THE GOVERNMENT OF MONGOLIA
COMMUNICATIONS AND INFORMATION TECHNOLOGY AUTHORITY

Access Solutions LLC

BLAVATNIK SCHOOL OF GOVERNMENT
UNIVERSITY OF OXFORD

Pathways for Prosperity Commission
Technology & Inclusive Development

Mongolia in the Digital Age

National Digital Strategy Primer for Mongolia

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FOREWORD

The digital revolution has had an enormous impact on how people live and work. Innovative technologies have already contributed significantly to Mongolia's society and its economy, and they continue to hold great potential for the future.

Mongolia, with its youthful population, has the potential to build a robust digital economy. However, only a small percentage of population participates in this technological world at the moment. As we diagnosed in the "Digital Readiness Assessment of Mongolia", the country has good infrastructure system, decent ecosystem for start-up companies and innovation companies as well as relatively friendly regulatory environment in terms of tax and registration. These positive indicators notwithstanding, the country still has gaps in connectivity, skills and policies and regulation that support innovation, and challenges regarding access to finance.

Following footsteps of many technologically advanced countries, Mongolia should to create strategy for the digital economy, which will guide the main stakeholders to develop system and platform to develop inclusive digital economy for everyone specially for those who are left out at the moment. As part of the "Mongolia in the Digital Age" project, we developed this strategy primer as a way to kickstart discussion about Mongolia's digital economy strategy, with the aim to help the country to accelerate its digital economy while ensuring inclusiveness.

With the help of variety of partners within the Pathways for Prosperity Commission, officials within and outside government, this Strategy Primer will present a set of proposals for how the government, private sector and civil society could work together to drive technological adoption across all economically significant sectors of the Mongolian economy, for the purpose of realising economic growth, job creation and sustainability. Most importantly, this document prioritises suggestions that will help to ensure that nobody is outside of the digital economy.

Pathways for Prosperity Commission and Access Solutions team

ACKNOWLEDGEMENT

The Government of Mongolia and Co-chairs and Commissioners of the Pathways for Prosperity Commission would like to extend their appreciation to the dedicated people who made this report possible. This project is co-owned and hosted by his excellency Khurelsukh Ukhnaa, Prime Minister of Mongolia and under the supervision of Oyun-Erdene Luvsannamsrai, Cabinet Secretariat of the Government of Mongolia.

It was drafted by the local implementation partner, Access Solutions which was led by Bolor-Erdene Battsengel, and included Tengis Sukhee, Gantuya Ariunsan, Azbayar Togtokhbayar and Batbileg Purevdorj. A lot of support and guidance provided by the Pathways Commission's team led by Professor Stefan Dercon and Professor Benno Ndulu and the commission's head of research and policy Toby Phillips. Invaluable contributions to this report were made by Tebello Qhotsokoane, Chris Eleftheriades, and Meena Bhandari.

The elaboration of this proposal would have not been possible without our sponsor the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and we would like to thank Ms. Marta Pérez Cusó, Economic Affairs Officer, ESCAP for her comments on the report.

The depth of this report is thanks in part to Chinbat Baatarjav, Chairman of the CITA and Tamir Jargalsaikhan, Director of the IT Department of the Cabinet Office of Mongolia and National Development Agency of Mongolia.

ABOUT PATHWAYS COMMISSION

The Pathways for Prosperity Commission on Technology and Inclusive Development is proud to work with a talented and diverse group of commissioners who are global leaders from the Government, the private sector and academia.

New technologies are radically transforming lives across the world in ways that would have been difficult to imagine even a few years ago. The Pathways for Prosperity Commission – co-chaired by philanthropist Melinda Gates, Indonesian Finance Minister H.E. Sri Mulyani Indrawati and Econet CEO Strive Masiyiwa - has sought to shift the digital technology discourse away from fear of job destruction, which has paralysed many decision-makers, towards a more practical discussion on how developing countries should prepare to forge new tech-enabled pathways to inclusive growth. While each country will (and should) determine its own approach to development in the digital age, it is clear from our consultations that policymakers would welcome operational guidance on the issues and decisions they are facing.

The Pathways for Prosperity Commission has therefore prepared a policy toolkit, which seeks to catalyse in-country processes to identify national opportunities and imperatives, from which a country strategy for inclusive growth in the digital age can be developed. The toolkit aims to help developing countries (i) self-assess their present state of digital readiness; (ii) structure national dialogue on trade-offs inherent in laying stronger digital foundations and (iii) trigger the development of operational plans to accelerate the country's preparation for harnessing technology to achieve inclusive growth.

The *Digital Economy Kit* was used to guide **a process rooted in Mongolia**, which has culminated in this primer strategy. Access Solutions LLC implemented the project under the leadership of the Communications and Information Technology Authority and liaised between the Government, the Commission, and local implementing partners involved in the pilot.

Contents

INTRODUCTION

Digital technologies have become one of the main tools for raising the competitiveness of national economy and transforming lives. Automation, big data, and Artificial Intelligence enabled by the application of digital technologies are significant contributors to the global economy. According to the report by McKinsey, the internet accounted for 21 percent of GDP growth over the last five years[1]. The internet is also a catalyst for job creation. Mongolia is getting digitally ready to create a robust digital economy and an inclusive, digital savvy society.

The Mongolian economy has been growing steadily for the past few years as GDP growth rate increased by 1.2% in 2016, 5.3% in 2017 and 6.9% in 2018 respectively (ADB, Country Report). The Government of Mongolia is seeking to harness technological advances to improve existing businesses, create new products and markets, and enhance daily life. This is in response to the unique attributes of Mongolian society, such as the nomadic lifestyle and sparsely distributed population, which create a gap in society between people who live in remote areas or ger district and people who live in the city or central Ulaanbaatar.

Given the magnitude of change in competitive advantage that digital technologies can confer on adopters, the risks of slow or poor adoption of these innovations can be dire for industries, governments, individuals, and nations. As many countries are embedding their digital strategies into their long-term national development strategies, the Government of Mongolia is also aiming to promote digital strategies for economic growth.

In the framework of the "Mongolia in the digital age" project, the Digital Readiness Assessment and a series of dialogues on Digital Infrastructure, Human Capital, Access to Finance and Regulatory Environment were conducted between the period of April-September 2019 with about 100 stakeholders from government, civil society and business. More than 200 hours of discussions were synthesized here in this work. The Government of Mongolia owned and hosted the project through its responsible agencies including the Cabinet Office of Mongolia, Communications and Information Technology Agency and National Development Agency.

As a result of these works Mongolia should aim to create "DIGITAL INCLUSIVE SOCIETY" to reduce the inequality in the society as well as to promote inclusive economy in the country. There are several issues to consider to develop a strategy document for the people of Mongolia and to reap the benefits that new technologies provide and make sure no-one is left behind:

1. How do we encourage individuals to take advantage of opportunities in the digital economy by:
   - increasing their use of digital technology to interact with each other, businesses and governments
   - incentivizing them to seek education and skills development

[1] McKinsey report, The great transformer:The impact of the Internet on economic growth and prosperity, 2011

opportunities that will position them for jobs of the future

2. How do we encourage and support businesses to take advantage of the digital opportunities and to compete internationally in a global digital economy by:
   - planning for an increasingly digital future
   - developing new business models and driving the uptake of new technologies
   - investing in digital infrastructure to support their productivity and competitiveness
   - investing in their people by developing the digital skills of their staff

3. How does the Government provide an enabling environment for the economy to maximize the opportunities for all Mongolians by:
   - ensuring education and training meets current and future needs
   - helping businesses take advantage of digital opportunities and leave no one behind
   - facilitating investment in enabling digital infrastructure
   - improving access to data and the use of data while maintaining strong data safeguards
   - protecting themselves from online threats and misuse of their data, while improving digital literacy.
   - ensuring regulatory frameworks are flexible, adaptable and fit-for-purpose
   - delivering digital government services that are secure, fast and easy to use

All the questions set out above belong to the National Three-Pillar Policy which reflects three primary goals including economic development, social development and good governance to help a Mongolian citizen to have better quality of life. This strategy primer will therefore align with this existing national policy structure.

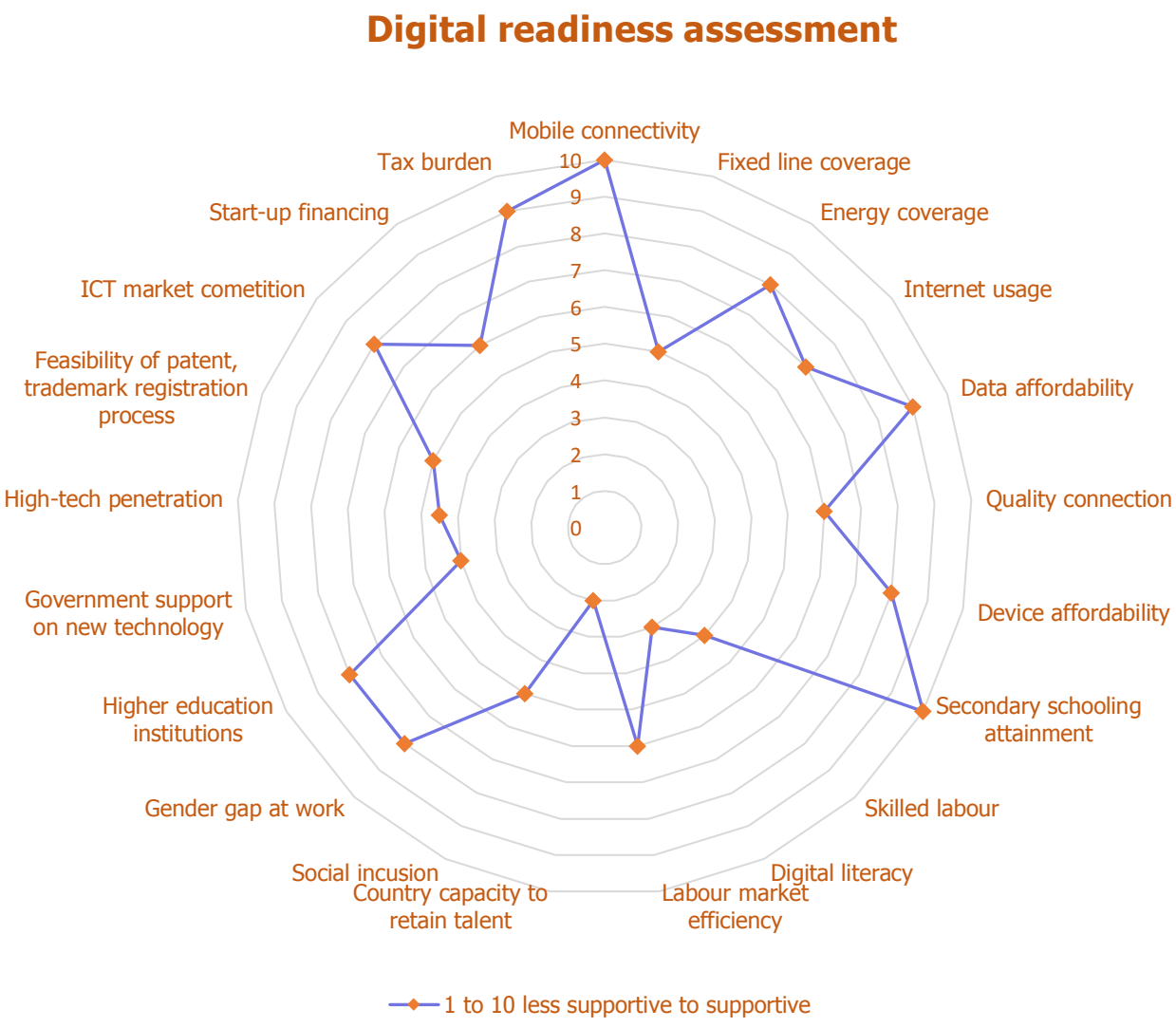
Digital strategies also have the potential to accelerate Mongolia's progress in achieving the sustainable development goals (SGDs) and becoming a leading middle-income country by increasing GDP per capita and reducing income inequality. Specific targets in zero hunger, quality education and reduced inequality are far from the target level[2] and "affordable and clean energy", "industry, innovation and infrastructure" appear to be the most pressing issues for Mongolia according to the SDG indicators[3]. Making progress on these goals will require sound strategic planning and deliberate long-term investments. We can use digital strategies as an accelerator to reach national long-term goals.

2 The share of people in poverty increased by eight percentage points, in recent years from 21.6 percent in 2014 to 29.6 percent in 2016, revealing that one third of the population now lives below the national poverty line. People living close to the national poverty line are at risk of falling into a poverty trap.

3 SDG Index and Dashboard report 2018

SITUATIONAL ANALYSIS

In reviewing the initiatives, policies and regulations needed to drive Mongolia's digital economy while ensuring that the gains from digitally enabled growth are inclusive, we need a stock take of the state of digital readiness as measured against the desired levels in an inclusive digital economy.



Digital readiness of Mongolia is examined through four key enablers, which include digital access, human capabilities, access to finance and regulation. The data and insights are derived from the Digital Readiness Assessment published as a part of this project. The summary of the insights from the assessment are provided below.

Digital access and inclusion – Currently, one out of five people in Mongolia is living in a condition of limited electricity. People living in rural areas and in some parts of ger districts are particularly affected by gaps in electrification. Many people living in these

areas still use conventional ways of generating heat for their daily life. Having access to electricity is the basis of productive digital use, and the country's readiness for digital age is constrained by the electrification rate of 80 per cent.

According to International Telecommunications Union (ITU), overall internet connectivity in Mongolia is higher than the world and regional average. People living in urban areas enjoy quality and affordable internet access through fixed connections and mobile usage. For instance, there were 1,4 million 4G/LTE users and 2,5 million 3G users in 2018, which outnumbers the total population of the country[4].

Discrepancies in digital accessibility are observed among nomadic herders and ger districts due to the lack of basic infrastructure. There is a gap in infrastructure proliferation, especially for those who live in ger districts, where households have no connected fibre directly coming to their home, and for people living in rural areas where coverage and signal strength are poor. There is also a huge challenge for Mongolia to make internet affordable for everyone. On average, people spend slightly over 2 percent of their monthly income to access internet. But statistics reveals that approximately 30 percent of the population are living below the poverty line and having internet access is still expensive for these people.

Digital identification has been developing for the last few years. Introduction of Electronic ID card and e-Government services are considered major achievements of Mongolia in the digital age. Banking, telecommunications, and other private sectors are enabled to use such digital identification, and services have become more accessible and less costly. Over 90 percent of adults hold bank accounts, and 20 percent of them are using mobile transactions actively. However, the absence of a strong legal environment for online payments and integrated gateways are the issues that should be tackled in the near future.

Human capabilities and digital skills –Mongolia can become a digital ready country by redoubling efforts on education, and expanding new digital capabilities including both technical skills and basic digital literacy. There is a rising inequality in digital literacy in the country, especially between residents of the ger districts and the countryside, and those in urban areas. This is largely due to the lack of access to digital infrastructure and poor English language skills, both of which limits people living in ger districts and countryside from using digital devices, and engaging with information on the internet, thereby excluding them from digital opportunities.

Furthermore, during the dialogue session in Human Capital and Education stakeholders strongly emphasized that there is a mismatch between the labour market and education system. Due to the lack in quality and relevance of curricula, teaching-learning methods, and internship programs, Mongolia's education and training systems seem to have resulted in skilled-labour shortages and skill mismatches. "Employers spent 3 more years to prepare

[4] Communications Regulatory Commission of Mongolia, 2018

a university graduate to make him/her ready for job. It is a great loss," stated by one of the employers in the technology sector during the panel discussion. Many of them lack in creativity, problem-solving capabilities and other soft skills, which are required for success at tech companies.

Another challenge for new graduates is poor foreign language skills. English became the core subject since 2010 and is embedded in the core curriculum, but it is taught differently in urban-rural and centre-remote areas of the city due to the lack of skilled teachers as discussed in the dialogue session.

In the labour market, there is a huge deficit in skilled labour[5]. A shortage of employment opportunities in rural areas, a mismatch between education goals and the labour market demand, an inability to retain talent, and gender inequality in the context of cultural norms can be identified as considerable causes for poverty.

Access to finance – Mongolia does not have significant entry or exit barriers for businesses, and the economy is highly open to foreign trade and investment. The tax burden is also among the lowest in the world across the spectrum of taxation. However, it was emphasized that financial system, consisting of major banks, is not able to support start-up businesses during the dialogue session on Access to Finance. These banks have high loan interest rates and very stringent requirements for new businesses.

The investment climate for start-ups is generally quite poor. With few resources, entrepreneurs are often left alone to seek their own funding from private individuals. The lack of available capital greatly stifles the development of innovation-driven enterprises. The current ecosystem would largely benefit from a network to connect private investors with entrepreneurs as well as the creation of programs to educate entrepreneurs on how best to search for funding. By increasing knowledge about the investment climate, potential investors might be more comfortable investing in Mongolian start-ups, and Mongolian start-ups might be able to more successfully approach potential investors.

From the side of the entrepreneurs, the lack of understanding about company structure, financial and legal environment was a major challenge reflected during the dialogue session. Many outstanding entrepreneurs and application developers are in lack of knowledge about sustainable revenue models and understanding of the business leadership.

Policy and regulation – The current policy environment is not responsive enough to address challenges brought by digitalization and innovative business models, especially to regulate the business models driven by platforms. An example is "Easy ride" taxi application, which is more like "Uber" and a disruptor in the taxi market. In a supreme court case brought by the taxi operators against the company, the court ruled that "Easy

[5] WEF 2017, Competitiveness report, Mongolia is ranked 112th globally.

Ride" was a taxi company, not simply a platform, forcing them to comply with regulations for taxi companies, specifically regulations about where the steering wheel has to be in a formal taxi. Easy Ride saw themselves as providing a platform that brings efficiency to the already popular informal taxi market, a majority of whose drivers use cheaper imported cars whose steering wheels are on the 'wrong' side, but the state did not recognise them as a platform. Similar cases are bound to come up as platforms and other disruptive businesses, Non-Banking Financial Institutions (NBFIs) come to Mongolia. In order to incentivise innovation and benefit from the job creation and formalisation potential that these platforms bring, the Government will have to think critically about regulation and market definition.

There also gaps in the current taxation system, especially in terms of knowledge and understanding of how to tax digital assets. At present, the definition of digital assets is not well stated in the law, limiting the state's capacity to tax digital assets and businesses that trade in these. Globally, different countries are considering different modes of taxing digital assets, like the Significant Economic Presence (SEP) in India and Indonesia, and Mongolia needs to develop the necessary capabilities to craft its own policy around these issues.

Furthermore, the digital age presents a lot of challenges around data management and governance. In Mongolia, there is a big need to address the daunting challenges of ensuring data privacy and ensuring cyber security for businesses, government and civil society. There is a deficit of legal frameworks dealing with data protection and cyber security which will be a priority issue for the Government, businesses and for individuals.

Finally, during the dialogue sessions, representatives from intellectual property authority and inventors debated on the national strategy to tackle the trade off between the need for innovation and open standards, as well as the need to protect intellectual property rights for inventors. Lack of IP enforcement is criticized for disincentivising innovation and R&D.

Digital economy strategies

Strategy one: Introducing digital education to all the phases of life

As more than 70% percent of the population is younger than 40 years old and high literacy rate, new technologies can be adopted relatively quickly in Mongolia. However, the current education system faces challenge of embedding the technological skills in the education system. The strategy points out two important factors including the education system to ensure that curriculums from primary school to university education offer digital skills and life-long learning which enables all levels of the workforce to learn and re-learn throughout their lives.

Strategy two: Improving connectivity and accessibility

Overall connectedness to internet is higher than the world average and regional average. People living in urban areas enjoy quality and affordable internet access through fixed connections and mobile usage. Discrepancies in digital accessibility are observed among nomadic herders and ger districts due to the lack of basic infrastructure.

Therefore, we suggest taking actions to improve the mobile internet connectivity throughout the country by pushing increased 4G coverage across the country and investing in 5G to ensure that the country remains competitive. The Government can also increase digital use by looking to provide critical government services in health, education and social services digitally, thereby incentivising business as well as government to look for innovative and effective ways to bring those left behind into the digital sphere.

Strategy three: Effective regulation to create friendly environment for business

The role of Government as a regulator is likely to evolve to be more closely linked to citizens and businesses, and to be able to adapt to change faster, minimising negative impacts on innovation and ensuring maximum access to international markets. To create an effective regulation system which provides a friendly environment for business, Mongolia needs to work towards even faster adaptability to new technologies, technological disruptions and innovations, pro-competition digital economy and enhance the intellectual property system.

Strategy four: Better ecosystem for innovative start-ups

Mongolia has a small domestic market, so start-ups looking to build innovative products have to use Mongolia as a prototyping market, and export products and services to other markets where there is greater scaling potential. The Government can play an important role in supporting local start-ups at an early stage, creating a regulatory

environment that supports innovation, and helping to turn their ideas into viable businesses through interventions like Hub Incubator centre which aims to provide mentorship.

To create such system which encourages and helps innovative start-ups to survive and further develop, all the stakeholders including both public and private sectors need to work together and collaborate to improve the quality of Research and Development and innovation brought by start-ups.

Strategy five: Well-developed cyber security and data protection system

While technology brings many advances, improvements and better approaches to solve challenges, it also brings risks, for instance in terms of ensuring cyber security and data protection. One of the key pillars of digital society is cybersecurity. There is still huge room for improvement in cybersecurity in terms of capacity and capability. Therefore, Mongolia needs to improve cybersecurity by developing and implementing cybersecurity national framework and heavily investing into capacity building. Also, the Government should encourage innovative uses of data by both government and business and promote ethical norm for appropriate use of data.

Strategy six: Sectoral policies, embedding technology to accelerate the development

The advantages of the digital technology do not only lay in the technology sector. The technological development can help every sector to be more productive and to make a direct positive impact on the key social and economic indicators of the country. In order to do so policymakers should conduct active inter-agency discussions to ensure sectoral perspectives and fully digitize the Government public service delivery.

1. INTRODUCING DIGITAL EDUCATION TO ALL THE PHASES OF LIFE

Education plays a critical role in shaping the lives of young Mongolians. Maintaining a strong national curriculum is crucial to ensure young Mongolians are well-prepared for disruptive changes in the 21st century. It must cover the knowledge and skills required by Mongolian students to live and work as a global citizen, regardless of where they live or what school system they are in.

There is mismatch between education system and labour market. We need Mongolians to be equipped with the skills required to thrive in an evolving job market.

Barriers to digital literacy and access to technology is key to ensure participation in the labour market and social inclusion, particularly for:

- Unemployed youth
- Women
- People in low socio-economic groups and er districts
- People living in remote areas and indigenous herders
- Senior citizens

To help these people to transition or reskill, the education sector needs to embrace non-traditional forms of study. This could include micro-credentials, which recognise informal and formal learning in specific areas and offer an efficient way to ensure that employees are keeping their skills relevant and certified. On the other hand, the pace of technological change makes it difficult to predict the nature of digital skills that will be needed in the future. Requirements will change quickly so we will need to up-skill people through building life-long learning culture

Mongolia will establish:

Recommendation 1: Establishing an education system that ensures digital capabilities for all

1.1 **Action:** The Ministry of Education, Culture, Science and Sports (MECSS), in partnership with existing digital literacy programs such as NEST Academy and Faro, should create an information science course in the primary and secondary school curriculum and in teacher education and continued training. This standardised curriculum would include basic computer literacy courses, data and information literacy courses to encourage responsible consumption and usage of digital information, and an introduction to programming and design. It is important that the relevant assessments are created as part of this curriculum to ensure that the Government can monitor its progress on improving digital and information literacy for all Mongolians.
Outcome: Every high-school student will have a basic knowledge of information science and programming.

1.2 **Action:** The Government, through the MECSS should train primary and high school teachers to adapt digital technologies in the teaching and learning process. Teachers will be critical for delivering digital literacy curriculum, so it is important that the relevant ministries also provide assessments for teachers and invest in updating the training curriculum as new capabilities or knowledge requirements arise.
Outcome: 25 percent of teachers (approx. 7000 teachers) will receive training by 2025

1.3 **Action:** The MECSS should ensure that teachers delivering English lessons are fluent enough to teach the subject by doing assessments and providing additional training where relevant. In area where there are no qualified teachers, the Ministry would explore online modules with facilitation, as they invest in teacher training in those areas. Limited English capacity, especially for students outside of Ulaanbaatar, remains a key barrier to productive use of internet.

Outcome: Every high school student will have intermediate English skills and the ability to go online for further self-education by 2028.

1.4 **Action**: The MECSS should also partner with CITA, institutions of higher learning and high performing high schools like Sant and local digital education content creators to create and test an e-learning platform to supplement in-class education. If Mongolia wants to build 21st century skills in all areas of study, the country needs to consider newer and more cost-effective delivery tools and digital learning contents that could potentially close the achievement gap across regions. These e-learning solutions will need to be complemented with adequate training and collaborative deployment with the involvement of schools and teachers.
Outcome: All high-schools will be equipped with online and distance-learning facilities prioritizing special schools and schools in remote areas.

1.5 **Action**: The Government should set up a human capital information system that does not only perform an accounting exercise of the human capital composition of the economy, but provides a framework and information so that the labour market can begin to respond flexibly to market needs, especially as they pertain to new skills for a digital economy. The MECSS will also need to engage with the industry/sector representatives to better align training to industry needs. This would necessitate the formation of sector skills councils which represent various major skills in the country, and feed information to the MECSS and to institutions of learning at all levels.
Outcome: Maintained skilled workforce that can keep up with rapid technology change and seize job opportunities

Recommendation 2: Establishing a life-long learning culture

2.1 **Action**: The Government should partner with NGOs, local institutions of higher learning, and international and local online education content providers to provide certified online-only and online-with-facilitation education and training programs and centres. To incentivise participation, these centres should be able to grant certificates for completion which can be a signal to employers of self-improvement. These initiatives will provide flexible learning opportunities and supplement available education options. The content generated via this collaboration should be constantly upgraded to fall in line with industry needs and global trends, which will be generated by sector skill councils and the human capital information system.
Outcome: A nationwide life-long learning initiative that provides opportunities for skills upgrading for students, workers and the elderly.

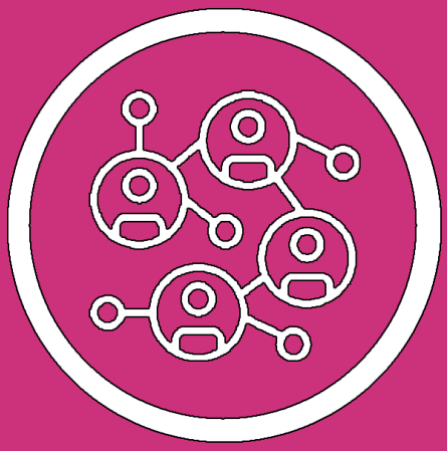
2.2 **Action**: The Government should create incentive schemes for the private sector actors to invest in continual skills upgrading of their workforce. The Government could consider avenues such as Skills Development Funds where government would match contributions from private sector for skills upgrading. The Government could also consider other avenues for incentivisation such as tax credits for enrolling employees into training programs. This would require partnerships with training centres, universities, and paid online training courses. This approach could allow the private sector to play a role in building and maintaining a broad base of digital competency across their workforce, which benefits employers, as well as the workers.
Outcome: All level of the work force will be equipped with relevant digital and other necessary skills or knowledge.

2.3 **Action:** The Government should set up mandatory skills saving schemes for citizens, paid for through employee contributions similar to pension payments. These schemes would create opportunities for skills upgrading initiated by the individual. Those not in employment would have their contributions subsidised by the state. This initiative will be important because while incentive structures for business could work, private sector actors are likely to invest in skills upgrading limited to the capacity of a worker to do their job, and no further improvements beyond that. These personal 'skills savings accounts' would allow workers to pay for skills upgrading opportunities at their own will.
Outcome: Mongolian citizens who are driven, and enabled to engage in life-long learning, and who keep up with skill needs of the future.

Recommendation 3: Investing in developing digital talents

3.1 **Action**: The Government, through the relevant agency, will include coding boot camps in the Government's TVET structure. To this end, existing accreditation/funding arrangements can be applied to such initiatives.
Outcome: Increased number of high skilled digital experts working domestically and internationally.

3.2 **Action**: The Government, through CITA, will initiate supplementary education options such as direct mentorships and apprenticeships to improve the capabilities of existing IT engineers.
Outcome: Increased number of high skilled digital experts working domestically and internationally.



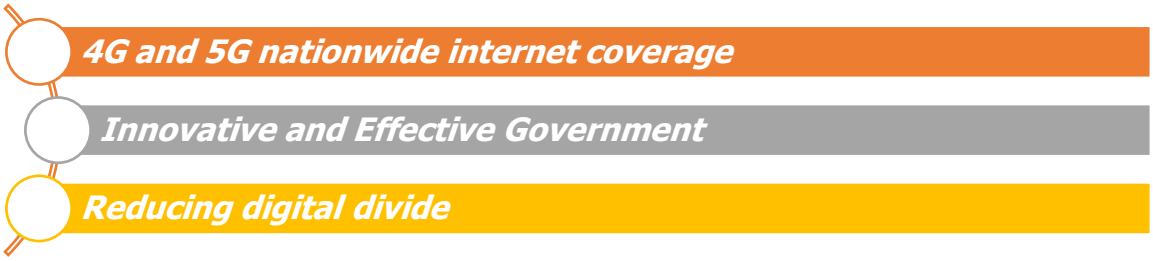
2. IMPROVING CONNECTIVITY AND ACCESSIBILITY

Electricity infrastructure, as the skeleton of digital transformation, has been a challenge for Mongolia given its traditional nomadic lifestyle, harsh weather conditions, and sparsely distributed populations in vast territory. More than 80 of the total population have connected to centralized electricity system. The remaining 20 percent, who are herders living far from the aimag (province) or soum (villages) centres, have limited electricity access.

There is a significant difference of internet use between the rural and urban users. Internet access is adequately diversified in urban areas, as the urban population benefits from plenty of options such as mobile data, mobile broadband, fixed broadband, etc. Costs of each means vary by its usage, and having internet is affordable for half of the population. However, in rural areas, there is not enough diversity in lower cost offerings and means of connections.

The Government of Mongolia has already introduced e-government system and transparent account which allows citizen to see budget expenditures online. Currently the Government aims to reduce the digital use gap and change public service delivery to online.

Mongolia will establish:



Recommendation 1: Improving mobile internet connectivity and provide nationwide 4G coverage

1.1 **Action**: The Government, through CITA, should incentivise mobile operators to expand 4G services to rural areas and ger districts. They should investigate tax incentives and policies that optimises capacity and incentivises investment in rural network infrastructure and prioritise coverage as a key driver of spectrum policy.
Outcome: Increase of 4G penetration from 40 percent to 60 percent of active mobile users.

1.2 **Action:** The Government, through the Communication Regulatory Commission (CRC), should develop and enforce passive and active infrastructure sharing policies among private and public service providers, especially in rural areas and the ger district.
Outcome: Increased coverage and affordability of mobile broadband, especially in currently underserved areas.

1.3 **Action:** CITA, in partnership with Mobile Network Operators (MNOs) should begin scoping and planning for investment in, and allocation of 5G network. In doing this, they should ensure that spectrum pricing, tax incentives and infrastructure sharing policies support wider coverage so that a majority of Mongolians are connected to 5G.
Outcome: 5G is introduced in the near future, and plans for universal coverage of 5G are made.

Recommendation 2: Moving towards Innovative and Effective Government

2.1 **Action:** The Government, with the leadership of CITA, should develop end-to-end digital services that are comprehensive, simple and run on an intuitive citizen interface. For this to happen, the Government would need to develop competencies in service design, human centred design, and opt for more collaborative and consultative approaches to e-services design.

Outcome: User friendly digital public service that increase service provision for those who are currently excluded from service provision.

Recommendation 3: Bridging the digital divide

3.1 **Action:** The Government should target digital literacy campaigns and coding courses to women, unemployed people and those living in disadvantage. The success of these initiatives will require time bound targets for increasing the number of women and unemployed persons with digital literacy skills and baseline coding.
Outcome: Wider inclusion of excluded groups into the digital economy.

3.2 **Action**: The Government should create funds and grant schemes that are aimed at getting women into STEM fields. These could perhaps include tying tax credits for businesses to invest in such schemes. To support these schemes, the Government should also create campaigns that target gender norms that influence subject choices of women and young girls.
Outcome: A greater number of women graduating as developers, machine learning scientists and innovators in the tech sector.

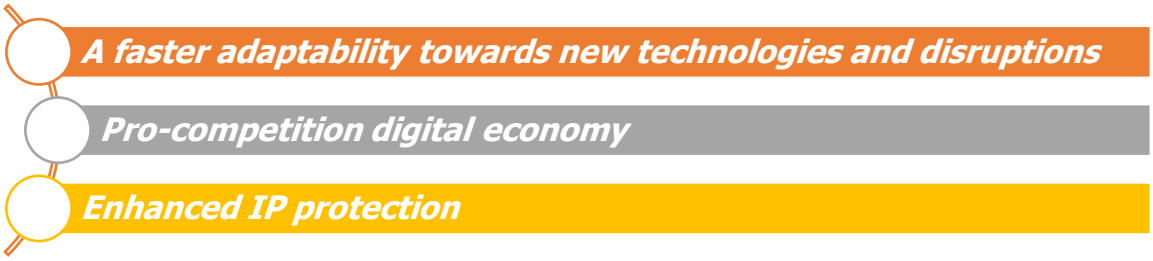
3. EFFECTIVE REGULATION TO CREATE A FRIENDLY ENVIRONMENT FOR BUSINESSES

The role of Government in the digital age as a domestic regulator is likely to evolve to be more closely linked to citizens and businesses, allowing it to adapt to change faster, minimise negative impacts on innovation and ensure maximum access to international markets. Regulations needs to be tailored to innovative digital activities through technology-neutral and principles-based approaches.

Many of the participants in our dialogue sessions expressed their opinion on the regulatory situation for not being reflective enough to address challenges brought by digital platforms and innovative business models. Moreover, lack of IP enforcement, taxation policies on digital assets, and other policy issues may hinder innovation and digital opportunities for new businesses.

Even though the regulatory environment of Mongolia is likely to support new business with its low tax rate and gives more flexibility to new business, there is also a room for further development especially for the start-ups and tech businesses to attract domestic and international investment.

Mongolia will establish:



Recommendation 1: Improving adaptability towards new and disruptive technologies

1.1 **Action:** Mongolian regulators should take up regulatory practices that encourages innovation while protecting consumers. Various regulators, from the Bank of Mongolia (BoM) to the CRC, should investigate approaches like co-regulation and regulatory sandboxing in order to test new innovative ideas, while allowing regulators to understand the impact of these products so that they apply appropriate regulations.
Outcome: The regulators pass regulation that is supportive and adaptive.

1.2 **Action:** The Government should create national framework to attract international investment for innovative businesses and to assess business environment on regular basis in order to continually strengthen the legal protection for international and domestic investors.
Outcome: A satisfactory business environment for investors.

1.3 **Action:** The tax authority and Ministry of Finance should look to update tax law to include the taxation of digital assets. This will involve looking at existing approaches to taxation of organisations based on their digital economic footprint in the country, instead of on the basis of physical location.
Outcome: A fair tax policy that efficiently taxes digital assets and transactions, raising revenue for government without distorting incentives in the digital economy.

1.4 **Action:** The Government should make plans to reduce entry and exit barriers for new businesses in the market, and to digitalize the business registration process to be more cost effective.
Outcome: An increased market penetration and promotion of newly established businesses.

1.5 **Action:** The BoM should work with existing digital payment platforms when creating digital payment gateways and policies, so as to allow for seamless digital financial services ecosystem in Mongolia. This will include the integration of

international payment modes such as paypal in the digital payments ecosystem, thereby allowing for greater usage of domestic and international e-commerce platforms.
Outcome: An increased usage of digital financial services, and greater financial inclusion.

Recommendation 2: Establishing a fair competition environment

2.1 **Action:** The Government should accommodate specific characteristics of platform economies and other innovative business models when defining markets and applying regulation. Disruptive businesses are likely to face resistance from incumbents in the sectors that they are challenging, so it is crucial that the Government maintain a pro-innovation bias, and regulate new entrants accordingly.
Outcome: An amended law that promotes innovative business models.

2.2 **Action:** The Government should enhance competition law enforcement and to ensure strict and timely collection of fines and charges imposed by competition authority.
Outcome: The establishment of good practices to foster competition.

Recommendation 3: Enhancing IP protection

3.1 **Action:** The state should look to to strengthen intellectual property protection for local and international digital contents and to establish a valuation system.
Outcome: Incentivized digital content makers, thus increased number of patents.

3.2 **Action:** The Government should strengthen the IP protection law enforcement.
Outcome: An increased private incentive to invest in innovation and R&D.

4. CREATING A FRIENDLY ECOSYSTEM FOR INNOVATIVE START-UPS

In many countries, start-ups have been one of the main drivers for digital transformation as they are creating new approaches to solve problems, introducing digital solutions and working closely with digital communities. Many start-ups develop digital solutions and business models that are quickly scalable and provide interesting solutions for established companies. Following this international path, Mongolia has also been trying to create an environment for start-ups to flourish and create innovations to solve problems within the society.

Mongolia has a small domestic market, so start-ups looking to build innovative products have to use Mongolia as a prototyping market, and export products and services to other markets where there is greater scaling potential. The Government can play an important role in supporting local start-ups at an early stage, creating a regulatory environment that supports innovation, and helping to turn their ideas into viable businesses through interventions like Hub Incubator centre which aims to provide mentorship.

Also, funding options need to be diversified by looking at options such as increasing the number angel investors and venture capital funds in Mongolia. Lack of understanding of sustainable financing and business principles is one of the main reasons for poor development of start-ups in Mongolia.

The Government of Mongolia, national universities, private companies and all other stakeholders need to collaborate to make a strong and sustainable ecosystem to create an innovative start-up culture. The Government should work closely with key industries and academic institutions to discuss, coordinate and collaborate to improve the quality of R&D and innovation brought by start-ups.

Mongolia will establish:

Recommendation 1: Establishing a supportive ecosystem for start-ups

1.1 **Action:** Innovation and technology hubs should organize knowledge sharing events including bootcamps and hackathons to help start-ups make the connection with the investors
Outcome: A learning and sharing culture among start-ups and increased networking opportunities with investors

1.2 **Action:** The above-mentioned organizations should work with universities to provide advisory services to empower start-ups through, especially around their human resource capabilities in the field of management, product marketing, and finance.
Outcome: Start-up entrepreneurs will have better knowledge of business principles and finance and revenue models.

1.3 **Action:** The Government should promote public and private initiatives to establish technology and innovation incubators and co-working spaces with low-cost offices, as a way to increase participation of those from low-income backgrounds in the startup ecosystem.
Outcome: Increased number of sharable facilities for start-ups.

1.4 **Action:** The Government and its responsible agencies including CITA, Municipality Office and National Development Agency (NDA) and private sector should work together to make Mongolia an attractive, competitive location for venture capital funds by improving the legal and tax framework and by creating promotional tools and tax incentives to continuously seek diversification in funding opportunities
Outcome: Increased opportunity to access to finance for the start-ups.

Recommendation 2: Building a start-up and innovation culture

2.1 **Action:** The Government should look to strengthen coordination and collaboration between public and private sector and academic institutions to create shared

innovation and knowledge management, which will then contribute to the development of products.
Outcome: The establishment of shared knowledge management system and innovation culture.

2.2 **Action:** The Government should establish a collaborative platform for researchers and digital start-ups to develop, test and sell their ideas, goods and services. The government should also organize nationwide Digital Start-up Competitions and hackatons.
Outcome: Increased R&D and efficient use of resources.

2.3 **Action:** The Government should create a high-tech start-up Fund to offer initial investment and grants for innovative start-ups and to promote other sources of public investment.
Outcome: Increased number of innovative start-ups that are able compete in the market.

5. WELL-DEVELOPED CYBER SECURITY AND DATA PROTECTION SYSTEM

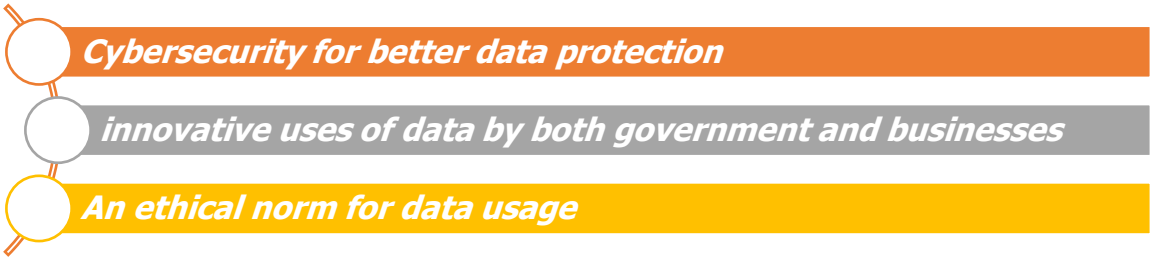
Information and communication technologies evolved so much that most of the aspects of our lives are digitized. As much as the technology brings so many advances, improvement and better approaches to solve many emerging challenges, it also brings as much risks especially on the data. One of the key pillars of digital society is cybersecurity. There is still huge room for improvement in cybersecurity in terms of capacity and capability.

Existing Cybersecurity capability is not sufficient and Mongolia is ranked 85th according to the Global Cybersecurity Index ITU 2018. It is also worth to mention the non-existence of agency or entity that is responsible for cybersecurity.

The increasing adoption of new technologies are helping the world to create data-based economy throughout the world. Similarly, Mongolia does have a lot of data which have not been efficiently used to help public organizations and private companies to improve their service and ensure inclusiveness in the society. The collection of high-quality data gives opportunities for business to constantly grow across industries and changing the way we work. Therefore, Mongolia should commit to keep learning technological advancements for constant growth whilst ensuring the privacy of citizens data and protection.

The most important factors of the digital data use in the modern world which reflects value of judgement, freedom of speech and respect to one another Along with the Data Protection law which is to be approved in the end of 2019, there is a need for a framework to provide more detailed guidance.

Mongolia will establish:



Recommendation 1: Improving cybersecurity for better data protection

1.1 **Action:** The Government should set up a cyber security agency which will develop a national cybersecurity strategy. To respond to the rise of cyber-attacks from Russia and China, the cyber security agency will set up legal measures, technical measures, organisational measures, and develop the requisite capacities within country to anticipate and respond to cyber-attacks and cybercrime.
Outcome: A national cybersecurity framework and national cybersecurity strategy.

1.2 **Action:** The Government, through the cyber security agency, will accelerate capacity building in the field of cybersecurity by developing professional training courses and integrating international certification programs into higher education curriculum to prepare cybersecurity personnel.
Outcome: Increased number of professional training courses and national experts on cybersecurity

1.3 **Action:** The Government should create a certification framework with standards for professionals and organisations. This framework should provide incentives to encourage firms and government departments to employ accredited staff.
Outcome: Increased number of certified staff who are familiar with cybersecurity standards in both the public and private sector.

Recommendation 2: Encouraging innovative uses of data by both government and businesses

2.1 **Action:** The Government should establish an open data platform that will enable innovation in service delivery. The Government should collaborate more with private sector companies, young social entrepreneurs and start-up companies to leverage open data as a public good.
Outcome: Open data platform and increased innovation.

Recommendation 3: Establishing an ethical norm for appropriate use of data

3.1 **Action:** CITA, in partnership with relevant institutes of higher learning, should produce an ethical framework for data management, usage and sharing. This framework will help all stakeholders to understand the limitations of data use and define the ethical minimum requirements.
Outcome: A data ethics framework that is updated with expert consultation

3.2 **Action:** The Government should organise a series of public dialogues about data ethics to increase awareness and promote the data ethics codes. These codes should be disseminated to the public via social campaigns.
Outcome: Increased public awareness on ethical use of data.

6. SECTORAL POLICIES, EMBEDDING TECHNOLOGY TO ACCELERATE SOCIO-ECONOMIC DEVELOPMENT

The advantages of the digital technology do not only lay in the technology sector. Technological development can help every sector to be more productive and to make a direct positive impact on the key social and economic indicators of the country. In order to do so policymakers should conduct active inter-agency discussions to ensure sectoral perspectives.

"*IT sector in Mongolia is ready to support the core economic sectors to have better use of high technologies. The only inconsistency is that the domesticating process of such technologies in agriculture, mining and other sectors is slower than the IT sector's capacity*" said by Bilegdemberel Badamdorj, Director of IT Policy Planning Department.

ICT will be utilized as the most cost-effective and widespread channel for establishing a constant interactive platform for dialogue with citizens, civil society and the private sector, receiving citizens' complaints on service delivery and feedback on policy decisions, and publishing results for mass dissemination. Digitalization will play a key role in modernising public services, increasing service productivity and reducing labour intensity, increasing the level of satisfaction with and effectiveness of services, and increasing the openness of, trust in and engagement with governments.

Mongolia will establish:

Recommendation 1: Digitalizing Government services

1.1 **Action**: In addition to its investments in human capabilities to enhance digital use, the Prime Minister's Office, through the Office of the Cabinet Secretary and the relevant agencies, such as CITA and National Bank of Mongolia, should continue to invest in the development of enablers –such as interoperable digital identity, open data policies, unified digital payment platforms, and electronic records infrastructure– across all government departments. These initiatives and policies will allow for better coordination across ministries, and improve data collection and usage in service delivery, and as a consequence increase efficiency and quality of service delivery.
Outcome: Improved public service delivery due to digitisation, especially in health, education and welfare, and increased efficiency in internal government processes.

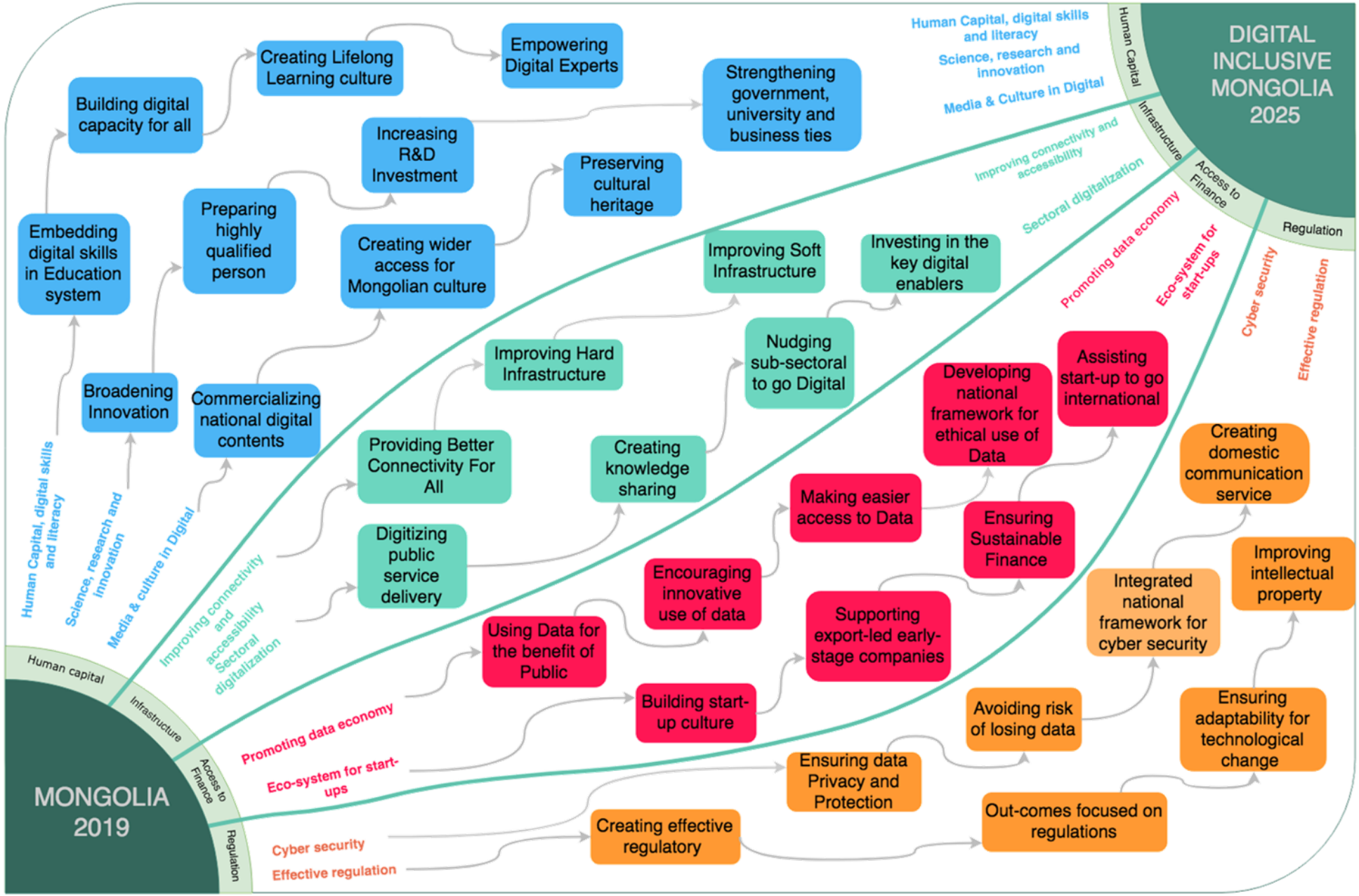
1.2 **Actions**: The central government should accelerate the integration of IT systems and databases across all government departments. All ministries and agencies should also look to digitise legacy data systems as part of a larger move toward 'paperless' government. These actions will result in the creation of a public data management system.
Outcome: Increased amount of data being digitized across sectors

1.3 **Actions**: To deliver on its inclusion mandate, especially for the poorest, the central government, through CITA and the Ministry of Labour and Social Welfare should mandate knowledge sharing across relevant government programs targeting the poorest for a more cohesive digital welfare system. This will entail the integrated, user-centred design of administrative processes of social welfare, social protection and health and education.
Outcome: An improved and user-friendly welfare registration system.

Recommendation 2: Establishing sub-sectoral digital policies

2.1 **Action:** The NDA, in partnership with CITA should look to embed sub-sectoral digital policies into sectoral development strategies, especially in tourism, agriculture, mining and energy. This will ensure that government's digital strategy for sectors is aligned with the development strategies. **Outcome**: Digital perspectives will be integrated in sectoral development frameworks in alignment with digital technologies

Roadmap to digital inclusive society



CONCLUSION

Considering readiness conditions Mongolia can capture digital opportunities brought by disruptive technologies. Digitalization of economic sectors including mining, agriculture and electric industry is a primary step towards a sustainable future. However, people are Mongolia's greatest resource. As we enter the fast-paced and often unpredictable digital economy with disruptions and frontier technologies, we need prepare not only by providing infrastructure but educating people to actively interact with the digital world and take part of the digital economy.

The Strategy Primer articulates the future challenges of digital economy and spells out what Mongolia should do to ensure inclusiveness and develop workforce that will be globally competitive.