DIGITAL STRATEGY

INTELLIGENT BHUTAN

May 2024
Government Technology Agency

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Contents

Abbreviations

GDP	Gross Domestic Product
ICT	Information and Communications Technology
NDI	National Digital Identity
AI/ML	Artificial Intelligence and Machine Learning
AR/VR	Augmented Reality and Virtual Reality
IoT	Internet of Things
EA	Enterprise Architecture
WoG	Whole of Government
PPP	Public-Private Partnership
KPI	Key Performance Indicator
GDC	Government Data Centre
NSW	National Single Window
GPU	Graphics Processing Unit
R&D	Research and Development
FDI	Foreign Direct Investment
LG	Local Government
ISP	Internet Service Provider
RUB	Royal University of Bhutan
CST	College of Science and Technology
GCIT	Gyalpozhing College of Information Technology

Foreword

In the rapidly evolving landscape of the 21st century, digital transformation is not just an option but a necessity. It is with great pleasure that I introduce this vital and forward-thinking digital strategy for Bhutan. Digital transformation is crucial for maintaining a competitive edge, boosting operational efficiency, and addressing evolving expectations of our citizens and customers. It allows businesses to stand out through innovation, make better decisions backed by data, and deliver personalized, seamless customer experiences. Bhutan must embrace digital transformation to advance towards a vibrant digital society and establish a digital ecosystem supported by an agile & responsive digital government that will drive economic growth.

The establishment of the Government Technology (GovTech) Agency in December 2022 is a significant step towards achieving the country's digital transformation journey, driven by the mission to provide innovative digital solutions that are effective, efficient and most importantly focussed on making the lives of our citizens better. The dedication to digital transformation is further cemented with the establishment of the GovTech Commission chaired by myself, with the mandate to champion the nation's digital transformation efforts.

The GovTech Agency and the commission will work collectively to revolutionize public service delivery, transform government operations, establish a robust digital ecosystem and empower citizens through cutting-edge technologies. The agency will ensure secure and efficient operations by protecting critical data, foster greater innovation, enhance decision making with advanced data analytics and build robust digital infrastructure for relevant connectivity. Adoption of emerging technologies such as artificial intelligence and developing user-centric digital services will be a priority to continuously improve accessibility and user experience. These efforts will modernize government functions and enhance citizen engagement, creating a cohesive and innovative digital society.

The government's unwavering dedication to digital transformation is geared towards catalyzing economic growth and instilling efficiency in public services. These initiatives transcend mere modernization; they encompass a complete reimagining of

government operations and an elevation of citizen engagement. The digital strategy is aimed at fostering a unified, forward-thinking digital strategy that not only articulates the steps towards a developed nation but in the process the government will focus on creating valuable opportunities for all.

(Tshering Tobgay)
Prime Minister

Executive Summary

Bhutan's eGovernment Development Index by the UN's ranking has progressed from 152nd to 115th in the last ten years. This is due to Bhutan's rapid adoption of e-government initiatives through government-to-citizen (G2C) services, but the full benefit of digital transformation is yet to be realised. Recognizing the potential of digital transformation, the Government Technology (GovTech) Agency was established in December of 2022 to spearhead Bhutan's digital journey. To bring about digital transformation in the country, three strategic priority areas have been identified: Digital Governance, Digital Economy, and Digital Society.

Under Governance, the focus is on achieving intelligent governance by revolutionising public service delivery, transforming government operations, and empowering enhanced decision-making. The Digital Economy strategy pillar aims to increase the contribution to GDP from the ICT sector by leveraging digital technologies to transform the non-ICT industries, strengthen the digital ecosystem, and accelerate the growth of the ICT industry. The Society pillar emphasises leveraging digital solutions to empower citizens, promote volunteerism, facilitate swift delivery of justice, foster a knowledge-based society, enhance safe communities, and provide economic opportunities. This is aimed to promote community vitality and improve overall quality of life.

Digital transformation will be achieved with the use of technological solutions, developing a robust talent pool, promoting the establishment of accessible, reliable and affordable infrastructure, and creating an enabling environment supported by a conducive regulatory regime.

1. INTRODUCTION

In the digital age, a nation's progress is driven significantly by the effective implementation of technological solutions and forward-thinking ideas. Since the formation of the GovTech Agency, one of the major initiatives has been the centralisation of ICT infrastructure, services and personnel. This has already led to efficiency and cost reduction in government operations and improved user experience of government services.

Guided by the vision of building "a technologically advanced nation, with empowered citizens, and a thriving digital economy," the GovTech Agency aspires to bring about a profound transformation across the economic, governance, and societal landscapes. By harnessing the power of digital technologies, the Agency aims to revolutionise public service delivery by streamlining processes, establishing efficient governance structures, fostering a culture of innovation and empowerment, promoting public participation in decision-making processes, and enhancing transparency and accountability.

This Digital Strategy sets the course for propelling Bhutan towards a future where technology serves and empowers every citizen, enriches society, and drives sustainable economic growth.

2. CURRENT STATE OF AFFAIRS

The existing systems, outdated and constrained in functionality, contribute to delays and errors. This is exacerbated by agencies operating in silos, resulting in duplication and inefficiency. Furthermore, the lack of data-driven decision-making exacerbates these challenges, hindering the optimization of resources and service improvement.

The ICT contribution in the Bhutanese economy was 3.03% of the GDP in 2022, highlighting room for growth in this rapidly evolving industry. However, the country faces hurdles due to inadequate digital infrastructure, a domestic focused ICT industry with limited scope to scale or competitive enough to enter the global market due to limited digital competencies, and weak linkages between educational institutions and industries. In addition, the non-ICT industries/sectors have been operating in status-quo with limited growth which is compounded by a general absence of a comprehensive digital strategy. The digital ecosystem is not robust, secure and usable to all segments of the economy. In the trading and industry sectors, there is an absence of end-to-end services for exporters and importers. The lack of quality data across sectors prevents leveraging big data and analytics for effective planning and decision-making.

The absence of platforms for public engagement on government initiatives weakens the inclusivity of the national narrative, hindering community vitality. Additionally, the lack of platforms for volunteering services impedes the development of a sense of belonging and active community engagement, impacting overall health, resilience, and vibrancy across social, economic, cultural, and governance realms.

The digital divide stemming from disparities in skills, accessibility, affordability, reliability, and service quality hampers social and economic mobility, undermines community cohesion, and impacts collective well-being. Addressing the challenges in justice and crime through ICT is crucial to combat pervasive insecurity that erodes safety and trust within communities.

3. INTELLIGENT BHUTAN

Intelligent Bhutan is the vision of the national digital strategy supported by the three key pillars: a digital society, digital economy, and digital governance. Intelligent Bhutan is an aspiration derived from the pursuit of creating a knowledge based economy. The pillars have defined targets encompassing enhancing digital literacy among the population, improving digital infrastructure to reach more citizens, and utilising technology to enhance public services and creating a thriving digital economy. The key strategies include enhancing cybersecurity measures to protect digital assets and data, fostering collaborations between the public and private sectors to drive innovation, and creating a conducive regulatory environment to support the growth of the digital economy. By investing in digital infrastructure development, improving internet accessibility, and prioritising the adoption of emerging technologies, Bhutan aims to create a robust digital ecosystem that empowers its citizens, enhances economic opportunities, and ensures efficient and transparent governance. Through the alignment of these elements, Bhutan aspires to evolve into a technologically advanced nation that is digitally empowered and ready for the future.

The National Digital Strategy is also envisioned as the strategy for private sector engagement and growth of the ICT industry. Major initiatives in the strategy will be implemented by the private sector as a direct technical partner for development and deployment of systems/technology, as a consultant during the design of the proposed strategies or in a Public-Private Partnership (PPP) model at a broader level with expanded scope.

Intelligent Bhutan

A technologically advanced nation, with empowered citizens, and a thriving digital economy

Digital Society

400,000+ citizens know how to productively and safely use digital services

Level 4 in Cybersecurity maturity by 2029

- Enhance digital literacy and skilling.
- Strengthen Communities.
- Ensure safety and security of citizens.

Digital Economy

Digital Economy contribution of USD 600 million by 2034

5000 quality jobs by 2029

Establish data economy by 2029 (health, agriculture and climate)

- Digitializing Industries.
- Strengthen digital ecosystem.
- Accelerate growth of the ICT Industry.

Digital Governance

Public services satisfaction rating of > than 4.5 by 2029

10% government operating cost reduced by 2029

Data maturity increased to level 4: informed by 2029

Patient satisfaction on health services improved

- Rethinking Public Services Delivery.
- Transforming government operation.
- Smart governance.

INFRA

1. Affordable broadband
2. Affordable devices.
3. Strengthen Data Center

Regulation

1. Conducive policies
2. Update ICM Act.
3. Update Data protection and Cybersecurity legislation
4. Review and modernise Acts to enable digitalisation.

R & D

1. Exploring new growth opportunties in ET
2. Strengthen collaboration between Government, Industry and Academia
3. Testbeds leveraging Bhutan's strengths and opportunities

Talent

1. ICT literacy for all.
2. Upskilling and reskilling of professionals

Cyber Security

1. National cyber security strategy
2. Cybersecurity Standards and Technologies
3. Critical Information Infrastructure Protection and capabilities.

Adoption

1. Energy efficient solutions
2. Embracing Emerging Technologies
3. Digital Payments
4. Building GovStack
5. Digital Assets and Blockchain Strategy.

Education

National Digital Identity

3.1. Digital Governance

The vision for Bhutan's Digital Government by 2034 emphasises 'Intelligent Governance.'

The imperative for intelligent governance stems from the critical need to make smart, integrated, and timely decisions as a government. This includes providing better services to citizens and making informed policy decisions that directly impact our productivity as a nation. Intelligent governance is essential to addressing the complexities of modern governance and in ensuring that decisions are proactive, strategic, and impactful for the nation's socio-economic development and well-being.

The three key strategic thrusts driving the Intelligent governance pillar are:

3.1.1. Rethinking Public Service Delivery

The rethinking of public service delivery involves leveraging technology and innovative strategies to improve access, efficiency, and responsiveness in government services for both businesses and citizens, including health facility services. Key performance indicators (KPIs) include enhancing satisfaction rates from 4.101 to greater than 4.5 for citizens, boosting digital service adoption rates, and establishing a baseline for entrepreneurs and patient satisfaction ratings for health facility services.

Some of the key initiatives are:

1. Development of a blueprint for public service delivery for both citizens and businesses.

2. Optimise and re-engineer public service delivery processes and systems.

3. Single access point establishment for citizens and businesses, both physical and digital services such as establishing one Government call centre for all services.

4. Establish citizen feedback mechanisms and improve citizen engagement.

5. Strengthening universal access to digital services.

6. Improving public service delivery in health by developing a digital strategy for health to focus on blockchain tech for pharmaceutical traceability & authenticity of medications, data-driven health sector for preventive medical care, and to drive new health data-driven market and implementation of virtual care - digital health platform project are proposed.

7. Introducing blockchain technology in public services delivery through NDI such as introducing blockchain technology in land management using NDI, school results verification, using digital signature under NDI to go paperless end-to-end etc.

8. Implementing AI/ML to automate routine tasks such as implementing AI in Job Portals for RCSC and MoICE, introducing AI to extract relevant information from submitted documents like identification papers, tax forms, or permits, reducing the need for manual data entry and verification in different RGoB systems.

9. Develop and deploy Citizen Services Chatbots: AI-driven chatbots to provide instant responses to citizen inquiries handling routine queries related to government services, such as application status updates, eligibility criteria, and basic procedural information.

10. Using IoT devices to collect real-time data for monitoring public infrastructure and services: Using IoT to help MoIT, Thromde and local governments in better maintenance of structural health of bridges, tunnels, and other critical infrastructure. This data will help in early detection of defects or damages, preventing accidents and minimising maintenance costs.

11. Incorporation of AI and AR/VR based solutions to augment education services.

The critical stakeholders for this strategy are:

1. All Government Agencies who have public-facing services.
2. Public Services Delivery Division, Cabinet Secretariat.
3. Royal Civil Service Commission for the evaluation and monitoring component.

3.1.2. Transforming Government Operations

Transforming government operations for efficiency, accountability, and operation cost savings involves strategic initiatives aimed at optimising resource utilisation and enhancing service delivery.

By 2029, 10% reduction in government operating expenses, 20% reduction in the number of civil servants needed to operate government digital systems, and 50% reduction of government systems is targeted to be achieved. In addition, improve process efficiency within the same timeframe.

Some of the key initiatives are:

1. Standardisation and Interoperability: Establish common standards for data formats, interfaces, and processes across government systems. Promote interoperability to enable seamless data sharing and communication between different agencies and departments.

2. Enterprise Architecture (EA) for the Whole of Government (WoG): Conducting an EA assessment across the entire government enabling the development of a cohesive ICT strategy. This will lead to consolidated systems which will eliminate duplication, improve data integration and quality, and reduce maintenance costs while also enabling the development of holistic service-driven systems instead of agency-specific systems.

3. Building GovStack: Developing a strong platform will be one of the foundations and success factors for Bhutan's digital government, i.e., central infrastructure components and services. This will speed up the development and introduction of digital services throughout the government. This approach involves adopting common platforms, open-source solutions, and cloud services to improve interoperability, reduce duplication, and enhance scalability across government agencies.

4. Process Optimization: Conduct comprehensive reviews of existing processes to identify inefficiencies and areas for improvement. Introducing robotic process automation (RPA) and AI/ML to automate routine tasks to optimise resource allocation.

5. Public-Private Partnerships (PPPs): Foster collaboration with the private sector to leverage external expertise and resources in implementing digital solutions and sustainability.

The critical stakeholders for this strategy are:

1. Different Government system owners.
2. Ministry of Finance.
3. Cabinet Secretariat.

3.1.3. Smart Governance

Data analysis is not fully leveraged in governance decision-making due to varying levels of data literacy among managers and specialists, hindering their ability to recognize data as a valuable resource for insights. Additionally, despite the extensive collection of data , challenges persist with the accessibility and quality of this data, posing obstacles to its effective utilisation in decision-making.

Smart governance focuses on empowering government agencies in enhanced decision-making through data-centric approaches, open data initiatives, and prioritising security and privacy with citizens' collaboration. The KPI indicator includes moving data maturity level from a "Level 1 - Data Aware" where many organisations are collecting and managing data but are not fully leveraging it for

decision-making. Moving to "Level 4 - Informed" signifies a higher level of data maturity, where the organisation utilises data effectively for decision-making, strategic planning, and performance management. This level indicates that data is a key driver in governance processes, enabling informed decision-making and proactive strategies based on data insights.

In order to adopt smart governance in Bhutan, the following mechanisms should be in place:

1. Digital Infrastructure: Bhutan has a Government Data Centre (GDC), but requires redundant cloud storage or else be ready to use global cloud service such as AWS. In terms of connectivity, the 20 districts are well connected with fibre network but needs to be more redundant. Currently, 5G services are available only in some places which is essential for IoT services.

2. Data-Driven Decision Making: Implementing data-driven decision-making across agencies by leveraging existing systems and data to analyse trends, enabling proactive decision-making and strategic planning, and moving away from reactive approaches. This will involve establishing a single source of truth and collating information from various sources for diagnostic and prescriptive analytics to understand the current state and envision future outcomes. Bhutan's civil registration system is already integrated into many citizen services, demonstrating the value of such integration. Expanding this integration to include land, building, immigration, judiciary, and other datasets will prevent data duplication and provide valuable insights for decision-making.

3. Citizen Engagement: Establishing an inclusive platform that allows citizens to actively participate in national decision-making processes, ensures that their voices are heard and valued in shaping policies and initiatives. GovTech Maturity Index (WorldBank, 2022) shows low scores (0.317 from the scale of 1) on the Digital Citizen Engagement.

4. Open Data: Promoting transparency and accountability by making government data openly accessible to the public. This initiative encourages innovation and collaboration as citizens and organisations leverage data for various applications and solutions.

5. Security & Privacy: Prioritising citizen trust and ethical data management through stringent security measures and privacy policies. This initiative ensures that personal data is protected and used responsibly in accordance with legal and ethical standards.

6. Develop Data Governance Framework: Establishing a structured framework for managing and utilising government data effectively, including data collection, storage, sharing, and privacy protocols.

7. Develop emerging technologies strategy: Formulating a strategic plan for implementing AI and other emerging technologies in government operations, focusing on enhancing decision-making, automating tasks, and improving public service delivery. National Emerging Technologies Strategy will also look into linking with the labour market and the future skilling perspective to establish an end to end strategy for Bhutan.

The critical stakeholders for this strategy are:

1. All Government Agencies.
2. National Statistic Bureau.

3.2. Digital Economy

The Digital Economy refers to economic activities driven by technology. In this pillar, the strategies will confine to ICT related activities of the ICT industry, e-commerce and digital media including digital content creation, publication, online gaming, graphics and animation. The strategies under this pillar will explore the “allow first and regulate later” concept specifically for businesses related to emerging technologies. Further, it will also position technology as an enabler to boost the economy, enhance the productivity and returns of other industries.

The goal set for the digital economy complements the 13th FYP economic cluster goals of increasing GDP contribution to USD 5 billion by 2029 and creating full employment (97.5%) with quality jobs. Within this goal the Digital Economy targets to contribute USD 300 million to GDP by 2029 and USD 600 million by 2034 that translates to a 5% GDP contribution from the digital economy by 2029 and 6% by 2034.

The three key strategic thrusts driving the economy pillar are:

3.2.1. Digitalizing Industries

With the objective for improved efficiency and optimization, digital transformation is the process of fundamentally changing how other industries operate by integrating digital technologies across all aspects of their business to reshape from how they generate products and services to changing the landscape that will be well-positioned for economic boost and scale in the future. 8 potential sectors are identified under this strategic thrust with the following key proposed areas:

1. Automate commercial harvesting for wood based industry.
2. Facilitate end-to-end licensing and trade service as part of the NSW project. NSW will be developed with the ambition to integrate to regional NSW of the regional countries where Bhutan has a trade agreement.
3. Consolidate the national resource mapping & inventory of Bhutan.
4. Sustainable agriculture and livestock tech for commercial farming.
5. Digital Tourism is going beyond the traditional physical travel experience using digital technologies such as personalised experience and virtual tours.
6. Sustainable, smart and resilient transport system.
7. Strengthen data ecosystem for Health, Agriculture and Climate.

The critical stakeholders are:

1. Associated ministries & agencies related to the 8 identified sectors (Agriculture, Forestry & Livestock, Trade, Industry & CSI, Construction, Transport, Tourism, Mining, Energy and Health sector).
2. ICT industry as implementing partner.

3.2.2. Strengthen Digital Ecosystem

Strengthening the digital ecosystem involves creating an environment that supports the growth and development of digital businesses, innovation, and entrepreneurship to drive digital economy & formation of new enterprises. It encompasses a range of interconnected elements (e-commerce, digital payment solutions, digital platform for global market access) that contribute to the success of the digital economy. This strategic thrust strives to strengthen the ecosystem to capture the new growth opportunities evolving from transformation of other industries and accelerating the growth of the ICT industry.

The key proposed areas are:

1. e-Commerce platform reaching every Cottage, S&M industries.
2. Establish a secure supply chain & logistic system.
3. Platform for global market access including Digital Payments.
4. Digital hub for integrating potential emerging technologies in other sectors.

The critical stakeholders are:

1. Ministry of Industry, Commerce and Employment as the collaborating partner to achieve employment targets through the proposed strategy.
2. RMA to strengthen digital payments.
3. Ministry of Agriculture & Livestock and Ministry of Home Affairs and LG to establish a network for farm supplies & onboarding farmers and citizens.
4. Ministry of Foreign Affairs and External Trade as partner for global market access.
5. ICT industry, BPC, Telecom operators/ISPs & DHI as technical partners.

3.2.3. Accelerate Growth of the ICT Industry

Accelerating the growth of the ICT industry involves implementing strategies and initiatives to foster innovation, competitiveness, and sustainability within the sector to become one of the major sustainable sector for economic growth in the country.To accelerate its growth, the key focus areas are:

1. Globalisation of the ICT industry.
2. Strengthen ecosystem for tech startups including funding model & tech jobs (Freelancer, Remote work and Digital nomads).
3. Establishment of 100 acres IT park.
4. Formation of entreprise/s to drive the ICT business in the global market.
5. Strengthen Industry Academia linkage.
6. Promote entrepreneurs in Data Center services/Cloud services and tap on the potential of the global big data analytics and processing industry.

The critical stakeholders are:

1. ICT industry as collaborating and implementing partner.
2. Ministry of Energy and Natural Resources and BPC as collaborating partner for power requirements.
3. Ministry of Industry, Commerce and Employment as collaborating partners since digital jobs are also a priority agenda of the ministry.
4. RUB, CST and GCIT as supporting partners for government, industry and academia linkage.
5. Tech startups, digital freelancers and remote workers as collaborating partners.
6. Ministry of Foreign Affairs and External Trade as partner for global market access.
7. BPC, Telecom operators/ISPs & DHI as technical partners.

3.3. Digital Society

Digital solutions hold the potential to advance nation-building efforts and foster community cohesion by promoting transparency and trust. By improving accessibility and connectivity, digital technologies empower individuals to connect, learn, collaborate, and contribute to collective progress.

The goal for digital society is, by 2029, more than four hundred thousand citizens know how to safely use online services (online public services, online banking, video conferencing, social media, etc). To make citizens safe in digital space, cybersecurity maturity level will be increased from Level 1: start-up to level 4: strategic. The initiatives highlighted under the digital economy and digital governance will contribute towards achieving this goal as the ultimate beneficiary of the initiatives are the citizens. In addition, outlined below are the strategies aimed at leveraging digital solutions to enhance societal well-being:

3.3.1. Enhance digital literacy and skilling

Empower citizens to utilise online services safely and foster a knowledge-based society, encouraging active participation in national discourses and leveraging economic opportunities in the digital world while promoting healthy technology practices. Key initiatives supporting this vision are detailed in section 4.3.

The critical stakeholders for this strategy are:

1. Government agencies including the Ministry of Education and Skills Development and the local government.
2. Educational institutions: Schools, colleges, universities and vocational training institutes.

3.3.2. Strengthen communities

Promoting volunteerism and donations for good causes through digital platforms to strengthen social connectedness, and increase belonging and nationalism. Some of the key initiatives proposed are:

1. Development of a systems for volunteers and donations contributed by citizens.
2. Promote culture and heritage knowledge sharing via digital platforms to preserve spiritual and cultural traditions.

The key stakeholders are:

1. Local government.
2. Community organisations and members (including CSO's).
3. Educational Institutions.
4. Ministry of Home Affairs.

3.3.3. Ensure safety and security of citizens

Facilitate and improve swift justice delivery, reduce crime rates in all 20 districts to ensure safety of people. Some of the initiatives being:

1. Enhancement of the judiciary system by introducing online services, developing systems for coordinated case management, etc.
2. Improvement of the monitoring of public places using CCTVs, IoTs, etc.

The key stakeholders for this strategy are:

1. Law enforcement agencies.
2. Government agencies.
3. Educational Institutions.

4. STRATEGIES AND ENABLERS

The following strategies will be implemented to achieve the above goals.

4.1. Digital Infrastructure

Putting in place a reliable, accessible, affordable and 'usable - fit to use' digital infrastructure wherever it is required regardless of geographical location or socioeconomic status. An infrastructure sharing mechanism to be put in place to make technology use affordable and accessible.

1. Strengthen mobile connectivity coverage to all parts of the country with at least 4G broadband.
2. Connectivity to all schools, hospitals, colleges, government offices.
3. Make the cost of connectivity more affordable by increasing the international bandwidth consumption resulting in lower cost of international bandwidth.
4. Enhance redundancy and resiliency on digital connectivity with International Internet gateway via Bangladesh, Satellite Communications, national fibre optic network redundancy, redundancy to high population and economic zones.
5. Strengthen cloud/data centre services (developing active DR site for GDC, attract FDI in data centre).
6. Introducing affordable devices.

4.2. Adoption of Technologies

1. Embracing technologies such as artificial intelligence, blockchain, robotic process automation and the Internet of Things revolutionises public service delivery by optimising and enhancing systems which benefits both citizens and businesses.

2. Build high processing capability by investing in GPU servers.

3. Adoption of energy efficient equipment and solutions.

4. Fintech strategy focusing on multi-channel robust digital payment system and digital currencies (CBDC & NFT tradings).

5. Digital Assets & blockchain strategy.

6. Building GovStack: Developing a strong platform will be one of the foundations and success factors for Bhutan's digital government and development of other GovStack such as Messaging Block, Scheduler Block, Identity, e-payment and Workflow engine will be very important stack for all new systems development, other stacks such as Digital Signature would also be a very important Block which needs to be developed using NDI.

7. Dzongkha Natural Language Processing shall be made available to the public so that digital online services can be provided in our local language. This shall also augment the uptake of Dzongkha language by the youth.

4.3. Digital Skills and ICT Talent Pool

Digital skills empower the citizens to harness the full potential of digital technologies for personal and professional growth. Digital skills program will cover ICT literacy, services, and usage for the general public, monk bodies, students, and others, with a special emphasis on promoting healthy technology habits and practices. This program will also focus on upskilling and reskilling civil servants to embrace the digital transformation and deliver services efficiently.

ICT Talent pool is focused on creating a highly skilled ICT talent pool in the country to drive innovation, economic growth, and competitiveness in the digital age. The program will address the current skills gap in the market as well build a pool of professionals with deep tech skills.

4.4. Strengthen Cybersecurity

Prioritising cybersecurity fosters a culture of cyber resilience, enhances trust, protects digital assets, and ensures the security and stability of the digital ecosystem now and in the future. A cyber security strategy will be developed and cybersecurity Standards and Technologies will be adopted while enhancing Critical Information Infrastructure Protection and capabilities.

4.5. Legislation and Regulatory Framework

Modernization of legislation and regulatory frameworks creates an enabling environment for the ICT sector to thrive in the country. The ICM Act, and Telecommunications & Broadband Policy will be reviewed and amended to make it appropriate for future developments.

4.6. Research and Development in Emerging Technologies

Strengthening R&D collaboration among Government, Industry and Academia to create a culture of innovation and seizing new opportunities to maintain a competitive edge in a rapidly evolving industry. In the process, testbeds will also be introduced to leverage Bhutan's strengths and opportunities. The R&D collaboration will also explore new growth opportunities in potential emerging technologies.

5. DIGITALIZATION IN EDUCATION

We aim to implement digitalization in education to modernize both student learning and teaching methodologies. This initiative will focus on building resilient, agile, and future-ready talent in the digital era. As technology rapidly advances and transforms our way of life and the economic landscape, digital transformation in education becomes crucial. Our approach involves two major priorities:

1. Developing a digital strategy for education to guide the digital agenda and ensure that our education system is aligned with the needs of the future.

2. Building a robust digital education ecosystem that supports personalized learning experiences, integrates advanced technology, and fosters innovation in teaching and learning.

Through this initiative, we seek to prepare a generation of talent ready to thrive in the digital age and position education as a key driver of our national digital strategy. By leveraging technology to enhance accessibility, engagement, and effectiveness in learning, we will create an education system that is inclusive, efficient, and responsive to the demands of the 21st century.

6. NDI STRATEGY- FOUNDATION OF THE NATIONAL DIGITAL STRATEGY

NDI will be the underlying foundation driving the national digital strategy and a key driver in the overall digital transformation agenda of the country. The NDI has the potential for digital inclusion of citizens, opportunity for almost all services to be offered online with level 2 system integration (Use cryptographically signed data attributes in the NDI wallet to complete all e-Forms), ensuring higher data quality and more efficient service delivery to citizens. Therefore, NDI strategy will be developed focusing broadly on the following:

1. User Onboarding and Enrolments.
2. Integration with Government Services.
3. Social and Financial Inclusion.
4. Redefining the financial service industry with the use and integration of eKYC.
5. Leverage verifiable credentials (VC) tied to NDI for efficiency and productivity gain in the private sector and its services.
6. Promotion and Education.
7. Monitoring and Evaluation.

7. FINANCE AND HR

GovTech Agency serves as a vital role for driving digital transformation and fostering innovation across government and private sectors, with the overarching goals of enhancing digital governance, digital economy and digital society. Currently, GovTech Agency is operating with two departments and eleven divisions comprising 352 staff nationwide. Given the huge responsibilities and mandates, the existing staff strength would not suffice to effectively execute all tasks and initiatives. Therefore, the Agency would require an additional 215 personnel to fully realise these strategic objectives.

With the transformation, the Agency is mandated to oversee the functionality of all government systems, conducting essential tasks such as business requirement analysis, business process re-engineering, system integration, and software development of key projects. Additionally, the Agency plays a pivotal role in facilitating communication between agencies and providing technical and business design requirements for government systems. The agency's involvement in overseeing new IT projects demands meticulous planning, coordination, and execution to deliver innovative solutions that align with stakeholders' expectations. GovTech Agency is also committed to developing and enhancing systems as outlined in the 13th FYP, in addition to managing over 400 existing systems.

On the cybersecurity front, GovTech ensures a robust framework encompassing strategy, policies, and legal governance to effectively safeguard against digital threats. We prioritise the development of standards and guidelines, compliance monitoring, protection of critical infrastructure, and incident handling and management. Our efforts also include vulnerability assessments, incident management, and capacity building to bolster cybersecurity defences.

In fostering the growth of the IT industry, GovTech focuses on strategic planning, technology adoption, innovation, and talent development. Initiatives such as developing Science and Technology Innovation Parks, Tech hubs, and conducting Research & Development activities aim to modernise traditional industries and create a digitally literate society.

GovTech is responsible for designing and implementing network topology for government agencies and institutions, as well as managing and maintaining networks, including last-mile connectivity. We also oversee the legal framework requirements for the space and telecommunications sector, conducting research and recommending emerging technologies such as space and telecom-related applications. Additionally, we play a crucial role in developing legal frameworks for emerging technologies like AI, AR/VR, IoT, Blockchain, Robotics, Computer Vision, and Drones, collaborating with stakeholders to establish policies, strategies, and plans for their responsible implementation and use.

Our mandate includes conducting research and development activities tailored to Bhutanese conditions, ensuring that adopted technologies and systems are suitable and effective. As a pivotal entity in Bhutan's technological advancement, GovTech promotes the adoption of emerging technologies, engages in global technology governance forums, and advises the government on strategic investments. Collaboration with international and national stakeholders fosters expertise sharing and partnership for sustainable development. GovTech also engages in improving data quality and data governance for evidence-based decision-making using government systems.

To realise the overall vision of 'A technologically advanced nation, with empowered citizens, and a thriving digital economy' there is a need of additional ICT personnel of 215 which will be recruited on contract basis to meet the delivery of this strategy. In addition, GovTech will look for experienced Project officers who will coordinate and manage IT projects.

The funds necessary for the 13th FYP is estimated to be Nu.13 billion. This is based on the draft 13th FYP and additional funds based on the new activities identified. It is to be noted that some of the activities will be funded by the respective agencies (hospitals connectivity by MoH, schools connectivity and devices by MoESD, and connectivity of offices by LGs, in addition to devices for the respective agency staff). However, more accurate and detailed estimates will be determined while finalising the 13th FYP.

8. ASSUMPTIONS AND RISKS

1. Many agencies are still working in silos and do not see the benefit of integrated end-to-end services. Agencies may resist adopting new technologies or processes due to concerns about disrupting established workflows, fear of job displacement, or uncertainty about the benefits of digital transformation. In some cases, there is also a lack of clear ownership or accountability for digital transformation efforts. Without strong leadership and dedicated ownership at all levels, initiatives can stall or encounter difficulties in implementation.

2. Attrition is one of the challenges experienced by all the sectors but with digital transformation at the forefront of development along with driving the digital economy, the attrition of technical professionals is a risk with potential for derailing the vision of intelligent Bhutan. However, opportunities also lie in taking advantage of the growing market of freelancers and remote workers.

3. The demand for power requirement will also be one of the factors impacting the demand for FDI investment in data centres and AI compute centres. Therefore it is critical to address the need for adequate power requirements for large scale investments to be made in the ICT sector.

4. Conflicting rules and regulations and difficulty in consolidating and changing the rules and regulations present notable hurdles. The process of consolidating and updating these regulations to suit the demands of a digital era is particularly challenging. This complexity can impede the smooth adoption and integration of digital technologies within government agencies and private sectors alike. Harmonising and standardising regulations becomes crucial to enable efficient digital transformation initiatives, fostering an environment conducive to innovation, collaboration, and regulatory compliance. By addressing these challenges, Bhutan can unlock the full po-

tential of its digital infrastructure and pave the way for sustainable growth and development in the digital age.

5. Formation of entreprise/s to drive the ICT business in the global market will require to relook at the hiring modalities for the company to create a sustainable and competitive enterprise. One of the proposals is to account for the performance based incentives or share of the company as a model for hiring, especially the management team.

6. Challenges in data collection and measurement for the digital economy as there is no consolidated data for the digital economy. While the GovTech Agency envisions the potential contribution from the digital economy, there is a need to streamline the data collection and measurement process including the ownership of the data and strategies.

7. Widespread introduction and use of technology in daily lives of a citizen could face some resistance from the public and organisations. Individuals could be less willing to use online services, enhanced surveillance of urban areas could be criticised for invading privacy, citizens with limited online knowledge could fall victim to cyber crimes easily, different sectors could resist digital transformation of their service delivery. Early awareness and advocacy to citizens and organisations would be vital.

8. International geopolitical scenarios could affect the digital advancement in the country as it can disrupt the supply chain of digital equipment and devices, make domain experts unavailable to provide consultancy services, increase cost of goods and services. Factors like natural disasters, pandemics and wars could all disrupt the global market. While most of the situations would be out of our control, some aspects of preparedness could be incorporated into the planning phase to avoid such scenarios.

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