

འབྲུག་གཞུང་འབྲུག་རྒྱུ་ལས་ཤེ།
GovTech
Bhutan



ESCAP
Economic and Social Commission
for Asia and the Pacific



Kingdom of Bhutan Digital Economy Development and Transformation Strategy

A TECHNOLOGICALLY ADVANCED NATION, WITH EMPOWERED
CITIZENS, AND A THRIVING DIGITAL ECONOMY

འབྲུག་གཞུང་འབྲུག་རིག་ལས་ཤི།
GovTech
Bhutan



ESCAP
Economic and Social Commission
for Asia and the Pacific



Copyright September 2023
GovTech Agency and UNDP
All rights reserved

This report has been commissioned as part of UNESCAP and UNDPs support to the GovTech Agency through the UNRCO, to understand the current digital ecosystem and devise a digital strategy for a thriving digital economy in Bhutan. Core team leads for this project include Deepika Rai (Chief ICT Officer, GovTech), Jamyang Sonam (Deputy Chief ICT Officer, GovTech), Tshokey Lhamo (ICT Officer, GovTech), Tshering Wangchuk (ICT Officer, GovTech), Tshering Wangmo (Digital Advocate, UNDP Bhutan), Calum Handforth (Digital Programmes Strategic Manager, Chief Digital Office, UNDP), Debashis Nag (Digital Transformation Specialist, Chief Digital Office, UNDP) and Stephanie Choo (Social Affairs Officer, UNESCAP).

ACKNOWLEDGEMENT

We would like to extend sincere appreciation to the interviewees and stakeholders for providing invaluable input during the process of drafting this document.

A special thank is extended to the Office of the UN Resident Coordinator Bhutan, the UNDP Bhutan Country Office, UNESCAP based in New Delhi and colleagues from divisions within the GovTech providing valuable guidance and support.

We would also like to thank our two international consultants Mr. Tanatat Puttasuwan, Digital Economy and Strategy Expert, and Mr. Ahamed Nishadh Najeem, Sub-Regional Digital Expert for South Asia for engaging with diverse stakeholders during the bilateral discussions and validation workshops.

KINGDOM OF BHUTAN
DIGITAL ECONOMY DEVELOPMENT AND TRANSFORMATION STRATEGY

TABLE OF CONTENTS

ACKNOWLEDGEMENT	2
ACRONYMS AND ABBREVIATIONS	4
LIST OF ILLUSTRATIONS:	5
EXECUTIVE SUMMARY	6
BACKGROUND	7
COUNTRY CONTEXT	8
SECTOR AND INSTITUTIONAL CONTEXT	9
METHODOLOGY, APPROACH, LIMITATIONS	10
PART A: ICT SECTOR AND DIGITAL ECOSYSTEM ANALYSIS	12
PART B: DIGITAL ECONOMY DEVELOPMENT AND TRANSFORMATION STRATEGY	28
INTERNATIONAL CASE STUDIES AND PRACTICES.....	48
FDI IN ICT AND DIGITAL SECTOR AND JOB CREATION	53
FREELANCE AND REMOTE WORK	54
APPENDICES	56
REFERENCES.....	64

ACRONYMS AND ABBREVIATIONS

AI	Artificial Intelligence
APCICT	Asia Pacific Training Centre for Information and Communication Technology for Development
ASEAN	Association of Southeast Asian Nations
BtCIRT	Bhutan Computer Incident Response Team
BNB	Bhutan National Bank
BoB	Bank of Bhutan
BPO	Business Process Outsourcing
CMM	Capability Maturity Model
CRVS	Civil Registration and Vital Statistics System
CSC	Community Service Center
CSI	Cottage and Small Industries
CSO	Civil Society Organizations
CTO	Chief Technical Officer
DEE	Department of Employment and Entrepreneurship
DDF	Digital Development Fund
DHI	Druk Holding and Investments Limited
DOI	Digital Object Identifier
DPO	Disability Persons Organization
DDSB	Digital Development Strategy Board
D MDF	Department of Macro-Fiscal and Development Finance
DISRS	Digital Industry Skills Requirements Survey
DST	Digital Service Tax
EIS	Executive Information System
ESCAP	Economic and Social Commission for Asia and the Pacific
FYP	Five-Year Plan
FY	Fiscal Year
FDI	Foreign Direct Investment
GDC	Government Data Center
GSP	Generalized System of Preferences
GDP	Gross Domestic Product
GNHC	Gross National Happiness Committee
GovTech	Government Technology Agency
HR	Human Resource
IBLS	Integrated Business Licensing Service
ICMA	Information, Communications and Media Act
IT	Information Technology
ICT	Information and Communication Technologies
ISP	Internet Service Provider
ITES	Information Technology Enabled Services
ITO	Information Technology Outsourcing
ITU	International Telecommunication Union
JICA	Japan International Cooperation Agency
KPI	Key Performance Indicator
LMIC	Lower Middle-Income Country
MLE	Monitoring, Learning and Evaluation
MoAL	Ministry of Agriculture and Livestock
MoESD	Ministry of Education and Skills Development
MoENR	Ministry of Energy and Natural Resources

MoF	Ministry of Finance
MoFAET	Ministry of Foreign Affairs and External Trade
MoH	Ministry of Health
MoICE	Ministry of Industry, Commerce and Employment
MoIT	Ministry of Infrastructure and Transport
NDI	National Digital Identification System
NSB	National Statistics Bureau
Nu	Bhutanese Ngultrum, the national currency
OGOP	One Gewog One Product
ONDC	Open Network for Digital Commerce
PMO	Prime Minister’s Office
PWD	Persons with Disabilities
R&D	Research & Development
RCSC	Royal Civil Service Commission
RGoB	Royal Government of Bhutan
RMA	Royal Monetary Authority of Bhutan
RUB	Royal University of Bhutan
RSEB	Royal Stock Exchange of Bhutan
SEO	Search Engine Optimization
SOP	Standard Operating Procedures
SSOT	Single Source of Truth
TTPL	Thimphu Tech Park Limited
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
WoC	Whole of Country
WoG	Whole of Government
WTO	World Trade Organization

LIST OF ILLUSTRATIONS:

Boxes:

Box 1:	Bhutan’s ranking and scores in international indexes related to technology
Box 2:	Example of India’s digital economy development
Box 3:	Capacity of the Government Data Center

Figures:

Figure 1:	Percentage Share of Internet Connection by Dzongkhags
Figure 2:	Percentage of Mobile Subscribers in Bhutan
Figure 3:	Percentage of Internet Users in Bhutan
Figure 4:	ICT Skills
Figure 5:	Thematic Pillars in Digital Economy Development and Transformation Strategy

Tables:

Table 1:	Worldwide IT Spending Forecast
Table 2:	Comparative Prices of Mobile Broadband in Other Countries

EXECUTIVE SUMMARY

The Royal Government of Bhutan (RGoB) is in the process of formulating the 13th Five-Year-Plan (2023 – 2028), and it identifies priority development clusters including economic development, social development, security, and governance. Part of the 13th Five-Year-Plan (FYP) focuses on the ICT sector and digital economy development – “Digital Bhutan”, with the aims to

- i) increase the GDP contribution from the digital economy to 10 percent by 2034;
- ii) generate gainful employment and create 1,000 jobs per year in the digital economy starting in 2024; and
- iii) attract and increase foreign direct investments (FDI) from Nu. 43.3 to Nu. 100 billion by 2029.

Focusing on digital tools to enhance economic and social development, the RGoB has taken significant steps to develop the ICT sector. For examples, the Digital Drukylul Flagship Programmes to enhance digital infrastructure and provide the foundation for e-government, the biometric-based national digital identity system, public and private service deliveries, ICT in schools, enabling the business environment and creating opportunities for digital businesses, and bridging the digital divides and digital literacy. The efforts were reaffirmed by the COVID-19 pandemic where digital is the “new normal” to leverage the country’s comparative advantage and strive towards sustainable development. The RGoB also established the Government Technology Agency (GovTech) to be the dedicated agency to lead and coordinate ICT and digital economy development.

The Digital Economy and Transformation Strategy of the RGoB supports the development vision “Developed Bhutan”, a robust vision of the digital economy as articulated in the 13th FYP. The vision is to become a high-income country, driven by innovations, empowered citizens, and technologically advanced digital economy to achieve long-term sustainable economic and social growth. Through the literature reviews, consultations, and validation by the government and stakeholders, the strategy is prepared and presented in two parts, namely

Part A: ICT and Digital Ecosystem Analysis reflects on the developments and existing ICT and digital ecosystem analysis, the gaps and challenges, and future development aspirations of the Whole-of-Country, including the government, private sector and stakeholders; and

Part B: Digital Economy Development and Transformation Strategy delves into specific strategic recommendations, and is organized under six thematic pillars, namely

- i) Digital Infrastructure Development;
- ii) Digital Government Development;
- iii) Private Sector Development and Enabling Business Environment;
- iv) Digital Financial Services Development;
- v) People and Skills Development; and
- vi) A cross-cutting pillar Governance, Institutional Arrangements, and Legal Reforms.

A total of 30 sub-strategies are recommended, the narratives are followed by the summary of the sub-strategies. Appendix B includes the aggregated summary table for reference. Part B also presents international case studies and best practices in digital development and transformation. In addition, identification of ICT and digital business for potential FDI and job creation, and freelance and remote work are also discussed.

BACKGROUND

In recent years, ICT and digital technologies have transformed the Bhutanese economy, in government, businesses, as well as people's lives, and for both public and private sector service deliveries. Especially during the COVID-19 pandemic the country witnessed the increasing use of digital technologies to support inclusive economic and social developments, the phenomenon of which is also seen internationally. The RGoB foresees the opportunity to further develop the digital economy, with the vision for Digital Bhutan to become "a technologically advanced nation, with empowered citizens and a thriving digital economy." To realize the vision, the RGoB has embarked on significant steps in developing the ICT sector, including enhancing the ICT infrastructure, public sector restructuring, public and private services delivery, policy, and regulatory reforms to support the enabling environment, and skills and capacity development. In these early stages of development, challenges remain to further leverage the potential of digital economy to play a major role in long-term sustainable economic and social development and growth. In this context, digital economy and its development is enabled not only by ICT and digital technologies but should be supported by policies and regulations that are consistent with international practices. A thriving digital economy serves as a driver to generate economic activities, jobs, trade, as well as innovations in multi-sectors and industries such as agriculture, tourism, manufacturing, education, health, and technology to achieve economic and social development and growth.

The RGoB is in the process of formulating the 13th FYP (2023 – 2028), and it classifies four priority development clusters including **economic development, social development, security, and governance** with emphasis on

- **Prosperity:** providing income generation opportunities for the citizens as well as for businesses and contributing to GDP growth.
- **People:** ensuring equal participation in economic and social development activities, including skills and capacity development, and with the emerging digital technologies improving digital literacy and bridging digital divides to not leaving anyone behind.
- **Progress:** leveraging the digital economy to improve public service delivery and enable economic and social development that is comparable to international developments and practices.

More specifically, the **Governance Cluster, Outcome 1, Output 5** aims to strengthen the ICT and digital ecosystem through four projects, namely¹

- i) strengthen the digital ecosystem;
- ii) digital transformation of the government;
- iii) strengthen cyber security; and
- iv) strengthen the digital payment system.

The development of the ICT sector is to advance Digital Bhutan to be the driver of economic growth, with **specific targets** including:

- i) to increase the share of GDP contribution from the digital economy to 10 percent by 2034;
- ii) to generate gainful employment by creating 1,000 jobs per year in the digital economy starting in 2024; and
- iii) to attract and increase FDI from Nu. 43.3 to Nu. 100 billion by 2029.

¹ Royal Government of Bhutan. "Consolidated 13th FYP, 25 May, 2023".

In 2022, the RGoB was restructured, and the GovTech was established to be the dedicated agency to lead and coordinate ICT and digital economy development. The digital development efforts, for example, the Digital Drukylul Flagship Programme that focuses on fiber-optic government network, citizen centric public and private service deliveries, ICT in schools, the biometric-based national digital identity, and digital literacy are progressing and are now part of GovTech’s ICT and digital economy development mandates. The RGoB is also in the process of enhancing the ICT infrastructure. The enabling laws and regulations are being reviewed. HR capacity, skills development and digital literacy are being addressed in both formal education and also professional and public trainings.

The assignment is two-fold, Part A, the “the ICT and Digital Ecosystem Analysis” and Part B, “the Digital Economy Development and Transformation Strategy”. The strategy includes recommendations on policy measures and/or regulatory reforms to further enable the development of digital economy, opportunities in ICT sector, potential priority areas of FDI, job creation including freelance and remote work, and capacity building in the digital sector that are consistent with the RGoB development vision as articulated in the 13th FYP, and implementable in the next 10 years.

COUNTRY CONTEXT

The Bhutanese economy exhibited consistent growth and gains in poverty reduction prior to the COVID-19 pandemic. Since the early 1980s, the annual growth of GDP averaged 7.5 percent, with 5.5 percent of GDP in 2019, making Bhutan one of the fastest-growing economies globally. From 2007 through 2017, Bhutan reduced poverty by two-thirds, from 36 percent to 12 percent, based on the US\$3.20/day poverty line², albeit the pace has slowed down in recent years due to COVID-19 pandemic. Much of the growth has been driven by public sector-led hydropower development projects and the export of electricity to neighboring India.

Economic dependence on construction-related hydropower projects and prevalence of subsistence employment in agriculture make Bhutan’s economy highly vulnerable to macroeconomic volatility and climate shocks. Given the nascent non-farm private sector in Bhutan, agriculture (including subsistence) accounts for close to 50 percent of employment in Bhutan.³ At the same time, most of Bhutan’s productive infrastructure, fertile agricultural land, and over 70 percent of the settlements are located along the main drainage basins, which puts them at high risk of flooding.

Bhutan’s economic contraction from the COVID-19 pandemic highlights the need for diversifying the economy, adopting digital technologies to enhance economic activities, and nurturing skilled Bhutanese workers. The unemployment rate has risen almost twofold to 5 percent in 2020 from 2.7 percent in 2019.⁴ Activity in the service sector declined as tourist arrivals dried up, leading to significant loss of jobs and livelihoods.⁵ Industrial activities were severely disrupted due to shortages in critical inputs (including migrant workers) and depressed external demand, especially from India. Consumption and investment declined due to domestic containment measures and disruptions in public sector infrastructure projects. High inflation has also eroded the real incomes of the people. The RGoB foresees the opportunity to further transform the economy and develop the digital economy.

² Summarized from WBG Country Statistics Report, 2022

³ Bhutan Labour Force Survey Report 2021

⁴ Bhutan Labour Force Survey Report 2021

⁵ Services sector workers in urban areas, including many that are directly or indirectly dependent on tourism, have experienced job or earning losses (United Nations Development Program. “Rapid socio-economic assessment of COVID-19 on Bhutan’s Tourism Sector.” March 2020).

Bhutan will graduate from LDC to become LMIC by end-2034 and aims to achieve the upper middle-income country level by 2029. The 13th FYP identifies priority development clusters, i.e. economic development, social development, security, and governance, and growth through digital development and digital economy is the strategic direction. The RGoB heeds the vision “Bhutan can be rich and be happy” without forgoing sustainable development and leaving no one behind.

Bhutan has comparative advantages, but there remain challenges to development. Bhutan has the comparative advantage by being land-linked, strong English language skills, young dynamic workforce, rich natural resources and the only “carbon neutral” country in the world, and political stability. While the challenges that need to be overcome include:

- Economic: small-sized market economy, impediments to private sector doing business, economic dependency on South Asia region, cumbersome businesses and company laws and regulations including tax laws, and large informal economy, HR capacity and migration of young workforce (brain drain)
- Governance: newly restructured public sector structure is still being coordinated, lack of information sharing from the siloed working environment, public sector data management is fragmented, traditional access to public service delivery is inefficient
- Social: digital divide, digital literacy, rural disparities and poverty, HR capacity
- Security: including economic, climate, environment, and cybersecurity

SECTOR AND INSTITUTIONAL CONTEXT

The RGoB has taken significant steps to develop the ICT sector and Digital Bhutan, and designated GovTech as a dedicated lead ICT development agency. Policy measures and regulatory reforms to enable ICT and digital sector development and to enhance economic activities have started and are on-going. In 2022, the RGoB was restructured, and GovTech was established to be the dedicated agency to lead and coordinate the ICT and digital sector development, and also to oversee the on-going ICT and digital economy developments. Based on the Governance Cluster Outcome 1, GovTech is accountable for two KPIs, GovTech Maturity Index and Cybersecurity Capability Maturity Model (CMM) Index.

1. The GovTech Maturity Index comprises of four components:
 - i) Core Government System or e-government
 - ii) Public Service Delivery
 - iii) Citizen Engagement
 - iv) GovTech enablers

According to the World Bank’s 2021 assessment, GovTech Maturity Index was at “high” which means there is significant focus on GovTech as the lead agency. Policy initiatives and regulatory reforms such as the Digital Druklyul Flagship Programmes that focused on fiber-optic infrastructure, government digitalisation, citizen centric services such as passport and driver’s license, public service delivery, ICT in schools, the biometric-based national digital identity (NDI), and digital literacy.⁶ In the 13th FYP, the RGoB is targeting to improve GovTech Maturity Index to achieve “Very High”. To achieve the goal, GovTech will focus on all components; however, the priority will be given to the low performing components.

⁶ World Bank Regional Brief South Asia, GovTech Maturity Index 2022 Update, and consultations with GovTech.

2. The Cybersecurity CMM was developed by the Global Cyber Security Capacity Center under the University of Oxford. The model considers five dimensions which constitute the national capacity a country requires to be effective in delivering cybersecurity services. The five dimensions are:

- Dimension 1: Cybersecurity Policy and Strategy
- Dimension 2: Cybersecurity Culture and Society
- Dimension 3: Building Cybersecurity Knowledge and Capabilities
- Dimension 4: Legal and Regulatory Frameworks
- Dimension 5: Standards and Technologies

The five dimensions consist of twenty-one components are assessed based on stages or levels of maturity, of which there are five stages:

- Stage 1-Start-up: No capacity exists, or it is being considered. The start-up level may reflect a thought or an observation about cybersecurity, where no concrete action has been taken.
- Stage 2-Formative: Some aspects of cyber-security have been formulated, but may be ad-hoc, disorganized, poorly defined - or simply new.
- Stage 3-Established: The elements of cybersecurity are in place and working, with defined scope, roles and responsibilities. Consideration of the relative allocation of resources may not yet have been discussed at this stage, nor has trade-off decision-making been made concerning the relative investment priorities.
- Stage 4-Strategic: This stage is concentrated on strategic decision-making. Choices have been made at a national level about which parts of the sub-factors are important, and which are less important for the country. These choices posit an intended outcome once implemented, which takes into account particular circumstances and other existing national goals. These decisions are reflected in strategic resource allocation.
- Stage 5-Dynamic: At the dynamic stage, there are clear mechanisms in place to refine strategy in the light of the prevailing circumstances, such as the technology of the threat environment, global conflict, or significant changes in one area of concern (e.g. cybercrime or privacy). Dynamic entities have developed methods for evolving and changing strategies in a highly flexible manner. Rapid decision-making, reallocation of resources, and constant attention to the changing environment are key features of this stage.

In 2015, the Oxford University, with support from the World Bank, assessed Bhutan's cybersecurity CMM, and it was determined that a total of twenty out of twenty-one components across the five dimensions to be at Stage 1: Start-up. By 2025, Bhutan aims to implement the ICT and digital economy development strategy and implement key cybersecurity programs to achieve Stage 3: Established for all the components under the five dimensions. As per the CMM 2021, there are now twenty-three components.

METHODOLOGY, APPROACH, LIMITATIONS

Methodology and Approach. Literature was reviewed, including for example, country and sector analysis documents and reports, laws and regulations, international organizations' reports, research and strategy papers, international practices (see References). This was followed by in-country and remote interviews (see Appendix A) to collect data and gain a deeper understanding in relations to ICT sector ecosystem, development of digital economy, challenges and impediments to the sector's contribution to economic development, policy measures and reforms that have been implemented, and future development aspirations of the RGoB, and challenges facing the private sector and stakeholders.

Limitations. While the strategy has been prepared comprehensively, there were certain limitations that could have impacted on the depth of some of the recommendations. The limitations include the limited time to acquire information and prepare the strategy, difficulties in obtaining updated statistics and relevant documents pertaining to the ICT sector development and the national plan, most of which were gathered on a rolling basis as the strategy was prepared. While government officials were more than willing to share information and comments, it was found that information was not current, at times conflicting and needed to be verified independently, which is the norm of most developing countries. The strategy was also presented and validated by the RGoB and stakeholders and adjusted to enhance its workability. Overall, the strategy was guided by the GovTech Agency, and in some cases other government agencies, educational institutions, private sector, CSOs, industry experts, the ESCAP and the UNDP.

PART A: ICT SECTOR AND DIGITAL ECOSYSTEM ANALYSIS

Background

The Kingdom of Bhutan, with a population of little less than 800,000 and a GDP of approximately USD 2.5 billion, the country has taken significant steps over the last few years to develop its economy, and a sector that has been identified by the RGoB to achieve the vision of a “Developed Bhutan” is the ICT sector through digital economy.

In 2011, the government prepared the Bhutan ICT Roadmap to recognize the value that ICT can bring to economic and social development guided by the principles of Gross National Happiness. In 2015, the roadmap was revised to meet the emerging challenges facing Bhutan. It outlined the country's vision for the development of the ICT sector over the next 10 years through 2024. The roadmap identified three key outcomes:

- **ICT for good governance:** To use ICT to improve the efficiency and transparency of government services and to support the socio-economic development policies. This includes initiatives such as an integrated citizen services, e-government for policy formation, which include data on economic, social, environmental, revenue and taxation, procurements, and contracts.
- **ICT for a shared national consciousness:** To use ICT to promote a shared national identity, culture and citizen-centric. This includes initiatives like creating an online national library and developing educational ICT resources in the Dzongkha language.
- **ICT as a key enabler for sustainable economic development:** To promote economic development and growth. This includes initiatives such as developing a national ICT infrastructure, promoting ICT and ICT-enabled businesses, human resource capacity development, legal and regulatory reforms.

The Bhutan ICT Roadmap also identified the following challenges:

- **Lack of ICT infrastructure in rural areas:** Bhutan is a mountainous country with a small population spread over a large area. This makes it difficult and expensive to provide ICT infrastructure to rural areas.
- **High cost of ICT services and limited access especially in rural areas:** The cost of ICT and digital services in Bhutan is relatively high compared to other countries resulting in limited access. This is due to several factors, including the high cost of importing ICT and digital equipment and the small size of the market preventing economies of scale.
- **Shortage of skilled ICT professionals:** A major challenge to the development of the ICT sector is that Bhutan does not have a large pool of skilled ICT professionals.
- **Low awareness of the benefits of ICT and limited digital literacy:** There is still a low level of awareness of the benefits of ICT among the Bhutanese people. This can hinder the adoption of ICT and the realization of the benefits of ICT for economic and social development. There is also a large gap in digital divide (i.e. urban and rural areas and gender divides) and digital literacy.
- **Lack of a clear ICT development plan and strategy, policy, legal and regulatory framework:** Bhutan does not have a clear long-term plan, policy and legal and regulatory framework for ICT. This can lead to uncertainty and investment risks in the ICT sector.

Since the launch of the roadmap in 2011, the RGoB has made significant progress through various initiatives. Investments made in the ICT infrastructure, software systems for government, IT parks, educational development system, and enabling FDI tech businesses are testaments to the progress.

In implementing the ICT Roadmap, the RGoB initiated the Digital Drukyul Flagship Programmes which is a government initiative to transform the country into a digitally advanced and inclusive society. The project was implemented under the 12th FYP (2018-2023) with an allocated budget of Nu 2.676 billion (approximately USD 30 million) aimed to achieve the following goals:

- Provide universal access to high-speed internet
- Develop a national digital identity system
- Digitize government services
- Promote the use of ICT in education and healthcare
- Create a more vibrant and sustainable ecosystem for the IT industry

The project identified the following systems and projects to be implemented:

- Digital Identity
- Digital Schools
- Enhanced Connectivity
- Integrated Citizen Services
- Integrated Business Licensing System
- Electronic Patient Information System
- Bhutan Integrated Taxation System
- ICT Capacity and Capability

In addition to the projects implemented by the RGoB, the private sector has played a key role in the development of the ICT sector. There are now several ICT companies and businesses operating in Bhutan, including software development, IT service providers, and e-commerce companies. Tech entrepreneurship is also a growing area with many start-ups launching in the country. These companies are creating jobs and helping to drive economic growth. Initiatives such as the Thimphu Tech Park Limited (TTPL) and the Bhutan Innovation and Technology Center (BITC) have been supporting the private sector, especially the tech start-ups.

However, the ICT sector is still in its early stages of development, but it has the potential to play a major role in the country's future. The RGoB realized this can be achieved through policies designed to foster meaningful integrations between the public and private sectors to efficiently share knowledge and expertise in ICT. The government and the private sector are currently working in partnership in many areas to develop the sector and to make it a driver of economic growth and social progress. Regulations and policies have long been barriers for such partnership to happen, but in recent times efforts to review the laws and regulatory frameworks have started. A change in the mindset of the officials for public-private partnership also has helped in this process.

Box 1: Bhutan's ranking and scores in international indexes related to technology

Bhutan's rankings and scores in international indexes related to technology.

e-Government Development Index (EGDI) - 2022 Global Rank: 115

Telecommunications Infrastructure Index (TII) - 2022 Score: 0.5261

Online Service Index (OSI) - 2022 Value: 0.5996

E-Participation Index (EPI) - 2022 Global Rank: 83

Open Government Data Index (OGDI) - 2022 Value: 0.6225

Despite challenges, the RGoB and the private sector are committed to continuing to develop the ICT sector. Some of the potential opportunities that Bhutan has in developing its ICT sector include:

- The global demand for ICT and digital services is growing rapidly. Bhutan can tap into this demand by developing a competitive ICT industry.

Table 1: Worldwide IT Spending Forecast

Worldwide IT Spending Forecast						
	2022 Spending (in Millions)	2022 Growth	2023 Spending (in Millions)	2023 Growth	2024 Spending (in Millions)	2024 Growth
Data Center Systems	\$216,095.00	13.70%	\$224,123.00	3.70%	\$237,790.00	6.10%
Devices	\$717,048.00	-10.70%	\$684,342.00	-4.60%	\$759,331.00	11.00%
Software	\$793,839.00	8.80%	\$891,386.00	12.30%	\$1,007,769.00	13.10%
IT Services	\$1,250,224.00	3.50%	\$1,364,106.00	9.10%	\$1,502,759.00	10.20%
Communications Services	\$1,424,603.00	-1.80%	\$1,479,671.00	3.90%	\$1,536,156.00	3.80%
Overall IT	\$4,401,809.00	0.50%	\$4,643,628.00	5.50%	\$5,043,805.00	8.60%

Source: Gartner, Inc - <https://www.gartner.com/en/newsroom/press-releases/2023-04-06-gartner-forecasts-worldwide-it-spending-to-grow-5-percent-in-2023>)

Box 2: Example of India’s Digital Economy Development

“India Stack has been used as a platform to foster innovation and competition; expand markets; close gaps in financial inclusion; boost government revenue collection; and improve public expenditure efficiency.

Digital payments are now ubiquitous, Unified Payments Interface (UPI) accounts for 68 percent of all payment transactions by volume. The use of digital payments has expanded the customer base of smaller merchants, documenting their cash flow and improving access to finance. Roughly 4.5 million individuals and companies have benefited from easier access to financial services through the Account Aggregator, since it was first launched in August 2021, and adoption is increasing rapidly. Digitalization has also supported formalization of the economy, with around 8.8 million new taxpayers registered for the GST between July 2017 and March 2022, contributing to buoyant government revenues in recent years. Government service provision is streamlined; for example, citizens can access documents issued by state and central government through one platform. Similarly, the India Stack has digitized and simplified Know Your Customer procedures, lowering costs; banks that use e-KYC lowered their cost of compliance from USD 12 to US 6 cents. The decrease in costs made lower income clients more attractive to service and generated profits to develop new products.”

Alonso, C. T. Bhojwani, E. Hanedar, D. Prihardini, G. Una and K. Zhabaska. “Stacking up the Benefits: Lessons from India’s digital journey” IMF Working Paper No. 23/78, International Monetary Fund, Washington DC, 2023.

- ICT sector can be leveraged to expand economic activities in a number of ways, such as by supporting e-commerce, e-government, public service deliveries, and the development of new businesses.
- ICT can be used to improve social progress in a number of ways, such as by providing access to education, healthcare, transport, public utilities, and by promoting social inclusion.

1. Digital Infrastructure

a. Background and Introduction

Digital infrastructure is the foundation of a digital ecosystem. It includes the physical and digital components that enable the delivery of connectivity, digital services, such as networks, devices, software, and data among others. A strong digital infrastructure is essential for a country to grow its digital economy and create jobs.

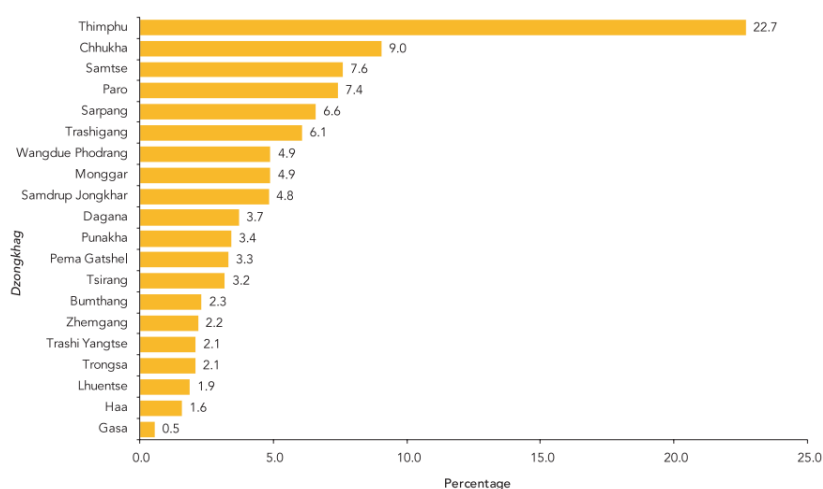
In Bhutan, significant efforts have been made by the RGoB to improve the digital infrastructure. For example, the National Fiber Optic Network, Government Data Center, National Internet Exchange Point.

There are many benefits for the RGoB to invest in digital infrastructure. Firstly, it can help to create jobs in the IT sector and IT enabled services (ITES). The digital economy is growing rapidly, and there is a high demand for skilled workers with technology skills. Secondly, digital infrastructure can help ease domestic and cross border payments and boost economic growth. By making it easier for businesses to connect with customers and suppliers, digital infrastructure can help to reduce transaction cost, increase productivity and innovation. Thirdly, digital infrastructure can help to improve government policy formulation aspects with evidence-based digital data, to provide efficient public services for citizens to be able to access those services easier and improve efficiency and transparency, and to help ease domestic and cross-border payments.

b. Connectivity

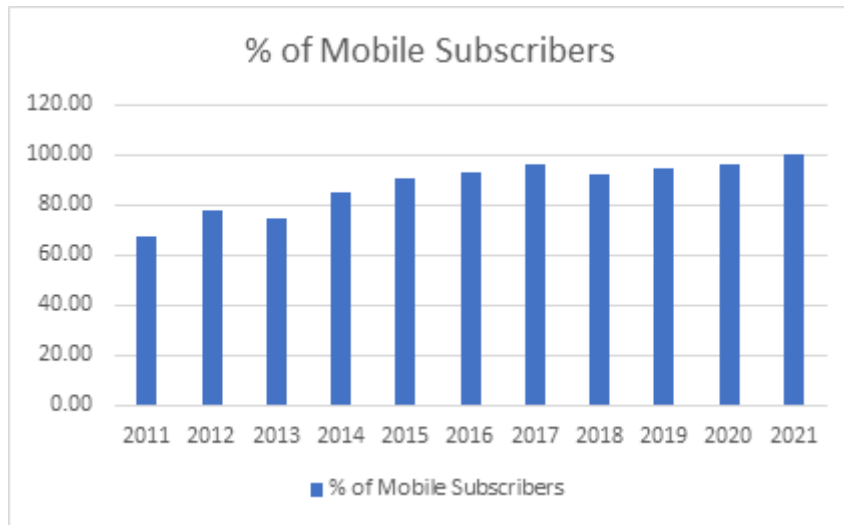
Connectivity is one of the key enablers to develop the ICT sector and the robust digital economy. It allows businesses to connect with their customers, suppliers, and partners in new and innovative ways. This can lead to several benefits for the stakeholders such as government, citizens, and businesses. According to the Bhutan Living Standards Survey Report 2022, 95 percent of the households in Bhutan own a smartphone, 99.6 percent of those have mobile internet connection, while 96 percent have mobile connection. These high penetration rates are results of the significant investments made by the RGoB in the last few years in ICT and telecommunication infrastructure.

Figure 1: Percentage Share of Internet Connection by Dzongkhags



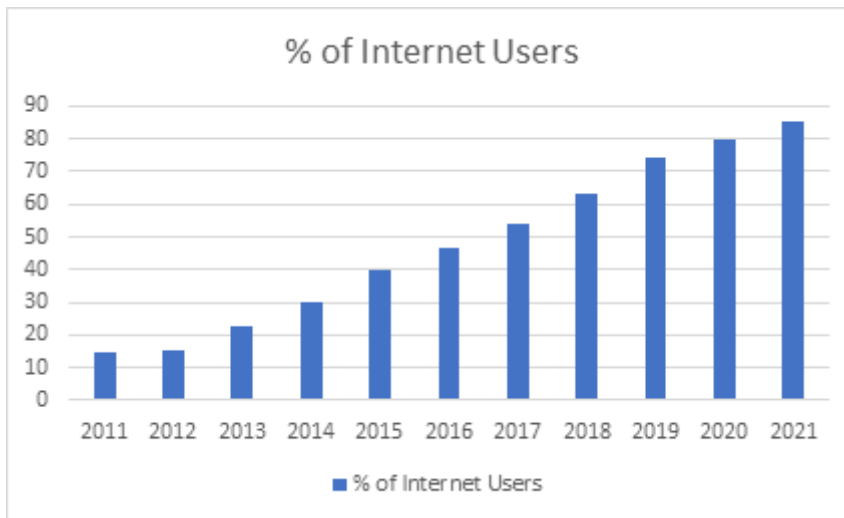
Source: Bhutan Living Standards Survey Report 2022

Figure 2: Percentage of Mobile Subscribers in Bhutan



Source: International Telecommunication Union (ITU) World Telecommunication/ICT Indicators Database

Figure 3: Percentage of Internet Users in Bhutan



Source: International Telecommunication Union (ITU) World Telecommunication/ICT Indicators Database

The private sector has also made investments in digital infrastructure in the country. Tashi Cell, a private telecommunication company, has a wide coverage of 4G networks in the country and have started implementing 5G networks in addition to Bhutan Telecom, a state-owned telecommunication service provider. These two telecommunication companies are the main mobile operators in the country and own a majority of the market share.

While the access to internet in Bhutan is high, the cost of internet in Bhutan has been a concern as it is relatively high compared to other countries in the region. This is a barrier to the adoption of ICT and digital services by businesses and households. The government is

working to address this challenge by investing in additional infrastructure and internet pipelines to improve internet connectivity.

Table 2: Comparative Prices of Mobile Broadband in Other Countries

Country	Service Provider	Data Package	Cost in Local Currency	Cost / GB in Local Currency	Cost / GB in USD
Bhutan	Bhutan Telecom	8.46 GB	BTN 499.00	BTN 59.00	0.71 USD
Sri Lanka	Dialog Axiata	15 GB	LKR 1,091.00	LKR 73.00	0.25 USD
India	Reliance Jio	30 GB	INR 299.00	INR 10.00	0.12 USD
Bangladesh	Robi Axiata	20 GB	BDT 449.00	BDT 22.5	0.21 USD
Nepal	Ncell Axiata	20 GB	NPR 499.00	NPR 25.00	0.19 USD
Vietnam	Viettel	90 GB	VND 150,000.00	VND 1666.67	0.07 USD
Myanmar	MPT	8.66 GB	MMK 18,000.00	MMK 2,078.50	0.99 USD
Cambodia	Smart Axiata	15 GB	USD 1.50	USD 0.1	0.1 USD

Source: Official websites of the Service Providers of countries mentioned in the table

One of the reasons why internet penetration rate is high in Bhutan is due to the investments made by the RGoB to put in place a nationwide fiber optic network connecting all 20 dzongkhags, with nearly 3,300 kilometers of fiber optic cable. The project started in 2011 and is constantly being upgraded. With this initiative, domestic fiber rings are also executed to enhance the overall domestic redundancy in the country. All government infrastructure, national and thromde levels such as public buildings, schools, community centers, etc. are provided internet access through this fiber network. The fiber infrastructure is also leased to the national internet service providers (ISP) to expand their coverage, which has also helped the government to bring down the overall internet price in the country.

While the connectivity infrastructure internally is strong, with exceptions in the remote rural areas, significant concerns remain with regards to connectivity with the outside world. Bhutan is currently connected to the outside world through two fiber optic lines which are routed through India. There have been concerns raised by many about the current infrastructure as both these cables are coming through the same region of India and any form of disaster, natural or man-made, happening in this region affecting the fiber cables will cut off internet access to the whole of Bhutan. The stability of the connection of these two cables has also been questioned as internet access is frequently disrupted due to cable issues in the neighboring country. For these reasons, Bhutan is striving to establish a third international internet gateway. The discussions have prolonged due to various reasons such as geopolitical reasons as well as commercial viability. However recently, the Governments of Bhutan, India and Bangladesh have reached a tripartite consensus on the third internet gateway. The discussions are currently ongoing between the ISP's of India, Bhutan and Bangladesh to finalize the agreement and implement the third internet gateway in order to enhance reliability, stability, and also to reduce the risk of accessibility during disaster or emergencies.

In the case of mobile connectivity and mobile internet, concerns about the quality of mobile signals remain in many parts of the country, especially in the rural areas. This is due to the challenges faced during expansion of mobile base stations or telecommunication infrastructure. Reasons such as high regulatory costs, limited and delayed approval for expansions by local authorities, and commercial viability are mentioned by the mobile operators. Due to these reasons, accessing good quality of services may be challenging for citizens in rural areas which may deepen the digital divide. With the National Digital Identity (NDI) about to be implemented countrywide, rapid expansion of mobile connectivity will be crucial. This can also help in decentralizing the economy from the capital city of Thimphu to outside regions enabling new CSIs, SMEs and digital start-ups.

c. Government Data Center

The Government Data Center (GDC) is a Tier II standard data center located within the Thimphu Tech Park in Bhutan. It was inaugurated in 2017 and was funded by the Government of India. The GDC is a critical national ICT infrastructure that serves as a platform to efficiently and reliably deliver government-to-government (G2G), government-to-citizen (G2C), and government-to-business (G2B) services. The GDC was established in response to the growing need for a centralized and secure facility to house the government's ICT infrastructure. The GDC provides a centralized location for all government ICT systems, which makes it easier to manage and secure the data.

The GDC is considered a critical national infrastructure that is essential for the delivery of government services and also to develop e-government initiatives. It provides a secure and reliable platform for the delivery of government services to citizens and businesses. The GDC is also helping to improve the efficiency and effectiveness of government operations. It is well-designed and well-managed by the GovTech, which is responsible for the overall day-to-day operation and maintenance of the GDC, and it is poised to play an even more important role in Bhutan's journey of digital transformation.

The government is planning to expand the capacity of the GDC to host more government ICT systems as it has currently reached about 70% utilization. The division responsible for the CDG has already initiated a technology refresh process to upgrade the resources to be able to host future government systems. GovTech is also working with the International Telecommunication Union (ITU) and the World Bank to study the requirements to ensure it is future proof. Bhutan Cyber Incident Response Team (BtCIRT) is also supporting the GDC by providing cyber security services for the data center.

Box 3: Capacity of the Government Data Center

<p>The Government Data Center</p> <ul style="list-style-type: none">• The GDC is a 2,500 square foot (232 sqm.) facility that is designed to Tier II standards.• The GDC has a power redundancy system that provides 99.99% uptime.• The GDC has a security system that includes 24/7 monitoring.• The GDC is connected to the national fiber optic network.• The GDC has a backup site to ensure that data loss is minimized.
--

2. Digital Government

a. Background and Introduction

A major outcome of the Bhutan ICT Roadmap is the use of ICT for Good Governance. For this, the government has been investing significantly in digitizing many of its public services towards achieving digital transformation. While the process of digitization by the public sector and adoption by the public has been slow over the years, a blessing in disguise has been the COVID-19 pandemic which accelerated the digital transformation in Bhutan significantly. Many sectors saw a rapid change with new digital systems being introduced and this resulted in quick adoption by the public.

In the health sector, applications like Druk Trace mobile application helped the country in contact tracing during the pandemic. Although it was slow to be adopted, the application became a success story after awareness and publicity. At the peak, nearly 70,000 people were using the application daily to record their movements. Furthermore, the Bhutan Vaccine System was developed with the support of UNDP Bhutan to record and track the vaccination of citizens. This system is now in a transition phase to add records of all vaccinations to citizens and connect it to the national health system.

In addition, the Integrated Business Licensing Service (IBLS), the automated passport and visa systems, and public services such as utilities and waste management have been digitized in the citizen services portal.

In the financial sector, Bhutan has traditionally been a cash-based economy with very little adoption of digital banking and fintech solutions. This too changed with the pandemic with the Royal Monetary Authority (RMA) enhancing the domestic payment gateway, and the major banks introducing QR-based payment applications which are now the preferred mode of payment in the country. The facility is also available for tourists visiting Bhutan to sign up for banking applications to make payments using QR codes. The RMA is working with the banking sector to ensure that the core banking systems and digital banking facilities meet international technology standards and are ready for the digital revolution.

The Ministry of Education and Skills Development (MoESD) signed up for the Google for Education program providing all schools and students with access to the Google Classroom LMS to continue their education during the pandemic. This has made school students adopt technology and the ministry has now built a Moodle-based advanced LMS to digitize the education sector.

The legal sector is another sector that has been digitally transformed in the last few years. The Bhutan e-Litigation platform was launched again with the support of UNDP in Bhutan. In this platform, citizens, lawyers, and legal organizations including the Office of the Attorney Generals can register their cases, file documents, make relevant payments, and remote hearings.

Recently, the Prime Minister's Office (PMO) Dashboard was launched with support from the ITU to consolidate and bring all live data and information into one dashboard for easy review and decision making by the Prime Minister. This dashboard is expected to be a catalyst in accelerating the digitization of government systems as live data is required for the dashboard to effectively function.

b. The GovTech Agency

In December of 2022, the former Department of Information Technology and Telecom was restructured to establish the GovTech Agency as per the Civil Service Reform Act 2022 with a

core mandate to lead the digital transformation for the RGoB. Several divisions and units that carried out various ICT services spread across the RGoB were absorbed into GovTech and 11 divisions responsible for different components of a digital ecosystem were created.

GovTech has been structured in such a way that it covers all the operational aspects of ICT, digital economy, and digital government developments, which is a positive step towards creating a Digital Bhutan.

One of the main challenges that GovTech faces in the digital transformation journey is the unavailability of digital skilled human resources in the public sector. This is due to many personnel migrating out of the country in the last few years seeking economic opportunities. Therefore, there is an urgent need to increase the capacity of staff with those who have ICT skills. One solution already adopted by the RGoB is to consolidate all the ICT staff in the civil service and place them at GovTech thereby centralizing the ICT services. For a country with a small civil service population, this is meant to ensure that the available resources are managed efficiently and shared. There are also concerns of the officers at GovTech not having specialized training and certification such as on data center operations and machine learning which need to be rectified.

GovTech is now working with the Royal Civil Service Commission (RCSC) and line agencies to identify key ICT capacity needs and develop ICT systems in the different agencies with a whole-of-government approach or e-government in mind. Currently, there are over 400 government digital platforms, with redundancy and duplicity among agencies. The Digital Services Transformation Division at GovTech is now reviewing the systems to understand their functionality and find possible ways to reduce and integrate systems where applicable.

GovTech has also the mandate for Technology Industry Development with focus on growth and globalization of the Tech industry, Data Science & AI for Government, promotion of emerging technologies such as drones, augmented reality, virtual reality, telecom, and space exploration. The Data Science Team is currently working on identifying the potential of using data generated through government systems for data-based decision making and for sharing data for public use. The Emerging Technology Division is working with development partners such as JICA to identify potential regulatory changes required for allowing the usage of drones in Bhutan for commercial and non-profit purposes and studying the necessary regulatory requirements for safe use of AI in Bhutan.

c. National Digital Identity

The National Digital Identity (NDI) project, a key initiative started under the Digital Drukyl Flagship Programmes, is a key development in the digital transformation initiative of Bhutan. It is based on self-sovereign identity (SSI) philosophy where individuals will have control over their own digital identity(ies) as well as data and can choose who they share their personal information with. The NDI uses biometrics, such as facial recognition, to authenticate users and is stored in a digital wallet on a user's smartphone. It will be used to access government services, such as passports and driver's licenses, as well as private sector services, such as banking and healthcare among other things.

The NDI is designed to make it easier for people to access services and to reduce the risk of identity fraud. The NDI was launched in February 2023 and is in the late stages of development and is expected to be rolled out soon. Currently, stakeholders are being onboarded for the wider rollout later this year and it has the potential to be a major step forward for Bhutan in

terms of digital transformation. The project has been praised by privacy advocates for its focus on giving individuals control over their personal information.

GovTech and DHI, when designing the NDI, have also considered the digital divide and digital literacy and have included several features and functionality for non-tech citizens to create their own digital identity. The NDI will use the Bhutan Civil Registration Department database as a foundation and build identities on it and expect the system to grow to provide many services using different verifiable credentials enabling radical digital transformation in the years to come. The private sector has also been invited to work with the NDI to enable authentication and other services provided by NDI not only in transforming government and public services, but also for transforming commerce in the country.

d. Citizen Services Portal

Another key initiative of GovTech is the Citizen Services Portal, a one-stop system for citizens to access over 120 public services which can be accessed at <https://www.citizenservices.gov.bt/>. More public services are in the process of being added and digitized into the citizen service portal. This portal has gained popularity amongst the citizens, especially the younger generation in the cities, one concern raised by many is the difficulty faced while making payments through the G2C payment gateway implemented in the citizen services portal. While the government payment gateway is not a direct payment gateway but only a middleware for government services to be connected with a third-party payment gateway such as that of the RMA, the reliability and stability of the middleware has been questioned because of its instability and frequently being offline. Action needs to be taken to rectify this soon so that the public will continue to use the portal and not be discouraged by challenges faced in the payment gateway.

3. Legal and Regulatory Framework

Bhutan's primary legislation in effect for the ICT and digital sector is the Bhutan Information, Communications and Media Act 2018, also known as the ICMA. The Act sets out a number of regulations governing the ICT sector, including:

- Licensing requirements for ICT service providers
- Technical standards for ICT equipment and services
- Privacy and security protections for ICT users
- Content regulations for online and offline media

The Act was last updated in 2018, many of the provisions are very broad and left to interpretation as and when issues arise and not specific to the advancement in areas such as data privacy, data protection, and data sharing both internal and cross-borders. The RGoB is reviewing the Act and is expected to be completed by the end of 2023.

The other major legislation that affects the digital sector is the Bhutan Telecommunications and Broadband Policy of 2014. It is the key policy document for the development of telecommunications in Bhutan. The policy has four main objectives:

- **Market driven:** Telecommunications and broadband infrastructure provision and service delivery will be achieved through the operation of market forces. The government will support in establishing backbone infrastructure, and rolling out services to areas which are not commercially viable.

- **Universal access:** Telephony and broadband services shall be made accessible to all Bhutanese. All dimensions of access including availability, affordability and capacity to use shall be addressed.
- **Affordability:** The Government shall ensure that telephony and broadband services at entry levels shall be made affordable for all people in Bhutan.
- **Leadership:** Leadership in telecommunications and broadband usage at all levels of society, especially by the private sector, shall be promoted. The Government will lead by transforming its own processes and public sector services.

The Bhutan National Digital Identity Act of 2023 was adopted recently by the National Assembly. This law is a significant step towards the implementation of the NDI, with a robust framework which ensures the independence of the functioning of the NDI company under the ambit of the act to facilitate efficient and secure digital interactions for citizens with public services, businesses, and other stakeholders.

Laws related to cybercrimes and cyber security are currently being drafted by GovTech and BtCIRT with the support of development agencies such as ITU and World Bank and are expected to be completed by 2024. The cyber security act is also identifying critical digital infrastructures within Bhutan to understand how best to protect them in the future.

4. Private Sector

a. Background and Introduction

The private sector in Bhutan is a relatively new and small sector, but it is growing rapidly. The private sector is dominated by small-scale enterprises in tourism, trade, industry, and services.

The RGoB has identified the private sector as a key driver of economic growth and has implemented a number of policies to promote its development. These policies include providing tax breaks, access to finance, and training and support programs for start-ups.

The ICT sector has been identified as a priority by the RGoB and eligible companies are given concessionary tax rates for up to 5 years as well as exemption on sales tax and customs duties when importing technology equipment to be used in the business.

GovTech has also started several programs towards supporting the private sector IT industry in Bhutan. The TTPL is one such initiative. Other initiatives include capacity building and certification programs for the private sector, industry academia linkage, digital literacy program including training non-IT SMEs to promote adoption of ICT for economic growth and increase market consumption, addressing ecosystem issues for tech startups, addressing the issues and challenges related to IT business environment and special drawing facility and credit card facility for overseas USD purchases of ICT equipment and software in collaboration with the RMA.

A significant concern of the private sector is the lack of skilled ICT and digital professionals, many of whom have left the country in the last two years seeking economic opportunities. Compensation of domestic jobs cannot be compared to overseas wages. GovTech is working with the private sector as well as the education sector to increase the technology education in the country, but formal education will take time to develop skilled professionals.

The RGoB is also looking into alternatives such as promoting freelance and remote work that is a growing sector in Bhutan as well as encouraging digital nomads to work in Bhutan to overcome these challenges. Challenges exist in this approach as limitations on inwards and outward remittances by RMA exist which need to be reviewed.

b. Thimphu Tech Park Limited

The RGoB invested in building the first ever tech park of Bhutan and launched the Thimphu Tech Park Limited (TTPL) in May 2012. The park is spread across 5 acres, only a part of it is currently utilized, with 58,000 square feet of space currently available for use.

The TTPL currently has 19 tenants employing approximately 800 Bhutanese.

The BITC was also set up in TTPL by the RGoB. The BITC TTPL currently houses a business incubator for new start-ups to setup and operate from with subsidized office space, internet and other facilities, a Tier-II standard data center and a shared technology center. The Incubation Center of the BITC has incubated 57 startups as of 2022 of which 54 have graduated and 39 are currently active in the market which is a 72% success rate for the incubation center.

c. Tech Start-up Development

Tech Entrepreneurship is also being looked at by the RGoB as a key development of the digital economy. Currently, the support ecosystem for tech entrepreneurship is very limited in Bhutan. Organizations such as Impact Hub Thimphu, Loden Foundation, UNDP through its Springboard Programme, Startup Center in Thimphu, Innovate Bhutan under the Youth Development Fund and initiatives implemented by the Department of Entrepreneurship and Employment under MoICE are some of the leaders in the ecosystem. These organizations have been keeping the ecosystem active for many years, especially through the pandemic from 2020 through 2022. The Loden Foundation also organizes a startup festival, the “Druk Tshongrig Gatoen” annually to promote entrepreneurship and innovation in Bhutan.

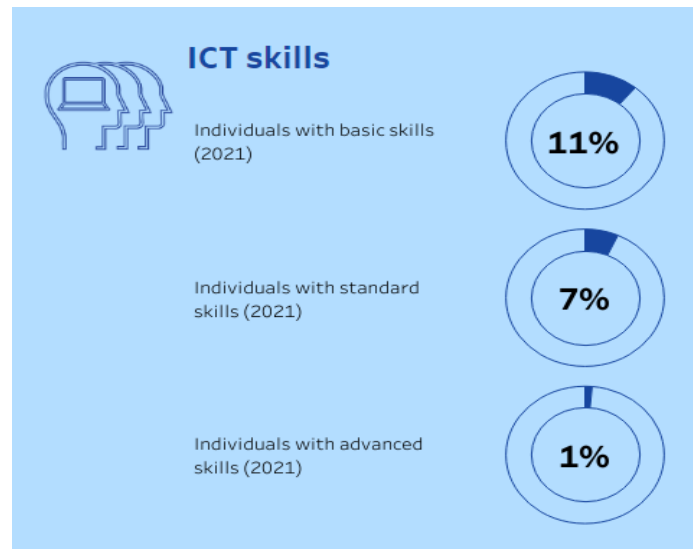
A major concern in the entrepreneurship ecosystem in Bhutan is the lack of experienced mentors and coaches to support the aspiring entrepreneurs. A small number of entrepreneurs who have been supported by programs such as that of Loden Foundation have provided ad hoc mentoring, but the need for strong mentors in different domains and experiences is felt in the ecosystem. Access to finance is also another major impediment for the ecosystem which needs to be addressed by the RGoB, especially for the idea stage startups.

5. People Capacity Building

a. Background and Introduction

Human resources are key in creating a digital economy. In addition to the challenges faced by the civil service in Bhutan about capacity issues, the private sector also faces similar challenges, especially in the ICT sector where many have migrated out of the country. As per the Labour Force Survey 2022 by the National Statistics Bureau, out of 287,785 persons of the total employed persons in Bhutan 0.9 percent work in the ICT sector.

Figure 4: ICT Skills



Source: ITU Digital Development Dashboard (<https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/Digital-Development.aspx>)

While many technology companies including start-ups face a shortage of skilled employees in the market as well as not being able to retain employees due to various factors. Action needs to be taken urgently to rectify this situation so that talent is retained in the country.

b. Primary and Secondary Education

ICT is being increasingly popularized within the education sector in Bhutan as a tool to equip teachers, educators and students to reap the maximum of readily available ICT resources both nationally and internationally. The MoESD has developed iSherig-2, an extended Education ICT Master Plan operationalized from 2019 to 2023, covering capacity development of educators, capacity development of learners, ICT integration for learning support, usage of digital educational resources, ICT infrastructure development in education, administrative and learning systems development, and resource mobilization. This is clustered under three components, iAble, iBuild and iConnect. The plan provides a comprehensive framework to transform education sector through ICT via three key outcome areas,

- **Motivation for lifelong learning:** Provision of ICT facilities and tools to equip learners with transferable skills and values to enable their meaningful and productive participation in a digital workforce while being “socially responsible, culturally grounded, ecologically sensitive, and spiritually aware and globally competent.”
- **Effective teaching and learning:** Promotion of ICT-integrated curricula and interdisciplinary digital pedagogy to facilitate collaboration among educators and learners, in order to provide learners with personalized and active learning experiences through the use of digital resources.
- **Efficient administration system:** Establish a comprehensive and integrated management information system that streamlines the collection and provision of data for informed decision making and evidence-based planning, monitoring and evaluation.

In addition, extra steps have been taken by the RGoB to introduce the following elements of ICT literacy into school education.

- ICT Access: Learners being aware of ICT and having access to the same within the school.
- ICT Commerce: Learners being aware of and being educated on digital economy.
- Digital Communication: Learners being able to communicate via ICT.
- ICT Literacy: Learners being educated on technology and its appropriate usage to be able to make appropriate decisions in the digital world.
- ICT Etiquette: Learners being educated on standards of conduct or procedures in using ICT resources, rules, regulations, and values to help them become responsible ICT consumers.
- ICT Law: Learners being educated on ICT or digital law, ethical use of technology and cybercrime.
- ICT or Digital Security: Ensuring safety of ICT users and promoting necessary precautions to guarantee safety for ICT users.
- ICT Rights and Responsibility: Understanding ICT education as a gateway to global access, facilitator the democratic process, and a pathway to several rights and fundamental freedoms, but at the same time, educating learners that such freedoms are extended to everyone in a digital world, and that rights come with responsibility and accountability; and
- ICT Health and Wellness: Promoting wider awareness and education on ensuring physical and psychological wellbeing in an ICT dominant world and educating learners on negative implications of technology on their wellbeing.

However, challenges in operationalizing still persist. The curricula are being revised to adopt the latest in technology.

Further to this, GovTech together with the Department of School Education has started the rollout of the CodeMonkey programme in Schools in 2021 with the aim of introducing programming and computation thinking for school students. 800 teachers from 565 schools were trained for the implementation of this program in their respective schools. The department also organized a national coding competition for the students who were enrolled in the CodeMonkey program to encourage the students to take more interest in the subject.

c. Higher Education

The Royal University of Bhutan (RUB) has taken steps to address this issue by increasing the size of the annual student intakes in 2023 for technology courses within their colleges and is introducing several new courses such as data science, new media, software engineering, machine learning, and have noted that the interest for these courses by the students are very high. While this is a positive step, it is an advanced level and also a long-term solution as those who go through these courses will only be ready for the market in 3-4 years.

Further to this, colleges such as the Gyalpozhing College of Information Technology, College of Science and Technology, Sherubtse College among others have gone through significant transformation over the last few months to be future ready including a Nu 1.08 billion infrastructure development as part of the 12th FYP.

d. ICT Professionals

GovTech in the recent past has taken initiative to conduct trainings for the ICT professionals in Bhutan. This is towards upskilling the existing workforce as well as introducing some new skills to those who want to pursue a career in that area. Some of the training that have been

done to date include trainings on blockchain, AI & ML, cybersecurity, network administration, digital marketing and mobile application development.

Through these training programs, more than 3,200 professionals have been trained from 2020 through the end of Fiscal Year 2022-2023. It should be noted that of these professionals, approximately 1,700 have utilized access to the Udemy Online Learning Platform provided by GovTech to take various courses.

GovTech will be continuing to provide these training programs and has identified areas such as robotics, Artificial Intelligence, Machine Learning, IoT, Fullstack development, cloud architect as areas where training would be offered.

e. General Public

Bhutan has been quite agile in introducing policy initiatives to popularize ICT and digitalization; however, adoption of such policies still remains low and not widespread. These initiatives do not always get the necessary traction despite the effort and resources committed to it. Specifically in the case of the citizen services system. The situation improved after the COVID-19 pandemic which accelerated digital adoption among the general public which has a digital literacy rate of approximately 49 percent.

GovTech, through the Community Service Centers (CSCs), has also started digital awareness programs and digital literacy training for citizens to build the digital skills of the people in the remote areas. The 202 CSCs are currently in operation and are managed by the National CSI Development Bank Limited, a state-owned bank, to ensure the sustainability of the centers.

GovTech organized a nationwide digital literacy program that included comprehensive training sessions for citizens from all walks of life, including civil servants, youth, monastic bodies, armed forces, and entrepreneurs. Over 10,000 individuals have gained fundamental knowledge and skills in various aspects of digital literacy. The training modules were carefully designed to cover essential topics such as computer fundamentals, government-to-citizen services, digital payment systems, Google Workspace, online security measures, ICT for businesses, and secure social media usage. These modules are designed to equip participants with the tools they need to navigate the digital world confidently and responsibly. This initiative has empowered citizens across the country to use technology to develop themselves personally and professionally, while also contributing to the growth of the nation's digital ecosystem

PART B: DIGITAL ECONOMY DEVELOPMENT AND TRANSFORMATION STRATEGY

Developing a unique Bhutanese digital development and transformation strategy to achieve the long-term vision of digital economy or “Digital Bhutan” requires multi-sectoral and partnership efforts of the RGoB, private sector, CSOs and Bhutanese people.

Vision of Bhutan in 10 years: Growth through digital development

A high Middle-Income Country, with higher-than-average GDP growth, focus on innovative digital economy supporting multi-sectors sustainable growth, driven by private domestic investments and FDI in the ICT and digital and related industries and exports-led goods and services to multiple and diverse trade partners, supported by young highly skilled vibrant workforce with increasing returnees seeking gainful economic opportunities and wealth. Social cohesion and less disparities between cities and rural areas, with less dependent on international financial supports.

Digital technology is a tool to increase economic activities, generate private investments both domestic and FDI, drive innovations in core economic sectors (e.g. agriculture, tourism, health, education, finance and transport), to improve workforce skills and create jobs, and to propel the country towards sustainable economic and social growth. The effectiveness of digital technology must be supported by the enabling environment that is consistent with the country's socio-economic development and cultural values.

Digital Economy

Digital Technologies are at the forefront of development. It can provide a unique opportunity for a country to transform economic activities, improve public and private service deliveries, expand business opportunities and markets, bridge digital divide, and connect citizens to services and jobs.

The Digital Economy often refers to an economy in which digital technologies are used as a tool to advance the existing economic activities, create business opportunities and new jobs through innovations, and connect businesses and citizens to digital services and digital jobs of tomorrow.

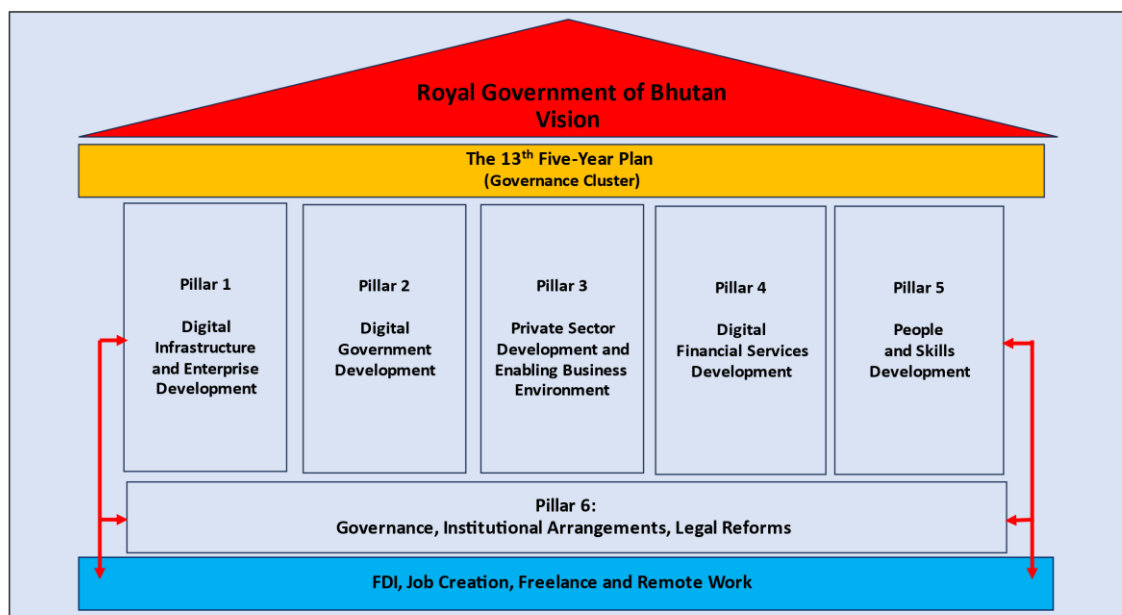
The Digital Economy, may include but not limited to, e-commerce, e-marketplace, e-education, e-health, streaming platforms, social media, and remote work option. The backbones of the digital economy are the high-capacity and stable connectivity, supporting legal and regulatory frameworks, cybersecurity, and digital skill capacity of the citizens and businesses to use the technologies, leverage the knowledge, and expand innovations to promote economic activities and growth.

In recent years, the RGoB has undertaken significant steps to develop the ICT and digital sector. This strategy builds on prior development activities and seeks to recommend development directions and to identify key strategic actions that should be implemented by the RGoB, to further enable the environment for digital development and transformation, develop the digital private sector, increase FDI, create jobs and increase the sector's contribution to GDP.

The strategy is organized under 6 thematic pillars, namely i) Digital Infrastructure and Enterprise Development, ii) Digital Government Development, iii) Private Sector Development and Enabling Business Environment, iv) Digital Financial Services Development, v) People and Skills Development, and vi) a cross-cutting pillar Governance, Institutional Arrangements, and Legal Reforms. A total of 30 sub-strategies are recommended, the narratives are followed by the summary of the sub-strategies, while the aggregated summary table is included in Appendix B. Part B also presents international case

studies and best practices in digital development. In addition, the preliminary identification of ICT and digital businesses for potential FDIs and job creation⁷, and freelance remote work are also discussed.

Figure 5: Thematic Pillars in Digital Economy Development and Transformation Strategy



1. Digital Infrastructure and Enterprise Development:

Developing the “Digital Bhutan” requires a high-capacity, stable and reliable digital infrastructure, at affordable prices. The current 4G network and the development of 5G network technology are connected through two fiber optic fixed-lines from the same region of India. The bandwidth and stability of the internet gateways are issues of concern to both the public and private sectors. As discussed in Part A, adding a third gateway would increase the bandwidth, provide a more stable and reliable networks and internet connections by reducing the frequent down-time disruptions, provide opportunities for increasing digital businesses, cross-border digital trades and e-commerce, increase opportunities for freelance and remote digital services, and provide a back-up system in event the two existing gateways are disrupted. Recently, the tripartite consensus has been reached between the governments of Bhutan, India and Bangladesh on the third fiber optic line that would pass from Bangladesh through India to Bhutan. The agreement between the Bhutan and India ISPs remains to be completed.

1.1 The RGoB may explore options such as high speed fixed wireless access or low earth orbit constellations to improve connectivity in remote areas. While it may take time for the ISPs to complete the agreement, the RGoB has also explored internet connectivity via satellite, however it was proven expensive as it required high initial investments.

1.2 The RGoB may consider supporting the adoption of private sector cloud service providers for non-sensitive data to reduce the cost of cloud hosting and increase storage capacity for both the RGoB and private sector. India offers a robust market for cloud service providers that are secured, less expensive and based on easier deployable infrastructure. International experiences show that government data center will likely run out of capacity in the long-run, therefore, a hybrid data

⁷ The UNESCAP Trade and Investment Division and Invest Bhutan are in the process of preparing the FDI Strategy for the ICT and digital sector. This strategy paper is aligned with the soon to be completed FDI strategy.

center – cloud system leveraging government cloud with the private sector cloud service providers may be considered. Considerations for cybersecurity and sensitive data protection policy will have to be developed prior to undertaking the decision.

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
1. Digital Infrastructure and Enterprise Development:			
1.1 While it may take time to install the third fiber optic system, the RGoB may explore other options to provide access	Explore other options such as high speed fixed wireless access and other satellite options including emerging low earth orbit constellations to improve connectivity in remote areas.	GovTech	3-6 months
1.2 Consider private cloud service providers to reduce cloud hosting cost and increase storage capacity in the medium and long-term for both the RGoB and private sector	Explore private cloud service providers to host non-sensitive public and private data that would be secured and less expensive, with increased storage capacity.	GovTech	3-6 months

2. Digital Government Development:

2.1 Develop disaggregated “baseline” data for measuring the progress of RGoB’s FYP and the Digital Development Master Plan. Based on interviews with the RGoB and the international consultant assisting the government in the preparation of the 13th FYP, the “baseline” data, measurement indicators, and data collection parameters for the FYP, and especially the digital component have not been comprehensively developed. Given government agencies mostly operate stand-alone data platforms, a database mapping exercise should be conducted to identify the data gaps and what disaggregated data should be collected and digitized for the FYP. The database should include the contribution of digital economy to GDP for continuous monitoring of progress or lack of, and for formulating strategic policies and action plans.

2.2 Accelerate integration of the “single source of truth” (SSOT) single portal e-Government data platform, and enhance the executive information system (EIS), dashboard, and the equivalent of the financial management information system (FMIS)⁸. Digital government would holistically support the RGoB’s “data-driven” socio-economic development policies, providing effective monitoring of government projects, programmes and expenditures, improving transparency and efficiency in public service delivery, public financial management including financial resource planning, budgeting, revenues, and expenditures. Following the RGoB restructuring in 2022, more than 400 digital data platforms of the RGoB agencies remain in silos and fragmented.⁹ Different ministries collect data at different time-point frequencies, some quarterly while others collect data annually, causing a mismatch in data analysis and inconsistent or duplication in development policies. Part A discussed the on-going review of the 400 digital platforms by GovTech to reduce

⁸ The RGoB has implemented the e-PEMS and MYRB systems, which are the equivalent of the intended FMIS. Both are comprehensive in capturing financial data for executive management purposes. The RGoB should consider enhancing the applicability, capacity and integration of the two systems into the SSOT platform.

⁹ For examples, the MoICE has more than nine stand-alone digital platforms including the Integrated Business Licensing Service (IBLS), the Labour Work Permit System (LWPS), the Visa and Immigration Services. The MoAL has eight stand-alone data platforms, Thimphu Thromde has more than five stand-alone government service platforms.

redundancy and duplication. The suggested SSOT dashboard could also be linked to the high-level dashboard developed by the ITU for the Prime Minister's Office.

The EIS, dashboard and the equivalent of the FMIS should be enhanced for the executive branch based on authoritative levels, to include for examples the integrated revenue administration system, the customs administration system, debt management system, comprising data for ministerial use and for economic and social development planning purposes. The system should also integrate and capture the ICT sector public spending and economic activities for policy making purposes. In addition, the SSOT data platform can consolidate the annual budget, expenditures, public procurement system already launched, and contracts signed with government agencies, all of which can be digitized in the future to enhance transparency in public spending.

2.3 Expand the e-government <https://www.citizenservice.gov.bt> public service delivery platform, develop the EIS system and dashboard. The objective is to emphasize and improve the reliability of the current citizen-centric public services, packaging the services around life events, add new services, and expand access to the people. The EIS and dashboard for management of public services should also be developed or enhanced if already available. Currently, there are over 120 public services included in the platform such as water resource management, waste management, emergency response and rescue, health and occupational safety measures, passport application, and public comments and grievances. While more services are being added, the platform should be user-friendly and accessible to all citizens including the persons with disabilities (PWDs) and the digital illiterates. The platform has already achieved success in being accessible in rural areas through the 202 CSCs, where operations are based on public-private partnership similar to the Common Service Center of India and the Union Digital Center of Bangladesh. In the next phase, improvements to the platform can be made to expand access to the PWDs, the visual impaired, the illiterates, and the older vulnerable groups.

2.4 Integrate public procurement and government contracts data to develop the e-Procurement and e-Contract systems, to enhance public-private transparency, and to promote more efficient fiscal expenditures. The digital procurement system has been launched, and the digital contract system is in the pipeline. The e-Procurement and e-Contract systems will provide greater transparency and consistency in government procurement price structures and contract values and allow the private sector to bid for government contracts more transparently and implement the project within the cost/pricing structure. This would be most beneficial for tendering construction contractors and for large scale construction projects. The RGoB may also consider digitizing historical procurements and contracts, going back 2-3 years, to allow trend analysis and price reference.

2.5 Enhance the Government Data Center (GDC). The GDC is currently a Tier II certified data center, owned and operated by the GovTech, and is located within Thimphu Tech Park. The GDC is a crucial platform to provide efficient and reliable G2G, G2C and G2B services. The capacity of the GDC will be an issue in the future as digital data and services are added for the digital transformation. The ITU recently completed the review of the GDC and recommended an upgrade of the system from Tier II to Tier III, which is planned for during the 13th FYP, and to further upgrade to Tier IV in the future.

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
2. Digital Government Development:			
2.1 Develop disaggregated baseline data to measure the progress of the RGoB's FYP, the contribution of digital sector to GDP, and also the progress of the Digital Development Master Plan	Conduct data mapping exercise, develop baseline data for the FYP, including a measurement approach, a dash board, and MLE framework for reporting.	Cabinet Secretariat, NSB, GovTech, International Expert	Within 6 months as the 13 th FYP becomes effective
2.2 Accelerate the integration of the "single source of truth" (SSOT) e-Government platform, enhance EIS, dashboard for financial management information system (FMIS) or the equivalent thereof, monitoring government revenues and expenditures	Complete the review of the RGoB's more than 400 standalone data systems, reduce and/or integrate the more robust database into a SSOT single portal data platform, identify common systems to reduce the transformation cost, develop comprehensive interoperability framework, including enhancement of the FMIS or the equivalent such as the e-PEMS and MYRB if needed.	GovTech, DHI, International expert	16-24 months
2.3 Expand the https://www.citizenservice.gov.bt e-Government public service delivery platform to add services and expand access to the people, develop EIS and dash board	Accelerate the integration of public services provided by the national, thromde and dzongkhag levels, into the https://www.citizenservice.gov.bt public service platform, and increase citizens access to the platform. (Note: The NDI system, currently being rolled out and soon to be completed, will provide the citizens access to the one-stop platform)	GovTech, DHI, relevant ministries	12 months and on-going operations
2.4 Develop e-Procurement and e-Contract Systems	The digital procurement system has been launched, and the in-the-pipeline digital contract system should be completed. Disaggregated data such as direct and indirect procurement and types of contracts (e.g., constructions, services, consultants) should be categorized to enhance transparency, price reference, and cost-saving. Eventually integrated e-Procurement and e-Contract systems can be created. Explore scope to embed open contracting data standards, to improve functioning and effectiveness of procurement – and to drive broader open data agenda across government.	GovTech, Dept of Procurement MoF, DHI, and international expert on e-Procurement and e-Contract	12-18 months and on-going operations
2.5 Enhance the Government Data Center (GDC)	Upgrade the GDC from the current Tier II to Tier III to absorb the increasing digital data and services being added in the digital transformation process.	GovTech	12 months

3. Private Sector Development and Enabling Business Environment:

3.1 Speed up regulatory reforms to allow “once only” submission of required documents for businesses applying for multiple government services to facilitate ease of doing business.

Multiple and identical documents are required for businesses to apply for government services with different government agencies. For examples, the MoICE’s Integrated Business Licensing Service (IBLS), the Labour Work Permit System (LWPS), the Creative, Intellectual Property and Media Department, Passport and Drivers’ License services are all stand-alone systems, accessible to applicants, but each department requires submission of the same documents, of which government-issued documents must also be verified, which are time-consuming and costly for businesses. Digital tools such as the digital object identifier (DOI) may be considered for verification of government documents to reduce processing time and also cost savings.

3.2 Promote cross-border digital trade for exports, regional integration, and business partnerships.

Bhutan’s e-Commerce is at an early stage and its development is underpinned by the 2021 e-Commerce Policy. The sites <https://www.ogop.bt> and <https://druksell.bt>, mobile application such as zala.bt, and smaller tech start-ups are providing e-Commerce platforms for international trades, but transactions are irregular and small in volume given the lack of exposure internationally and also the limitation in the international payment gateway and also logistic supports for shipping and handling.¹⁰ The RGoB, in partnership with DHI and the private sector, may promote e-Commerce cross-border trade for exports through G2G and B2B relationships, and possibly linking with the larger international e-Commerce platforms to expand the promotional efforts internationally.

3.3 Bhutan Brand, including tourism and uniquely designed products, are the country’s hidden gems and a comparative advantage that can be proactively promoted through “Bhutan Believe” using digital technology in combination with the traditional organized international events.

Bhutan is considered a niche market, small economy in a land-locked mountainous location, the only carbon-neutral country in the world, with comparative advantage in natural and cultural tourism, green agriculture, and local products designs that can be leveraged in the international markets. “Bhutan Believe” was coined to promote Bhutan Brand through Made in Bhutan and Grown in Bhutan, such as the One-Gewog-One-Product (OGOPs), the high-end tourism, and uniquely designed products and textiles can be marketed to a wider international markets and customers. The e-Commerce stores, <https://www.ogop.bt> and <https://druksell.bt> and other smaller platforms can be made more visible internationally, and both sites can help promote local high-quality products that otherwise do not have access to external markets due to high access cost. The Fab23 Bhutan Conference in July 2023, DHI launched the Bhutanverse platform to be a vehicle to attract digital businesses and promote tourism globally. In addition to digital promotions, the traditional “Bhutan Believe” global events can be organized in parallel in selected countries and markets with high purchasing power to attract high-end customers and travelers. As mentioned in sub-strategy 4.1, to facilitate digital development and trade, the international payment gateway will need to be markedly improved.

¹⁰ International payment gateway needs to be further developed to enable and increase e-commerce transactions, cross-border and regional trades. (See sub-strategy 4.1)

3.4 Set up digital business development and advisory for digital start-ups. As discussed in Part A, digital start-ups are considered to be in the early stage of development, with many of them located in TTPL. Start-ups usually require financial support and business development guidance and advice, especially at the early stage of business operations. Bhutan is working closely with google, and can approach the tech giant to provide tech incubation support through google coaching and mentoring program. Within the country, business advisory can be organized and delivered by experienced tech professionals who are passionate about mentoring their peers, DHI tech staff, private companies located in TTPL, and digital nomads in Bhutan (see related discussion in sub-strategies 5.2 and 5.3). In some cases, partnerships with other big tech firms can be forged to establish a long-distance coaching program through personal referrals and relationships. The advisory services may also include industry standardization, i.e. ISO and GI, and also the application process.

3.5 Promote youth, women and PWDs employment and entrepreneurship. In 2021, Bhutan’s unemployment rate was 4.8 percent, while youth unemployment stood at 20.9 percent, and in Thimphu where most of the youth are concentrated, the rate was 32.6 percent.¹¹ Women unemployment was also high at 6.16 percent in 2020.¹² According to the Disability Persons Organization (DPO), there are approximately 16,000 PWDs in Bhutan, majority of them reside in the rural areas, and most are unemployed. The high unemployment rates among these three groups were partly due to digital and gender divides, skill mis-match, employers were not able to find employees with the right skills and experience, while job-seekers could not find jobs that match their qualifications. The digital divide and the mismatch in demand and supply skills facing Bhutan are discussed in Part A, while Pillar 5 discusses the need for upskill and reskill of ICT workers to promote freelance and remote work.

With the appropriate level of digital skills and capacity, these three groups can be gainfully employed, especially on freelance and remote work. The RGoB can collaborate with the private sector to kick-start the recruitment and hiring process by consider providing fiscal incentives such as tax deductions or tax credits to companies, especially in the ICT and digital sector, and proportionately higher amounts of incentive for R&D and FDI companies. The incentives could also be considered for part-time employment, and freelance and remote work to promote the sector. For start-up entrepreneurs, the incentives may include waiver of business registration fees, waiver of bank fees, and tax incentives for the ITES.

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
3. Private Sector Development and Enabling Business Environment:			
3.1 Accelerate regulatory reform and adopt digital tools to streamline submission of required business documents to save time and cost	Eliminate redundant regulation on submission of identical business documents for each application of government services. A “once only” documents submission regulation may be adopted through the integrated digitized e-	The Cabinet Secretariat to coordinate regulatory reform with MoICE, MoENR, MoH, MoF, RMA, MoHA, MoIAT	6-9 months

¹¹ Labour Force Survey Report (2021) and Ministry of Labour and Human Resources (2022). “Bhutan Workforce Future: Stepping Stones to Industrial Strategic Propositions for the Agriculture, Creative and Digital Sectors”.

¹² Ibid. and WBG Bhutan Country Statistics 2020.

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
	<p>Government services single-window (Item 2.5) for applications of all government services.</p> <p>The RGoB may consider adopting and piloting the use of Digital Object Identifier – a code system to verify government-issued documents, and not requiring the applicants to have to verify government issued documents.</p>		
3.2 Promote cross-border digital trade for exports, regional integration, and business partnerships	The RGoB, in partnership with DHI and the private sector, may promote cross border e-commerce for exports through G2G and B2B relationships and linking with international e-commerce platforms to create awareness and expand the digital markets.	MoICE, GovTech, DHI RMA, MoFAET	Immediately
3.3 Promote Bhutan Brand globally through a combination of digital marketing, virtual events, organized international events, and in-country visits	<p>The RGoB, in partnership with the Chamber of Commerce and tech companies may collaborate to increase digital marketing efforts through social media platforms (e.g., Tiktok, Facebook, Instagram) and SEO, to promote Bhutanese e-commerce platforms including https://ogop.bt and https://druksell.bt.</p> <p>A virtual roadshow. Organize series of virtual and physical “Bhutan Believe” Global Event – led by the Bhutanese embassies, in partnership with host-country organizations (e.g. chamber of commerce, retail association, tourism authorities and tourism association), to promote Bhutan Brand, unique products and tourism – targeting tourism authorities, global tour companies, international media, luxury designer brands, high-end retail department stores, and eco-friendly global retail boutiques.</p> <p>Following the “Bhutan Believe” global events, invite high-potential customers, business partners to visit Bhutan and connect them with suppliers and service providers.</p> <p>In addition to CSI market stores in Australia, U.S., and Bangladesh, additional boutique stores with on-line shops in countries such as the UK, France, Switzerland, and Japan should be explored in partnership with local businesses to further enhance the visibility of Bhutan Brand.</p>	<p>DHI, Super Fab Lab, private sector partners (Chamber of Commerce, digital marketing professionals, international bloggers, influencers)</p> <p>MoFA, MoICE, GovTech</p> <p>MoFA, MOICE, GovTech</p> <p>MoFA, MOICE</p>	<p>3 months</p> <p>6-8 months</p> <p>9 months</p> <p>9-12 months</p>
3.4 Set up digital business development and advisory for digital start-ups, which may include BPO/ITO related businesses	Set up Peer-2-Peer Digital Mentoring and Coaching Program for tech start-ups and CSIs. Mentors and coaches could be recruited from companies located in TTPL as part-time volunteers or in some cases paid mentor/coach, DHI tech staff, university	GovTech, TTPL, DHI, Super Fab Lab	4-6 months

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
	volunteers, digital nomads. Advisory services may include industry standardization, i.e., ISO and GI, and the application process.		
3.5 Promote gainful employment and entrepreneurship for youth, women and PWDs groups in the ICT and digital sector, including freelance and remote work	The RGoB may consider providing fiscal incentives such as tax deductions or tax credits to companies employing the three groups, with proportionately higher incentives for ICT sector, BPO/ITO, software developers, and FDI digital companies. The incentives would also apply to part-time and remote work employments to promote the sector. For start-up entrepreneurs, additional incentives may include waiver of business registration fees, waiver of bank fees, and tax incentives for the digital enabled businesses.	MoF, MoICE	Immediately

4. Digital Financial Services Development:

4.1 The RGoB may provide policy and facilitation support to commercial banks to seek international strategic partners and FDI to develop their core banking systems to meet international standards, and also to improve the international payment gateways. The domestic payment gateway in Bhutan is hosted by the RMA, with 70 registered merchants, and the system functions effectively for payments and funds transfer domestically. However, the international payment gateway restriction on transaction amount and transaction failures were identified by the private sector as common impediments to business activities. Transactions involving international credit card, debit card, ATM card, and approval authorization of foreign-issued cards are viewed by businesses as not usable in Bhutan. Currently, credit card transactions are processed through India, while payments are processed through Nepal and India. Remittances are also affected as experienced by those transferring funds back to families in Bhutan. In practice, there are two main reasons for the transaction failures - technical and business:

- The first technical reason is that Bhutanese banks' core banking systems and ATM machines are not technically compatible with those of international banks, and automated approval of transactions may deny approval.
- The second business reason is that it is well-known that in South Asia, credit card frauds are rampant and the card issuing-banks must absorb the fraudulent charges, resulting in higher operating costs. As a result, the card issuing-banks restrict approval when the card is used in Bhutan to reduce fraudulent risks.

It is important to note that credit card companies such as Visa, Mastercard and American Express would not develop the international payment gateway with the host country's central bank, but rather only with commercial banks. Currently, Bank of Bhutan and Bhutan National Bank are the only two commercial banks with international payment gateways. Credit card companies are in the process of negotiating with Tashi Bank and Druk PNB Bank to develop additional systems.

Remittances are also processed through the international payment gateways of BNB and BoB, and only for each bank's account holders. Tashi Bank has its own remittance system, which is processed through correspondence banks, and the service is available to non-customers. In addition, Western Union, MoneyGram, Xpress Money, and Ria also provide remittance services in partnership with local banks.

Other international payment gateway such as PayPal is yet to establish their presence in Bhutan citing low business volume and high per transaction operating cost of Bhutan's small economy.¹³

Given the current limitations of the international payment gateways, the RMA strongly recommends to businesses transacting with foreign clients and foreign visitors that they inform their card issuing-banks of the travel dates and duration inside the Kingdom of Bhutan that the cards will be used, and that authorization approval should be provided.

4.2 Improve the capacity of the G2C payment system. The G2C system is an intermediary connecting the <https://www.citizenservice.gov.bt> public service delivery platform to the domestic payment gateway. As discussed in Part A, the system has been found to be unstable, with frequent downtimes and caused incomplete transactions, and system upgrade should be considered as more government services are being digitized in the citizen service portal.

4.3 In the medium term, the RGoB may explore the possibility of setting up a Digital Development Fund (DDF) to support tech start-ups. Start-up businesses often lack financial resources for investment and business operations and have difficulty accessing financial market. Loans from financial institutions are sometimes difficult to obtain, the interest rate terms and conditions are unaffordable, and borrowers may not have the credit history to be eligible. The RGoB may consider bridging the access to financial gap by providing low interest investment loans and performance-based grants for technical and capacity building to eligible start-ups. The borrowers must illustrate viable business plans, with potential future income to meet repayment terms and conditions. International experience in countries such as Taiwan, S. Korea and Thailand showed that the governments were willing to invest seed funds in the DDF and operate it sustainably.

It is strongly recommended that a feasibility study for the DDF be conducted prior to policy decision. The DDF is a complex undertaking, where the fund is operated as a quasi-financial intermediary, with both investment loans and technical and capacity building support through performance-based grants. A robust financial resources, management and technical capacity will be needed to deliver effective financial services, and to promote it as a revolving fund to maintain sustainability.

¹³ Interview with Bhutan National Bank

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
4. Digital Financial Services Development:			
4.1 Provide policy and facilitation support for banks to seek international partners and attract FDI to develop core banking systems, and to further improve the international payment gateway	The RGoB may consider hosting a B2B forum for Bhutanese banks to connect with correspondent and international banks, and investors to forge partnerships in developing the core banking systems to meet international standards, and to seek FDI or explore PPP modality to improve the international payment gateways.	RMA, MoF, GovTech, DHI	6-8 months
4.2 Improve the G2C payment system for the https://www.citizenservice.gov.bt	Improve the G2C system that is linked to the platform to reduce the downtime, increase reliability and stability of the system.	RMA, DHI, BNB, BoB	6-8 months
4.3 In the medium term, the RGoB may consider setting up a Digital Development Fund (DDF) that is consistent with international practice	A feasibility study for a DDF should be conducted. The DDF can provide low interest investment loans and performance-based technical and capacity building grants to tech start-ups.	GovTech, MoF, International Expert	8 months to complete feasibility study

5. People and Skills Development:

Human resource capacity is the key to creating a digital economy. Based on the Labour Force Survey 2022, out of the 287,785 employed persons in Bhutan, only 0.9 percent or 2,600 persons worked in the ICT sector. Within the ICT and digital sector, according to the RUB, there are approximately 2,700 new enrollments each academic year, with 800 graduates. Approximately 75 percent of the graduates, or 600 people are in science and technology, and out of this number less than 70 percent, or less than 420 people find jobs in RGoB, DHI, and the private sector.

Both the public and the private sectors are facing challenges in both vertical and horizontal HR capacity development. Vertically, the ICT sector is experiencing shortage in skilled professionals. Upskill and reskilling programs are being developed but will take time to produce professionals. Horizontally, the market requirements for ICT skills are not being understood and met. The country needs to expedite the development of HR capacity to meet market requirements and in order to retain professionals. Formal education takes time for students to learn and complete the academic curricula. The Digital Jobs in Bhutan Report (2021) and Part A discussed the fact that university graduates often lack practical digital skills and experience when they enter the work force. Student internships at technology companies are rare, and when internships are available they are short in duration, often 1-2 months at most, which do not allow the interns to acquire proper technical knowledge and skills. The RUB is revamping its ICT and digital technology curricula starting in 2023, and it will take up to 3-4 years for RUB to produce high-caliber graduates to service both the public and private sectors.

As discussed in the Bhutan Workforce Futures Report (2022), and through interviews with tech start-ups and several FDI companies voiced their concerns over increasing digital staff turnovers, where employees resigned and emigrated overseas to seek better economic opportunities. Prior to COVID-19 pandemic, companies in TTPL recruited new staff twice a year. However, since 2021 they recruited new staff four times a year in order to fill the technical skills gaps and the empty positions necessary to deliver timely services to their clients.

For both the public and private sectors, once new staff are recruited, considerable in-service training, mentoring, and coaching are still needed. Digital skills ranging from basic digital knowledge to more in-depth specialized training such as data analytics, software development, networking, graphic design, web design etc.

Statistically, digital penetration among the general public in Bhutan is quite high. According to the Bhutan Living Standard Survey 2022, 95 percent of Bhutanese own a smartphone, and 99.6 percent of the households have mobile internet connection. However, digital literacy remains a concern, especially for Bhutanese living in rural areas, the elderly, and the illiterates. Delivery of public services are being integrated into the e-government <https://www.citizenservice.gov.bt> at a rapid pace, and without capacity to absorb and use digital technology, the vulnerable groups will be left behind. GovTech has initiated a digital literacy program with the objective to enhance digital skills of the people, especially in the rural areas through the 202 CSCs, to educate the general public on the growing significance of technology and safe use, economic empowerment and most importantly to be independent tech entrepreneurs. Prior to the 12th FYP, digital literacy focused on providing awareness and workshops to the citizens benefiting 15,290 people across the country. The sensitization program was conducted in central schools targeting students of 10 and 12 standards. During the 12th FYP, under the Digital Drukylul Flagship Programmes, the focus of digital literacy shifted to providing hands-on training to use digital technologies and applications that are relevant to the citizens. A part of the curriculum has also been integrated into the school education. The sensitization and education program were initiated through the development of digital content on e-services and other technological related content including cyber security.

Below are recommendations on in-service training and capacity building for the public and private sectors.

5.1 The Digital Industry Skills Requirements Survey (DISRS) should be conducted to better understand the digital and technology industry and market requirements, and to align the industry demand with the supply of skilled HR. The survey will provide information in mapping digital skills and HR capacity with industry requirements and future thinking so that the RGoB can stay updated, and guide ICT education and professional training. The survey includes identification of digital jobs and skills for youth, women and PWDs, and the types of remote work that can be promoted for job creation. The DISRS should be completed with inputs from digital businesses, FDI companies, and start-ups.

5.2 Capacity development and training for the RGoB: New civil service recruits working in digital jobs should be required to attend digital skills development training programmes. The programmes should provide integrated and continuous in-service training on ICT and digital technology and future trends for new recruits as well as existing civil servants working in ICT jobs. The training curricula should cover the basic digital skills requirements of the RGoB, and more specialized skills in the more advanced programmes. Digital skills may include for examples data

analysis, big data, and digitization of annual performance agreements of ministries. A training-of-trainers programme can be developed, and also at the same time the on-training curriculum can be designed for the public and can be delivered in-person or through e-Digital learning platform that is gender friendly, accessible to youth, the illiterates and PWDs in rural areas.

In addition to the trainings, the RGoB can enhance HR capacity through:

5.2.1 Prepare a comprehensive capacity development programme for the RGoB digital transformation, including digital skills requirements, ICT project management, change management, and career path development. The programme may be further developed and expanded to provide digital literacy training through the CSCs for the public in rural areas. Other learning supports such as mentoring and coaching, student and professional internship and exchange programme should also be organized and promoted. A group of trainers may be recruited, and a Training-of-Trainers programme be implemented. GovTech new recruits should also be intensively trained in equivalent to the private sector professionals. The RGoB may also request from the APCICT or bilateral support for these programmes from countries in the region such as India, Bangladesh, or Sri Lanka.

5.2.2 A team of digital expert advisors to assist GovTech in preparing the action plans for the National Digital Sector Master Plan, prioritizing and coordinating the development of digital economy, and provide on-going technical advice. The advisors to work closely with GovTech may include digital experts within the TTPL, ministries, private sector, international digital professionals, and digital nomads that are qualified as mentors and coaches, and academia.

5.2.3 International digital experts and consultants under the RGoB or international organization contracts may be solicited to provide in-person trainings to RGoB ICT professionals and develop a standard operating procedures (SOPs) manual for the projects they worked on to capture knowledge transfer, and the SOPs can also be used for future trainings.

5.3 Capacity development support for the private sector: The digital industry needs a “fast track” development of capable ICT and digital professionals to fill the high turnovers and limited HR capacity and talents. Pre-service formal education and training do not provide enough skilled professionals in a timely manner. Businesses face high recruitment and in-house training costs to upskill their digital workers. FDI companies and larger businesses provide in-house training to staff in areas such as digital data analytics, graphic design, web development, blockchain technology, product development, and business development. The whole-of-industry in-service professional training is seen as a short-term solution, but thus far it is not well-organized, and therefore staff mostly learn on-the-job.

The RGoB may consider supporting the private sector in-service training as follows:

5.3.1 Assist in organizing in-service professional development programme. GovTech, in partnership with the stakeholders of the digital industry, may initiate development of professional skills development curricula for new recruits entering the job market so that they can be absorbed into the sector within a short period of time, and also refresher course on new digital thinking and trends for existing professionals. The programme may cover technical skills such as software engineering, networking, graphic designing, web designing, machine learning, UX (User Experience) engineering etc. The trainings can be delivered by the private sector, possibly setting up a digital industry training institute financed by tech companies. While the limited number of capable professional trainers is a crucial component of the trainings, and must be addressed by the industry.

5.3.2 Initiate with the tech companies in setting up “Digital Help Desk” to be the first responder to provide technical knowledge and quick responses to tech industry workers and start-ups, as well as being a service to the general public. This will enhance knowledge sharing and capacity for digital literacy. The help desk may solicit trained professionals as part-time resource persons to resolve digital problems and advice on digital development, augmenting the in-country digital advisory services.

5.3.3 Provide ICT and digital sector businesses fiscal and tax incentives to provide digital literacy training to the public and also train and employ youth, women, and PWDs. Secondary school students Grades 11th and 12th, women and PWDs may be given intensive ICT and digital trainings for market-readiness. The RGoB and businesses may develop joint training curricula which would lead to fast-track employment and also remote work opportunity for this group of workers. Possible areas of training and employment include digital content development, digital design, and digital marketing.

Main Sub-Strategy	Activities to be completed	Lead Agency*	Estimated Timeline
5. People and Skills Development: Capacity Building, Upskills, Reskills, Professional Trainings			
5.1 Conduct Digital Industry Skills Requirements Survey (DISRS) to assess the industry requirements for digital skills	GovTech may lead the effort to survey the market requirements to align with the short-term development of HR skills, professional training and capacity building, and more medium-term formal education.	GovTech, TTPL, DHI, PS, FDI companies, RUB, International expert	3 months
5.2 Capacity development and training for RGoB: New recruits working in digital jobs should be required to attend digital skills development training programmes	Expand the existing capacity development programs and curricula for ICT and digital technology and future trends to upskill and reskills tech professionals. Trainings can be delivered in-person, or through on-line learning platforms, and should be on-going including refresher courses.	GovTech, TTPL, DHI, RUB	Prepare curricula in 6 months, start training in 2024
5.2.1 Prepare a comprehensive capacity development programme for the digital transformation for the public sector. Recruit Trainers to go through the T-O-T		GovTech	Immediately

Main Sub-Strategy	Activities to be completed	Lead Agency*	Estimated Timeline
	programme. Digital literacy curricula may be further developed for the general public and in rural areas, and the programme may be expanded through the CSCs to bridge the digital divide.		
	5.2.2 Set up a team of digital expert advisors to assist GovTech in preparing the Action Plans for the Master Plan, prioritizing and coordinating the development of digital economy, and provide on-going technical advice. The advisors can be a combination of tech industry professionals and international experts.	GovTech	Immediately
	5.2.3 International digital experts and consultants under RGoB or international organizations' contracts may be solicited to deliver in-person training and prepare SOPs for the projects.	GovTech, Relevant ministries	Immediately
	5.3 Capacity development support for the private sector		
	5.3.1 Assist in organizing in-service professional development programme to upskill and reskill ICT sector workers.	GovTech, DHI, TTPL, tech industry companies	Immediately
	5.3.2 Initiate setting up the "Digital Help Desk" by the private sector to be the first responder of digital questions or problem solving for tech workers as well as the public in general, augmenting the in-country digital advisory services.	GovTech, DHI, TTPL, tech industry companies	Immediately
5.3.3 Provide ICT and digital sector businesses fiscal and tax incentives to train and employ Youth (Grades 11 th and 12 th in particular), women, and PWDs	The RGoB may consider providing fiscal incentives and urge tech companies to develop joint training curricula covering digital content development, e-commerce, digital marketing, and graphic design, and fast-track employment for this group of people.	MoF, GovTech, DHI, private sector, MoESD, MoICE	Immediately

6. Governance, Institutional Arrangements and Legal Reforms: The sixth pillar represents a cross-cutting strategy:

6.1 Prepare the National Digital Development Master Plan (The Master Plan) to extend the coverage of the current ICT Roadmap that will expire in 2024. In 2011, the Bhutan ICT Roadmap was formulated and it was revised in 2015 to outline the country's vision for the development of the ICT and digital sector over 10 years through 2024. As discussed in Part A, the roadmap identifies three key areas of development:

- ICT for Good Governance
- ICT Enabling a Shared National Consciousness
- ICT as a Key Enabler for Sustainable Economic Development

As Bhutan continues on an accelerated path of digital sector development to realize Digital Bhutan, a comprehensive plan will be needed to supplement the ICT Roadmap, which will expire in 2024. A digital government platform will not only integrate data, but also provide evidence-based in policy-making, and timely and effectively allow for monitoring learning and evaluation of development projects and public services. The Master Plan should cover the current and on-going developments including infrastructure development, ICT strategy, internationalization of ICT sector and industry, integration of more than 400 RGoB's digital systems, data governance framework, inter-operability framework, data exchange for both public and private sector, legal

and regulatory regimes, development of digital economy, digital technology investment and financing plans, mechanisms to engage the private sector and international investors in the digital sector, human resources, and skills and education capacity development. This is clearly a huge undertaking, and the Master Plan can be designed to address specific priority sectors such as agriculture, tourism, and trade, with objectives and timeline to complete, and also responsibilities.

6.2 Establish the equivalent of the Digital Development Strategy Board (DDSB). The Master Plan is comprehensive, with multiple stakeholders, and the preparation and subsequent implementation of the plan need to be holistic and integrated. It is recommended that the DDSB, or its equivalent high-level multi-sectoral committee, be established to oversee the preparation of the Master Plan and the implementation of digital development and transformation efforts. The establishment of the DDSB or committee is consistent with good international practices, and based on the principle that the policy formulation role should be separated from the implementation role. Such a board could be mandated to authorize policies such as data protection, privacy, digital documents and signature, data standards, and mobile government. Following the civil service reform of 2022, the government's digitization functions were centralized under the GovTech, with a clear operational mandate. However, the undertaking is huge, and institutional coordination for planning, implementation, and monitoring remain a challenge. The RGoB has already established the High-level ICT Steering Committee (HCICT) and the Committee for Coordinating Secretaries (C4SC) that could effectively function in the same purpose as the DDSB. The committee could provide directions and guidance from multi-sectoral perspectives, keep the stakeholders informed and contribute to the whole-of-government digital transformation efforts. This recommendation is also similar to Singapore's Government Technology Agency (also called GovTech) which has a statutory board power of the government of Singapore to approve the digital development plan and monitor activities. In Thailand, the Digital Economy, and Society Commission (DESC), an autonomous agency mandated to oversee the national digital development plan and monitor implementation progress. The DESC reports to the multi-sectoral board of directors in addition to horizontally be accountable to the Ministry of Digital Economy and Society.

The committee or the DDSB should comprise high-level representatives from the RGoB,¹⁴ private sector, academia, tech and digital experts, and civil society organizations (CSOs) to foster cooperation, coordination, open communication, build relationship and team, and reduce the silo work environment across the industry and among the stakeholders.

6.3 Revise the ICMA 2018 to provide a comprehensive data governance framework to enable data sharing and data protection and privacy for both the public and private sectors. Sharing of data and information among RGoB agencies is limited,¹⁵ and in some cases government agencies' policies, public services, and programs are not coordinated across the board, resulting in duplications and in some cases gaps in government services. The integration of the more than 400 stand-alone systems into a SSOT e-Government platform (sub-strategy 2.2) has been slow because Bhutan does not have the data interoperability framework between the systems, and no specialized data privacy policy and regulations. Data collected or generated by government systems are at risk of being shared with unauthorized people which could result in fraud and exposure of private information. The GovTech is currently formulating a data policy which can lead

¹⁴ It is strongly recommended that the membership of the DDSB (or equivalent thereof) includes the Ministry of Finance to align the development policies with the budget allocations for implementation.

¹⁵ It should be noted that this situation is not unique for the Kingdom of Bhutan, many developing countries face the same situation in limited coordination and communications within the public sector.

to better decision making in the government based on actual data. The TTPL also hosts the national data center platforms for the RGoB and private sector at low-cost subsidized fees. The data governance framework, including data exchange and data privacy regulations would enable sharing of data between RGoB agencies.

The lack of a data governance framework also hinders the private sector to integrate businesses, share commercial knowledge, R&D, and innovations across the digital sector. For example, financial institutions, banks, and non-banks, are restricted by the lack of data protection and privacy framework to innovate personalized financial products, to offer investment planning advice, and to provide financial literacy and inclusion of rural retail consumers and businesses. As a result, business growth in the digital sector has been slowed and limited especially for start-ups.

The ICMA 2018 has been reviewed by the Office of the Attorney General, with support from the World Bank, with the results soon to be shared with the RGoB. From a business development perspective, the ICMA could be revised expeditiously to include a more specific data governance framework that will enable sharing of digital data.

6.4 The cyber-security and cyber-crimes should be developed as a separate legislation. These are different issues from the data governance framework and they should be developed for both legal and institutional frameworks. The BtCIRT was established in 2012 following the readiness assessment conducted by the ITU to measure not only the cybersecurity level of Bhutan, but also the cybersecurity threat landscape. The BtCIRT is currently developing the national cybersecurity strategy, including protection of domestic and cross borders digital transactions, open data protection and privacy, digital signatures, and human rights protection.

6.5 Revise the Income Tax Act (2002) to eliminate the potential double tax surcharge on dividend paid to company shareholders and personal income tax to promote company registration and FDI companies. Entrepreneurs operating businesses are issued business licenses by the IBLs under the MoICE. The RGoB also encourages businesses to register as a company limited to receive lower corporate income tax rates¹⁶, and it is also a requirement for FDI eligibility. The number of registered companies have not grown since pre-COVID pandemic and the main reason is that when a company pays dividend to its shareholders, the company deducts a 10 percent dividend tax, while the shareholders must also declare the dividend income and pay personal income tax, amounting to a double tax surcharge. The Income Tax Act (2002) is currently being reviewed, and revisions should be expedited.

6.6 The Department of Labour and the Department of Immigration may consider reducing professional qualification for international ICT/tech professionals, freelancers, and digital nomads with proven credentials to enter the Kingdom. The visa and SDF regulations pertaining to the ICT professionals have been effectively revised as of June 1, 2024. However currently, this group of professionals must hold a degree qualification to be granted a visa. Whereas in practice, an increasing number of ICT professionals, freelancers and digital nomads are non-degree graduates, but rather they have high level of ICT knowledge and professional experience that can be contributed to the development of the digital economy of Bhutan. While in Bhutan, they may work with local start-ups, web designers, graphic artists, social media influencers, and digital

¹⁶ Business License Tax rate is 30% of net profit. Companies pay 25% corporate income tax on net profit. SOEs pay 30% corporate income tax on net profit.

marketing. The contribution of their professional services is immense and it should be leveraged by the government. This group of people can be solicited to provide professional trainings, advisory services, peer-to-peer mentoring and coaching in their areas of expertise, and also for the local freelancers and remote work. The RGoB may also consider assessing personal income tax or withholding tax on foreign independent contractors and digital nomads working in Bhutan.

6.7 The Telecommunications and Broadband Policy 2014 should be reviewed to facilitate private investments and FDIs, particularly in the remote areas.

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
6. Governance, Institutional Arrangements, Legal and Regulatory Reforms			
6.1 Prepare the National Digital Development Master Plan, a “strategy and action plan” for short, medium, and long-terms development of Digital Bhutan. The Master Plan should be submitted for approval to the Digital Development Strategy Board (DDSB) outlined in Item 6.2	Establish the Master Plan Team to prepare the Master Plan, comprising, but not limited to, working-level representatives from the Cabinet Secretariat, relevant ministries, RCSC, RSEB, DHI and Super FabLab, TTPL, private sector, FDI companies, RSEB, RMA, Financial Institutions (banks and non-banks), academia, start-ups digital businesses, CSIs, and CSOs.	GovTech	6-8 months
6.2 Establish the equivalent of the Digital Development Strategy Board (DDSB) to direct and oversee the preparation and implementation of the Master Plan and the country’s digitization efforts	RGoB may consider utilizing the HLICT Steering Committee or the C4CS to be equivalent of the DDSB. Members should comprise high-level representatives from the agencies listed in Item 6.1 (or a smaller group of policy-makers as necessary), to provide guidance to the development of the Master Plan, and subsequent monitoring of implementation progress.	The Cabinet Secretariat, GovTech to serve as secretariat	Immediately and on-going
6.3 Revise the ICMA 2018 to include data governance framework, data protection and privacy, and interoperability protocols for sharing of digital data	The ICMA 2018 is currently being reviewed. The Act should be expeditiously revised to comprehensively include data governance framework, data protection and privacy, data integration, and data exchange.	GovTech, Office of the Attorney General	12 months
6.4 Development of protections laws and regulations on cyber-security, cybercrimes, consumer protection, and human rights protection (e.g., cyber bullying)	The national cyber security strategy is currently being developed, and it would underpin the development of the protection laws and regulations.	BtCIRT, GovTech, MoHA	To be confirmed
6.5 Revise the Income Tax Act (2002) on the dividend double taxation to promote company registration and also to attract FDI companies	Eliminate the dividend double taxation (shareholders and personal income taxes), to encourage company registration and increase the number of companies, also applicable to FDI companies.	MOF, MoICE, Office of the Attorney General	6 months
6.6 Reduce professional qualification for international ICT/tech professionals, freelancers, and digital nomads with proven credentials to enter the Kingdom.	Internationally, increasing number of ICT professionals, freelancers and digital nomads are non-degree graduates, but rather they have high level of ICT knowledge and professional experience that can be contributed to the development of the digital economy. They may	Department Labour, Department of Immigration,	Immediately

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
	<p>work with local start-ups, web designers, graphic artists, social media influencers, and digital marketing, become advisors, mentors, coaches. The contribution of their professional services is immense and it should be leveraged by the government.</p> <p>The RGoB may consider assessing personal income tax or withholding tax on foreign professionals working as independent contractor.</p>	MoF	
6.7 Review and enhance the Telecommunications and Broadband Policy 2014 to facilitate private investments and FDIs, particularly in the remote areas	The RGoB may initiate the review of the telecommunications regulations.	BiCMA	Immediately

* GovTech is the lead agency or the coordinating agency for implementation

INTERNATIONAL CASE STUDIES AND PRACTICES¹⁷

Innovative Start-up Ecosystem: The case of Barcelona
Overview
<p>Global economy stands to experience significant effects from digital transformation, prompting governments worldwide to prioritize the development of digital infrastructure and services. Government's primary objective is to create an entrepreneurial ecosystem that fosters investment in innovation and start-ups. In recent decades, both local and national governments have actively sought to establish thriving ecosystems for start-ups and entrepreneurs. Such entrepreneurial activity contributes to greater flexibility in the labour market and is linked to the generation of employment opportunities. Moreover, it leads to the introduction of innovative products and services that benefit citizens, while also generating overall wealth that can have positive effects in sectors like health, education, agriculture, social services etc.</p>
Background
<p>Entrepreneurial ecosystems are intricate networks of interconnected actors and elements that provide essential support for productive entrepreneurship. These ecosystems encompass multiple areas including cultural aspects, formal institutions, infrastructure and amenities, information technology, diverse talent pools, and market demand. In fact, systemic conditions such as networks, leadership, access to finance, availability of talent, knowledge exchange, and support services all play crucial roles in shaping the functionality of these ecosystems.</p> <p>In general, digital transformation policies can play a crucial role in establishing and nurturing entrepreneurial ecosystems by implementing effective strategies and offering incentives that stimulate and support the formation of new companies. These can encompass various forms of support, such as financial assistance and advisory services, as well as regulatory incentives and the establishment of enabling infrastructure and networks; which have been used to create an effective start-up ecosystem in Barcelona. Additionally, governments have taken steps to establish incubators, accelerators, and coworking spaces, all aimed at providing a conducive environment for entrepreneurial endeavours. They have also launched mentorship programs and support initiatives specifically designed to assist entrepreneurs. Furthermore, investments in education programs have been made to cultivate entrepreneurial skills and knowledge among aspiring individuals.</p>
Notable aspects
<p>Barcelona start-up ecosystem is based on creation of local policies to develop the overall ecosystem and its first generation of entrepreneurs and start-ups. Following are the key success factors during last few decades:</p> <ul style="list-style-type: none">• The initiative of 'Barcelona Activa' in 1986 as a business incubator and the ODAME program, aimed at supporting women entrepreneurs, have emerged as the one of the early successes for Barcelona. 'Barcelona Activa, an initiative by Barcelona City Hall, promotes the economic development of Barcelona and its metropolitan area with the mission to promote economic policy and local development to improve the quality of life of the local community through job creation, the promotion of entrepreneurship and support to companies. The institution has the unique program of "Women Entrepreneurs School (ODAME)" which provides "targeted" training, networking support and services especially designed for women's entrepreneurship" Over the years, these initiatives have played a pivotal role in attracting talent, foreign investment and stimulating local economic activity in the city.• The emergence of the internet in the late 1990s provided a catalyst for the realization of the local policy agenda's full potential. It facilitated the growth of a digital ecosystem that eventually evolved into an ideal global business hub, enabling seamless business operations on a global scale.• The primary objective was to nurture and retain local talent, stimulate economic activity, and attract high-quality investments associated with the digital ecosystem. One related example of this is the Barcelona Tech City initiative designed to foster the development of cutting-edge digital infrastructure with high-speed broadband connectivity and drive innovation and creativity.• Another public policy was-continuous investment in education/training for digital & entrepreneurship education in partnership with universities & business schools. Barcelona Activa provided essential support for local business development through its comprehensive collection of start-up documents. With a vast selection of documents and continuous training programs, covering various topics like marketing, legal entities, business taxes, and funding,

¹⁷ Sources: UN Chief Digital Office, UNDP Bhutan Country Office

Barcelona Activa has equipped entrepreneurs with valuable business skills. These resources enable businesses to navigate the local market more effectively and make informed decisions.

- Additionally, efforts were made to support internationalization and attract foreign start-ups and investors to Barcelona.
- Some of the key services to the start-ups and entrepreneurs encompassing a range of incubators, focusing respectively on newly created companies, companies set up as public-private entities, and start-ups with high technological impact in fields such as IoT, AI, Big Data, nanotechnology, and robotics etc.
- Other key services include co-working opportunities for small start-up teams, evaluating business feasibility, networking assistance including connections to suppliers, assistance complying with Spanish taxes and other legal regulations etc.

Insights from Bhutan

While building a great start-up ecosystem, Bhutan needs to leverage its international connections to bring not only investments but to bring emerging / world-class technologies, attracting talents and know-hows. Neighbours like India and Bangladesh has strong [start-up India](#) and [start-up Bangladesh](#) programs which may also be considered for adaption in Bhutan's context.

The factors crucial for attracting international funds to an ecosystem may vary depending on the unique characteristics of each ecosystem; however, some of the common factors that were observed over time are: state of the art infrastructure, tax incentives, regulatory framework, education and training, networking opportunities, promotion of innovation etc.

Software Technology Parks of India

Overview

Following World War II, the United States witnessed the emergence of science parks (also called as science and technology parks or technology parks or technoparks that accommodates cluster of firms typically work involving science and technology), with Silicon Valley in California becoming a prominent hub for high-tech industries, particularly information technology and software development. This success story set the standard for high-tech parks worldwide. In Asia, Japan and Korea led the way by emphasizing basic research and development conducted by government institutes and universities. Presently, IT Parks have become prevalent in developing nations across the globe, including India, China, Malaysia, the Philippines, Costa Rica, and the Dominican Republic.

In the case of India, the IT/IT-enabled services (IteS) industry has emerged as a significant contributor to economic development. It has made a substantial impact on the country's gross domestic product, employment generation, and facilitated broader accessibility to innovative technology on a global scale. Over the past few decades, India has established itself as a prominent global destination for IT and IteS outsourcing, renowned for delivering top-notch technology solutions and business services. The country's capacity and cost competitiveness in providing IT solutions remain key differentiators in the global ICT demands. Throughout this transformative journey, software technology parks or high-tech parks located in various Indian cities have played central roles.

Background

Government policies and facilitations have played a key role in the development of the IT industry in India, like setting up of Software Technology Parks (STP) and Special Economic Zones (SEZ), removing duties on imports of IT products and easing of controls on investments in ICT sector helped India to gain dominant position in world's IT scenario. However, the prominent role of the Indian government in helping foster the success of India's IT industry was establishment of Software Technology Parks of India (STPI) as an autonomous society under the Department of Information Technology, Ministry of Communications, and Information Technology (currently MeitY) in 1991 and was initiated as a Software Technology Park Scheme. This scheme offered 100% exemption from income tax for export profits for a 10-year period, in addition to exemption from customs duties, service tax, excise duty, and rebates. The STPI also provided essential infrastructure support and single window clearances for setting up export-oriented units. Deregulation in the telecom sector also played an important role in the growth of this industry.

In addition to the federal government, state governments are actively implementing targeted policies and schemes to incentivize the ICT industries. They are focused on creating a favourable business environment and attracting investments in the ICT sector to foster the development of the industry within their respective states. Apart from establishment of STPs, certain state governments have created IT parks to facilitate the growth of IT industries. These parks serve as catalysts for new business development and technological innovation by leveraging the synergies within a clustered environment. They offer essential infrastructure and support services to businesses, with a specific focus on high-quality communication facilities, real estate, and office spaces with ample capacity.

India's first international gateway and network operations for Information Technology (IT) was established at the Software Technology Parks of India (STPI) in Bangalore's Electronic City. Besides Bangalore, other cities such as Hyderabad (Andhra Pradesh) and Chennai (Tamil Nadu), Pune (Maharashtra) are the cities which have undergone an immense growth in the IT sector. In recent years, ICT firms in India are expanding to tier II or tier III cities like Ahmedabad, Bhubaneswar, Surat, Chandigarh, Ludhiana, Jaipur, Nagpur etc. due to cost advantage for both labour and real estate.

Notable aspects

- Attracting anchor investors: Proactive approach by Government in attracting strategic anchor investors which will further lead to raise visibility and attract large companies. For example, Government succeeded in getting Microsoft in Hyderabad which made it easier to attract follow-on investments from other high-profile companies such as Oracle, IBM, Accenture etc.
- Consideration of separate development authority for IT parks – The concept of Industrial Area Local Authority (IALA) for the development of IT parks can be considered like in Telangana
- Single window time bound clearance (Ease of doing business) – Single Window Clearance mechanism for speedy approval of various clearances across various departments can be considered. Core activities such as investor relationship management, application submission to Karnataka Udyog Mitra, single window clearance process and escort services for speedy implementation of the projects have been computerized. Also, Kerala state has implemented K-SWIFT- Single Window Interface for Fast & Transparent Clearance to enable Ease of Doing Business
- Development of infrastructure through Public Private Partnership (PPP) – HITEC City, Hyderabad, is an example of successful IT parks built on PPP mode, which helped to accelerate the development of infrastructure, improve the distribution of risk and incentives among the parties involved, enhance public management, and improve quality of service
- Industry academia partnerships for enhancing employability skills and Strategy for improving quality of education – Government promoted industry academia partnerships where industries can collaborate with colleges to set up research labs in the college campuses. Proper strategy may be defined for improving quality of education and thus linking education and employment and entrepreneurship. Kerala Government have established ICT Academy of Kerala in Public Private Partnership model (PPP) wherein youths of Kerala are trained with digital skills to enhance their employability prospects in the IT industry, thereby opening up greater opportunities for them.
- Effective marketing/branding and awareness to attract investments- Marketing and branding plays a significant role in attracting investments. Aggressive presence in digital media, trade shows, conferences, symposia, seminars at national and international levels can outreach potential investors showcasing benefits such as single-window clearance, tax incentives and other benefits. Further, complete online information guide and creating awareness among potential investor is one of the key success factors; e.g. Karnataka has set-up an online information portal for providing comprehensive information/guide to investors regarding setting up and obtaining approvals/registrations for establishing a company in the state.

Insights for Bhutan

Electronic City in Bangalore,HITEC City in Hyderabad, Technopark in Thiruvananthapuram, TIDEL Park in Chennai, and Magarpatta IT City in Pune are among the booming IT parks in India that have witnessed significant development over the years. The success of these IT parks can be attributed to government interventions, well-established physical and digital infrastructure, including reliable power, water, and telecom facilities. Additionally, these parks benefit from established connectivity to international and domestic cities, as well as access to a well-qualified, ample, and cost-effective workforce, which further contributes to their success. Some of these best practices and lessons learned can be utilized for improving the utilization of existing one and development of the new IT Parks in Bhutan.

e-Rozgaar Programme: The case of Pakistan

Overview

Payoneer, a US based financial services company declared Pakistan the 8th fastest growing freelancing country based on its year-on-year revenue growth of its freelancers in 2021. The journey towards building the freelancing economy started in early 2014 with the series of workshops provided by the TechHub Connect, Pakistan’s first co-working space dedicated for freelancers. The series of trainings provided to the budding freelancers led to the adoption of a freelancing model resulting in the Chief Ministers e-Rozgaar programme. The programme was implemented with the backdrop of addressing the increasing unemployment situation in the country. The Punjab Information Technology Board and the Youth Affairs and Sports department established 45 e-Rozgaar centres in 36 districts of Punjab mainly with the mission of providing training opportunities to youth for self-employment using internet-based freelancing. The vision for this programme is to reduce unemployment and drive economic growth in Pakistan by increasing inflow of foreign currency.

The programme comprises of a three-month training with the curriculum structured in a three-course track that comprises of technical (coding, web development etc), non-technical (content writing, digital marketing, etc) and creative design (graphic design, log design, concept design etc). The programme is open to candidates without prior experience for those participating in the non-technical and creative design courses, while minimum education/relevant degree is required for technical domain.

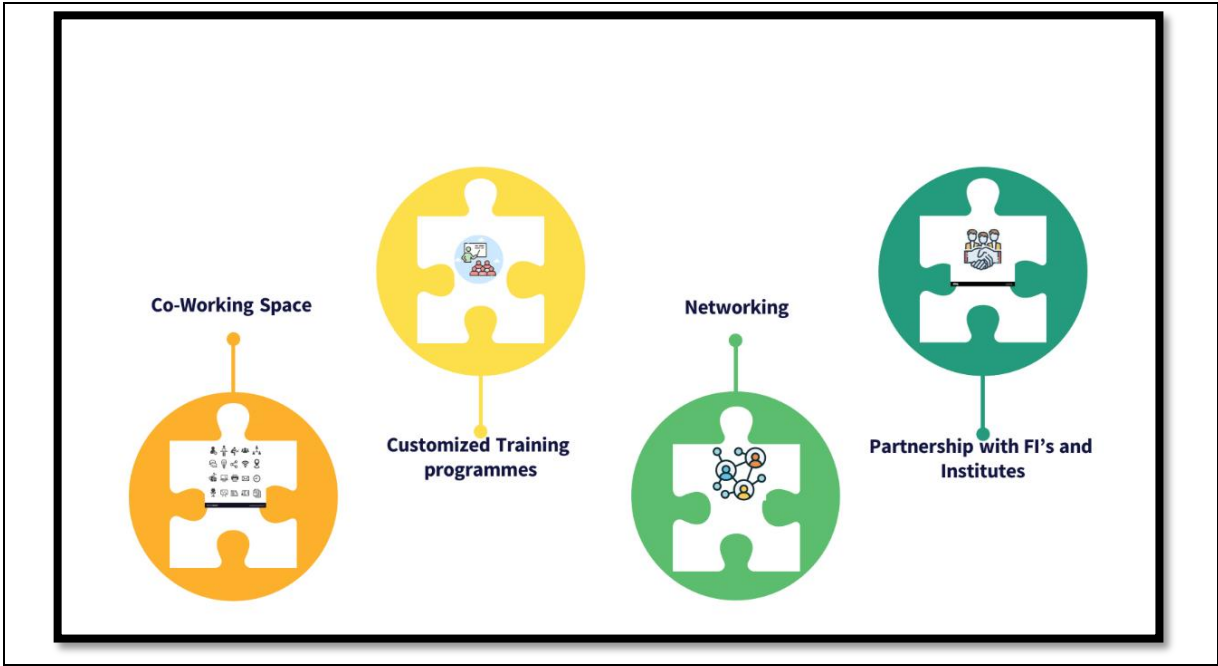
In addition to the training, the programme also provides free equipped co-working space to freelancers in all 36 centres. National level freelancing conventions are also organized support networking of different players in the ecosystem, similarly talks, trainings and workshops are organized in collaboration with CrossOver a leading remote work platform that matches talented professionals with remote careers.

What does success look like

In the first cycle of the training, 33,109 applications were received, of which 10,000 candidates were selected on merit basis for training. As of 2023, 52,000 candidates have been trained and PKR 3.6 billion has been earned after training while PKR 500 million has been reported to have been earned during training.

Insights for Bhutan

While the exact figure around the number of freelancers is not available, the uptake and interest for freelance and remote work in Bhutan is slowly gaining attention. This was evident from the 66 people who were trained in freelancing provided by DHI BiZAP. In addition, there are other actors like the Dessung Skilling Programme and the Ministry of Industry, Commerce and Employment that also provides freelancing training. The changing mindset of the younger generation from doing the 9-5 job to having the flexible working hours, this presents an economic opportunity to address the unemployment issue and the inflow of resources to the country. One key component that Bhutan can focus on is to build on the existing infrastructure such as the community centres in other districts and the existing co-working spaces to provide space for training and post training works. Networking events to connect the freelancers to one another and others in the region and global. Building networks with global companies such as Facebook and CrossOver in the case of Pakistan is crucial to provide the freelancers with a platform to showcase their skills and connect. Another critical partner to be included in this overall programme are the financial institutions to support payment tools.



FDI IN ICT AND DIGITAL SECTOR AND JOB CREATION

This section summarizes Bhutan's FDI policy framework, the country's comparative advantage, strengths and challenges that were discussed in earlier sections in order to identify and recommend broad ICT and digital businesses that may attract FDI and result in job creation, including freelance and remote work in Bhutan. In this context, the recommendations are, in part, based on Part A the Analysis of the ICT and Digital Ecosystem and Part B the Digital Economy Development and Transformation Strategy.

It is also important to note that the recommendations in this section are aligned with the UNESCAP's "Project on Attracting FDI in the Digital Economy in Bhutan" currently in progress to identify and assess specific high-potential digital businesses for FDI, and to develop concrete strategies and action plans together with Invest Bhutan, the main FDI agency under the MoICE. In addition, some of the recommendations are in reference to the Digital Jobs in Bhutan Report 2021.

According to the RGoB, part of the 13th FYP focuses on ICT and digital sector development, with the aims to i) increase the GDP contribution from the digital economy to 10 percent by 2034; ii) to generate gainful employment by creating 1,000 jobs per year in the digital economy starting in 2024; and iii) to attract and increase FDI from Nu.43.3 billion to Nu. 100 billion by 2029. Achieving these goals will not be easy, and attracting FDI will need to be based on leveraging Bhutan's comparative advantage and strengths, and addressing the challenges that affect the country's ability to attract international investors.

Bhutan's FDI policy and regulatory framework are well in place and are competitive compared to countries such as Bangladesh, Malaysia, and Thailand with similar incentives. The FDI framework has been adopted since 2002, with several revisions and updates through the years, and following the public sector restructuring in 2022 Invest Bhutan, a division under the MoICE, is the main government agency overseeing FDI. The current FDI framework advocates a level playing field for FDI and domestic companies, with differences in priority sectors receiving corporate tax incentives up to 10 years. The ICT and digital sectors were designated as one of the priority sectors from 2021 – 2026. To be eligible for FDI privileges, the business must be a registered company inside the Kingdom of Bhutan, with required proportionate local shareholders depending on the type of business, ranging from 51 to 100 percent. The minimum project value must be at least Nu. 50 million. Currently the number of FDI companies are small and are concentrated on the hospitality service sector, followed by ICT and digital sector.

Bhutan's comparative advantage also lies in "soft power," with challenges to be addressed. The country is known for its strong commitment to sustainability and cultural values, with strong English language skills, low-cost labour depending on experience and qualifications, green low-cost energy, and relative ease in doing business index ranked 89 out of 190 countries by the World Bank's Doing Business Report 2020. At the same time, there are key challenges including inexperience and young workforce, dwindling supply of capable workers especially in the ICT and digital sector who migrated overseas to seek economic opportunities (brain drain), ICT infrastructure that is still being improved by the RGoB to increase the bandwidth and system stability, physical tech facilities such as within the Thimphu Tech Park that need to be improved and expanded in capacity to host FDI companies, and competition from other countries in the region. However, investment and business opportunities exist in the short-medium-long terms in the ICT and digital sector, including new capacity training initiatives to "fast track" development of digital skills capacity, growth in artificial intelligence (AI) across multi-sectors replacing labour intensive data processing and reporting, the medium-term provision digital services such as AI labelling in the creative industry which is probably attractive to young Bhutanese

workforce. While the large tech businesses that require more advanced skills such as semi-conductor design and deep digital engineering are more for the long-term development.

Environment for a robust FDI:

A robust FDI in the ICT and digital sector is predicated on four international business requirements, namely

- i) confidence in high-capacity digital infrastructure that is reliable and stable, cost effective, and accessible;
- ii) HR skills capacity and reliability of the tech professionals in the country;
- iii) ease of doing business and level playing field in the host country; and
- iv) a work environment that welcomes foreign companies and their international staff.

The RGoB is in the process of continued development of all four areas above, including enhancing the digital infrastructure, developing SSOT and digital government, expanding public service delivery digital platform, improving cyber security and digital data protection laws, streamlining business regulations to ease doing business, and supporting the private sector in developing international payment gateways, an essential feature of international business transactions.

The most important drivers of digital development are HR skills and capacity and ICT infrastructure that would support a continuous and stable system. The types of business and jobs that are attractive to FDI can be considered in two phases, the short-term of 1 to 5 years and the medium to long-term of 5 to 10 years.

- Short-term – 1 to 5 years basic digital development stage (not in particular order):
 - Data configuration and adaptation services
 - ITES – the RGoB is focusing on youth employment and exporting ITES
 - Small scale and ethical BPO (for example the likes of Scan Café and iMerit)
 - Creative industries back-office support (“creative process outsourcing”)
 - Mobile application for wellness, agriculture production, tourism
 - Software development
 - AI annotation/labelling
 - Testing destination for technology (for example drones)
- Medium and Long-terms – 5 to 10 years moving towards taking off stage (not in particular order):
 - Machine learning
 - Data management and data structure
 - Data science and analytics
 - Blockchain and AI modelling
 - Interactive design
 - Commercialization of researches and innovations

FREELANCE AND REMOTE WORK

The advancing and increasing use of ICT and digital technology, coupled with the COVID-19 pandemic have changed the economic landscape and the way we do business globally. Freelance and remote work has also gained traction and popularity among international businesses and independent professionals for the lower business cost and in most cases the ability to generate higher productivity. According to findings from the Foresight Study (2023) jointly conducted by GovTech and UNDP Bhutan, in 2022 the global freelance industry was valued at US\$4.5 billion and is projected to increase to US\$10.7 billion by 2028.¹⁸ Bhutan is not oblivious to these developments, and is in a position to turn these developments into opportunities in job creation, employment, and economic growth. The rise of freelance workers in Bhutan is mainly due to the changing mindset of young Bhutanese towards work and the freedom to work and manage their work-life balance, and in flexible working hours and additional income.

As discussed in Parts A and B, Bhutan is facing challenges in order to enable remote work environment and to promote freelancing jobs. Some key challenges that should be highlighted include:

- While university education curricula are being revamped, and parts of the new curricula will support development of remote digital skills, formal education takes time to produce qualified professionals. Recently, efforts to increase HR skills and capacity have been implemented. The BiZap program under the DHI has been providing freelance digital trainings and a small number of graduates have been able to secure remote jobs, mainly from India and Singapore. In addition, the HR capacity and skills development strategy discussed in Part B also recommended professional trainings, coaching, and mentoring for ICT and digital sector workers.
- A minimum of 10 GB of data is used per month by remote freelancers to deliver services. The current internet connectivity and bandwidth are not adequate to support remote work environment, especially in areas outside the large cities. As discussed, the RGoB is in the process of enhancing the infrastructure.
- Currently, freelance, and remote workers use bank transfer to receive payment for their services, followed by PayPal and Apple Pay. The cost of international fund transfer through commercial banks' international payment gateways is too expensive, and it discourages young remote workers from seeking international remote work.
- Cybersecurity and frauds are rampant, not just in Bhutan but globally, and without legal protection inside the country, it is difficult to grow the remote freelance industry. GovTech is working to develop the digital protection laws.
- Lack of clear policy guidelines on taxation of freelance work hinders international firms from contracting local remote workers.

While not all the challenges are being addressed, Part B, the strategy recommended several actions that the RGoB may consider in developing the ICT and digital sector, many of which aims to support and promote remote and freelancing work, including

- The Digital Industry Skills Requirements Survey (DISRS) should be conducted immediately to better understand the digital and technology industry and market requirements, and also for remote work.
- The "Roadmap for ITES" be prepared expeditiously to identify strategic activities for FDI and international businesses.
- Promote youth, women and PWDs employment, entrepreneurship, and remote work.
- Legal and regulatory reform to increase ICT and digital businesses.

¹⁸ GovTech and UNDP Bhutan (2023)

APPENDICES

Appendix A: List of Consultations and Interviews

Organizations (multiple representatives participated in the interviews)

1. Bank of Bhutan
2. Bhutan Telecom
3. Bhutan Cyber Incident Response Team (BtCIRT)
4. Department of Immigration, Ministry of Home Affairs
5. Disability Persons Organization
6. Druk Holding and Investments Ltd.
7. GovTech Agency
8. iMerit Bhutan Private Ltd.
9. International Telecommunication Union
10. Invest Bhutan
11. Japan International Cooperation Agency
12. Loden Foundation
13. Media Community in Bhutan: Bhutan Broadcasting System, Bhutan Media Foundation, Bhutan Today, Bhutan Times, Business Bhutan, Journalist Association, Khuensel, The Journalist
14. Ministry of Agriculture and Livestock
15. Ministry of Education and Skills Development
16. Ministry of Energy
17. Ministry of Finance: Departments of Budget and Public Expenditures
18. Ministry of Health
19. Ministry of Industry, Commerce and Employment: Department of Employment and Entrepreneurship, Department of Labour, Department of Creative Media and Intellectual Property, Policy and Planning Department, Department of Trade, Department of Industry
20. Ministry of Infrastructure and Transport
21. National Statistics Bureau
22. National Digital Identification Team
23. Office of the Prime Minister and Cabinet
24. Private Sector Tech Start-up Group: Shrawa, Start-up First, iBest, Impact Hub Bhutan, Samuh, Branding Bhutan, WebNet Bhutan
25. Royal Civil Service Commission
26. Royal Monetary Authority
27. Royal University of Bhutan
28. Scan Café Private Ltd.
29. Super Fab Lab
30. Tashi Bank
31. Thimphu Tech Park
32. Thimphu Thomde
33. UNDP Bhutan Country Teams on Health, Governance, Taxation
34. UN ESCAP: Trade, Investment and Innovation Division, Energy Division, Information and Community Technology and Disaster Risk Reduction Division
35. UNESCO Education Team
36. Royal Stock Exchange of Bhutan
37. Tarayana Micro-Finance

Individuals:

30. H.E. Kinzang Dorji, Ambassador Extraordinary of Bhutan to Thailand

31. Professor Taoufik R., Consultant on the 13th Five-Year Plan

32. Mr. Nicolas Maystre, International Consultant

Appendix B: Summary of Digital Economy Development and Transformation Strategy

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
1. Digital Infrastructure and Enterprise Development:			
1.1 While it may take time to install the third fiber optic system, the RGoB may explore other options to provide access	Explore other options such as high speed fixed wireless access and other satellite options including emerging low earth orbit constellations to improve connectivity in remote areas.	GovTech	3-6 months
1.2 Consider private cloud service providers to reduce cloud hosting cost and increase storage capacity in the medium and long-term for both the RGoB and private sector	Explore private cloud service providers to host non-sensitive public and private data that would be secured and less expensive, with increased storage capacity.	GovTech	3-6 months
2. Digital Government Development:			
2.1 Develop disaggregated baseline data to measure the progress of the RGoB's FYP, the contribution of digital sector to GDP, and also the progress of the Digital Development Master Plan	Conduct data mapping exercise, develop baseline data for the FYP, including a measurement approach, a dash board, and MLE framework for reporting.	Cabinet Secretariat, GovTech, International Expert	Within 6 months as the 13 th FYP becomes effective
2.2 Accelerate the integration of the "single source of truth" (SSOT) e-Government platform, enhance EIS, dashboard for financial management information system (FMIS) or the equivalent thereof, to monitor government revenues and expenditures	Complete the review of the RGoB's more than 400 standalone data systems, reduce and/or integrate the more robust database into a SSOT single portal data platform, identify common systems to reduce the transformation cost, develop comprehensive interoperability framework, including enhancement of the FMIS or the equivalent such as the e-PMES and MYRB if needed.	GovTech, DHI, Interoperability Lab, International expert	16-24 months
2.3 Expand the https://www.citizenservice.gov.bt e-Government public service delivery platform to add services and expand access to the people, develop EIS and dash board	Accelerate the integration of public services provided by the national, thomde and dzongkhag levels, into the https://www.citizenservice.gov.bt public service platform, and	GovTech, DHI, relevant ministries	12 months and on-going operations

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
	<p>increase citizens access to the platform.</p> <p>(Note: The NDI system, currently being rolled out and soon to be completed, will provide the citizens access to the one-stop platform)</p>		
2.4 Develop e-Procurement and e-Contract Systems	<p>The digital procurement system has been launched, and the in-the-pipeline digital contract system should be completed.</p> <p>Disaggregated data such as direct and indirect procurement and types of contracts (e.g., constructions, services, consultants) should be categorized to enhance transparency, price reference, and cost-saving. Eventually integrated e-Procurement and e-Contract systems can be created.</p> <p>Explore scope to embed open contracting data standards, to improve functioning and effectiveness of procurement – and to drive broader open data agenda across government.</p>	GovTech, Dept of Procurement MoF, DHI, and international expert on e-Procurement and e-Contract	12-18 months and on-going operations
2.5 Enhance the Government Data Center (GDC)	Upgrade the GDC from the current Tier II to Tier III during the 13 th FYP to absorb the increasing digital data and services being added in the digital transformation process.	GovTech	12 months
3. Private Sector Development and Enabling Business Environment			
3.1 Accelerate regulatory reform and adopt digital tools to streamline submission of required business documents to save time and cost	<p>Eliminate redundant regulation on submission of identical business documents for each application of government services. A “once only” documents submission regulation may be adopted through the integrated digitized e-Government services single-window (Item 2.5) for applications of all government services.</p> <p>The RGoB may consider adopting the use of Digital Object Identifier – a code system to verify government-issued documents, and not requiring</p>	The Cabinet Secretariat to coordinate regulatory reform with MoICE, MoENR, MoH, MoF, RMA, MoHA, MOIAT	6-9 months

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
	the applicants to have to verify government issued documents.		
3.2 Promote cross-border digital trade for exports, regional integration, and business partnerships	The RGoB, in partnership with DHI and the private sector, may promote cross border e-Commerce for exports through G2G and B2B relationships, and linking with international e-commerce platforms to create awareness and expand the digital markets.	MoICE, GovTech, DHI, RMA, MoFAET	Immediately
3.3 Promote Bhutan Brand globally through a combination of digital marketing, virtual events, organized international events, and in-country visits	<p>The RGoB, in partnership with the Chamber of Commerce and tech companies may collaborate to increase digital marketing efforts through social media platforms (e.g., Tiktok, Facebook, Instagram) and SEO, to promote Bhutanese e-commerce platforms including https://ogop.bt and https://druksell.bt.</p> <p>A virtual roadshow. Organize series of virtual and physical “Breathtaking Bhutan” Global Event – led by the Bhutanese embassies, in partnership with host-country organizations (e.g. chamber of commerce, retail association, tourism authorities and tourism association), to promote Bhutan Brand, unique products and tourism – targeting tourism authorities, global tour companies, international media, luxury designer brands, high-end retail department stores, and eco-friendly global retail boutiques.</p> <p>Following the “Bhutan Believe” global events, invite high-potential customers, business partners to visit Bhutan and connect them with suppliers and service providers.</p> <p>In addition to CSI market stores in Australia, U.S., and Bangladesh, additional boutique stores with on-line shops in countries such as the UK, France, Switzerland, and Japan should be explored in partnership with local businesses to further enhance the visibility of Bhutan Brand.</p>	<p>DHI, Super Fab Lab, private sector partners (Chamber of Commerce, digital marketing professionals, international bloggers, influencers)</p> <p>MoFA, MoICE, GovTech</p> <p>MoFA, MOICE, GovTech</p> <p>MoFA, MOICE</p>	<p>3 months</p> <p>6-8 months</p> <p>9 months</p> <p>9-12 months</p>

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
3.4 Set up digital business development and advisory for digital start-ups, which may include BPO/ITO related businesses	Set up Peer-2-Peer Digital Mentoring and Coaching Program for tech start-ups and CSIs. Mentors and coaches could be recruited from companies located in TTPL as part-time volunteers or in some cases paid mentor/coach, DHI tech staff, university volunteers, digital nomads. Advisory services may include industry standardization, i.e., ISO and GI, and the application process.	GovTech, TTPL, DHI, Super Fab Lab	4-6 months
3.5 Promote gainful employment and entrepreneurship for youth, women and PWDs groups in the ICT and digital sector, including freelance and remote work	The RGoB may consider providing fiscal incentives such as tax deductions or tax credits to companies employing the three groups, with proportionately higher incentives for ICT sector, BPO/ITO, software developers, and FDI digital companies. The incentives could be considered for part-time and remote work employments to promote the sector. For start-up entrepreneurs, additional incentives may include waiver of business registration fees, waiver of bank fees, and tax incentives for the digital enabled businesses.	MoF, MoICE	Immediately
4. Digital Financial Services Development:			
4.1 Provide policy and facilitation support for banks to seek international partners and attract FDI to develop core banking systems, and to further improve the international payment gateway	The RGoB may consider hosting a B2B forum for Bhutanese banks to connect with correspondent and international banks, and investors to forge partnerships in developing the core banking systems to meet international standards, and to seek FDI or explore PPP modality to improve the international payment gateways.	RMA, MoF, GovTech, DHI	6-8 months
4.2 Improve the G2C payment system for the https://www.citizenservice.gov.bt	Improve the G2C system that is linked to the platform to reduce the downtime, increase reliability and stability of the system.	RMA, DHI, BNB, BoB	6-8 months
4.3 In the medium term, the RGoB may consider setting up a Digital Development Fund (DDF) that is consistent with international practice	A feasibility study for a DDF should be conducted. The DDF can provide low interest investment loans and	GovTech, MoF, International Expert	8 months to complete feasibility study

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
	performance-based technical and capacity building grants to tech start-ups.		
5. People and Skills Development: Capacity Building, Upskills, Reskills, Professional Trainings			
5.1 Conduct Digital Industry Skills Requirements Survey (DISRS) to assess the industry requirements for digital skills	GovTech may lead the effort to survey the market requirements to align with the short-term development of HR skills, professional training and capacity building, and more medium-term formal education.	GovTech, TTPL, DHI, PS, FDI companies, RUB, International expert	3 months
5.2 Capacity development and training for RGoB: New recruits working in digital jobs should be required to attend digital skills development training programs	Expand the existing capacity development programs and curricula for ICT and digital technology and future trends. Trainings can be delivered in-person, or through on-line learning platforms, and should be on-going including refresher courses.	GovTech, TTPL, DHI, RUB	Prepare curricula in 6 months, start training in 2024
5.2.1 Prepare a comprehensive capacity development programme for the digital transformation for the public sector. Recruit Trainers to go through the T-O-T program. Digital literacy curricula may be further developed for the general public and in rural areas, and the programme may be expanded through the CSCs to bridge the digital divide.		GovTech	Immediately
5.2.2 Set up a team of digital expert advisors to assist GovTech in preparing the Action Plans for the Master Plan, prioritizing, and coordinating the development of digital economy, and provide on-going technical advice. The advisors can be a combination of tech industry professionals and international experts.		GovTech	Immediately
5.2.3 International digital experts and consultants under RGoB or international organizations' contracts may be solicited to deliver in-person training and prepare SOPs for the projects.		GovTech, Relevant ministries	Immediately
5.3 Capacity development support for the private sector			
5.3.1 Assist in organizing in-service professional development programme to upskill and reskill ICT sector workers.		GovTech, DHI, TTPL, Tech industry companies	Immediately
5.3.2 Initiate setting up "Digital Help Desk" by the private sector to be the first responder of digital questions or problem solving for tech workers as well as the public in general, augmenting the in-country digital advisory services.		GovTech, DHI, TTPL, tech industry companies	Immediately
5.3.3 Provide ICT and digital sector businesses fiscal and tax incentives to train and employ Youth (Grades 11 th and 12 th in particular), women, and PWDs	The RGoB may consider providing fiscal incentives and urge tech companies to develop joint training curricula covering digital content development, e-commerce, digital marketing, and	MOF, GovTech, DHI, private sector, MoESD, MoICE	Immediately

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
	graphic design, and fast-track employment for this group of people.		
6. Governance, Institutional Arrangements, Legal and Regulatory Reforms			
6.1 Prepare the National Digital Development Master Plan, a “strategy and action plan” for short, medium, and long-terms development of Digital Bhutan. The Master Plan should be submitted for approval to the Digital Development Strategy Board (DDSB) outlined in sub-strategy 6.2	Establish the Master Plan Team to prepare the Master Plan, comprising, but not limited to, working-level representatives from the Cabinet Secretariat, relevant ministries, RCSC, RSEB, DHI and Super FabLab, Thimphu Tech Park, private sector, FDI companies, RSEB, RMA, Financial Institutions (banks and non-banks), academia, start-ups digital businesses, CSIs, and CSOs.	GovTech	6-8 months
6.2 Establish the equivalent of the Digital Development Strategy Board (DDSB) to direct and oversee the preparation and implementation of the Master Plan and the country’s digitization efforts	RGoB may consider utilizing the HLICT Steering Committee or the C4CS to be the equivalent of the DDSB. Members should comprise high-level representatives from the agencies listed in Item 6.1 (or a smaller group of policy-makers as necessary), to provide guidance to the development of the Master Plan, and subsequent monitoring of implementation progress.	The Cabinet Secretariat, GovTech to serve as secretariat	Immediately and on-going
6.3 Revise the ICMA 2018 to include data governance framework, data protection and privacy, and interoperability protocols for sharing of digital data.	The ICMA 2018 is currently being reviewed. The Act should be expeditiously revised to comprehensively include data governance framework, data protection and privacy, data integration, and data exchange.	GovTech, Office of the Attorney General	12 months
6.4 Development of protections laws and regulations on cyber-security, cybercrimes, consumer protection, and human rights protection (e.g., cyber bullying).	The national cyber security strategy is currently being developed, and it would underpin the development of the protection laws and regulations.	BtCIRT, GovTech, MoHA	To be confirmed
6.5 Revise the Income Tax Act (2002) on the dividend double taxation to promote company registration and also to attract FDI companies	Eliminate the dividend double taxation (shareholders and personal income tax), to encourage company registration and increase the number of companies, also applicable to FDI companies.	MoICE, Office of the Attorney General	6 months
6.6 Reduce professional qualification for international ICT/tech professionals,	Internationally, increasing number of ICT professionals, freelancers and digital nomads	Department of Labour,	Immediately

Main Sub-Strategy	Activities to be completed	Lead Agency	Estimated Timeline
freelancers, and digital nomads with proven credentials to enter the Kingdom.	<p>are non-degree graduates, but rather they have high level of ICT knowledge and professional experience that can be contributed to the development of the digital economy. They may work with local start-ups, web designers, graphic artists, social media influencers, and digital marketing, become advisors, mentors, coaches. The contribution of their professional services is immense and it should be leveraged by the government.</p> <p>The RGoB may consider assessing personal income tax or withholding tax on foreign professionals working as independent contractor.</p>	<p>Department of Immigration,</p> <p>MoF</p>	
6.7 Review and enhance the Telecommunications and Broadband Policy 2014 to facilitate private investments and FDIs, particularly in the remote areas.	The RGoB may initiate the review of the telecommunications regulations	BiCMA	Immediately

* For each recommendation, GovTech would be either the lead agency or the coordinating agency

REFERENCES

Abu Sayem, Md. "Union Digital Centre in Bangladesh: A Change Initiative to Improve the Service" Retrieved from <https://www.academia.edu/UDC> and <https://www.a2i.gov.bd>

Alonso, C.T.B, Hanedar, D., Prihardini, G., Zhabaska, U and K. (2023). "Stacking up the Benefits: Lessons from India's Digital Journey." IMF Working Paper No. 23/78, Washington DC.

Bhonsale, M. (2020). "Bhutan: Nurturing the entrepreneurship ecosystem." Observer Research Foundation. Available at: <https://www.orfonline.org/research/bhutan-nurturing-entrepreneurship-ecosystem-66306/>.

Bhutan Broadcasting Service (2018). "Bhutan's first code challenge." Available at: <http://www.bbs.bt/news/?p=108483>.

Bhutan Living Standards Survey Report 2022.

Business Bhutan (21 April, 2023). "Enabling Ecosystem for the Growth of the ICT Sector – Business Bhutan." Retrieved from <https://businessbhutan.bt/enabling-ecosystem-for-the-growth-of-the-ict-sector/>.

Daily Bhutan (2022). "Bhutan's Transition into the Age of Digitalisation." Retrieved from <https://www.dailybhutan.com/article/bhutans-transition-into-the-age-of-digitalisation>.

Deki, S. (2023). "Empowering Citizens for the Digital Age - Digital Literacy." Bhutan Today. Available at: <http://www.bhutantoday.bt/empowering-citizens-for-the-digital-age-digital-literacy/>.

Dorji, M. (2012). "A cashless economy in the making." The Bhutanese. Available at: <https://thebhutanese.bt/a-cashless-economy-in-the-making>.

Dorji, S. (2023a). "Enabling ecosystem for the growth of the ICT sector – Business Bhutan." Available at: <https://businessbhutan.bt/enabling-ecosystem-for-the-growth-of-the-ict-sector/>.

Dorji, S. (2023b). "More than 80% of the flagship programs have been completed". Business Bhutan. Available at: <https://businessbhutan.bt/more-than-80-of-the-flagship-programs-have-been-completed/>.

Dorji, T. (2020). "Bhutan Dialogues 30th Session: Role of Private Sector in Bhutan's Economic Development". www.youtube.com. Available at: https://www.youtube.com/watch?v=lo0pUIDuB6M&ab_channel=BhutanDialogues.

Dorji, T. C. (2022). "State of Bhutan's Entrepreneurship Ecosystem and How to Revive It in the Post-Covid Era." Available at: <https://tcdorji.wordpress.com/2022/04/20/state-of-bhutans-entrepreneurship-ecosystem-and-how-to-revive-it-in-the-post-covid-era/>.

Dorji, T. C. (2019). "The Role of Thimphu Tech Park in Bhutan's Technological and Socio-Economic Advancement." Retrieved from <http://drukjournal.bt/the-role-of-thimphu-techpark-in-bhutans-technological-and-socio-economic-advancement/>.

Fiscal Incentives (Amendment) Act of Bhutan (2022).

Gartner (2023). "Forecasts Worldwide IT Spending to Grow 5.5% in 2023". Available at: <https://www.gartner.com/en/newsroom/press-releases/2023-04-06-gartner-forecasts-worldwide-it-spending-to-grow-5-percent-in-2023>.

GovTech Notification. GovTech/DST/Out/2023-2024/1611 dated 24th July, 2023.

GovTech. "Summary of Digital Capacity Building Program for IT Professionals."

GovTech. "Summary of Digital Literacy Program."

GovTech and UNDP Bhutan (2023). "Draft Assessing the Potential of Freelance and Remote Work in Bhutan: A Foresight Report."

<https://www.citizenservices.gov.bt/>

Information, Communications and Media Act of Bhutan (2018).

ITU Digital Development Dashboard. Retrieved from <https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/Digital-Development.aspx>

Kumar, Uttam and Sukuta, S. K. (2020). "Proclaiming Growth and Development: Visualizing Bhutan from the Perspectives of GNH and ICTs". DOI: <http://dx.doi.org/10.21088/jswm.0975.0231.12120.4>.

Maystre, Nicolas (2023). "United Nations Bhutan – Economic Briefing".

Ministry of Information and Communications (2014). "Bhutan e-Government Master Plan".

Ministry of Information and Communications (2014). "Bhutan Telecommunications and Broadband Policy".

Ministry of Information and Communications (2015). "Revised Bhutan ICT Roadmap".

Ministry of Labour and Human Resources (2022). "Bhutan Workforce Future: Stepping Stones to Industrial Strategic Propositions for the Agriculture, Creative and Digital Sectors".

Moss, S. (2017). "The Kingdom of Bhutan opens first government data center: Data Center Dynamics. Available at: <https://www.datacenterdynamics.com/en/news/the-kingdom-of-bhutan-opens-first-government-data-center/>.

National Statistics Bureau. "Bhutan Labour Force Survey Report 2022".

Ngedup Thobchog, T. (2022). "Thimphu Tech Park aims to be Center of Excellence in IT and go global". The Bhutanese. Available at: <https://thebhutanese.bt/thimphu-tech-park-aims-to-be-center-of-excellence-in-it-and-go-global/>.

Oberoi, S.S. (2022). "Is Bhutan going Sri Lanka's way?" Available at: <https://www.newsdrum.in/analysis/is-bhutan-going-sri-lankas-way-74505.html>.

Pem, D. (2021). "Tech and ICT as the future of job creation in Bhutan". The Bhutanese. Available at: <https://thebhutanese.bt/tech-and-ict-as-the-future-of-job-creation-in-bhutan/>.

Ping, C. (2022). "Bhutan's transition into the age of digitalization". www.dailybhutan.com. Available at: <https://www.dailybhutan.com/article/bhutans-transition-into-the-age-of-digitalisation>.

Royal Government of Bhutan. (2017). "Annual Report: Department of Information Technology and Telecom, the Royal Government of Bhutan, 2017".

Royal Government of Bhutan. (2016). "Bhutan E-RNR Masterplan, 2016". Retrieved from <https://faolex.fao.org/docs/pdf/bhu191525.pdf>.

Royal Government of Bhutan, Department of Information Technology and Telecom (DITT) “Annual Report July 2020 – June 2021”.

Royal Government of Bhutan (2021). “e-Commerce Policy”.

Royal Government of Bhutan (2019). “E-Governance Policy for the Royal Government of Bhutan”. Retrieved from <https://tech.gov.bt/sites/default/files/egovPolicy.pdf>.

Royal Government of Bhutan. Ministry of Education: “Sherig-2 Education ICT Master Plan 2019-2023”. Retrieved from <http://www.education.gov.bt/wp-content/uploads/2021/09/iSherig-2-Education-ICT-MNasterplan-2019-2023.pdf>

Royal Government of Bhutan. Ministry of Labour and Human Resources (2022). “Bhutan Workforce Futures”.

Royal Government of Bhutan, Office of the Prime Minister (August 2021). “Digital Jobs in Bhutan Future Skilling and Demand Creation”.

Royal Government of Bhutan. “Revised Bhutan ICT Roadmap 2015. Retrieved from https://www.moic.gov.bt/media/files/bhutan_ict_roadmap_2015_pdf_85407.pdf

Royal Government of Bhutan. “The 12th Five-Year Plan (2018-2023)”.

Royal Government of Bhutan. Presentation on “Consolidated 13th FYP, 25 May, 2023”.

Royal Government of Bhutan. “Bhutan National Cybersecurity Strategy”. Retrieved from: <https://ncsguide.org/2021/11/22what-we-learned-while-developing-bhutans-first-national-cybersecurity-strategy/>

Tasleem, R. (2023). “Bhutan Adopts National Digital Identity Bill to Advance Digital Transformation” BNN. Available at: <https://bnn.network/politics/bhutan-adopts-national-digital-identity-bill-to-advance-digital-transformation>.

UN Department of Economic and Social Affairs. (2022). “E-Government Survey 2022”. Retrieved from <https://desapublications.un.org/sites/default/files/publications/2022-09/Web%20version%20E-Government%202022.pdf>.

UNDP (2020). “Rapid socio-economic assessment of COVID-19 on Bhutan’s Tourism Sector”.

UNDP (2021). “e-Litigation: Taking justice to the doorsteps of litigants”. Available at: <https://www.undp.org/bhutan/stories/elitigation-taking-justice-doorsteps-litigants> (Accessed 18 June, 2023).

UNDP (2021). “Partnering with Citizens for Better Public Services”. Retrieved from <https://www.undp.org/bhutan/news/partnering-citizens-better-public-services>.

Wangmo, K. (2021). “A New Digital System Drives Bhutan’s COVID-19 Vaccination Success” UNDP Asia and the Pacific. Available at: <https://www.undp.org/asia-pacific/press-releases/new-digital-system-drives-bhutans-covid-19-vaccination-success>.

World Bank Bhutan Country Statistics (2020)

World Bank. "Regional Brief South Asia, GovTech Maturity Index 2022 Update". Retrieved from <https://openknowledge.worldbank.org/handle/10986/39669>.



འབྲུག་གཞུང་འཕུལ་རིག་ལས་ཤེ།
GovTech
Bhutan



ESCAP
Economic and Social Commission
for Asia and the Pacific

