NEPAL DIGITAL SERVICES SECTOR MARKET SYSTEMS ASSESSMENT

USAID TRADE AND COMPETIVENESS ACTIVITY
DELOITTE CONSULTING LLP
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TABLE OF CONTENTS

OVERVIEW 1
ECONOMY OF NEPAL 1
USAID IN NEPAL 1
TRADE AND COMPETITIVENESS ACTIVITY 1
ASSESSMENT OBJECTIVES AND CONSTRAINTS 2

DIGITAL SERVICE SECTOR 3
OVERVIEW 3
CONSUMER SERVICES 3
BUSINESS SERVICES 3
INVESTMENT FINANCING 5
EMPLOYMENT 6
DOMESTIC CONNECTIVITY 6
DIGITAL LITERACY 7
GOVERNMENT ENVIRONMENT 7
COVID-19 IMPACT 10
DIGITAL SERVICES ENVIRONMENT 11
SUPPORTED INDUSTRY TRENDS 11
SWOT ANALYSIS 15

STAKEHOLDER ANALYSIS 18
KEY STAKEHOLDERS 18
STAKEHOLDER MAPPING 19

SUMMARY OF CONSTRAINTS 20
SECTOR-LEVEL ORGANIZATION 20
HUMAN CAPITAL 20
GOVERNMENT ENGAGEMENT 20
FINANCING 21
CYBERSECURITY 21
INTERNET CONNECTIVITY 21
DIGITAL LITERACY 21

RECOMMENDATIONS 22
IMMEDIATE ACTIONS 22
ACTIONS TO EFFECT CHANGE 23

ANNEXES 28
RESOURCES REVIEWED 28
KEY INFORMANTS 33
ENDNOTES 35
OVERVIEW

ECONOMY OF NEPAL
After three years of strong economic growth in Nepal, the impacts of the COVID-19 pandemic have dramatically restricted economic progress, reversing recent gains for Nepalis and illuminating the fragile foundation supporting Nepal’s growth. The Nepalese economy shrank by almost 2% in 2020, with 61% of firms shutting down and another 35% operating partially. Women and Dalit communities were the hardest hit. The large influx of returning migrants reduced future remittances—a financial lifeline for the most vulnerable—and pressured a labor market that already struggles to accommodate low and semi-skilled workers.

As the economic landscape in Nepal continues to evolve for longer-term economic recovery, there is an opportunity to promote more sustainable, resilient, and inclusive export-driven growth to mitigate the effects of the COVID-19 pandemic. One factor critical to Nepal’s economic progress will be the ability to harness the potential of large firms with a new generation of leaders, alongside innovative small-to-medium-sized enterprises, and entrepreneurs, to invest in and diversify higher-value markets and value-added products and services.

USAID IN NEPAL
Nepal is an important long-term partner for the United States and critical to regional stability and connectivity. Though Nepal has one of the slowest growing economies in Asia, the country continues to make steady progress in overcoming its development challenges.

USAID’s work in Nepal centers around three central themes critical for its development: supporting federalism; promoting inclusion; and strengthening institutions and resilience. To support these themes, USAID partners with the Government of Nepal (GoN) and local organizations to improve food security, expand and broaden economic growth, manage natural resources, improve quality health care and education systems, bolster democratic governance, and strengthen its capacity to mitigate and respond to natural disasters.

TRADE AND COMPETITIVENESS ACTIVITY
USAID Trade and Competitiveness Activity (TCA) is a five-year project to increase Nepali private sector participation in targeted global value chains by making them competitive, resilient, and sustainable. The Activity will support a new growth path for private companies to capitalize on global opportunities by targeting quality and high value exports (of products and services). It aims to foster sustainable growth by incentivizing actors (both private and public) through investments, innovations, employment, and the business enabling environment to expand their integration into the global market in select value chains.

The Activity will work to achieve the goal based on the following objectives:

- To increase access to market-based financial and non-financial services.
- To increase productivity in sectors with high growth and employment potential.
- To improve the investment climate and business enabling environment for targeted sectors.
ASSESSMENT OBJECTIVES AND CONSTRAINTS

OBJECTIVES

This assessment seeks to identify potential high growth employment areas for the digital services industry and where it can accelerate both growth and employment in the agriculture, tourism, health, education, and financial service industries in Nepal. In addition, the assessment evaluates constraints that prevent these subsectors in meeting requirements of the markets, such as access to finance and non-financial services, the business enabling environment, and policy issues. The assessment uses sub-sectors’ stakeholder analysis (practical Political Economy Analysis) to identify dominant players, change leaders, positive influencers and strong vested interest that could be detrimental to advancement of the sub-sectors.

The assessment made recommendations for strategies to accelerate growth of the priority subsectors, including priority policy reforms and business enabling environment improvements. The defined recommendations show how to optimize interventions that will increase revenue, generate employment, and expand participation of women, youth, and other disadvantaged groups.

METHODS

To make recommendations to the Activity and USAID, three methods were used to identify markets, subsectors, and key stakeholders.

First, a desk review of relevant publications, research, and press informed the basis of the assessment and indicated starting points for stakeholder interviews. The desk review included reviewing multiple reports from the World Bank, International Telecommunications Union, International Finance Corporation, and the GoN itself. The documents reviewed are listed in the attached Annex.

Second, key private sector stakeholders across were interviewed to discuss strengths, weaknesses, opportunities, and threats to high digital services growth and expanded employment in the digital services, agriculture, tourism, health, education, and financial service industries.

Third, the assessment activity and findings were shared with TCA and USAID staff for input and feedback to confirm and validate assessment insights.

CONSTRAINTS

The assessment was limited in scope and timeline. It was undertaken in June-July 2022 through a remote engagement with US-based Deloitte staff with a focus on specific aspects of the digital services sector and relevant subsectors. It should not be considered exhaustive research into all digital service markets or the overarching Nepal economy.
DIGITAL SERVICE SECTOR

OVERVIEW

This report makes a distinction between “ICT companies” and “digital services companies” due to unique local definitions in Nepal. The term “ICT companies” refers to retail stores that sell mobile phones, computers, and periphery hardware, often directly to individual consumers through kiosks or stores on main retail avenues. “Digital services companies” or “digital solution providers” refers to companies that sell software development, software-as-a-service, cloud hosting, cybersecurity, and other enterprise services to business and government customers. This report excludes retail hardware stores from its analysis and focuses exclusively on digital services and solution providers offering software services.

CONSUMER SERVICES

The consumer digital economy in Nepal has come a long way since the 1990s. Presently, mobile penetration is approximately 130% of the total population (Nepalis have multiple SIM cards) and 37% of Nepalis have access to mobile Internet services. Over 44% of the Nepali population uses social media.Ⅶ Two major internet service providers control the market, with Nepal Telecom, a government owned service provider, having 55% market share and Ncell, a privately owned service provider, having 40% market share. All other providers make up the remaining 5%.Ⅷ

However, a lack of digital infrastructure has led to expensive Internet, as 80% of the Nepali population is rural and has yet to receive digital services. Relative to income, Nepal has the most expensive Internet services in Asia, with users paying 2% of their monthly income for 5GB of fixed broadband and 4.91% for 5G of mobile broadband.Ⅸ

As a result, most digital services companies do not offer services directly to consumers. Instead, they focus on domestic and international business clients. The digital businesses that do focus on consumers, such as e-commerce and on-demand transport, almost exclusively target higher socioeconomic groups in Kathmandu and other major cities.

BUSINESS SERVICES

Nepal’s commercial digital economy services are nascent and centered in Kathmandu, accounting for only 3.7% of Nepal’s GDP.Ⅹ Most digital services firms are small and operate informally as singular consultants or informal teams. Interviewees explained that informal arrangements allowed these small groups to avoid government regulation, taxation, and foreign exchange controls. This informal structure results in limited, official information on their expertise, strengths, and revenue.

Most formal firms offer outsourced software, web, and mobile application development services to international clients, such as software programming, software testing, software maintenance, data analytics, document transcription and digitization services, and digitally enabled business process outsourcing (BPO) such as insurance claim processing, medical billing, accounting, and call centers.Ⅹ Some digital services firms also provide product-based solutions in financial technology, digital marketing, and specialized software.Ⅹ
While some of the formal firms specialize in certain sectors (e.g., Cotiviti focuses on international healthcare solutions) there is not a specific sector focus for Nepali firms overall. Each sector is characterized by opportunistic sales versus a strategic focus across the sector. Interviewees mentioned both Vietnam and Indonesia as direct competitors to Nepal on the international market but noted that India is too advanced and expensive to be a major competitor, although it can be an employer of Nepali firms to satisfy other international clients.

There are 15-20 large digital solution providers with 100+ employees formally operating. All are based in Kathmandu and have a direct business connection to internationally registered firms that share branding, leadership, and activities with the Nepali firm. The firms listed below are primarily Nepali firms, where most staff and software development are in the country.

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>KEY SERVICES</th>
<th>RELEVANT SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Braindigit IT</td>
<td>Managing custom software application development for enterprise customers</td>
<td>150 employees</td>
</tr>
<tr>
<td>CloudFactory</td>
<td>Training artificial intelligence algorithms by human-powered data tagging</td>
<td>4,000 employees</td>
</tr>
<tr>
<td>Cotiviti</td>
<td>Designing healthcare informatics, decision analytics, and risk assessment solutions</td>
<td>300 employees</td>
</tr>
<tr>
<td>Deerwalk</td>
<td>Creating healthcare data management, analytics, and business intelligence software</td>
<td>300 employees</td>
</tr>
<tr>
<td>F1Soft International</td>
<td>Deploying enterprise products for digital financial services and economic inclusion</td>
<td>900 employees</td>
</tr>
<tr>
<td>Javra Software</td>
<td>Delivers full cycle custom software development and cloud application management services</td>
<td>150 employees</td>
</tr>
<tr>
<td>LIS Nepal</td>
<td>Develops retail industry business intelligence, data warehousing, and data analytics solutions</td>
<td>200 employees</td>
</tr>
<tr>
<td>Sastodeal</td>
<td>Largest e-commerce service in Nepal with online shopping and delivery domestically and from India</td>
<td>150 employees</td>
</tr>
<tr>
<td>Vairav Technology</td>
<td>Produces cybersecurity software and data protection systems for enterprise clients</td>
<td>120 employees</td>
</tr>
<tr>
<td>Wordlink Communications</td>
<td>Largest ISP in Nepal, providing high speed fixed wireless broadband service</td>
<td>3,000 employees</td>
</tr>
</tbody>
</table>

The remaining digital service firms in Nepal are branches of larger international firms that conduct their primary business elsewhere. For example, Pathao, a Bangladesh-based ridesharing firm, is the largest on-demand service provider in Nepal. It has drivers in Nepal but does not have a large staff presence or software development activity in the country. The same is true for Daraz, a Pakistani e-commerce firm.
owned by Alibaba. Daraz sells many items in Nepal, and employs local delivery drivers, but most of its staff and software development are outside of the country.

There are almost no data centers in Nepal, as the international market for this commodity service is now hyper-competitive. Most cloud hosting providers offer managed services and network support on data center servers located in other countries. The GoN is a notable exception, as it has its own data center in Kathmandu - the Government Integrated Data Center (GiDC) - to store data from different public entities inside national borders. Interviewees mentioned this data center is slow, unreliable, and unacceptable for high-uptime commercial services.

**INVESTMENT FINANCING**

The investment climate in Nepal is challenging as Nepalese commercial banks do not lend on a cash flow basis. The banks require collateral, an obstacle for technology companies that may not have assets beyond the skills of their staff or their industry connections. Therefore, internal financing, venture capital, and foreign direct investment (FDI) are the main financing options for digital services firms.

**INTERNAL FINANCING**

Internal financing, or reinvesting profits into the company to fund growth, is the primary way interviewees funded their digital services companies. This financing is usually done with domestic profits, as most companies have an international partner that accrues the majority of the international revenue and profits. Further details on internal financing are provided in the government policy and regulation section.

**VENTURE CAPITAL (VC)**

VC firms in Nepal have over $50 million in assets under management, funded mostly by developmental finance institutions such as the International Finance Corporation. VC firms usually acquire an equity minority stake between 20-49% and play a proactive role in company management. The main VC firms in Nepal are generalists, investing in agriculture, education, healthcare, renewable energy, and tourism, in addition to technology innovations, so the total VC funds available to digital services firms are much lower than $50 million.

**FOREIGN DIRECT INVESTMENT (FDI)**

China has remained the largest source of FDI in Nepal for the past six consecutive years, totaling over $188 million in funds in 2021. These funds include digital services, which are open to FDI. Within telecommunications businesses, up to an 80% equity is allowed and digitally enabled services allow for up to 100% FDI. The GoN has given special priority to IT and BPO services due to their high export potential, yet they require FDI contributions to be at least $160,000 (as of July 2022) and undergo an investment approval process that can take eight months to a year.

FDI can present challenges to Nepali digital services companies who cannot compete with the larger financial strength of foreign challengers. For example, Alibaba, the Chinese e-commerce giant, bought Daraz, a Pakistani e-commerce company in the Nepal market that competes directly with Sastodeal, a Nepali firm. One interviewee noted that without concessional capital to support local firms, companies like Sastodeal would go bankrupt, allowing foreign-owned firms like Daraz to create a monopoly.
EMPLOYMENT
Nepal is not unique in facing a human capital challenge with retaining technology staff. People with medium to advanced digital skills in most emerging economies can sell their services on a global market either as a resident in their home country working for an international company (e.g., Google) or physically emigrating to another country to work there. One interviewee cited pay disparity as a core reason for the current brain drain in Nepal. His Nepali company only offered a monthly salary of $1,500 for software developers who can make up to $6,000 a month working for foreign companies in Nepal.

SUPPLY CHALLENGE
Nepal is experiencing an additional brain drain with Nepalese universities only graduating 3,000-5,000 software engineers per year. Multiple interviewees mentioned that the number of software engineer graduates was not enough in quantity or quality to meet the current demand. Interviewees noted inadequate training of those who do graduate and the need for Nepali digital service companies to create training and mentoring programs to equip staff with essential business and technology skills. To counteract this problem, one company even bought a training college to ensure a supply of trained staff.

New software engineers need to be trained in the full gamut of hard and soft business and technology skills. Staff need to have the ability to learn new languages, understand the newest software languages that universities understandably have trouble following, and build business skills in marketing and management. However, once staff have stronger digital skills they are often poached by foreign companies.

One interviewee quipped that, “No one works in Nepal, they intern here and then leave.”

GENDER CHALLENGE
Data from around the world suggests there may be a gender challenge with Nepali digital solutions providers employment practices that stem from wider gender disparities. Globally, women make up just 27% of employment in the digital services industry and account for fewer than 20% of leadership roles. In South Asia, only 38% of women use mobile Internet and twice as many boys as girls have Internet access in Nepal. Organisation for Economic Co-operation and Development (OECD) analysis has found that countries with high shares of women working from home also have the highest digital services employment rates for women, and that greater work flexibility creates higher employment rates among mothers.

DOMESTIC CONNECTIVITY
Nepali Internet is characterized by uneven coverage and poor data consumption despite impressive mobile Internet subscription numbers. For example, the COVID-19 pandemic increased Internet usage by 35% and the Nepal Telecommunications Authority (NTA) estimates that 90% of the population has access to the Internet, primarily via 3G and 4G services from mobile network service providers, in July 2021.

However, greater usage during the pandemic was constrained by unreliable networks and periodic network outages exacerbated by Internet providers that did not increase the supply of domestic Internet bandwidth. Locations with favorable terrain, high population densities, and high incomes have better connectivity and online activity levels usually correspond with these factors. Ownership of digital technologies and their use exhibit clear regional unevenness and a large urban-rural inequality.
For example, several interviewees from agriculture mobile app development companies discussed how their farmer customers had first generation smartphones with small screens or old navigation technology (such as wheels or knobs) that were not compatible with modern apps. In addition to outdated technology, the high cost of data prohibits rural residents from operating phone apps. An interviewee from an agriculture innovation hub said a consistent user of mobile apps in a rural area could receive a phone bill of 8,000 rupees a month. The average only rural Nepali earns about 14,000 rupees a month.

**DIGITAL LITERACY**

In addition to limited digital infrastructure in rural areas, people outside the major cities and the formal education system lack needed digital literacy. While urban food vendors use QR codes for menus and purchasing options, agricultural value chain companies have found that farmers do not have the digital literacy to operate agritech mobile applications.

Proven by one agritech company’s training practices, the company experienced a 60% download rate for their mobile platform by providing in-person training instead of telephone-based training, which historically achieved only a 30% download rate. However, even with an increased download rate, neither process created strong mobile app usage. More so than mobile apps or QR codes, farmers are using SMS text messages to communicate with agritech company digital services.

In the financial services sector, financial literacy challenges are compounded by digital literacy weaknesses. Urban or rural customers who are not confident with the financial literacy needed for traditional offline banking transactions often find corollary digital services overwhelming. In tourism, the main tour operators have high digital literacy, but tourism providers who work with homestays or other informal providers report low digital literacy by rural partners.

**GOVERNMENT ENVIRONMENT**

The digital services sector operates within the Digital Nepal Framework formulated by the GoN, yet government policy and regulatory issues remain within the larger business enabling environment that are actively impacting digital services companies.

One experience illustrates government challenges with digital services. Interviewees mentioned that multiple government officials stated the need for Nepali citizen data to stay in the boundaries of Nepal, with the expectation that the data would be on the Government Integrated Data Center. However, government officials made these arguments using Gmail as their official email accounts. Gmail is an internationally hosted service owned by Google, and its use suggests that the government struggles to enforce its own electronic data security and privacy rules and manage its own email server.

**GOVERNMENT POLICY & REGULATION**

There several government entities develop policy and issue regulations impacting the digital services industry:
The GoN previously adopted multiple governmental policies, including the Telecommunication Policy 2004, National Broadband Policy 2014, and National Information and Communication Technology Policy 2015. All of these policies were precursors to the Digital Nepal Framework (DNF) developed by the MoCIT in 2019 as an ambitious approach to raise digital literacy and support digital services.

The DNF is a roadmap for digital efforts to support economic growth and address important societal opportunities for Nepal to engage in the global economy. The DNF includes 80 activities divided into eight categories – digital foundation, agriculture, health, education, energy, tourism, finance, and urban infrastructure.

In 2022, the GoN announced that 22 billion rupees would be invested into the project, with the World Bank contributing 17 billion rupees in grants and 5 billion rupees in business loans. The MoCIT indicated these funds would be used for Internet expansion in rural areas, weather-resistant high-speed broadband connectivity across the country, and e-governance projects such as digital signatures, cybersecurity regulatory frameworks, and data center capacities.

**FINANCIAL REGULATION**

Many interviewees expressed frustration with ambiguous, outdated, and harmful government financial regulations for digital businesses. The GoN limits digital transactions to $200 per instance and $1,000 per day to reduce money laundering. This limit has a direct impact on domestic e-commerce and its ability to service large orders, in addition to its direct impact on international transactions.

Multiple interviewees also mentioned the difficulty to pay for international services, such as online ads, cloud hosting, software, or digital training using their rupee bank accounts. To bypass this restriction, many companies end up registering abroad. By registering abroad, companies accrue international revenue for the international entity and do not onshore profits to Nepal, paying for international services without restriction. One interviewee mentioned that just two of his companies could increase Nepal’s official digital exports by $55 million per year if they could onshore profits without restrictions.

There is a strong perception that Nepali businesses are unable to receive abroad payments in the form of credit card transactions or Internet-based payment systems like PayPal or Venmo and that only bank
transfers are possible. The lack of an easily accessible international credit card payment gateway may not have a major impact on business-to-business transactions by digital service firms, but it does greatly impact the tourism industry.

One interviewee said that for his tourism business, which relies on individuals purchasing goods and services in advance from outside the country, using bank transfers in lieu of credit cards or online payments is a major barrier to growth for tourism companies like his and for digital services firms supporting tourism firms online.

REGULATION SANDBOXES

A lack of regulatory sandboxes where financial technology companies can conduct live experiments in a controlled, time-bound environment under a regulator’s supervision\textsuperscript{xii} presents a specific challenge to the financial services industry.

Since the regulation sandbox practice started in 2015,\textsuperscript{xiii} there are now over 70 regulatory sandboxes for financial innovation across 57 countries. For example, the Reserve Bank of India has five sandbox cohorts already, each helping the government create and amend regulations that have tested and approved over 25 new digital financial services.\textsuperscript{xiv} Starting in 2016, the Bank of Thailand set up regulatory sandboxes to test all new innovative financial products and services, graduating 36 firms from the sandbox to offer standardized QR code payments, biometrics, blockchain, and P2P lending platforms to the public.\textsuperscript{xxv}

Without the innovation that regulation sandboxes provide, startups in Nepal are challenged by existing regulations that are designed for traditional banking solutions.

DIGITAL SERVICES TAXATION

Like any other business, the GoN applies corporate taxes on digital services firms. However, the government recently enacted a special non-resident digital service tax of 2% to international providers such as Google, Facebook, Twitter, and Netflix that offer services to Nepali citizens.\textsuperscript{xxvi} Over 20 countries have similar digital services taxes on social media, search engine, and entertainment firms generally located in the United States but who do not pay taxes in countries like Nepal, where they offer services but do not have major business operations.\textsuperscript{xxvii}

Nepal’s tax may have a negative impact on digital service firms in three ways.

1. Domestic firms will need to pay taxes on any services they receive from their international partner companies,
2. Domestic firms who buy services from international service providers like Amazon Web Services, will be expected to pay taxes, even if the digital service firm’s international partner pays for the service, and
3. The international partner of a domestic digital service provider will need to pay taxes on any services supplied to Nepali citizens.

In addition, the government expects the Nepali resident to pay the tax amount based on the purchases they make versus taxing the corporate entity that receives payment. The corporate entities are often beyond the reach of Nepal’s tax authority, meaning the tax burden will be on the Nepali person or entity.
Over 135 countries and jurisdictions have joined a new two-pillar plan from the OECD to reform international taxation rules and ensure that multinational enterprises pay a fair share of tax wherever they operate. xxviii Nepal could join this cohort to harmonize its taxation program with international leading practices.

CYBERSECURITY REGULATION

Interviewees discussed a lack of cybersecurity laws and a dearth of support for data security in general. In a study by the International Telecommunication Union (ITU), Nepal ranked 94th of 182 countries in the Global Cybersecurity Index 2020. xxix An improvement from 106th place in the 2018 index, Nepal still placed 17th among the 18 countries in the Asia-Pacific region.

As Nepal became more digitized, it suffered from a spate of cyberattacks ranging from hacking of the SWIFT system, coordinated ATM cash-out attacks of the Nepal Electronic Payment Systems, and data breaches of Nepali companies. xxx One interviewee, a head of a cybersecurity startup, attributed the recent spate of cybersecurity attacks to absent cybersecurity legislation, as the law is still in its third year of drafting.

As a result of these data breaches, investors worry that a lack of cybersecurity laws will allow further attacks by hackers and leave their data vulnerable. To the average Nepali user, the persistent fear of data leakages and loss of money in digital payment apps add to their mistrust of the digital financial services system.

POLITICAL INSTABILITY

Political instability serves as a barrier to Nepali economic success. With 28 governments in the past 31 years, the country continues to remain hostage to petty party politics, which has prevented significant developmental progress. xxxi In addition, the upcoming elections in November 2022 and the recent resignation of Nepal’s finance minister, Janardan Sharma, can distract government staff.

COVID-19 IMPACT

The pandemic restrictions turbocharged the shift to digital services. Overnight, the government and private sector had to move staff work and customer interactions online. This move had a direct impact on e-commerce. Nepal’s largest online supermarket saw sales surge by more than 200% from 2019 to 2020, with three-digit increases in 2021 as well. xxxii In agriculture, usage of digital financial services increased by 600% during the COVID-19 lockdown period. xxxiii

Nepal’s economy is now in the recovery phase from the COVID-19 pandemic shock. Economic activities are expanding due to the easing of pandemic restrictions and the increased availability of vaccines. Nepal’s economy is expected to expand by 4-6% this year, depending on how the surge in food and energy prices drives annual retail inflation. Inflation accelerated to a five-year high of 7% in Nepal, amid the risk of social unrest as imports of goods like fuel, coal and edible oil become costlier.

The longer-term impacts of COVID-19 are presently manifesting in the Nepali workforce. 80% of students were not able to attend primary school virtually between March 2020 and July 2021 due to a lack of Internet access or ability to use digital tools. xxxiv One interviewee noted how the pandemic created a
notably smaller pool of graduating software engineers and made recruitment an even more difficult task. Only Nepalis with better means were able to continue their studies and graduate from universities. By contrast, poorer Nepalis had to drop out of school and focus on day-to-day jobs to provide for their families.

**DIGITAL SERVICES ENVIRONMENT**

The supporting functions that help digital solution providers can be mapped with industry rules and regulations to create a visual representation of the digital services environment in Nepal.

The visualization shows that staff training (both pre-service and in-service) and entrepreneurship is important to develop innovative solutions and new companies. In addition, company financing, Internet access, and stable electricity supplies are important to the digital services environment.

The government brings formal policy and regulation to the market, as do industry associations and international software development standards. Informal community standards have their own impact on digital solution providers.

**SUPPORTED INDUSTRY TRENDS**

Nepal’s digital services sector is both an industry itself and a supporting subsector to other industries, including the agriculture, tourism, health, education, and financial services sectors. Market trends in each of these industries impact digital services companies, as do wider business enabling environment issues
like investment financing, domestic human capital, Internet infrastructure, and government regulation. Investments in digital solution providers can have a multiplier effect on the other industries. For example, when a provider develops a new tourism solution it can improve growth and employment as the solution is adopted by multiple tourism providers.

AGRICULTURE INDUSTRY

Agriculture engages around 66% of the total population in Nepal and contributes to one-third of the nation’s GDP. More than half the country’s farms are small, less than 0.5 hectare with average holdings of 0.7 hectare, and fragmented. Far more women work in agriculture than men, yet women face discrimination in access to agricultural extension, financial services, and technology solutions to reduce existing market inefficiencies.

Irrespective of gender, many farmers lack the equipment needed to access digital services. One interviewee noted that most farmers had older smartphones from the early 2010s that could not download modern mobile apps. Digital agriculture firms generally reach farmers through cooperatives or wholesalers who have the digital capacity and are trusted by farmers. Nepali digital agriculture firms are protected from international competition due to domestic logistics challenges, although the low margins on farm products make it difficult for digital agriculture firms to be profitable.

TOURISM INDUSTRY

Tourism was crushed by the COVID-19 pandemic in 2020. The GoN planned to welcome 2 million tourists, but the pandemic reduced tourism to just 200,000 foreign tourists. Limited tourist rebound has occurred in 2021 and 2022. The first quarter of 2022 has seen foreign arrivals more than double to almost 79,000, but tourism numbers remain less than pre-pandemic levels. According to one interviewee, the industry has only recovered to about 65% of pre-COVID levels.

Tourism companies report strong digital skills (e.g., website skills and content creation), developed in conjunction with digital services companies, in marketing their services internationally. International tourists respond with high degrees of trust in Nepali websites. However, the lack of international payment gateways and low cybersecurity levels inhibit online sales, such as prepayment for services via credit cards.

HEALTH INDUSTRY

The health system in Nepal is characterized by a wide network of health facilities, community workers, and volunteers that are dependent on foreign aid for 50% of the national health budget. In 2019, Nepal’s Universal Health Coverage service coverage index was 53%, which was below India at 61% but above Pakistan at 45%. Lower socioeconomic groups are often unable to obtain basic healthcare services due to burdens such as out-of-pocket payments, rural locations, limited local medical support, and the opportunity cost to seek medical care elsewhere. Only 62% of the Nepalese households can access health facilities in less than 30 minutes from their home.

The COVID-19 pandemic exacerbated existing inequalities and stressed the Nepali health system. Over 108,000 deaths have been directly attributed to COVID-19 and it caused significant disruptions to the prevention, diagnosis, treatment, and management of multiple infectious diseases.
The GoN is exploring multiple digital health opportunities. There is a significant opportunity for health system digitization to overcome healthcare fragmentation. The health ministry lacks a comprehensive database of hospitals and medical institutes and there is not a national electronic patient medical records system. In response, the DNF 2019 aims to introduce the National Digital Healthcare Program for public healthcare services and facilities, including e-Maternal Care and Mobile Health Units. Other digitization plans include a Centralized Telemedicine Center, drones for transporting emergency medical facilities, and establishing the E-Health Record System 2.0.\textsuperscript{xlii}

Nepal is already the first country to use open-source software (OpenIMIS) to manage national social health protection programs and the GoN invested in DHIS2 for electronic reporting of health data.\textsuperscript{xliii} There is also a significant opportunity with telehealth or electronic consultations that allow patients and health experts to communicate online for contact-free consultations.

**EDUCATION INDUSTRY**

Under the federal system, the 753 local and provincial governments and 260,000 teachers are responsible for basic education provision. At the federal level, the Ministry of Education, Science and Technology (MOEST) is the lead entity, with impressive gains in improving access and equity in education in recent years. Nepal has reached gender parity in basic and secondary education and increased the number of Dalit students in schools.\textsuperscript{xliv}

During the COVID-19 pandemic and resulting lockdowns, the education system went online, using FM radios, televisions, internet, and other internet-based technologies to engage students. The MOEST even launched Sikai Chautari, an online learning site for e-learning.\textsuperscript{xv} However, according to Nepal's Education Department, only 48% of public schools are online. Many students were excluded from online learning due to their inability to access online learning materials and the Internet\textsuperscript{xlvi} and 64% of Nepali children reported they did not find virtual learning effective.

The MOEST is launching a 10-year Education Sector Plan in 2022 that builds on the DNF to incorporate digital technologies into classrooms to assist teachers, enrich the learning experience, and improve educational outcomes. Investment in public classroom technology can complement the many existing consumer online learning courses and private school education management information systems favored by higher socioeconomic groups.

**FINANCIAL SERVICES INDUSTRY**

Financial services are in the recovery phase after the COVID-19 pandemic. The profitability of the banking sector rose by 21% in the fiscal year ending in mid-July 2021, with all commercial banks posting profits. Bank deposits swelled by 20% and credit to the private sector surged by 28%, resulting in the expansion of the greater money supply.\textsuperscript{xlvii} Specific to digital services, there are an estimated 4 million digital wallet users in Nepal, with usage doubling each quarter.\textsuperscript{xlviii} In addition, the GoN is adopting digital payments for both payout and revenue collection, including NEPALPAY QR codes for making government payments.\textsuperscript{xlix}

Interviewees reported very close associations between the financial services industry and digital services firms. Financial companies were early adopters of online transactions and recognized the need to either have long-term partnerships with digital services firms or bring technology skills in-house for greater control over solutions development. Due to the increase in mobile wallets during the pandemic, there is
an even greater connection between the two industries. However, cybersecurity is still a weak point for financial services firms.

INTERNATIONAL MARKETS

The international market for Nepali digital service providers is growing quickly and has seemingly unlimited room for expansion. The market can be divided into two categories:

- Software application services, including software development, testing, and support, software consulting, and systems integration.
- IT-enabled services and business process outsourcing (ITeS-BPO), including call centers, medical transcriptions, back-office operations, and content digitization and development.

The global market for BPO is estimated at $165 billion in 2022, with the US market accounting for $69 billion, and growing by 5% per year. The total revenues of registered ITeS-BPO service providers in Nepal were $75 million in 2017. Even as revenues increase by 20% percent annually, Nepali firms do not need to take market share from other countries to grow significantly as the relative amount is so small. They can continue to exploit Nepal’s wage advantage to drive the sector in the short to medium term, although their wage advantage will likely diminish over time as the quality of Nepali developers improves due to better training and competition increases from other low-wage countries like Vietnam and Indonesia.

International firms consider several factors when choosing to hire or partner with a Nepali digital solutions provider. While low prices may be initially attractive, international firms typically consider the following aspects to be more important than total price:

- Recommendations and referrals from related firms or industry partners
- Clear communications and transparency on all aspects of the project
- Experienced staff who produce high-quality software code and services

Currently, there isn’t a clear market focus by Nepali firms, who have historically seemed to be more opportunistic than strategic in their international partnering. There is opportunity for them increase their profile within segments such as healthcare or insurance solutions in the international marketplace. Nepali firms can also invest in improving their software development processes to increase the quality of work they deliver. There isn’t a single international software development standard that is recognized as the best, but there are several competing standards that can offer different types of assurances that a company can deliver high quality services and solutions, including:

- ISO/IEC/IEEE 90003 for the acquisition, supply, development, operation and maintenance of computer software and related support services.
- Capability Maturity Model Integration (CMMI) for software engineering and service development, acquisition, and maintenance processes.
- Project Management Body of Knowledge (PMBOK) guide for software development projects that use iterative agile approaches.
International firms may hinder Nepali company growth by keeping high-value work from the country and using negative perceptions of Nepali skills quality to depress revenues, thereby keeping most profits from Nepali firms.

**SWOT ANALYSIS**

The six SWOT analyses (Strengths, Weaknesses, Opportunities, and Threats) below are situational assessments that identify the internal and external factors that are favorable and unfavorable to each sector of the Nepali economy.

**SWOT ANALYSIS COMPONENTS**

<table>
<thead>
<tr>
<th>Helpful</th>
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<tbody>
<tr>
<td><strong>Internal</strong></td>
<td><strong>External</strong></td>
</tr>
<tr>
<td>Strengths</td>
<td>Opportunities</td>
</tr>
<tr>
<td>Weaknesses</td>
<td>Threats</td>
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</table>

**DIGITAL SERVICES**

This SWOT analysis looks at digital service firms as a sector of the Nepali economy.

<table>
<thead>
<tr>
<th>Helpful</th>
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<tbody>
<tr>
<td><strong>Internal</strong></td>
<td><strong>External</strong></td>
</tr>
<tr>
<td>Founder led and managed</td>
<td>Low-cost profile</td>
</tr>
<tr>
<td>Low human resources costs</td>
<td>Strong English language fluency</td>
</tr>
<tr>
<td>Connected to international partners</td>
<td>Wide open domestic markets</td>
</tr>
<tr>
<td>High staff turnover</td>
<td>Market distorting FDI</td>
</tr>
<tr>
<td>Low capitalization</td>
<td>High cost of Internet bandwidth</td>
</tr>
<tr>
<td>Limited focus on cybersecurity</td>
<td>Low retail customer Internet adoption</td>
</tr>
</tbody>
</table>
### Agriculture
This SWOT analysis looks at the agriculture industry through the lens of digital service firms.

<table>
<thead>
<tr>
<th>Helpful</th>
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</thead>
<tbody>
<tr>
<td><strong>Internal</strong></td>
<td><strong>Internal</strong></td>
</tr>
<tr>
<td>• Recognition that Internet can help</td>
<td>• Lack of connections to cooperatives</td>
</tr>
<tr>
<td>• Interest in online sales</td>
<td>• Low margins reduce interest in sector</td>
</tr>
<tr>
<td>• High trust in cooperatives</td>
<td>• No investments in cybersecurity</td>
</tr>
<tr>
<td><strong>External</strong></td>
<td><strong>External</strong></td>
</tr>
<tr>
<td>• Agriculture is 60% of Nepal’s GDP</td>
<td>• Lack of rural internet coverage</td>
</tr>
<tr>
<td>• Farmer digital literacy is growing</td>
<td>• High data usage cost</td>
</tr>
<tr>
<td>• No international competition</td>
<td>• Low ownership of smartphones</td>
</tr>
</tbody>
</table>

### Tourism
This SWOT analysis looks at the tourism industry through the lens of digital service firms.

<table>
<thead>
<tr>
<th>Helpful</th>
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</thead>
<tbody>
<tr>
<td><strong>Internal</strong></td>
<td><strong>Internal</strong></td>
</tr>
<tr>
<td>• High awareness of Internet sales</td>
<td>• Low use of advanced digital services</td>
</tr>
<tr>
<td>• High use of Internet marketing</td>
<td>• Unreliable rural Internet connectivity</td>
</tr>
<tr>
<td>• High desire to expand digital activities</td>
<td>• No investments in cybersecurity</td>
</tr>
<tr>
<td><strong>External</strong></td>
<td><strong>External</strong></td>
</tr>
<tr>
<td>• Tourists use the Internet to plan trips</td>
<td>• No international payment gateways</td>
</tr>
<tr>
<td>• High trust in digital marketing &amp; sales</td>
<td>• Limited virtual reality investments</td>
</tr>
<tr>
<td>• Potential for agro-tourism</td>
<td>• Potential COVID-19 disruptions</td>
</tr>
</tbody>
</table>

### Health
This SWOT analysis looks at the health industry through the lens of digital service firms.

<table>
<thead>
<tr>
<th>Helpful</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal</strong></td>
<td><strong>Internal</strong></td>
</tr>
<tr>
<td>• High awareness of digital services</td>
<td>• Low digital skills in rural areas</td>
</tr>
<tr>
<td>• Strong desire for digital solutions</td>
<td>• Perception of cost &amp; complexity</td>
</tr>
<tr>
<td>• Strong online skills at hospitals</td>
<td>• Desire to see patients, not screens</td>
</tr>
<tr>
<td><strong>External</strong></td>
<td><strong>External</strong></td>
</tr>
<tr>
<td>• GoN investments in digital health</td>
<td>• Low Internet access in rural areas</td>
</tr>
<tr>
<td>• Consumer demand for digital services</td>
<td>• Limited digital literacy in rural areas</td>
</tr>
<tr>
<td>• Donor investments in digital health</td>
<td>• High risk of hacking and data theft</td>
</tr>
</tbody>
</table>
EDUCATION

This SWOT analysis looks at the education industry through the lens of digital service firms.

<table>
<thead>
<tr>
<th>Helpful</th>
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<tbody>
<tr>
<td><strong>Internal</strong></td>
<td></td>
</tr>
<tr>
<td>• High awareness of digital services</td>
<td>• Low digital skills in rural areas</td>
</tr>
<tr>
<td>• Strong desire to experiment</td>
<td>• Perception of cost &amp; complexity</td>
</tr>
<tr>
<td>• Demand from students &amp; parents</td>
<td>• Desire to see students, not screens</td>
</tr>
<tr>
<td><strong>External</strong></td>
<td></td>
</tr>
<tr>
<td>• GoN investments in digital education</td>
<td>• Limited funding for educational activities</td>
</tr>
<tr>
<td>• Consumer demand for digital services</td>
<td>• Low Internet access in rural areas</td>
</tr>
<tr>
<td>• Donor investments in e-education</td>
<td>• Limited digital literacy in rural areas</td>
</tr>
</tbody>
</table>

FINANCIAL SERVICES

This SWOT analysis looks at the financial services industry through the lens of digital service firms.

<table>
<thead>
<tr>
<th>Helpful</th>
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<tbody>
<tr>
<td><strong>Internal</strong></td>
<td></td>
</tr>
<tr>
<td>• High awareness of Internet sales</td>
<td>• Limited focus on cybersecurity</td>
</tr>
<tr>
<td>• High use of Internet marketing</td>
<td>• Low staff digital services capacity</td>
</tr>
<tr>
<td>• High desire to expand digital activities</td>
<td>• Unreliable rural Internet connectivity</td>
</tr>
<tr>
<td><strong>External</strong></td>
<td></td>
</tr>
<tr>
<td>• High use of QR code payments</td>
<td>• Growing global cybercrime threats</td>
</tr>
<tr>
<td>• High use of mobile wallets</td>
<td>• Outages affecting digital transactions</td>
</tr>
<tr>
<td>• Opportunity in domestic market</td>
<td>• Low public trust in digital services</td>
</tr>
</tbody>
</table>

INTERNATIONAL MARKETS

This SWOT analysis looks at the financial services industry through the lens of digital service firms.

<table>
<thead>
<tr>
<th>Helpful</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal</strong></td>
<td></td>
</tr>
<tr>
<td>• Strong demand for low-cost support</td>
<td>• Perceptions of Nepali skills quality</td>
</tr>
<tr>
<td>• Keen understanding of needs</td>
<td>• Desire to keep high-value work in-house</td>
</tr>
<tr>
<td>• Connections to international clients</td>
<td>• Profit and connections hoarding</td>
</tr>
<tr>
<td><strong>External</strong></td>
<td></td>
</tr>
<tr>
<td>• Limitless international markets</td>
<td>• Potential taxation of services to Nepal</td>
</tr>
<tr>
<td>• International brand awareness</td>
<td>• Limits on cross-border transactions</td>
</tr>
<tr>
<td>• Strong perception of quality products</td>
<td>• Competition from Vietnam and Indonesia</td>
</tr>
</tbody>
</table>
STAKEHOLDER ANALYSIS

For this Activity, stakeholders are defined as individuals, groups, or organizations that have an interest in digital services and can mobilize resources to affect digital service company competitiveness. Different stakeholders within larger groups can have multiple objectives and views, which may differ and conflict with the norms of other stakeholders.

KEY STAKEHOLDERS

The following shows the dominant leaders, their influence area, and potential positive and negative directions they can have on digital service firms in Nepal.

<table>
<thead>
<tr>
<th>STAKEHOLDER</th>
<th>INFLUENCE AREA</th>
<th>POTENTIAL DIRECTIONS</th>
</tr>
</thead>
</table>
| Digital Services Businesses        | Directly provide digital services, economic growth, and employment opportunities | Positive: digital services expansion  
Negative: constraining government interventions |
| Digital Services Retail Customers  | Choosing desired services and paying market prices, driving growth             | Positive: better services at better prices  
Negative: perceived low value or overpriced services |
| Ministry of Finance                | FDI, Forex, international transfers, digital financial services               | Positive: increasing financial inclusion.  
Negative: disruptive innovation or exclusionary practices |
| Ministry of Communications and Information Technology | Internet access, connectivity, and competition e-Government | Positive: expansion of Internet access and usage, especially in rural or underserved areas  
Negative: monopolies or limiting access |
| Agriculture Industry               | Purchases digital services or develops internal digital capacity              | Positive: better services at better prices  
Negative: perceived low value, overpriced, or overly complicated services |
| Tourism Industry                   | Purchases digital services or develops internal digital capacity              | Positive: better services at better prices, specifically for international customers  
Negative: perceived low value or overpriced services |
| Health Industry                    | Purchases digital services or develops internal digital capacity              | Positive: better services at better prices  
Negative: perceived low value or overpriced services |
| Education Industry                 | Purchases digital services or develops internal digital capacity              | Positive: better services at better prices  
Negative: perceived low value or overpriced services |
STAKEHOLDER MAPPING

The following visualizes the key stakeholders in reference to their level of influence on digital services companies and the impact of their changes. Based on the mapping, financial services (banking) and international clients have the greatest influence and impact on digital services firms in Nepal. In addition, agriculture and tourism clients also have significant impact on digital services firms. To control their impact and influence, digital services firms should communicate with government ministries, satisfy retail and education customers, and monitor other donor programs.

<table>
<thead>
<tr>
<th>Stakeholder Type</th>
<th>Activity Description</th>
<th>Positive:</th>
<th>Negative:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Services Industry</td>
<td>Purchases digital services or develops internal digital capacity</td>
<td>better services at better prices</td>
<td>perceived low value, overpriced, or vulnerable services</td>
</tr>
<tr>
<td>International Markets</td>
<td>Purchases digital services and staff capacity to develop their solutions</td>
<td>better services at better prices</td>
<td>perceived low value, overpriced, or vulnerable services</td>
</tr>
<tr>
<td>Other Donors</td>
<td>Complimentary interventions and direct government support</td>
<td>enhancing related investments and increasing impact</td>
<td>working at cross-purposes or duplicating activities</td>
</tr>
</tbody>
</table>
SUMMARY OF CONSTRAINTS

Digital services firms face a series of constraints on their growth and employment opportunity. Firms in the agriculture, tourism, and financial services industries face constraints to expand their online services through internal solution development or purchasing services from dedicated digital firms.

SECTOR-LEVEL ORGANIZATION

There is currently no clear industry group that represents digital services firms at the national level. Existing organizations, such as the Computer Association of Nepal, focus on retailers of personal computing devices, resulting in limited, sporadic, and uncoordinated engagement with the government on digital issues and a lack of clarity on applicable rules and regulations. New legislation ignores the needs of digital services firms, with one interviewee wondering if the DNF implementation activities even included any input from actual digital services firms.

DIGITAL SERVICE NEEDS

Agriculture, tourism, healthcare, education, and financial services firms struggle to understand where they should invest their limited capital to have the greatest impact on their operations. There is widespread agreement that the overall industry, and each individual firm, are underinvesting in technology; however, multiple interviewees struggled to explain where and how much they should invest to increase their competitiveness. This investment confusion restricts the ability of these sectors to purchase services from digital companies.

HUMAN CAPITAL

Nepal universities graduate 3,000 students annually, with only 20% of them staying in Nepal to work. Outdated university curricula means that digital services firms who do hire Nepali graduates typically must provide extensive training and mentoring programs to prepare the new staff to work on client projects. One interviewee mentioned that his company has a 6-month internship program for all new hires to train (or re-train) to international skill levels. All interviewees said they could only keep staff for 2-3 years before the skilled staff left for international companies or emigrated outside of Nepal.

GOVERNMENT ENGAGEMENT

Without centralized industry representation to engage the government in a systematic and strategic process, digital services firms are left to informally engage with government actors. Companies attempting to engage the government independently often struggle to understand which ministries or regulatory bodies are responsible for specific business rules.

Government staff are also confused by new technological innovation ideas. One interviewee mentioned that government staff often conflate blockchain solutions, a distributed ledger technology, with banned cryptocurrencies like Bitcoin, resulting in multiple challenges to their company’s legal standing in the country. Some of these challenges originated in regulatory bodies that don’t actively regulate their company.
FINANCING
Nepali digital services firms are constrained in their ability to fund expansion via internal investments due to government foreign currency purchase restrictions. Firms only use onshore funds for pressing costs, as they cannot use onshore funds to purchase international goods and services. External investment, such as seed funds and VC is rare due to the foreign currency restrictions and the $160,000 minimum FDI requirement. The lack of sizeable, numerous venture capital firms to support start-up ecosystems and supply financial mentorship results in a limited pipeline of new entrants into digital services.

CYBERSECURITY
Cyber-attacks are persistent and expanding across the Nepali economy. A cybersecurity leader in Nepal noted that Russian cybercriminals now target trekking companies at the start of the tourist season and farmer cooperatives at the end of the growing season due to significant deposits the companies have on hand. In addition, financial services firms have remained under constant attack. All three respective industries faced ransomware attacks that sought payments that unlock systems but do not expose sensitive client data.

In addition, the GoN is also a target by nation-state actors that seek to destabilize the country instead of profiting from the target.

Both commercial and government groups lack awareness of how dangerous the Internet is now, and without government regulation requiring cybersecurity efforts, both groups may not implement protective practices that reduce risk and protect data effectively.

INTERNET CONNECTIVITY
The high cost of Internet connectivity directly restricts the ability of Nepali digital services firms to be cost-competitive in developing online solutions. The lack of Internet access outside of major cities constrains agriculture, tourism, and financial services companies from investing in online services, reducing revenue opportunities for digital services firms. It also reduces the ability for digital services firms to source employees from outside major cities since remote staff need reliable Internet access.

DIGITAL LITERACY
Farmers are unable to understand modern mobile application interfaces. Tourism industry staff are unable to create high quality websites. Banking staff are unable to manipulate and analyze data. New digital company staff are unable to start work without months of postgraduate training. Each of these issues, cited by interviewees, stems from a low level of digital literacy across the Nepali population. Digital illiteracy further manifests itself in low uptake of everything from Internet access to social media consumption and reduces the prestige of digital services companies and the services they offer.
RECOMMENDATIONS

Digital services firms can increase their competitiveness by becoming an export sector and supporting domestic markets in the agriculture, tourism, and financial services industries. Impact should be seen within 6-12 months for immediate actions and within the next year or more for longer-term actions.

IMMEDIATE ACTIONS

The following immediate actions can improve engagement with digital services firms and support leadership in their international and domestic competitiveness.

CONVENE A DIGITAL SERVICES ADVOCACY GROUP

Every report and interviewee reinforced the need for an industry-level advocacy group to serve as a credible voice for the digital services industry. There is not a clear leader in the market now; however, the recent Digital Nepal Conclave highlighted that Huawei – a Chinese telecommunications firm – wants to serve as that leader.

TCA should take the leadership role by leveraging the USAID brand to consolidate desire and excitement into an inclusive, unified digital services sector membership organization that includes the government, private sector, and civil society actors. This effort can build on an existing organization or create a new one.

The benefits of such an organization would immediately improve the business enabling environment due to:

- Strategic engagement with the government and direct influence on current and future regulation.
- Educating other domestic sectors on digital technology needs and online service benefits.
- Upgrading training provider curriculum to provide current skills and competencies.

ORGANIZE DIGITAL TRAINING PROGRAMS

Time and again, company leaders complained that they cannot hire enough qualified technology staff, leading them to create months-long training and mentoring programs to onboard entry-level software developers, online marketers, and digital solution salespeople. Existing university programs and training institutions did not supply enough graduates – in quality or quantity.

TCA should investigate organizing access to existing digital services training courses offered by the likes of Google, Microsoft, Cisco, Amazon, and other US-based technology companies to increase the digital capacity of Nepalis interested in a digital services career (preservice) or those already in the field that seek to upgrade their skills (in-service).

Training programs can be organized as learning ladders, allowing learners to enter and exit at predetermined points along a pathway that can lead from entry-level to CIO-level competencies. These learning ladders can involve multiple training providers, learning modalities, and payment schemes, resulting in certificates issued by the program or the digital services advocacy group.
CONDUCT DIGITAL MATURITY ASSESSMENTS

Leaders in agriculture, tourism, and financial services companies often expressed frustration and confusion on which digital services they need and the benefits that could accrue from investments into online solutions. This was especially pronounced with cybersecurity, where several interviewees openly stated they knew they could be targeted by cybercriminals but did not know how to protect themselves.

TCA should help these sectors understand their technology strengths, weaknesses, opportunities, and threats (SWOT) using a tool like Deloitte’s unbiased and revealing Digital Readiness Maturity Model assessment. This comprehensive assessment gives private sector companies insight into where they should and should invest in digital services to improve their near-term competitiveness.

Deloitte can initiate digital maturity assessments with leading firms across the three sectors to use in the context of Nepal and showcase the assessment’s value. It can then transition the assessment’s use to the digital services advocacy group for long-term sustainability.

ACTIONS TO EFFECT CHANGE

TCA can implement these longer-term actions to effect change in the digital services sector, and the agriculture, tourism, and financial services industries over the next year or more.

IMPROVE GOVERNMENT ENGAGEMENT

Government policy and regulations for digital services was described by interviewees as nonexistent, overly ambiguous, or restrictive. At the same time, interviewees did not regularly engage with the government, viewing policy interactions to be slow and confusing.

TCA should invest in developing ways for digital services companies and their clients to self-organize their interests and needs into clear policy points and facilitate constructive delivery that can result in improved government rules and regulations. This can be completed by the program directly or the digital services advocacy group.

There is already a clear demand for improved foreign exchange regulations that allow export-oriented companies to buy international services with minimal restrictions. In addition, there is demand for international customers to buy goods and services online from Nepali companies using major credit cards and electronic payment systems.

Other policy demands include electronic signatures, digital IDs, and clearer regulation of new digital services company services. Better digital services regulation can be combined with private sector seed-funding for innovative start-up companies and initiate easier access to foreign funds to increase entrepreneurial opportunities in the sector.
INCREASE SKILLED DIGITAL STAFF

Increasing the digital skills of potential and existing staff isn’t just a near-term activity.

TCA should engage the private sector over the long term to continuously evaluate its needs for quality, digitally skilled staff. In addition, TCA should work with universities and training institutions to improve their curriculum to match current and future needs.

The program can work with digital services companies to assess gaps in existing software engineering education programs and work with education stakeholders to develop targeted training activities that match private sector needs. Once these actions are completed, the program can then advocate with the government to support including these training activities in the degree processes.

The program can also work with digital services firms to design retention policies adn programs to keep skilled staff working for the GoN or private sector companies. Some interviewees suggested improving new office cultures, increasing incentive pay, or developing a 35-hour work week to retain employees.

PROMOTE CYBERSECURITY PRACTICES

There is no clear policy on cybersecurity for government or private sector entities. Cybersecurity awareness across both groups is low, leaving the Nepali economy exposed to security threats. Shown by recent attacks on US local government\textsuperscript{lii} and the Costa Rican government\textsuperscript{liii}, there is a distinct appetite for cyberattack on government, with the possibility of disastrous risks.

TCA should help government and agriculture, tourism, and financial services companies quantify their relevant cybersecurity risks and define the motivations of cybercriminals who attack each group. The program can then assist the government and digital services firms to develop relevant policies and commercial solutions to increase cyber resilience.

One obvious regulation would require organizations (government or private sector) to utilize advanced security technologies and methodologies when engaging in financial transactions. Although most banks do this already, there is not a strong legal requirement to do so. Another regulation could focus on the need for secure storage of personally identifiable information (PII) and financial transaction data, including secure backups of that data, to guard against ransomware.

CATALYZE AGRICULTURE SERVICES DIGITIZATION

Although it is the largest industry in Nepal, agriculture may also be the least digitized, as farmers often lack digital literacy, engage in subsistence farming, and are risk adverse, .

TCA should support the digitization of agriculture supply chains by helping input sellers, cooperatives, and wholesalers to increase their use of digital services and increase the digital literacy of Nepalese farmers. This digitization can be in coordination with Feed the Future activities that target high value vegetables, maize, rice, lentils, and goats.

With 40% of farmers listening to FM radio every day,\textsuperscript{liv} the TCA could initiate an intervention to start helping input sellers better target their goods and services to farmers. As farmers purchase inputs, they could connect directly to extension workers who use text message services (e.g., WhatsApp) to stay in
contact during the growing season and share new approaches and leading practices. In addition, farmers could also be offered affordable index insurance by innovative digital financial services companies that also provide lending and other services.

When harvest time approaches, cooperatives and wholesalers could connect to farmers via online marketplaces that aggregate demand, offer direct linkages to urban customers, showcase farm to fork traceability, and pay farmers via digital payments.

**UNLOCK TOURISM E-COMMERCE OPPORTUNITIES**

Tourism is the second biggest industry of Nepal and tourism companies are skilled in using online tools to market their services. However, several tourism experts bemoaned the lack of an international credit card payment gateway to facilitate online payments and mentioned that virtual reality tourism is an unexplored opportunity.

TCA should help the tourism industry secure an international credit card payment gateway to increase online sales and meet demand for digital payment services as almost all international tourists expect to pay for certain services using credit cards or payment systems like PayPal or Venmo in advance of their travel.

TCA can explore virtual reality (VR) tourism as a digital service sold to aspirational travelers – those who will never visit Nepal but still want to experience its beauty – a target market potentially much larger than tourists who physically visit the country. VR is fully immersive with 3D images and surround sound, and is more comprehensive than virtual tours, such as Google Street Views of Himalayan trekking routes.

**INCREASE DIGITAL HEALTH INVESTMENTS**

Nepal is lagging behind in key health indicators, which only got worse due to the COVID-19 pandemic. The GoN needs catalytic investment into digital health to accelerate Universal Healthcare Coverage across the country and in rural areas.

TCA should help the health industry improve health outcomes with targeted digital health interventions from digital solution providers that focus on interacting directly with patients and result in demonstratable improvements in the quality of care.

The GoN could institute a national healthcare hotline and a telehealth program (part of the national health system) that will allow citizens to call into a call center for a health consultation and get direction to local service providers for treatment and pharmaceutical drug prescriptions. As an example, the Babyl service from Babylon Health Rwanda uses this model to provide hyper-local health services to Rwandans on a nationwide scale for almost no cost to the patient.

**EXTEND DIGITAL EDUCATION SERVICES**

The GoN has just released the 10-year Education Sector Plan in 2022 that will provide investments across the education sector. This plan builds on the DNF by supporting the digitization of schools and improving teacher and student usage of digital education services.
TCA can provide the GoN education investments across the full landscape of information and communication technology, including FM radios, televisions, and Internet-enabled solutions. These investments can focus on traditional learning subjects, but use technology as a medium of learning to increase digital literacy.

The program can work with schools and digital service providers to extend existing eLearning systems, of which there are already many, and configure them for the best approach in Nepal. eLearning systems help students, teachers, and caregivers of students understand student progress (or lack of it) in real time and support student exploration and learning. eLearning systems built on the Moodle platform are even royalty or license free.

**EXPAND DIGITAL FINANCE SOLUTIONS**

Digital services companies are already deeply engaged with financial services firms to support digital financial services such as mobile wallets and QR code payment solutions that saw rapid adoption during the COVID-19 pandemic. However, engagement with these services has mainly focused on higher socioeconomic groups in major cities.

TCA should help increase digital financial inclusion with strategic private-sector partnerships that increase access to online financial services for all Nepalis. The program can utilize the USAID FinTech Playbook which details five objectives and ten illustrative ways to expand financial access and increase household financial resilience using digital technologies.

The program can increase knowledge of underserved market segments to help financial services and digital services firms understand the financial markets. They can develop appropriate mobile applications for rural and marginalized customers. The program can de-risk appropriate sources of capital to help extend the reach of digital financial services to new customers. In addition, the program can also help build awareness of formal financial services among rural and marginalized customers.

**GROW INTERNATIONAL MARKETS**

Nepali digital solution providers are deeply engaged with international software development companies and business process outsourcing firms. However, these relationships primarily leverage Nepal’s lower cost of staff and can be a hindrance to future growth when competition increases from other low-cost countries.

TCA should help digital solution providers move up the value chain based on quality solutions developed using international software development standards, with specialization into a specific software development category.

The program can help firms obtain ISO or CMMi certification in software development processes and use PMBOK standards for project management to immediately improve perceptions of quality. The program can also work with firms to develop a Nepal market niche in areas like healthcare or insurance that can brand the country as a leading developer of software for those subsectors. A defined brand conveys expertise and quality and insulate Nepal against competition from Vietnam, Indonesia, and other low-cost countries.
SUPPORT INTERNET ACCESS EXPANSION AND AFFORDABILITY

Nepal ranks at the lower end of Asian countries in many aspects of Internet access, affordability, and use with prominent digital divides between urban/rural and male/female groups.¹²

TCA should help the government and private sector promote relevant Internet infrastructure, awareness, and services to these groups and bring them online. Affordable infrastructure can include lower mobile data tariffs and fixed broadband services provisioned through a mix of government interventions and private sector innovations. Awareness campaigns can be supported via private sector marketing of agriculture, tourism, and financial services solutions that specifically target women, youth, and other disadvantaged groups in urban and rural areas.

A focus on agriculture and tourism solutions could have a larger impact on the rural and gender digital divides. Both industries have large populations of rural women leaders as many men work abroad to generate remittance income for their households.
ANNEXES

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### KEY INFORMANTS

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ENDNOTES

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