Digital Drukyul – an ICT Masterplan for Bhutan

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The Beginning

Bhutan began looking at Information Communication Technology as a means to improve public service delivery as early as 2004 when a policy document, the Bhutan InfoComm Policy and Strategy (BIPS), was developed by the Ministry of Information and Communications (MoIC) to guide ICT development in Bhutan.

The Department of Information Technology of MoIC was established to pilot an online security clearance service which was well received by citizens. It reduced the time it took people to get their security clearances, from an average of seven days to around one day. The Royal Audit Authority also leveraged online services to deliver audit clearances and significantly reduced turnaround time and improved convenience to applicants.

This initial pilot led the government in 2010 to try and radically transform all public services into e-services with a centralised "government to citizen" (G2C) initiative. The project was expanded and coordinated into a network of 200 Community Centres to support the rural population in using the new online services. Inevitably, such an ambitious plan met with equally complex challenges.

The G2C initiative was a mix of successes and failures. It was found that, while some e-services were used quite often by citizens, many were never used. The reasons for this were numerous, and studies were carried out by institutions and individuals to ascertain what they were. Some of the major reasons for the lukewarm success were the following:

- Many of the e-Services were designed in silos specifically by individual government departments and ministries of the government and were only able to partially fulfill the needs of citizens. More importantly, organisations did not make the services available fully online and citizens still had to physically visit offices to fulfill all requirements of the service.

- There were no online payment options, and thus fee-based services required applicants to physically visit offices to make payments, which nullified the advantage of having the service online to begin with.

- Most services required a legally verifiable identity, thus applying for e-services required documents to be physically signed and notarised, which further needed to be scanned and uploaded, creating additional friction. This also invalidated the purpose of online services.

- Studies also revealed that many citizens, particularly in rural Bhutan, were either unaware of the online services or lacked sufficient digital proficiency to leverage these online services.

- Citizens also complained that the e-services were not very user-friendly and did not make it convenient for them. They were still required to visit many agencies offline, before they could even begin the online process.

- Although the government already had many information systems, they were not leveraged to make services efficient. The systems were built using different technologies and could not communicate with each other. Without the possibility of sharing information, siloed e-services were developed, making it inconvenient, rendering the manual processes more efficient for many. The business registration system only registered a company after all prerequisites in terms of sector, location, and environmental clearances were manually processed.

- While there were some technical challenges, there were also many cultural and bureaucratic obstacles in implementing coordinated and efficient online services. There was resistance to change and resistance to working collaboratively among agencies to make services better. This was even highlighted by His Majesty The King.

  "I know that each ministry, government institution, parliamentary body or public agency has its own mandate. Still, you must work together, not in competition. Henceforth, I ask all of you to establish the practice of meeting regularly, sitting face to face every now and then, so that you will always be in collaboration as you carry out your separate responsibilities. And all problems may be resolved

without being allowed to fester and grow. Such shared effort will be in the true spirit of Gross National Happiness". (7th Session of 1st Parliament on May 20, 2011).

"… it has become evident that institutions in our country are all asserting 'independence' and seeking greater 'autonomy' at the expense of overall harmony. There is limited communication and coordination among agencies and this invariably leads to lack of coherence."(106th National Day Address 2013).

Therefore, Digital Drukyul. Inspired by His Majesty's vision, the Royal Government of Bhutan (RGoB) proposed a holistic, coordinated, "Whole of Government" (WoG) programme to leverage ICT to effectively deliver end-to-end online services so that citizens, irrespective of where they live, would have equitable access to public services by the end of the 12th Five-Year Plan.

The Digital Drukyul flagship programme of the government has been developed while keeping in mind the challenges learned from earlier projects, with the hope that the services will meet and even exceed the expectations of our citizens.

Some of the major projects that will be implemented as part of the Digital Drukyul flagship are the following:

Digital Identity: A unique digital identity for all legal, long-term residents in the country to authenticate themselves online using digital signatures and biometric technologies. What this means is that users using their digital identity will be able to legally transact through the Internet, independent of where they may live, as if they are physically in a government office.

It is expected that this platform will dramatically improve access to services for residents, in particular, those who live in remote villages. It is also expected to boost commerce, as it will enable legally enforceable identities that can be used for establishing trust online, an essential ingredient to buying and selling online.

It is expected that the digital identity will become a core platform for many other services that may require authentication of identity in Bhutan. One

of the biggest users of the digital identity may be the financial institutions, which may leverage this platform to provide eKYC (electronic Know Your Customer) services, removing the need for customers to physically present themselves to open bank accounts. It is also expected that the WoG Biometric platform may be leveraged to manage egress and ingress at the borders. Thus it will be implemented as a Whole of Government platform to be used by all government agencies that provide such services.

e-Patient Information System (e-PIS): This project will implement a digital health record for all citizens in Bhutan. The e-PIS will not only automate the operations of hospitals in the country but will also develop an information system that will securely maintain the historical medical records of all patients.

This means that citizens will no longer need to carry their medical files every time they visit a hospital. Physicians will also be able to quickly review a patient's medical files and be empowered to provide efficient diagnostic services. Furthermore, it is expected that the Ministry of Health and other relevant stakeholders will be able to use the data to carry out analytics to enable better policy decisions.

In the near future, it may also be used for training machine learning algorithms specific to Bhutan's context and ultimately help improve overall health outcomes in the country.

Bhutan Integrated Tax System: This project will develop an enhanced integrated tax system, integrating all aspects of personal, business, and value-added taxes in the country. This integrated system will significantly improve the quality of data collected on taxes, enabling better risk management and more effective and efficient tax monitoring. The project is also expected to significantly improve tax-related decision-making in the government, which will ultimately improve policies on taxes in the country.

Integrated Public Services: Although the G2C initiative identified around 150 online services across government, many of the services are rarely used by citizens. Surveys have revealed that these online services are not user-friendly and do not take the citizen's perspective into account. The services are built along agencies' structures, which makes the services, as far as citizens are concerned, incomplete and does not fulfill their

needs online. For example, a citizen processing work permits for foreign nationals must initiate the application through the Ministry of Labour and Human Resources, and the permit for entry/exit and the work/travel permits is issued by the Department of Immigration. Two related services are provided independently by two different agencies, requiring citizens to interact with multiple offices.

There are many opportunities for transforming these online services by integrating them across agencies and providing robust online payment options, so that citizens can get services delivered end-to-end online. This will effectively eliminate the need for citizens to travel physically to government offices, significantly improving service delivery and enhancing transparency and accountability of service providers.

The integrated online services will also be strengthened by the digital identity, which will provide the legal confidence to accept end-to-end online transactions without the need for agencies to — at any point in the review of the application — require the applicant to visit offices physically. The project is also expected to strengthen data systems in government so that they can effectively be shared as sources of truth when delivering services. This will further reduce the burden on applicants who need not repeatedly produce the same information for services across different agencies. The new process will enable the re-use of information captured by any government agency to be re-used by different authorised government agencies for delivering services.

e-Business: This project will focus on improving ease of doing business in Bhutan by using ICT to improve starting a business and simplifying the regulatory requirements for the import and export of goods.

The Ministry of Economic Affairs already has 34 government-to-business services, but applicants are still required to get sector clearances and location clearances, among other things. This adds significant burden to citizens, especially those who live far away from city centres, who have to physically visit offices for services, defeating the overall intention of online services. The Integrated Business Licensing component of e-Business targets multi-sectoral services, comprising over 50 different stakeholders and about 400 business activities, effectively transforming these physical processes into integrated online services.

The project will also implement a Single Customs Trade System (SCTS). It is envisaged that the Single Customs Trade System will establish a single point for electronic submission, in order to facilitate the lodging of standardised information to fulfill all the regulatory requirements for import, export and transit of goods.

This will allow traders to submit all related information required by regulatory agencies via a single electronic gateway. It is expected that this will eliminate the need for submitting essentially the same information numerous times to different government entities, some that are automated and others that still rely heavily on paper. Traders can anticipate this leading to reduced cost and time of compliance and increased predictability and transparency from the authorities.

Digital Schools: The project will develop systems so that schools can leverage numerous online educational content that students can access to be better prepared to productively contribute in the 21st century. The project will also develop an Education Information Management system as a single source for all data relating to students, teachers, and other data covering different aspects of education.

Enhanced Connectivity: Moving to a fully online ecosystem requires near ubiquitous and reliable connectivity throughout the country. The mobile operators, ISPs and possibly the cable operators, will play a major role in extending connectivity to most residents. Furthermore, with the support of the Universal Service Fund, the incumbent cellular operators will take mobile connectivity to most households through the rural connectivity projects. To strengthen the resilience of the core network, this project will strive to complete five domestic fibre loops, to bring about redundancy to our national core network, in collaboration with the Bhutan Power Corporation.

The project will also connect around 1,000 offices, schools, hospitals, RNR centres and other *gewog* (block) offices with high-speed fibre and wireless broadband connectivity. This will enable these offices to leverage reliable broadband connectivity in delivering their respective services online.

Parallel with this, the RGoB is also working hard to implement an independent International Internet Gateway as a backup to the "Chicken's

neck" corridor, Siliguri, India, to improve redundancy and thus reliability of connectivity to Bhutan. This will be another critical information infrastructure that we need as we forge ahead to develop an IT Industry.

What Next?

The world that we know is becoming highly volatile and unpredictable. While climate change is expected to severely affect poor nations, advances in technologies such as Artificial Intelligence (AI), Robotics and 3D printing are expected to revolutionise manufacturing in the future, significantly reducing the demand for cheap labour. This will largely unravel the manufacturing boom in developing nations that had offset the disproportionate distribution of wealth among nations during the Industrial Age.

There are already artificial intelligence programmes used in hospitals in developed nations that can read X-rays more accurately than radiologists. There are other AI programmes that can diagnose illnesses more accurately than regular general practitioners. This probably does not mean that we will no longer need doctors in the future. It does mean that we may not need as many doctors. A few specialist doctors, supported by AI, would probably be able to replace a larger number of doctors in the future. However, the hospitals may require more biomedical engineers who can interface with and repair the devices that run these AI programmes.

Some futurists predict that, in the next 10 years, autonomous cars will effectively replace most drivers in the developed world. Companies such as Tesla and Waymo will be able to provide autonomous taxis that will offer rides at a fraction of the cost now, but are much more effective and safer than human-driven taxis. If that were to happen just in the United States alone, up to five million people may lose their jobs to autonomous vehicles. Companies such as SpaceX, Blue Origin and One Web are working to deploy tens of thousands of next-generation broadband communication satellites covering the whole planet. If these companies, or other startups, are successful, they could potentially put conventional telephone/cellular companies out of business, putting yet again, millions out of jobs.

Technology is changing the world we live in and making the future highly unpredictable. It is in this unpredictable future that our youths must

navigate and find opportunities. A government's responsibility is to provide our youths with the necessary skills and conditions to effectively navigate this uncertain future, a challenge that most governments are struggling with even in the First World.

> "We have always steered our country in the right direction. We have successfully navigated through great geo-political and socio-economic changes of the past. This decade requires us to yet again skillfully navigate the new digital and technological landscape." His Majesty The King.