies. As per the NRB study, there were 275,433 SMEs registered in Nepal by the end of 2018 primarily funded by banks and financial institutions, cooperatives, venture capitals/ private equities, or capital markets.

The silver lining to challenges brought forth by COVID-19 include a rapid rise in platform-based businesses and the adoption of digital technologies, return of migrant laborers willing to invest remittance money, and the exponential adoption of digital wallets for payments, thus bringing more within the framework of the formal economy.

Types of SMEs by sector: As per the Nepal B2B directory⁵⁹, businesses in Nepal can be broadly categorized into the following sectors:

- Agriculture and Animal Products
- Apparel and Garments
- Art and Handicrafts
- Ayurvedic and Herbal
- Building and Construction
- Education and Training
- Energy and Power
- Financial Institutions
- Food and Beverages
- Furniture
- Gems and Jewelry
- Home Supplies and Services – Carpets included
- Metals and Equipment
- Paper and Paper Crafts
- Textiles, Yarns and Fabrics

⁵⁶ [Small and Medium-Sized Enterprises in Nepal: Examining Constraints on Exporting \(adb.org\)](#)

⁵⁷ [SMEs final book.doc \(sawtee.org\)](#)

⁵⁸ [SMEs Financing in Nepal: Five key findings of the report | Neftake \(nepaleconomicforum.org\)](#)

⁵⁹ [Nepalese Business Directory, Nepal B2B Portal, SME Directory - NepalB2B](#)

- Travel and Trekking

Refer to **Annex 2** for a sector-wise list of Federations and Trade Associations in Nepal; and to **Annex 3** for useful references to literature on SMES in Nepal.

CONCLUSION

This desk review intends to analyze challenges and identify opportunities for Nepal's rapid adoption of a digital economy. It is expected that credible information on the most current opportunities will emerge from current exploration with key actors in, and influencers of the ecosystem. As discussed, **Annex 1** provides a stakeholder tracker that aims to map such key actors and influencers.

The continued exploration will take the form of in-depth interviews. Such interviews will be conducted in two phases – first with the individuals listed in the below table; and then with leads and recommendations emerging from the first phase of interviews. It is expected that outcomes from the exploration will also inform *Udhyam* Nepal or provide a resource for comparing key findings with *Udhyam* Nepal's Market Assessment Study.

Annex 2: Stakeholders Consulted

Organization	Name and Title	Schedule
USAID/Nepal	Anita Mahat-Rana, Economic Specialist; Stuti Basnyet, Private Sector Engagement Advisor	16 th June 2022
Deloitte/Trade and Competitiveness Activity	<u>Agnes Luz</u> , Chief of Party; <u>Kanchan Gurung</u> , Market Systems and Enterprise Development Director	17 th June 2022
Pathways/Geokrishi	<u>Rajan Bajracharya</u> , Managing Director; <u>Bikash Dangol</u> , Director of Technology	26 th Aug 2022
Federation of Women Entrepreneurs Association of Nepal (FWEAN)	Suyesha <u>Sthapit</u> , Executive Director	7 th Sept 2022
ALOI	<u>Sonika Manandhar</u> , Co-founder & CTO	11 th Sept 2022
Data for Development/ The Asia Foundation	<u>Sajana Maharjan</u> , Director	12 th Sept 2022
Senior Consultant	<u>Manohar Bhattaraj</u> , former Vice-Chair, High-Level Commission for ICT (HLCIT)	13 th Sept 2022
Nepal Tourism Board	<u>Nandini Lahe-Thapa</u> , Senior Director	13 th Sept 2022
RUMSAN	<u>Ruchin Singh</u> , Managing Director	19 th Sept 2022
Nepal Tourism Board	Maniraj Lamichhane, Director & National Project Coordinator	20 th Sept 2022
Khalti	Amit Agrawal - Cofounder	20 th Sept 2022
Young Innovations	Bibhusan Bista, CEO	21 st Sept 2022
Open Knowledge Network	<u>Nikesh Balami</u> , CEO	22 nd Sept 2022
ICRA Nepal	<u>Sailesh Subedi</u> , Head of Rating Division; <u>Rajib Maharjan</u> , Assistant Vice President	26 th Sept 2022
Martin Chautari	<u>Harsha Man Maharjan</u> , Senior Researcher	27 th Sept 2022
King's College	<u>Narottam Aryal</u> , President	27 th Sept 2022
Antarprerana	<u>Niraj Khanal</u> , CEO	28 th Sept 2022
Mavorion	Indiver <u>Badal</u> , Systems Architect	29 th Sept 2022
Digital Rights Nepal	<u>Santosh Sigdel</u> , Chairperson and Founding Member	11 th Oct 2022
World Bank Nepal	<u>Siddhartha Raja</u> , Senior Digital Development Specialist	27 th Feb 2023

Annex 3: Revised Stakeholders' List

Organization	Name	Title
Ministry of Info Comms and Tech (MoCIT)	Krishna B Raut	Secretary
Ministry of Info Comms and Tech (MoCIT)	Anil K Dutta	Joint Secretary
Nepal Telecom Authority (NTA)	Purushottam Khanal	Chairperson
Nepal Telecom Authority (NTA)	Santosh Paudel	Director
National Information Technology Center	Pradip Sharma Paudel	Executive Director
National Information Technology Center	Manohar Bhattarai	Former HLCIT Chief; Digital Nepal Framework Consultant
Nepal Tourism Board	Nandini Thapa	Director - Tourism Marketing and Promotion
Ministry of Info Comms and Tech (MoCIT)	Krishna B Raut	Secretary
Fuse Machines Nepal	Irina Sthapit	Product Manager
Aji's	Irina Sthapit	Co-founder
Nepali Women in Computing	Irina Sthapit	Advisor
Code Rush Nepal	Astha Sharma	Co-founder
Girls in Tech	Astha Sharma	Managing Director
Girls in Tech	Melisha Ghimire	Managing Director
Aeloi	Sonika Manandhar	Co-founder and CTO
Urban Girl	Nikita Acharya	Founder
Smart Cheli	Pratiksha Pandey	CEO
Kimbu Tech	Karvika Thapa	Founder and CEO
Women in STEAM (WiSTEAM)	Binita Shrestha	CEO
Women in STEAM (WiSTEAM)	Richa Neupane	Cofounder
R & D Innovative Solution	Sunita Nemaphuki	CEO
Women in Big Data	Anjani Phuyal	Asia Lead
RUSMAN Group of Companies	Rumee Singh	Cofounder
Moonlit Solutions	Princi Koirala	Cofounder
LIS Nepal	Bonny Pradhan	Principal Software Engineer
Khalisisi	Ayusha KC	Founder
Zite	Nikita Rajbhandary	Cofounder and CXO
Thulo.com	Surakshya Adhikari	Cofounder, COO
Sochware	Eeda Rijal	Founder, CEO
Logpoint	Mona Shrestha	CEO
Women Leaders in Tech (WLIT)	Nhasala Joshi	
Federation of Women Entrepreneurs Association of Nepal	Suyesha Sthapit	Executive Director
Rooster Logic	Brijendra Lochan Joshi	CEO
Young Innovations Pvt. Ltd.	Bibhushan Bista	CEO

f1soft / e-sewa	Biswas Dhakal	President
CellApp	Manoj Bhattarai	CEO
Tootle	Sixit Bhatta	Cofounder, CEO
Foodmandu	Manohar Adhikari	Founder and CEO
MetroTarkari	Anil Basnet	Founder and CEO
Sikable	Gaurav Singh Basnyat	CEO
Sasto Deal	Amun Thapa	Founder and CEO
Khalti	Amit Agrawal/ Manish Modi	Cofounder, Managing Director
Health at Home	Dr. Bishal Dhakal	Founder
Foodmario	Rohit Tiwari	
Foodmandu	Manohar Adhikari	Founder/ CEO
RUSMAN Group of Companies	Ruchin Singh	
Mavorion Systems	Indiver Badal	Cofounder
Geokrishi	Rajan Bajracharya	
Daraz	Kamana Sharma	CEO
Incessant Rain Animation Studios	Kiran Bhakta Joshi	Founder
Microsoft Nepal	Deependra Bajracharya Subash Manandhar	Business Dev Manager Partner Sales Executive
Grow by Data	Prasanna Dhungel	Founder
Genese Solution	Anjani Phuyal	Global CTO
Brain Digit	Alok Pandey	CTO Nepal
Cloud Factory	John Snowden	General Manager Nepal
Kings College	Narottam Aryal	President
Information Technology Society Nepal	Pratap Sapkota	President
Code for Nepal	Nikesh Balami	Project Coordinator
Open Knowledge Nepal	Nikesh Balami	CEO
UNDP Accelerator Lab	Aliska Bajracharya Purnima Bajracharya	Head of Solutions Mapping Head of Exploration
Nepal Communitere	Aarati Joshi	Director, Finance
Nepal Communitere	Padmakshi Rana	Deputy Director, Programs
UKAID Skills for Employment Program	Stuti Basnyet	Deputy Team Leader
VIAMO	Aradhana Gurung	Country Representative
Humanitarian OpenStreet Map Team (HOT)	Dr. Nama Budhathoki	Regional Director for Asia
National Innovation Center	Dr. Mahavir Pun	Chairperson
Nepal Flying Labs	Uttam Pudasaini	Coordinator
NAXA	Uttam Pudasaini	Cofounder, Director
Karkhana	Sakar Pudasaini	
Nepal Youth Entrepreneurs Forum (NYEF)	Pavitra Gautam	Learning Co-chair

Birawa Advisors/ Ventures	Sanam Chitrakar/ Vidhan Rana	Founding Partner
Nepal Entrepreneurs Hub (NEHUB)	Suman Shakya	
Clock B Business Innovations	Binaya Devkota	CEO
Antarprerana	Niraj Khanal	Cofounder, CEO
Next Venture Corp	Kavi Raj Joshi	
Startup Hub Nepal	Dr. Shambhu Pokharel	
Data for Development/ The Asia Foundation	Sajana Maharjan	Director
Digital Rights Nepal	Santosh Sigdel	Founding Member
Dolma Impact Fund	Shabda Gyawali	Investment Director
One To Watch	Suman Joshi	Managing Director
Business Oxygen (Bo2)	Siddhant Raj Pandey	Chairman
True North Associates	Suman Joshi	Founder, Managing Partner
Nepal Private Equity Association	Siddhant Raj Pandey	Chairman
Team Ventures	Tenzin Sona Gonsar	Founder, CEO
Safal Partners (Investment Management Co)	Ashutosh Tiwari	Managing Director
Global Equity Fund	Manish Thapa	Managing Partner
Prabhu Capital	Aasis Gauchan	CEO
Adhyanta Fund Management	Manoj Paudel	Cofounder and Managing Partner
Avasar Equity	Dhruva Timilsina	CEO
Reliable Venture Capital Ltd.	Suday Kant Jha	CEO
Alpha Plus Ventures	Abiral Nepal	Head, Investment
The World Bank, Nepal	Siddhartha Raja	Senior Digital Development Specialist