DIGITAL ETHIOPIA 2025

A DIGITAL STRATEGY FOR ETHIOPIA INCLUSIVE PROSPERITY

Federal Democratic Republic of Ethiopia

Foreword

The world is undergoing a fourth industrial revolution at an unprecedented rate. Ethiopia must proactively embrace it to ensure our communities benefit, and our youth succeed in the new world. We are witnessing a global transformation driven by new technologies such as Artificial Intelligence, Internet of Things, Nanotechnology, and Big Data, amongst many others that offer new models for production, communication, and lifestyle. Our children require new skills and knowledge, and it is our responsibility to position them better in seizing the future.

Ethiopia is yet to realize its potential in the digital space and leverage technology to build a more prosperous society. Urgent, bold, and coordinated action is needed so we can make this transformation successful. We are on a journey of rapid economic and social change. In 2019, we adopted the Homegrown Economic Reform Agenda and the Ten-Year National Development Plan (2020-2030). New digital technologies offer an opportunity to sustain growth and ensure every citizen benefits from a more prosperous nation.

Leveraging these digital opportunities demands a new mindset and leadership style from the Government. Enabling innovation means embracing the unknown. The Government commits to investing in Research and Development of future and emerging technologies as well as creating an enabling environment for courageous, innovative and committed people to develop new businesses, services and jobs.

Like many new and mostly unknown opportunities, there are risks to mitigate and lessons to be learnt to ensure our future is safe and inclusive. While these risks include cybersecurity innovation, harmful social media content, a growing gap between the rich and poor, the risks to not leveraging digital technologies, however, are higher for developing economies like ours. The Covid-19 pandemic, for example, has provided powerful lessons in the importance of digital tools: to trace and track high-risk individuals, to facilitate vaccine research, as well as to mitigate the economic downturn by safely enabling people to work remotely. Ultimately, the most considerable risk is complacency in understanding and navigating our new digital paradigm. Also, informed risk-taking and a compassionate spirit are vital to ensuring gender and socio-economic gaps are bridged and not merely managed.

Inclusively realizing new opportunities demands learning, collaboration, and partnerships, both within and beyond Ethiopia. The development of this strategy has been possible through cooperation and collaboration amongst various stakeholders, local and international leaders. Special thanks to the Ministry of Innovation and Technology, Oxford University's Pathways for Prosperity Commission, MasterCard Foundation, Tony Blair Institute, Dalberg, and the United Nations Economic Commission for Africa. Together we keep learning from each other, we collaborate more deeply, and we form more robust and more innovative partnerships.

This strategy is a first step and a call to *action*. Only work brings to life and delivers meaningful results to citizens who deserve a prosperous future. This strategy is the first step and fundamentally a call to action. I invite all those committed to a prosperous future for Ethiopia to join together and contribute all they can. I am confident we can do it together.

Abiy Ahmed Ali (PhD)

Prime Minister

Federal Democratic Republic of Ethiopia

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Executive Summary

Technological change has been the primary driver of social development, productivity improvements and inclusive growth. The world is, once again, at the dawn of the next technological change. Countries are at different stages and have different opportunities available to them in this new paradigm. A critical first step is to ensure the approach selected for digital transformation is treated as a means to a country's national development vision and priorities.

For Ethiopia, a digital transformation strategy needs to be aligned with critical Homegrown documents i.e. the 2019 Homegrown Economic Reform Agenda and the Ten-Year Development Plan (2020-2030) as well as with international commitments such as the Sustainable Development Goals and the African Union's Continental Digital Strategy. These guiding Government documents aim to correct macroeconomic imbalances, address structural impediments to inclusive prosperity and highlight sectoral priorities – ultimately to develop an inclusive, knowledge-based and prosperous society. Agriculture, manufacturing, mining, information and communications technologies (ICTs), the creative industry and tourism are the selected sectors that Government has prioritised for job creation, forex and exports, and inclusive growth. While the Government will use such guiding documents and iterative analysis to support and enable the digital economy, the role of the private sector will be fundamental in harnessing the full potential of digital transformation.

Strategy Objectives & Methodology

Ethiopia's digital economy is at an early stage of development with few private sector players offering digital services and some government driven digitalization initiatives. While these initiatives and services help solve important challenges, they cut across multiple stakeholders and require a coordinated effort to maximize their impact. This strategy was developed to provide a collective vision and, specifically to meet the following key objectives:

1. To propose an inclusive digital economy approach that will catalyse the realisation of Ethiopia's broader development vision.
2. To be a visionary umbrella strategy from which sectors and institutions can then design and co-create more specific action-oriented strategies with relevant budgets, timelines and key performance indicators.
3. To emphasize the need for a sense of urgency
4. To mobilize critical stakeholders to address the imperatives that will enable an inclusive digital economy
5. To coordinate and strengthen current initiatives underway so the most pragmatic and strategic pathways are explored to unlock growth and maximize impact.
6. To ensure an inherently international approach that will enhance Ethiopia's place in regional and global value chains while benefitting from best practice and interoperable systems.

This strategy was designed using the latest research – in particular from Oxford University's Pathways for Prosperity (P4P) Commission, which provided the Digital Economy Tool Kit utilised here.

As per the recommendations of the toolkit, a three-step approach was used:

(i) **Diagnostic -** a digital economy gap assessment was conducted using a framework of four pillars: infrastructure, enabling systems, applications and the broader ecosystem. Country case studies from which relevant lessons could be identified were conducted. These included global and regional leaders such as South Korea, India, China, Kenya, Nigeria and Rwanda.

(ii) **Dialogue** – over 60 stakeholders were engaged through bilateral structured interviews and workshops.

(iii) **Strategy** – this strategy was then developed utilising insights from both the Diagnostic and Dialogue steps.

Leveraging Digitally Enabled Pathways for Inclusive National Prosperity

This strategy took into consideration the current economic drivers (Agriculture, Manufacturing and Services), the priority sectors, and the national objectives of jobs creation, forex earnings and inclusive prosperity as a means of identifying the most relevant digital enabled pathways for Ethiopia. These are:

- Pathway 1: Unleashing value from agriculture,
- Pathway 2: The next version of global value chains in manufacturing
- Pathway 3: Building the IT enabled services, and
- Pathway 4: Digital as the driver of tourism competitiveness.

Pathway 1: Agriculture accounts for 45% of the GDP, 85% of the country's workforce, and 90% of export revenue. There are different agriculture technology initiatives; but the key ones are led by ATA and its partners. Globally, technologies such as Internet of Things (IoT) and Blockchain support the agricultural sector. IoT allows farmers to monitor their production and its use is growing at only ~30% per year in Africa due to devices being expensive whereas, blockchain allows Fair Trade labels, traceability, and better (cheaper) payment mechanisms to be implemented. **Two specific opportunities identified** for Ethiopia to succeed on this pathway are; **building a Digital Agriculture platform;** an integrated system that offers new insights that enhance the ability to make decisions and subsequently implement them, and **supporting and incentivizing Ag-tech entrepreneurship** as these will ensure innovations, jobs, export in agriculture and related sectors, and inclusivity within the thriving Ag-tech entrepreneurship sector in Ethiopia.

Pathway 2: Manufacturing has been Ethiopia's fastest growing sector over the past few years with a special focus on apparel production. Apparel production has been prioritized as it has supported economic growth in countries like China, Bangladesh and Vietnam. With this special focus Ethiopia is now becoming a new destination for global apparel production. Despite the Fourth Industrial Revolution (4IR) introducing robotic technologies, job opportunities in light manufacturing will continue to exist for some time yet due to the dexterous nature of the work. However, significant advancements are expected in communication technologies fundamentally changing how information is exchanged including how buyers make decisions and orders, and how staff is managed across borders. Currently, **apparel factories in Ethiopia are not technologically behind** as investors in the latest Ethiopian industrial parks arrived with new technologies. Two specific opportunities identified for Ethiopia to succeed on this pathway are; **enabling the adoption and creation of new**

communication technologies in industrial parks to expand access to global markets and **enhancing digitally enabled logistics management** approaches to boost export.

Pathway 3: IT-enabled services are those that are not directly IT related but merely performed via information technology infrastructure. In Ethiopia, export of **IT-enabled services is a small sector with only four firms providing such services**. Infrastructure is the most binding constraint. Globally, online labour is growing at 26% per year with developing economies leading supply while more developed ones dominate the demand side. Two specific opportunities identified for Ethiopia to succeed on this pathway are; **providing infrastructure to high potential talent centres** and **reframing and operationalizing the IT Park to attract leading Business Process Outsourcing (BPO), specifically Impact Sourcing Service Providers (ISSPs)** which are often non-profit, or semi-for-profit organizations with particular social business angles of targeting workers from underprivileged communities.

Pathway 4: Leisure and business tourism helped the **Ethiopian tourism industry to expand rapidly at a rate of 13% annually since 2007**, faster than the 7.3% annual average growth for Sub-Saharan Africa. However, challenges such as **lack of quality Internet connectivity and poor management of tourism data restrict the growth of the sector**. Globally, tourism GDP has grown at 4% annually, outpacing global economic growth at 3.2% and has made a significant contribution to socio-economic development. Ethiopia can take lessons from South Africa, Thailand, and Kenya that used digital technologies to unleash their tourism sectors. Three specific opportunities identified for Ethiopia to succeed on this pathway are; **driving digitalization across the tourism industry** by setting up a tourism digitalization task force, **improving tourist inflow and increasing tourist activity through** targeted digital marketing strategies, and **building capacity of tourism SMEs** to **adopt digital technologies** (including improving online presence and accepting digital payments).

Accessing Ethiopia's Readiness for Digital Transformation

Ethiopia's digital readiness can be enhanced by strengthening existing infrastructure; developing enabling systems; facilitating digital interactions between government, private sector and citizens; and strengthening the wider ecosystem – in particular, access to capital investment, human capital and the regulatory environment.

Infrastructure

Connectivity: Internet coverage has grown at an annual rate of 45%, which is slower than peer nations. Ethiopia has also evidenced a significant growth in mobile subscriptions with the proportion reaching 60% in 2017 (with 41% active subscription), but again, mobile adoption is still low compared to peer nations. A similar pattern can be observed for broadband access where active mobile broadband subscriptions stand at 7.1%, compared to an average 24.8% in the region. **Key challenges** identified are gaps across network coverage, affordability and quality. **Current initiatives** to resolve these challenges include sectoral reforms in the telecom sector led by the Ethiopian Communication Authority (ECA), and the Ministry of Innovation and Technology (MInT) 's work to upgrade and modernize the WoredaNet as well as improve bandwidth capacity. **Recommendations** to address critical gaps in connectivity is to have a

comprehensive telecom roadmap and robust regulations that can ensure accelerated progress towards the national objectives, to upgrade the WoredaNet by doing a detailed supply and demand side planning to improve institutional connectivity, and to set up and operationalize a universal service fund to expand infrastructure/ connectivity.

Power: Electricity access to households is 44% - on par with Sub-Saharan Africa (44.5%); with 50% connecting off-grid and major differences between urban (96%) and rural areas (31%). **Key challenges** for Ethiopia is the unreliability of power supply, and the financial unsustainability of the current highly subsidized tariffs. **Current initiatives** to resolve these challenges include a Public Private Partnership (PPP) proclamation and reform of power generation procurement, Ethiopian Electric Utility restructuring and corporatization, implementation of the electrification strategy (National Electrification Plan (NEP) 2.0), and transmission network expansion. **Recommendations** to address critical gaps in power are investing in last mile connection upgrade, diversification of energy sources and off-grid solutions, establish a targeted subsidies scheme, and facilitate follow up and maintenance through measurement and monitoring systems.

Enabling systems

Digital ID: The most important form of identification is the Kebele ID card that is issued by local administrators in more than 18,000 administrative locations. In many ways, it functions as the de facto national ID yet there is no central registry, no way to ensure uniqueness, and an extremely weak credential that can easily be forged. It thus limits usefulness for a digital economy as one individual might have more than one Kebele ID. **Key challenge** identified for efforts put to introduce a Digital ID are lack of coordination and communication among authorities resulting in individuals having different "unique numbers" for different programs which defeats the purpose of having a Digital ID. **Current initiatives** to introduce a National Digital ID program envisioned to replace the Kebele ID system is led by the Ministry of Peace. This Ministry is setting the strategy by engaging different stakeholders including MInT. Our key **recommendation** is to adopt the ten *Principles on Identification for Sustainable Development drawn around Inclusion, Design and Governance.* These *Principles* have now been endorsed by over 25 international organizations, donors, NGOs, and private sector associations.

Digital payment: In 2018, 12% of Ethiopians made or received digital payments, 4% hold debit cards and 0.3% (foreigners and diaspora) holds credit cards, as no bank in Ethiopia offers a credit card. **Key challenges** in this area is low internet penetration, high data costs, low mobile penetration, low access to formal financial services (banked population is 35%), lack of awareness of existing digital financial services and a fintech industry that is just beginning due to regulation constraints. The lack of interoperability among banks and financial services, as well as wallets, significantly hampers growth including entry of players for mobile money and innovation in financial solutions. **Current Initiatives** include reforms in the regulatory environment; the National Bank of Ethiopia (NBE) amended the Banking Services Proclamation to include Digital Financial Service Providers and it has recently released two draft directives namely a Payment instrument issuers Directive and an Agent Directive. In addition MInT has finalized the draft of a comprehensive all-in-one E-Transaction Proclamation. **Recommendations** to address critical gaps in digital payment are ensuring financial inclusion by promoting current financial

services and evaluating the adoption of innovative solutions, increasing usage by promoting benefits, encouraging innovation in the banking system and enhancing government coordination.

Cybersecurity: The Ethiopian Information Network Security Agency (INSA) counted 256 major cyber-attacks within a 6-month-period in 2017. This indicates that more investment needs to be made to enhance cybersecurity, as Ethiopia works towards digitalizing services. **Key challenge** for this sub-sector is Ethiopia has not undergone a cybersecurity assessment to identify vulnerability, lack of cybersecurity experts and lack of awareness among users. **Recommendations** to address critical gaps in cybersecurity are conducting a coordinated and centralized assessment of Ethiopia's cybersecurity, developing a framework and roadmap for national awareness campaigns and enabling the adoption of cloud solutions and data centres.

Digital Interactions among Government, Private Sector and Citizens

E-Governance: Ethiopia is currently progressing in E-Governance despite the lack of human capital and infrastructure. Ethiopia's tax collection to GDP ratio is 37% below the African average 17%, which indicates that a formalization of medium and small sized enterprises has huge potential to increase Government revenues. **Key challenges** are gaps in infrastructure and human talent, tax collection falling below targets, and current E-Tax architecture being under-utilised due to lack of coordination. These gaps further affect Ethiopia's Ease of Doing Business (EoDB) rank, which has been declining – though this is a relative than absolute measure. **Current initiatives** are being undertaken to digitise government operations, government services and develop better service delivery channels. **Recommendations** to address critical gaps in E-Governance include services to be designed with stronger coordination across government and leveraging digital technology to reduce regulatory complexity and costs around EoDB and E-Tax initiatives.

E-Commerce: Despite Ethiopia's large population and domestic market, very few organizations are providing E-Commerce services in Ethiopia. Ethiopian products such as coffee, textiles, and leather goods enjoy a favourable reputation internationally, and E-Commerce could open new markets. **Key challenges** identified in developing E-Commerce are under-developed financial and logistics sectors, the lack of a national addressing system, weak regulation and lack of coordination, and low Internet adoption and unreliable service. **Current Initiatives** by Government include introduction of a comprehensive proclamation to govern E-Transactions, E-Receipts and E-signatures, preparation of a regulation to promote digital payments, investments in fulfilment centres, and the signing of a Memorandum of Understanding (MoU) with the Universal Postal Union (UPU) to build an East Africa Hub as well as ensure the Post Office readiness for E-commerce. Moreover, E-Commerce start-ups are also beginning to emerge benefitting from international partnerships. **Recommendations** to address critical gaps in E-Commerce are clear policies, regulations and standards to be enacted, public and private players to build a robust logistics sector, the introduction of a national addressing system, and a strategic analysis to guide Government to unlock high impact market opportunities.

Broader Ecosystem

Finance: Ethiopia ranks low on ease of getting credit compared to peer nations including Rwanda and Kenya. **Key challenges** in financing are regulations that restrict sectors and limits foreign ownership

and participation, high collateral requirements and high interest rate by banks and foreign investors being asked to make commercially unviable minimum upfront investments. Furthermore, lack of access to forex continues to be a critical challenge for players. **Current initiatives** underway include MInT introducing a national incubation hub program and a national innovation fund, MInT work with the Commercial Bank of Ethiopia to disburse loans to projects that have gone through MInT due diligence. **Recommendations** to address critical gaps in finance are encouraging local investors to invest in the ICT sector, considering policy changes to facilitate more international investment, Public-Private engagement to mitigate the lack of direct access to finance, and circumventing the lack of direct access to finance through incubation of projects.

People: With Ethiopia aiming to create three million jobs by 2020 of which 300,000 are digital jobs, literacy targets need to go beyond basic literacy to including digital literacy with a focus on Ethiopia's rural population (constituting 80% of the population). **Key challenges** are gaps across the framework to enable the growth and development of digital skills, lower female literacy rates and large regional disparities. **Current initiatives** are underway within MInT to address digital literacy gaps and introduce digital programs to help 70% of Ethiopians become digitally literate by 2025. The government is also investing heavily in tertiary education. **Recommendations** to address critical gaps in human skills are government supporting and cultivating Ed-Tech sector, primary and secondary education to prioritise basic literacy and digital skills, universities to better prepare graduates for the realities of the domestic labour market, and government providing targeted digital skills trainings for relevant government employees.

Policy & Regulation: Assessment has shown that globally regulating the ICT sector and its dynamic, disruptive nature is challenging. This is also the case in Ethiopia. **Key challenges** identified in Ethiopia include limited understanding of the ICT sector and how to regulate it, and lack of consultation and communication in policy and regulation development (dis-incentivizing investment and innovation). **Recommendations** to address critical gaps in policy and regulation are adopt innovative and consultative approach to policy making, design stronger government coordination and multi-stakeholder engagement, introducing new regulatory solutions for investment and doing business, and revising public procurement regulation to meet ICT sector requirement.

According to the findings of the assessments, we have defined 13 short term (18 months) and 9 mid to long-term (18 months - 5 year) projects to address gaps and make digital transformation a reality. For each, project lead institutions and stakeholders are identified. Major stakeholders include MInT, MoF, MoTI, MoR, MoT, MoWIE, ECA, Ethio Telecom, INSA, AACA, EIC, EEU, EEP, EAL, NBE, ETSwitch, UPU, and EPSE.

There is urgency for these stakeholders to collaborate and take action.

1. Introduction

Traditional development windows may be closing, but new, technology-driven pathways are opening for countries that are proactive and able to adapt to change.

The Fourth Industrial Revolution (4IR) has started, technological changes are fundamentally altering the way people live, communicate, produce, work, and trade. While historically, manufacturing has been a major development driver[1], labour–substitution effect of automation may be closing the window for developing economies to leverage manufacturing for job creation and broader development[2].

However, the narrative on automation and technological advances, which focuses solely on job losses, is misleading. Alterative analyses that are open to disruptive new models are needed.[3]. While the last industrial revolution did lead to substantial worker displacements before living standards increased[4], today's changes are taking place at a time where there is a better understanding of what governments can do to support and steer their economies through these times of disruption. The misleading narrative arises because change is commonly analysed using traditional thinking – rather than taking into consideration fundamentally new and disruptive models.

Digital transformation is the journey from an analogue society where government, business, and social interactions take place in person, to a fully integrated inclusive digital economy where transactions are made faster, cheaper, and more secure using technology and where most of the interaction takes place online. **The 'digital economy'** refers to economic activity that utilises the enhanced interconnectivity of networks and the interoperability of digital platforms. It is born through the combination of two key network developments: (i) the Internet and (ii) IP-enabled communications systems – such as mobile networks, electronic payment systems and public service networks. Critical to developing a digital economy is innovation, which creates new and improved goods, services and business practices, through the creation or adoption of new technology; repurposing existing technology for a new use; or introducing existing technology to a new geography and user.

The figure below demonstrates the different digital transformation stages. However, navigating this journey is not about copying what others have done. Given the pace of change, governments must seek to work with the private and civil society sectors to (i) leapfrog where possible; (ii) iteratively adapt and customise existing technologies; and (iii) build in future proofing of long-term activities. While Ethiopia

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[1] Lin, J. Y. (2012). *New structural economics: A framework for rethinking development policy*. World bank. https://elibrary.worldbank.org/doi/abs/10.1596/9780821389553_CH04

[2] Ford, M. (2015). *Rise of the robots: Technology and the threat of a jobless future*. London: Hachette. https://www.hachettebookgroup.com/titles/martin-ford/rise-of-the-robots/9780465040674/

[3] Pathways for Prosperity Commission. (2018). *Charting pathways for inclusive growth: From paralysis to preparation*. Oxford: University of Oxford. https://pathwayscommission.bsg.ox.ac.uk/sites/default/files/2019-11/charting-pathways-report.pdf

[4] Frey, C. B. (2019). *The technology trap: Capital, labor, and power in the age of automation*. Princeton, NJ: Princeton University Press

has advanced out of the early analogue state in some areas and activities, digital penetration remains low and few citizens access government services or private sector products and services via the Internet.

The digital transformation journey, mapping of select countries to different stages:

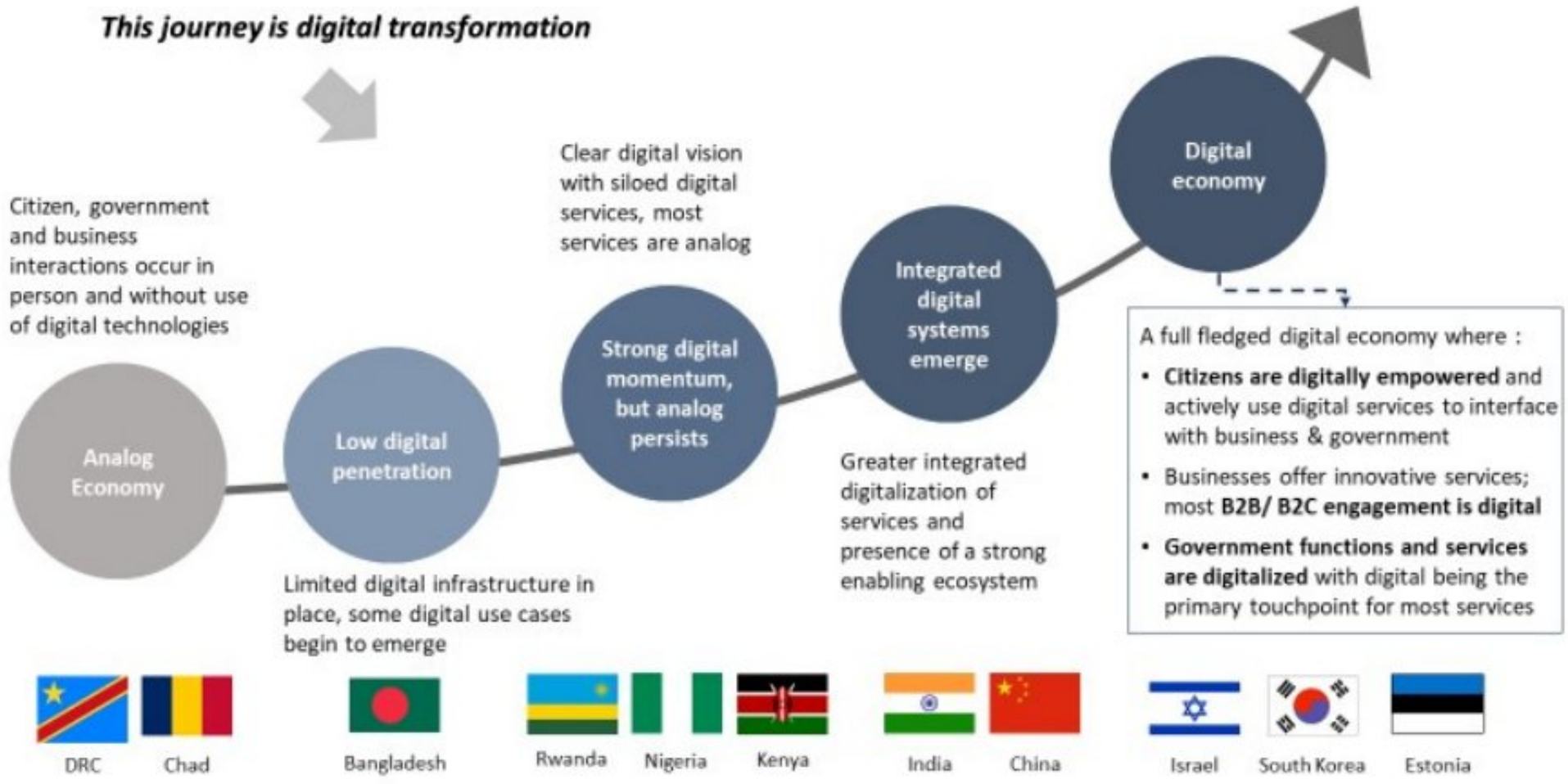

Figure 1: The Digital Transformation Journey

In the early stages of digitalisation, many of the discussions and activities by government agencies are typically siloed by mandate or sector, and typically focused on digitization or digitalisation of existing analogue practices – rather than the cross-sectoral big picture of digital transformation. Increasing digitalisation is also perceived to be a risk as it may exacerbate current opportunity gaps and disenfranchisement of vulnerable communities, which would need to be proactively managed. However, even if everyone cannot begin to be directly active digitally, well-designed digital programs can benefit these communities through more efficiently delivered public services and more data driven decision making to enhance their experiences.

While digitization of analogue interactions is part of the journey, achieving economic transformation requires fundamental shifts in the enabling environment and mind-set– shifts that may in fact have nothing to do with digital tools. For instance;

- Radical redesign of education curriculum to emphasis lifelong adaptation, creativity and collaboration over rote learning
- Fundamentally change the approach to regulation by adopting ethical core principles instead of seeking to repeatedly 'catch up' with product/sector specific rules

Digital Transformation is the ultimate vision, which encompasses digitization and digitalization:

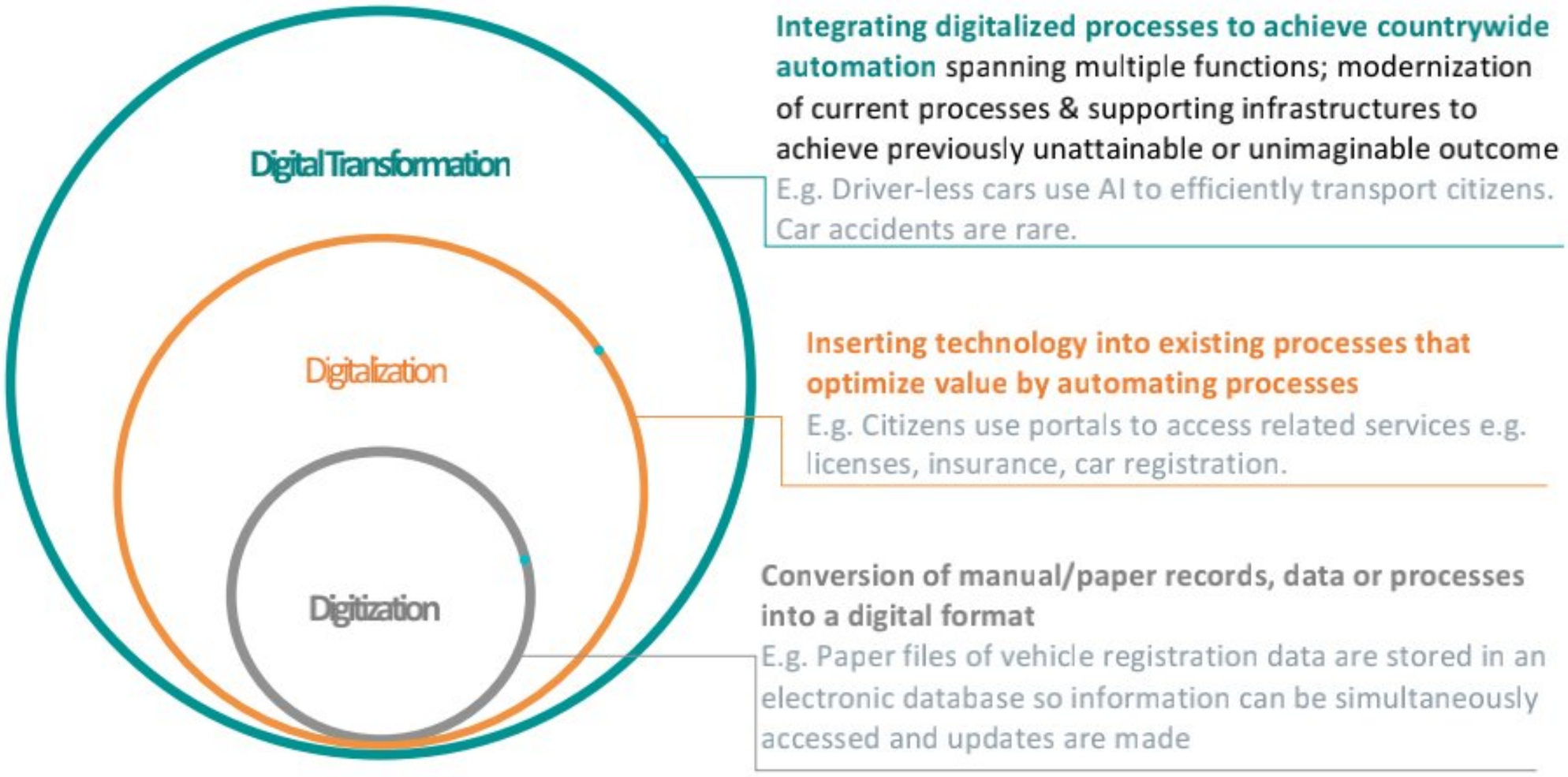

Figure 2: Definitions of Digital Transformation, Digitalization, and Digitization

Ethiopia is already on a journey of transformative growth and development. Gross domestic product (GDP) has risen from USD 8 billion in 2000 to USD 84 billion in 2018. During the same period, life expectancy increased from just under 52 years to nearly 66. At the start of the 21st century, less than two in five primary-aged children were enrolled in school, some twenty-percentage points below the Sub-Saharan Africa average. By 2015, primary school enrolment in Ethiopia had reached 85%, nearly ten percentage points above the Sub-Saharan Africa average. The government of Ethiopia is keen to continue this growth and development and has set itself ambitious targets including becoming a lower middle-income country by 2025. For example, the government is targeting the creation of three million jobs (including 300,000 digital jobs) by 2021; an improvement in the Ease of Doing Business ranking from 159 in 2019 to the top 100 also by 2021; and liberalization of key sectors like telecommunications.

Ethiopia will need to embrace the inevitable digital revolution and existential challenges it presents and prepare for bold decision-making and informed risk-taking. If not managed proactively, technological advances can significantly impede or even lock nations like Ethiopia out of development opportunities. The Government must be nimble and fast moving – which demands a rethink of where private sector and non-governmental actors should be the drivers of change. The Government of Ethiopia, in the Homegrown Economic reform agenda, acknowledges that much of GDP "growth has been driven primarily by public investment". Moving forward, the goal of the government is to build on past developmental success by transitioning to a private sector led economy.

This transition requires Government to play a very different role in enabling a digital economy. This role is more about creating an enabling environment and less about direct implementation. From a regulatory perspective, it requires a shift from 'risk-manager' to 'development enabler'. Early signs of this transition are already evident with the planned liberalisation of the telecoms and finance sectors. This will also require adopting a more optimistic and trust-based relationship with the private sector and non-government actors.

Developing a sound digital transformation strategy requires an in-depth understanding of the digital economy in its extended state. The digital economy extends beyond just the availability of digital products and services. Several interlinked elements such as infrastructure, enabling systems, a comprehensive regulatory environment etc. are essential to create a thriving digital economy. These elements enable citizens, businesses and institutions (including government) to participate and contribute to the digital economy. At the same time, they help create a conducive growth environment that drives innovation and improves service access. An analytical framework can help break down this complex system in order to assess the strengths, weaknesses, and gaps that are holding back digital transformation. A coherent framework also allows for systematic comparison across economies, helping surface key lessons and insights. Finally, by using a structured approach to identify challenges and opportunities, the framework can help reach an informed perspective on key decisions such as sequencing (what must be pursued in the short-term and what can be delayed), resourcing (which projects require significant capital and what can be done in an asset-light way), and governance (what can be pursued independently by an activist ministry and what requires broader stakeholder buy-in and collaboration). **The current strategy is anchored in a four-part digital economy framework- comprising infrastructure, enabling systems, applications and the broader ecosystem within which these pillars stand.**

In addition, the strategy identifies how and by whom digital technologies will be used in the economy i.e. which digitally enabled pathways for prosperity hold greatest potential for Ethiopia. The four pathways considered appropriate for Ethiopia's pursuit of job creation, increasing foreign exchange and inclusive prosperity where identified using a Digital Economy toolkit developed by the Pathways for Prosperity Commission at the Blavatnik School of Government that aims at enabling governments identify and understand opportunities presented by new technological advances.

For Ethiopia we have identified the following Pathways:

Pathway 1: Unleashing value from Agriculture
Pathway 2: The next version of global value chains in Manufacturing
Pathway 3: Building the IT enabled Services
Pathway 4: Digital as the driver of Tourism competitiveness

By developing and introducing policies, which allow innovation to flourish and support inclusive growth, the Government of Ethiopia can leverage the opportunities described above. These policies must enable economic actors to innovate, crafting a learning ecosystem through which they can identify successes and be prepared to shore up investment to back emergent winners. This national strategy, co-designed with government and in consultation with the private sector and civil society acts as the first step.

2. Vision and Objectives

Throughout history, technological change has been the primary driver of social development, productivity improvements and inclusive growth. The world is, once again, at the dawn of the next technological revolution, bearing transformational implications for all. Digital tools will create opportunities for governments, entrepreneurs and businesses, and bring benefits to society. The rapid and global growth of E-Commerce is a good example. However, many existing practices will be disrupted, and incumbents exposed to competition. The skill requirements of workers will change, and some jobs will be lost while new ones will be created through automation. Like previous large-scale technological and economic transformations, however, the benefits will be immense, but they will not materialize easily or through a smooth and cost-free transition. The net outcome will depend on two factors: first, the policies and investments undertaken at the national level to build countries' digital readiness and capabilities. Second, and more importantly, the efforts made to align the digital transformation strategy with countries' national development vision and objectives and the national policy framework that countries are pursuing to advance their economic development and achieve inclusive prosperity.

Thus, for late-starter countries such as Ethiopia, an essential requirement for balancing the benefits and costs of new digital technologies is to ensure that policies towards digital transformation are aligned with the country's national development vision, policy objectives and priorities. In Ethiopia, this would mean aligning the digital transformation strategy with the country's development plan, particularly the new ten-year plan, the sectorial priorities identified and the country's agriculture-driven and export-led industrialization strategy. It would also mean aligning digital transformation with the country's desire to create "decent" and productive jobs, promote inclusive growth and harness the competitive advantages that new digital technologies offer, in particular through E-Commerce. Ultimately, the value and effectiveness of digital transformation is measured by the degree to which digitalization enables the country to achieve these medium- to long-term national development goals and vision. This, in effect, means establishing a clear understanding of the country's development pathways and the policy framework shaping its development trajectory. It also means clarifying the government's national development objectives and vision and the logical imperatives for the selection of priority sectors and how they are expected to evolve moving forward.

Recent economic trends and national development goals

Ethiopia has been among the fastest-growing economies in Africa with an annual growth rate consistently well above the African and global averages. This impressive performance contrasts with the slow progress in structural transformation, lack of economic diversification and weak productive capacity. Essentially, Ethiopia is still an agrarian economy. 85% of the country's workforce relies on farming and rural economic activities for employment, income and livelihood. Over 84% of the country's exports consist of primary products generated from agriculture. The share of manufacturing is still less than 6%, much lower than the African and low-income countries' average (16%). The country is not endowed with natural resources and as a landlocked country; it suffers from structural impediments and logistical challenges. Yet, from 2003 to 2013, the growth of Ethiopia's

real GDP averaged 10.8% per year, enabling the country to double its per capita GDP (reaching USD 800 in 2017) and reducing extreme poverty by half.

The main driver of this unprecedented growth rate has been the government's bold and ambitious economic development strategy, which incorporated, among other things, a big push in public investment, particularly in agriculture, economic infrastructure (roads and energy) and social infrastructure (education and health). Key features of the Ethiopian development model include a pro-active State, high level of investment in basic infrastructure, enhancing productivity in smallholder agriculture, stimulating consumption-driven growth through interventionist macroeconomic policies and promoting economic diversification. In addition, the government has implemented major and ambitious public sector projects such as the construction of the Grand Ethiopian Renaissance Dam, which will be the largest in Africa. These elements have served the Ethiopian economy well over the past decade and are the main factors in the country's impressive growth and outstanding performance in poverty reduction and social development. The main interest of this strategy is to explore how digital technologies could be leveraged to sustain the growth momentum and enable Ethiopia to move up the development ladder and catch up with middle-income economies.

Building on recent achievements, in 2019 Ethiopia launched a Homegrown economic reform agenda aimed at correcting the macroeconomic imbalance, addressing structural impediments and refocusing sectoral priorities. In the last two decades, the main drivers of the economic development agenda in Ethiopia have been the five-year development plans that the country has been implementing since 2001. Altogether, Ethiopia has launched four consecutive five-year development plans including the current Second Growth and Transformation Plan (GTP II) (2015-2020) - to guide the overall development of the country. The first three plans gave due priority to pro-poor economic sectors including agriculture, while the latest plan gives more emphasis to industrialization, particularly manufacturing. As a follow-up to GTP II, and in conjunction with the homegrown economic reform agenda, the government has prepared a ten-year development plan to serve as a strategic roadmap and policy direction for the coming five to ten years. It is necessary that the broad direction outlined in the ten-year plan form the bases for designing Ethiopia's digital transformation strategy.

The Ten-Year Development Plan (2020-2030)

The main objective of the ten-year development plan is to lay the foundation for the development of an inclusive, knowledge-based and prosperous society. Agriculture, manufacturing, mining, information and communications technologies (ICTs), the creative industry and tourism are expected to play leading roles in job creation, technological learning, innovation, and in enhancing Ethiopia's export capacity.

The overarching goals of the ten-year development plan rest on five key pillars:

1. Consolidation and further development of the agricultural sector, the backbone of economic growth and industrialization and a major source of inputs, including labour, to the manufacturing sector. In the coming decades, digital technologies are expected to play a critical role in the improvement of agricultural productivity and facilitation of trade in agricultural products.

2. Encouraging technology transfer, deepening the technological and skills-base of the economy, particularly in ICT. Special attention will be given to the development of IT-enabled services, including through attracting investment into the ICT Park.
3. Identification of specific sectors as priority areas for investment and export-oriented industrialization. In addition to the current focus on textile and apparel; leather and leather products and agro-processing as priority export sectors, the coming decade will focus on six broad sectoral areas and economic activities as main sources of growth and structural transformation. These include agriculture, manufacturing, mining, services, particularly IT-enabled services, and tourism.
4. Attraction of export-oriented FDI into Industrial Parks and maximization of impact on job creation, transfer of technology and exports of value-added products. Efforts will be made to improve the operation and efficiency of industrial parks, including through the application of new technologies.
5. The implementation of a set of medium-term national development goals to be achieved by 2025 (Vision 2025). The main elements of Vision 2025 include;

   - Achieving inclusive growth and sustainable development;
   - Attaining middle-income status and a prosperous society;
   - Doubling, if possible, tripling, the country's total export capacity;
   - Becoming a leading manufacturing hub in Africa;
   - Increasing the GDP share of manufacturing sector from the current 5% to 17%;
   - Ensuring that the manufacturing sector contributes 40% of exports;
   - Creating 14 million jobs by 2025
   - Achieving a double-digit growth rate and sustaining it beyond 2025.

In implementing these goals, the government intends to continue to rely on some of the policy tools that it has applied so far, in particular: improving agricultural productivity; promoting linkages between agriculture and manufacturing; encouraging private sector investment in manufacturing, including through privatization; fostering technology transfer into targeted sectors; and investing in human capital development. Increasingly, digital technologies will become critical in creating an enabling environment for Ethiopia to achieve some, if not all, of these development goals. This strategy assesses Ethiopia's digital readiness; how digital technologies can be expanded in the economy; how they can support agriculture, manufacturing, tourism and other sectors; and improve government operations. It will also explore how digital technologies can be used to promote socially inclusive development and enable the country to export and become a competitive supplier of goods and services.

Digital transformation in Ethiopia is at an early stage of development. A few private sector digital services have emerged and some government driven digitalization initiatives have also been launched in recent years. For example, the efforts by the Ministry of Innovation and Technology (MInT) to upgrade and modernize 'WoredaNet'; the move by the Ministry of Transportation (MoT) to digitalize the national fleet management system; Ethiopian Investment Commission's (EIC) provision of online licensing services and digitalization of records; the experiment with Digital ID by the Ministry of Peace (MoP); and E-Payment systems by the National Bank of Ethiopia (NBE) to name but a few. Each of these initiatives is aimed at solving important challenges, but these initiatives cut across multiple stakeholders and require a coordinated effort to maximize their impact.

As noted in the Homegrown Economic Reform Agenda, the move to an inclusive digital economy can unlock significant growth and productivity gains for the country. To make the most of the opportunity, however, it is important for different initiatives to come together as a coherent and coordinated whole. And while this requires investment and nurturing of the IT sector in particular, we need to consider the IT sector's role as a cross cutting enabler of *all* sectors. We can no longer consider IT and digital as separate sectoral categories but rather something that all stakeholders must embrace and engage with. This document seeks to contribute towards that objective by developing an integrated umbrella strategy for leveraging digital pathways for inclusive prosperity.

Key Objectives of the Strategy:

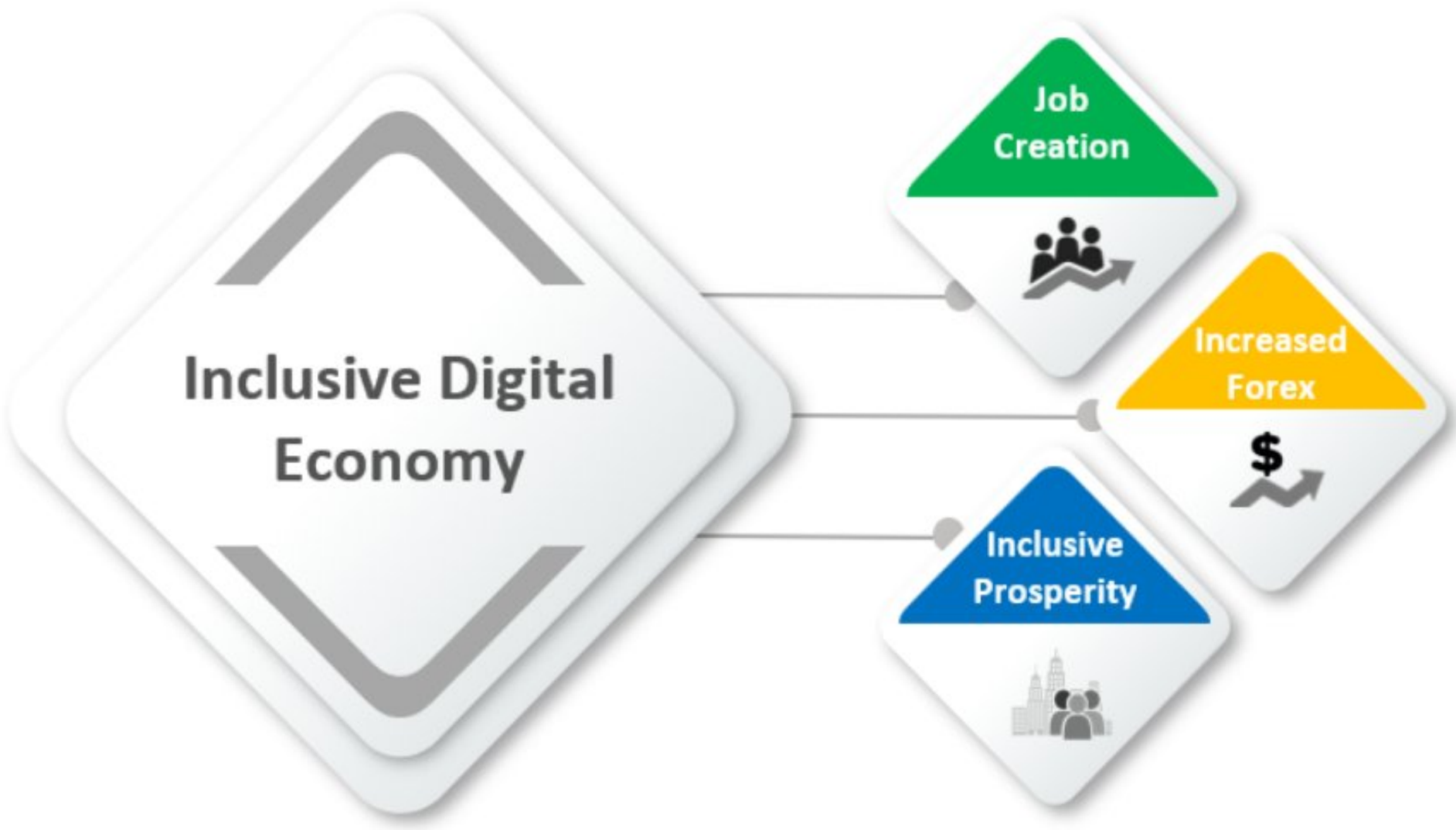

Figure 3: Key Objectives of the Strategy

1. **To propose an inclusive digital economy approach to catalyse Ethiopia's planned vision and objectives**. Therefore, this strategy has been developed in line with the key national objectives. This is consistent with other key Government strategies such as the Homegrown Economic Reform Agenda and the National 10-year Plan.
2. **To emphasize the need for a sense of urgency and mobilize critical stakeholders to address the fundamental imperatives and take advantage of digital opportunities that will shape Ethiopia's future.** Ethiopia is at an early stage of the digital transformation journey; consistent momentum and alignment among all players will be necessary. By bringing together key actors under the digital framing, new effort and thinking can be directed towards leveraging digital

transformation through more specific institutional and sectoral strategies that collectively support Ethiopia's development goals.

3. **To coordinate and strengthen current initiatives underway so the most pragmatic and strategic pathways are explored to unlock significant growth and maximize impact.** Several Government driven digitalization initiatives have already been launched to enable job creation; wealth generation; and investment but efforts are fragmented and their impact, therefore, reduced. Each of these efforts is solving important challenges, but these initiatives cut across multiple stakeholders and require coordinated effort to achieve the intended results. As discussed in the Homegrown Economic Reform Agenda, the move to an inclusive digital economy can unlock significant growth and productivity gains for the country, but to make the most of the opportunity it is important for different efforts to come together as a coherent, coordinated whole.

4. **Ethiopia's digital transformation must inherently be international in its approach.** The increased connectivity and accelerated globalization that is a part of the digital revolution means that the Government must ensure an international contextualization to this strategy. International standards and coordination have never been more critical.

The strategy also seeks to clarify the importance of digital transformation for Ethiopia. It presents a diagnostic of where the country lies on its digital transformation journey and recommends foundational gaps to be addressed as well as suggest ambitious opportunities to be pursued. **It has been developed by the Ministry of Innovation and Technology in consultation and collaboration with a number of government ministries, private sector parties, civil society and international development agencies.**

3. Framework & Methodology

The Pathways for Prosperity (P4P) Commission launched a Digital Economy Tool Kit that aims to develop a holistic, inclusive growth strategy that harnesses digital technologies throughout the economy.

This strategy utilised this thinking in exploring strategic opportunities for Ethiopia's Digital Transformation in particular, by analysing the four possible pathways for prosperity Ethiopia can use to expand the role of digital in achieving the national vision consisting of jobs creation, forex earnings and inclusive prosperity:

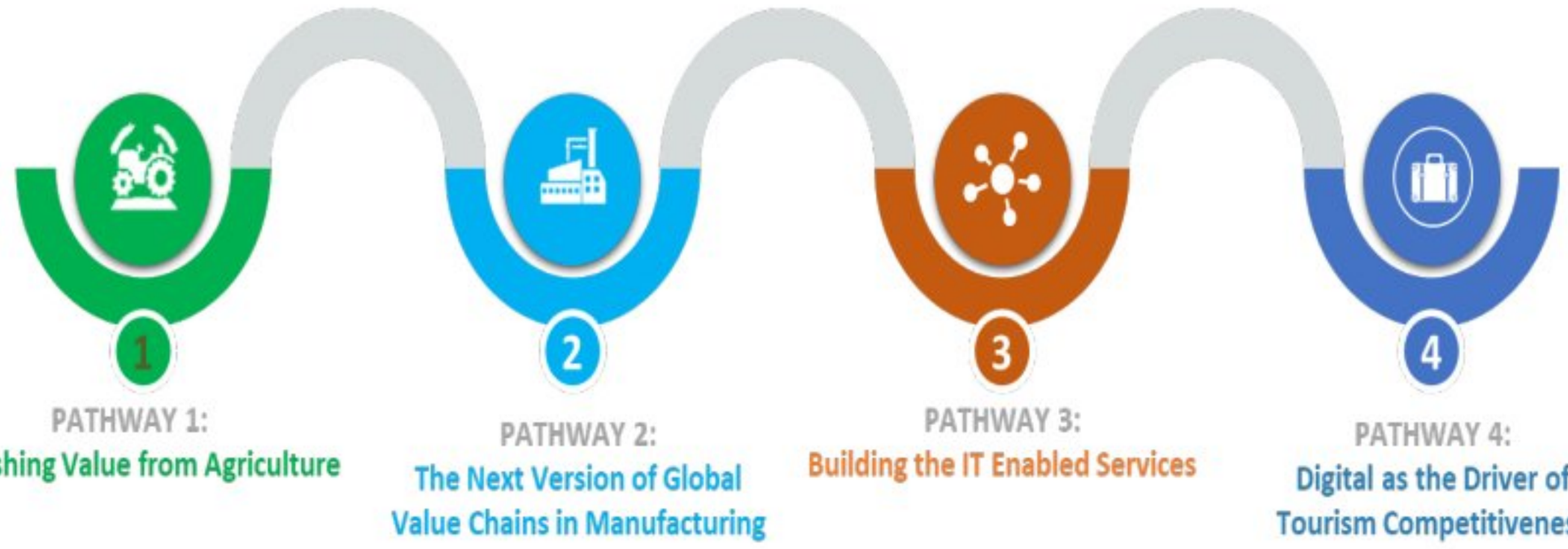

Figure 4: Pathways Framework and Methodology

The Methodology had three broad steps:

1. Digital Economy Gap Assessment: The analysis that shaped this strategy is anchored in a four-part digital economy framework comprising (i) Infrastructure, (ii) Enabling systems, (iii) Applications and the (iv) Broader Ecosystem. The framework is presented below.

Countries, which have shown significant progress in digital adoption (e.g.: South Korea, India, China, Kenya), typically demonstrate significant improvement across all elements of this framework. The four components of the framework are interlinked and cover various macro and micro factors that affect the evolution of a digital economy. It also facilitates exploration of relationships between the various components. For example, the ecosystem component affects development of all the other elements. Similarly, while applications can develop independently, enabling systems can aid their development. Finally, the framework is flexible and can be leveraged not only to assess the overall state of the digital economy, but also to independently analyse sectors such as E-Commerce that constitute the digital economy.

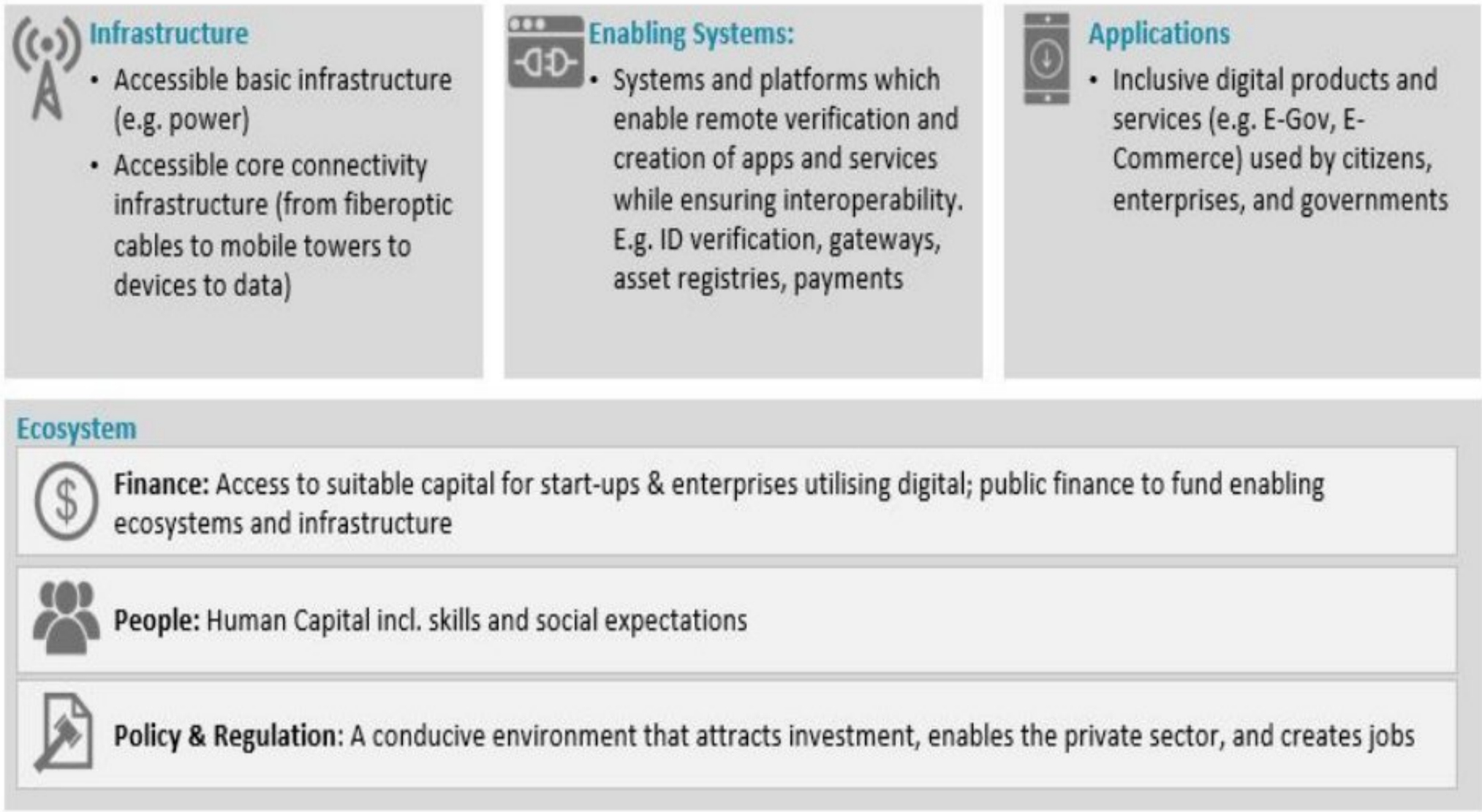

Figure 5: Digital Economy Framework

Four Part Digital Economy Framework:

- **Infrastructure:** Internet access for citizens, businesses, and governments is the backbone on which a digital economy is built. Creating this access requires two key pieces: basic infrastructure such as electricity and transportation, and core connectivity infrastructure that includes fibre optic cables, mobile phone towers, and affordable devices. The former allows for the latter to be developed and run in a seamless manner, and both must reach a mature state for a digital economy to run smoothly and continuously.

- **Enabling systems:** An intermediary layer or 'middleware' that links Infrastructure to Applications is essential to convert connectivity into usable products and services. This technology-backed layer consists of key systems such as Digital ID, payments platforms, asset registries, and cyber-security, which together allow for rapid verification and transactions. High transaction costs severely restrict the reach and uptake of applications and services. For example, relying solely on cash as a means of exchange (without Digital ID and payment gateways to facilitate transactions) can stunt the growth of E-Commerce.

- **Applications:** Applications are the gateways through which end-users (individuals and/ or organizations) participate in a digital economy. These are services developed and accessed on top of connectivity infrastructure and utilise enabling systems. They address a user felt need or challenge, enhance efficiency, and/or provide pathways to facilitate meaningful interactions

between users. Ultimately, value creation in a digital economy is largely a result of adoption of these applications. Examples include E-Commerce applications connecting buyers and sellers, E-Governance applications which help deliver government services, and social media applications e.g. WhatsApp, Facebook, Telegram.

- **Ecosystem:** The three layers highlighted above (Infrastructure, Enabling Systems and Applications) can develop and thrive only when operating within a supportive ecosystem. Such an ecosystem can lower barriers to innovation and encourage entrepreneurship, address constraints that restrict growth, promote inclusivity and attract resources to fund development across the other elements. Important elements include:
  - **Access to suitable finance** to fund infrastructure creation and provide capital for technology businesses
  - **Human capital** development which ensures basic digital literacy for citizens as well as advanced skills to prepare the workforce, especially youth, for future jobs
  - **Effective regulatory environment** which attracts investments, encourages private sector participation, promotes innovation and engenders trust in the digital economy

2. Dialogue: The second step was the **Dialogue phase** that consisted of a series of bilateral and workshop discussions. These iterative consultations helped to both validate insights from desk research and to develop a nuanced understanding of challenges. More than 60 stakeholders were consulted through a series of bilateral meetings and three workshops focused on Inclusivity, Regional Coordination and Exploring New Regulatory Approaches. These stakeholders included relevant government ministries and agencies, private sector actors, development partners and civil society organizations. Engaging such partners helped gather different perspectives and develop a well-rounded understanding of the challenges and transformative solutions.

Dialogue with multiple representatives from public and private sectors and development partners was conducted in the development of this strategy

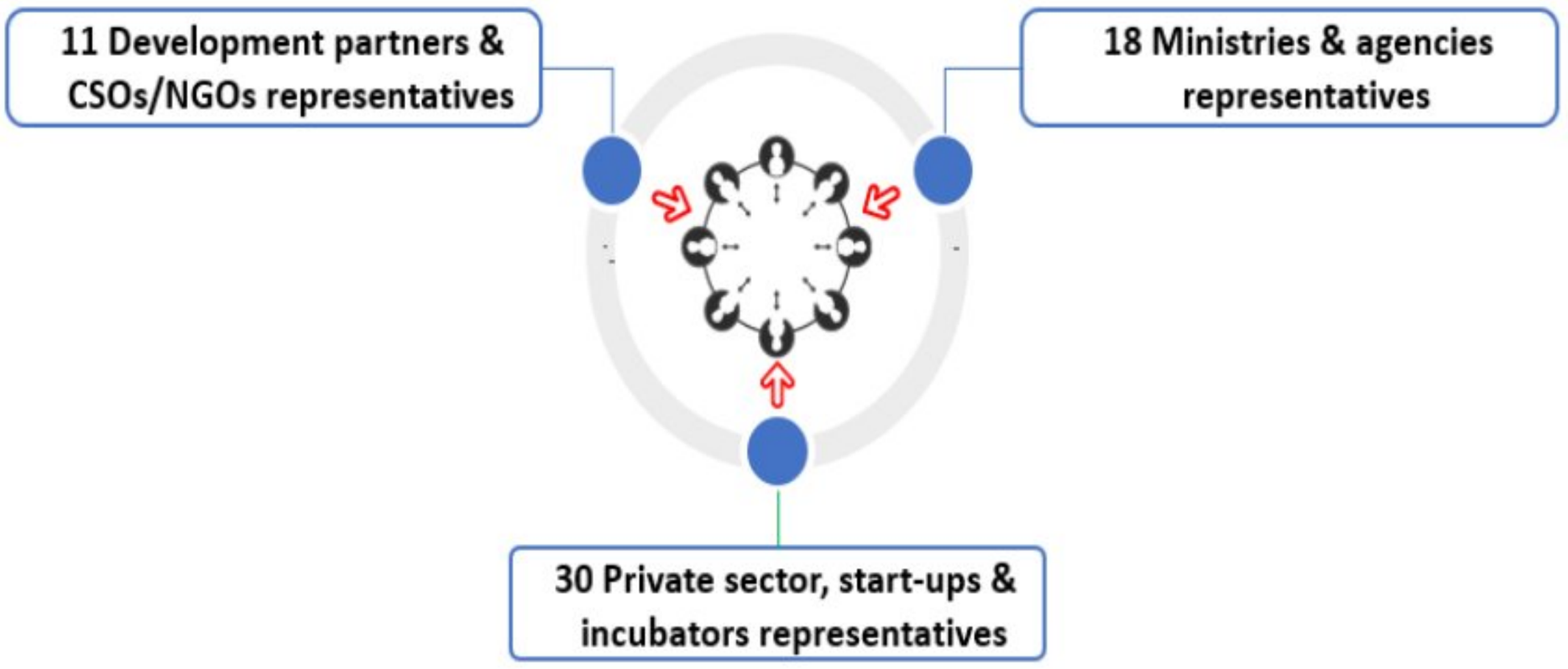

Figure 6: Stakeholder groups consulted

3. **The National Strategy**: The final step was to combine the findings from the Diagnostic and the Dialogue findings into this national strategy. The strategy seeks to recommend key opportunities to accelerate Ethiopia's journey of digital transformation. As a first step however, it is critical that the identified imperatives and foundational gaps in digital readiness are addressed with a high sense of urgency. A set of prioritized projects have been identified to address the major imperatives, sequenced according to a short-term (18 Months), mid-term (3 Years) and long-term (5 Years) timeline and assigned to the relevant government stakeholders best placed to lead the implementation according to their mandates.

4. Digitally Enabled Pathways for Prosperity for Ethiopia

Countries that have a Digital Transformation Strategy have selected a set of prioritized pathways that are most applicable and optimal to take along their Digital Transformation journey. Based on current economic drivers (i.e. Agriculture and Manufacturing) and the national vision Ethiopia has embarked on (i.e. jobs creation, foreign exchange earnings and inclusive prosperity), four pathways were selected to analyse opportunities and frame Ethiopia's digital journey.

The Four Pathways are considered to take Ethiopia through the Digital Transformation journey

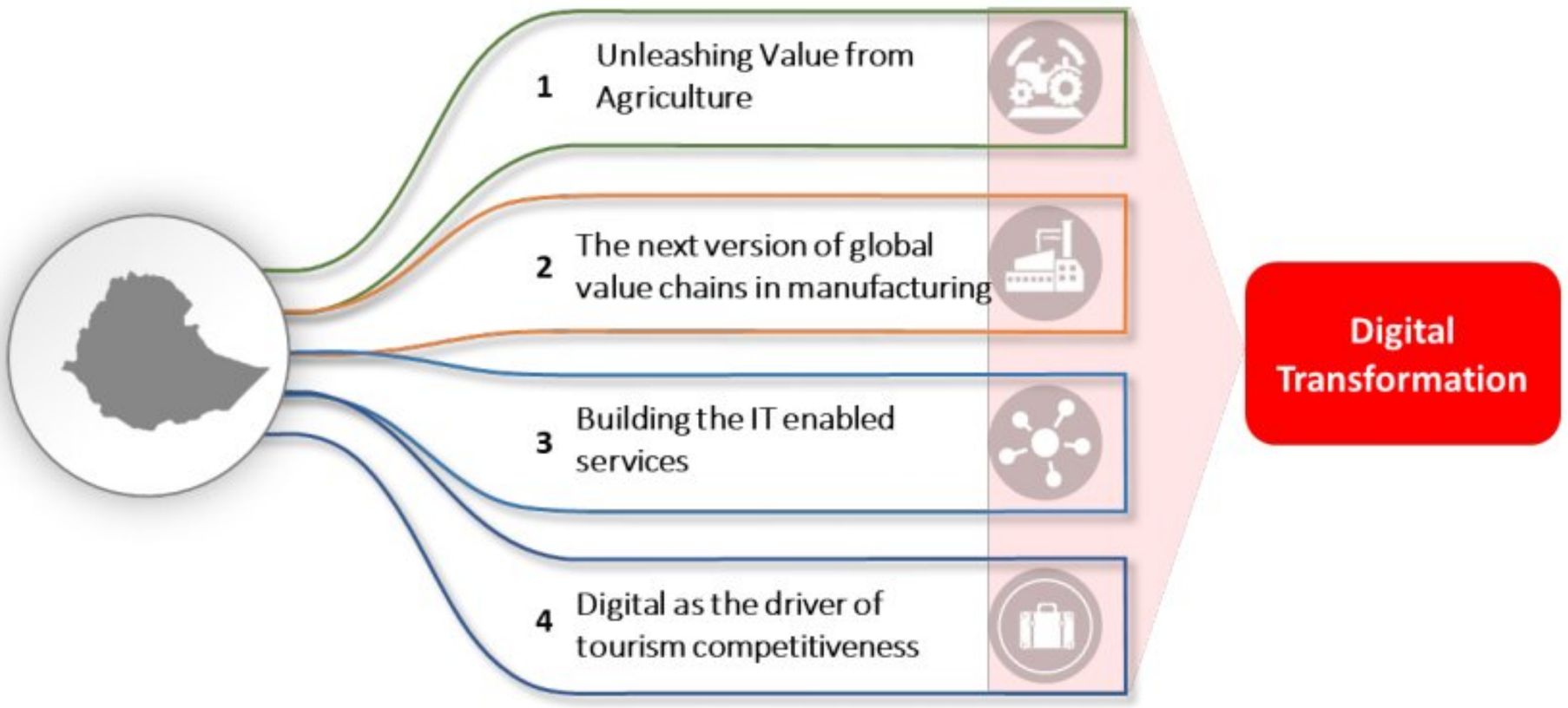

Figure 7: The Four Pathways to take Ethiopia through the Digital Transformation journey

4.1 Ethiopia's Pathway 1: Unleashing Value from Agriculture

Digital technologies have been successfully used to support agricultural productivity in various ways. The main ones can be categorized into: services for farm productivity enhancement (virtual extension services on pesticide usage, crop rotation, or localized weather forecasts); market information services (e.g. showing which markets offer the highest prices for their crops); financial services (e.g. providing farmers with access to credit). In coming years, more sophisticated technologies are expected to impact the sector and enhance modern farming techniques such as **Precision Agriculture** and **Vertical Farming**.

As emphasised the Homegrown Economic Reform Agenda, making optimal use of new and emerging technologies to modernize Ethiopia's agricultural sector is of utmost

importance. This pathway starts with first introducing Ethiopia's current position in the agriculture sector by showcasing some examples of digital initiatives underway, then highlights key technologies that are on the cusp of having an impact on agricultural development worldwide; followed by some areas of opportunity for focused government attention to facilitate faster digitally enabled agricultural transformation. Then, lastly, recommendations are provided for ensuring inclusivity.

4.1.1 Current Status

Ethiopia's Agricultural Development-led Industrialization (ADLI), started in the early 1990s, and has been extremely positive. Ethiopia has had some of the fastest growth rates in the world, initially strongly driven by agricultural yield increases, particularly in wheat and maize (Ethiopia's main crops besides coffee, oil seeds and teff). This growth started from a very low base, and Ethiopia's yields are still below the Sub-Saharan African average[5]. In recent years, growth rates of the services sector, and particularly the emerging manufacturing sector have overtaken agriculture. But due to Ethiopia's predominantly rural population, agriculture will play a crucial role in Ethiopia's economy for the coming decades. To put these sectors in perspective, even though agriculture's proportion of the economy keeps shrinking, it still accounts for 32.8% of GDP, 85% of the country's workforce, and 90% of export revenue (ibid). Smallholder farmers are prevalent in Ethiopia, as 95% of the country's agricultural output hails from small farms.

Ethiopia has utilized various information and communication technologies over the course of the 2000s and 2010s, from digitally aided extension services and other productivity enhancing services, to market information services for farmers (e.g. Minten et al. 2012[6]). Rural Internet penetration for Ethiopian farmers has been 4%. This is lower than the Sub-Saharan African average, as are Ethiopia's rural literacy rates.

The Ethiopian Agricultural Transformation Agency (ATA) has had a crucial impact on driving farmer incomes and productivity by aligning central and local agricultural strategies; creating capacity for performance tracking and enhancing the consultation process across government, the private sector and foreign donors.

Key initiatives currently being led by ATA and its partners, including the Ministry of Agriculture (MoA), listed below have laid a solid foundation for the application of Agriculture technology.

The Ethiopian Soil Information System (EthioSIS) project aims to digitally map *all* of Ethiopian soil resources and establish a National Soil Information Database to be used by smallholder farmers and policy makers for accurate decision-making on fertilizer use and to address soil problems.

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[5] Tsan, M., Totapally, S., Hailu, M., & Addom, B. (2019). The digitalisation of African agriculture report 2018- 2019. Wageningen, The Netherlands: CTA/Dalberg Advisers. https://cgspace.cgiar.org/handle/10568/101498

[6] Tadesse, G., Bahiigwa. G. 2015. Mobile phones and farmers' marketing decisions in Ethiopia. World Development 68, 296-307. https://doi.org/10.1016/j.worlddev.2014.12.010

The Shallow Ground Water mapping uses a similar nation-wide mapping and database development approach to advance irrigation and reduce rainfall dependency.

ATA's National Market Information System for Agricultural Commodities (NMIS) is among the most dependent on digital technology as it aims to collect data on a wide range of crops, then process and disseminate this information to farmers and other value chain actors across the country.

The very recently launched **Agricultural Commercialization Clusters** program; a platform that allows buyers to get in contact with farmers production clusters of specific commodities geographically located.

The 8028-farmer hotline, NMIS' flagship project, to receive mass and customized information including agronomic best practices through the interactive voice response (IVR) and short message service (SMS) platform. To date, the hotline has more than 3.6M registered callers and has broadcasted more than 2 million alerts, accommodating features that ensure inclusivity such as the provision of information in five different local languages. A scale-up of the system is scheduled for 2019-2020, in which the system plans to develop a strategy to incorporate livestock information, weather thresholds, rural financial services and agricultural inputs.

ATA Rural Financial Services is implementing an Input Voucher Sales System (IVS, e-Voucher) Program. This was formulated in response to the difficulties that smallholder farmers face in accessing credit for agricultural inputs such as fertilizer, improved seeds, and labour-saving tools, all of which are essential to increasing production and productivity in a sustainable manner. The system engages local microfinance institutions (MFIs) or Rural Saving and Credit Cooperatives (RuSACCos) to qualify farmers for loans and issue cash or credit vouchers that can be used to redeem inputs at nearby cooperative stores. By doing so, it minimizes the risk that farmers will be prevented from using inputs because of their high initial costs. Facilitating credit access is a proven means to encourage farmers to experiment with and use improved technologies. The technology used is a smart phone and an NFC tag.

However, these initiatives are hampered by several challenges, especially connectivity, the lack of enabling regulations, appropriate finance, and skilled human capital. Diagnostic of the sector to identify gaps was anchored in the digital economy framework, which brings together the four interlinked elements – infrastructure, enabling system, applications and the broader ecosystem – that make up the digital economy. Challenges across all four components are critical but stakeholders highlight those at the enabling system (open-access data and interoperable platforms) and ecosystem levels (access to finance, human capital, policy and regulations) as most restrictive. Despite strong growth trajectory across Africa, these obstacles have contributed to Ethiopia being relatively far behind other countries in terms of number of technology start-ups and overall funding received.

4.1.2 Global Trends

Several emerging digital technologies have great potential for the future of agriculture around the world and are already contributing to higher agricultural productivity in developing countries today. Two such technologies are; the Internet of Things (IoT), and Blockchain technologies.

The Internet of things (IoT): In agriculture, the IoT is most widely used for helping farmers better monitor their yields and thus better predict their harvests, better locate and identify diseases, better anticipate the weather, better apply fertilizer, and map fields. This is usually done via various types of small sensors – soil sensors, livestock sensors, weather sensors, storage sensors or locations sensors. These can be used not only to measure rainfall and temperature in the air and ground, but also the temperature in animals, moisture in the soil, pH and nutrient levels in water, pressure in the atmosphere, location of problem zones, possible moisture that could spoil harvested crops in storage.

State of the art technology has long been utilized on the factory-like farms in advanced countries. Though IoT offers two promising features: (a) devices are now much smaller and much more affordable for developing countries; and (b) the revolutionary aspect is that they are connected to the Internet. This can be done using low-cost equipment such as small weather robust boxes that measure and transmit certain indicators to the cloud; regular mobile phones; or more sophisticated airborne devices such as balloons, satellites, or drones (with the latter covering wider regions and thus particular services can be created that are affordable or can be financed via agreements with partner organisations).

This all means that IoT in African agriculture is growing rapidly – by some estimates at 30% per year. Growing pains still exist, as devices are still expensive, but several examples of successful applications already exist in Africa: Kenya by far the leading country on the continent, followed by Nigeria and Rwanda. Service that provides on-farm sensors and real-time information to farmers about their own farms seems most successful.

Blockchain technologies: Another innovative technology for agriculture is blockchain – the decentralized ledger technology that underpins crypto currencies (the most widely known is Bitcoin), and that can also be used in various other ways, such as smart contracts (this is often associated with Etherium). In agricultural value chains, farmers tend to receive minimal amounts for the hardest work. To qualify for FairTrade labels, companies need to ensure that their farmers adhere to FairTrade standards. Blockchain allows every transaction in a value chain to be easily traced, so adherence can be easily measured.

Much as with the IoT, blockchain technologies are incurring growing pains. Crypto currencies are prone to erratic swings and have provided a platform for cybercrime attacks; the value of a decentralized ledger is undeniable. The Etherium model is thus far less established, as the underlying technology is often much too slow, and many applications are not actually in need of decentralized ledgers.

Blockchain technologies are nonetheless advancing, and can currently be used best to follow products along the value chain. Famously, the Dutch company tip2farmer[7] allows consumers in café to not merely tip their waiter but also the farmer who planted and harvested the coffee beans used in that particular cup of coffee. Similar value chain tracking initiatives already exist in Ethiopia. The famous co-founder of Etherium, Charles Hoskinson, has launched Cardano's coffee

[7] See https://tip2farmer.com/.

blockchain initiative in Ethiopia.[8] G&H Blockchain has a similar undertaking in Ethiopia, and other attempts exist throughout Africa, such as in Mali for tea that goes to the global retail brands. Hence, the most widely used application of blockchain in Africa is currently in providing transparency, and better (cheaper) payments methods (e.g. see Agrikore).[9]

4.1.3 Where Ethiopia Can Succeed: Opportunities

The Homegrown Economic Reform Agenda points out how to build upon success of the past while undertaking macro-economic, structural and sectoral reforms for an inclusive growth, creating jobs and chart a way to prosperity. The following is an extract in regards to the Agricultural sector:

1. Enhance productivity of small-holder farmers and pastoralists through *provision of modern inputs and services*;
2. Develop a legal framework that will allow farmers to *lease land use rights* and become shareholders in large commercial farms;
3. Modernize livestock production through improving veterinary infrastructure, research and innovation, and establishing linkages with other industries;
4. Establish *effective linkage between agriculture producers and commodity markets as well as the commercial value chain*;
5. Encourage private sector investment in agricultural R&D and exploring PPPs *to expand medium and large-scale irrigation infrastructure;*
6. Develop a legal framework for agriculture-specific financial services such *as micro lending, crop insurance, and forward contracts.*

Of the six highlighted areas four require digital infrastructure to effectively deliver the services and the transformation required. Below are specific opportunities we believe will be transformational for the sector.

4.1.3.1 Building a Digital Agriculture platform

Digital Agriculture is the use of new and advanced technologies integrated into one system to enable farmers and other stakeholders within the agriculture value chain to improve food and livestock production.

The ubiquity, portability and mobility of digital technologies is transforming agriculture and food production. Specifically, in the agriculture and food sector, the spread of mobile technologies, remote-sensing services and distributed computing are already improving smallholders' access to information, inputs and markets, increasing production and productivity, streamlining supply chains and reducing operational costs.

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[8] See https://forkast.news/watch-charles-hoskinson-co-founder-of-ethereum-and-iohk-on-why-cardano-is-a-better-platform-part-i-3/; and https://www.reuters.com/article/us-ethiopia-coffee-blockchain/the-coffee-farmers-betting-on-blockchain-to-boost-business-idUSKCN1Q7039.

[9] See https://www.cellulant.com/agrikore/.

Most of today's farmers make decisions such as how much fertilizer to apply based on a combination of rough measurements, experience and recommendations. Once a course of action is decided, it is implemented but the results are normally not seen until harvest time.

In contrast, a digital agriculture system gathers data more frequently and accurately, often combined with external sources, such as weather information. The resulting combined data is analyzed and interpreted so the farmer can make more informed and appropriate decisions. These Precisions Agriculture techniques allow decisions to be quickly implemented with greater accuracy through robotics and advanced machinery, and farmers can get real-time feedback on the impact of their actions.

Technologies used include sensors, communication networks, remote-sensing services, Unmanned Aviation Systems (UAS) or drones; Artificial Intelligence (AI), robotics and other advanced machinery and often draw on the principles of the Internet of Things. Each one of these brings something valuable to farming from data collection, through to management and processing, as well as guidance and direction.

This integrated system offers new insights that enhance the ability to make decisions and subsequently implement them. This brings critical advantages for farmers and wider social benefits. It also enables organizations to share information across traditional industry boundaries to open up new, disruptive opportunities.

Within Ethiopia, Artificial Intelligence initiatives have started within government, higher education and in the private sector with some registered successes in robotics and machine learning. The Ethiopian Biotechnology Institute (EBTI), the Technology and Innovation Institute (TechIN), MInT, the Ministry of Science and Higher Education and the newly established Artificial Intelligence Research and Development Center focus on research, talent development, skills and education, ethics and inclusion, standards and regulations. The recently approved Artificial Intelligence Research and Development Centre will support future technologies. The center will develop AI services, products and solutions based on localized research and development adapted to the Ethiopian context. Addis Ababa University (AAU) has a postgraduate program and an Artificial Intelligence & Robotics Center of Excellence that enables collaborations between academia and industry demand.

These centers should prioritize innovation within the agricultural sector, which is of the utmost importance for the national economy. Digital agriculture has the potential to transform the agricultural sector, enhance food systems (i.e. agro processing and services). However, the 'digitalization' of agriculture and the food value chain has certain challenges to overcome. Issues such as cybersecurity and data protection, labour replacement and re-education and the risk of creating a digital divide between economies, sectors or individuals with differing abilities to adopt new technologies. Despite these points, there is no doubt that digital transformation in agriculture is here to stay. Securing its widespread adoption will require collaboration and consensus across the value chain on how to overcome these challenges.

Potential Timeline for Implementation: **Mid Term (18 months to 3 years)**

4.1.3.2 Support and Incentivize Ag-Tech Entrepreneurship

An opportunity, which needs focused attention of resources and will likely have significant impact not only on transforming agriculture but also jobs, export and inclusivity, is ensuring a thriving Ag-tech entrepreneurship sector in Ethiopia.

Technology entrepreneurship is driving global economic growth and creating jobs, while also improving quality of life through cutting-edge innovation. Ag-Tech entrepreneurs, like all other tech entrepreneurs, follow a four-step process to transform their technology idea into an enterprise; research and ideation, design and validation, enterprise establishment, and scale-up. Each of these stages need consistent and effective support from the government to flourish and revolutionize agriculture so its impact on jobs, foreign exchange earning, and inclusivity is maximized.

Government support and incubator services can be strengthened based on needs of Ag-Tech start-ups and innovators. This would require careful evaluation of start-up requirements by engaging with various start-up founders and partnering with relevant stakeholders such as private investors, and technical advisors to provide the required services. Existing Ag-Tech start-up founders should be engaged to share experience-based lessons, to offer mentorship and guidance, and to provide technical and capacity building support for new start-ups. By tracking industry needs and market trends, government and businesses can incentivize the birth and growth of high-demand solutions, which will further inspire entrepreneurs. By ensuring alignment among all implementing government institutions across regions, delays in decision-making can be avoided; implementation of innovative agriculture solutions can flourish. **This is instrumental to encourage the youth to remain in rural areas and modernize agriculture rather than migrate to urban areas in search of service-related jobs**.

MInT is well positioned to play an influential role in the technology entrepreneurship space. It is committed to and is already supporting Ag-Tech businesses to address some of the major challenges within the sector through the national business incubator program as well as other associated initiatives. Supporting and incentivizing Ag-Tech businesses will not only transform agriculture but it will engage the youth across the country and expand the demand for related services boosting the overall ecosystem necessary for successful technology entrepreneurship.

Moreover, MInT and the Job Creation Commission (JCC), in collaboration with relevant stakeholders, is working on a Start-up legal framework. This framework will enable a vibrant innovation ecosystem that supports local start-ups to develop home grown solutions. This is an important framework as only local entrepreneurs have the skills and understanding to develop content in local languages and address issues of a local context.

Potential Timeline for Implementation: **Mid Term (18 months to 3 years)**

4.1.4 Ensuring Inclusivity

Ethiopia has done tremendous efforts and progress in agricultural development. The biggest challenges to utilizing digital technologies in Ethiopia and ensuring inclusivity are related to infrastructure (phone line and internet access) and human capital (low rural literacy levels). The infrastructure bottleneck will be easier and faster to solve, and, once this is improved, it will boost digital literacy as well.

It is often assumed that the high levels of rural illiteracy prevent Internet adoption, but applications can be designed to address this challenge. Voice services such as the farmer hotline 8028 already exist and new versions are continually improving. Big data and AI allow for better voice recognition and even translation services are improving at rapid speeds. Innovators are currently working on new versions of voice-based applications for farmers throughout Ethiopia, all of which will increase the scope of served farmers. Of course, such digital initiatives will need to be backed by investments in power and connectivity. These technologies should also be viewed as short-term gap fillers until investments in literacy pay off in the long term.

4.2 Ethiopia's Pathway 2: The Next Version of Global Value Chains in Manufacturing

Manufacturing is a highly relevant pathway for achieving an inclusive digital economy, especially in Ethiopia where the industrialization journey is already underway. This Pathway section depicts the nuances of technological advancement in the apparel sector, including digital communication, production and logistics. It then outlines the most important investments for Ethiopia's apparel sector to ride the global wave of technological change.

Light manufacturing creates foreign exchange and inclusive jobs. It is geared toward global value chains, serving global markets. Historically, the core benefit of breaking into this sector was the generation of foreign exchange, job creation and the absorption of women and unskilled workers into this sector. Like no other sector, manufacturing can absorb rural-urban migrants and serve female empowerment by providing independent incomes to women. Labour intensive light manufacturing, such as apparel, also tends to employ disproportionately many women. And women employment in light manufacturing, particularly in apparel, has led to a host of positive development effects.

4.2.1 Current Status

Manufacturing has been a fast growing sector for Ethiopia over the past few years. Apparel manufacturing has long served countries like China, Bangladesh or Vietnam well, and it is one of the most important light manufacturing export sector in Ethiopia to date. Hence, while there are other important manufacturing sub-sectors, this section focuses on the apparel export sector.

Ethiopia is currently becoming a new destination for global apparel production. Industry leaders are increasingly looking for an alternative to Asia based production and increasingly seeking to source from Africa as the last low-labour cost frontier. For example, top retailer PVH's goal was to shift 25% of their production from Asia (mainly China, Bangladesh, and Vietnam) to Africa. The Government of Ethiopia proved to be the best partner for this endeavour and benefitted from the various large investments that were made. Ethiopia's competitive labour and electricity costs as well as trade privileges such as the African Growth and Opportunity Act (AGOA) make it an attractive destination. State of the art

industrial parks were erected; 13 government and private parks; four of which are focused on apparel exports (Hawassa, Mekelle, Kombolcha, and Adama). Located across the country and away from the capital city, many people are expected to benefit from the access to jobs and the urbanization benefits that come with these industrial hubs.

However, Ethiopia's success in establishing itself as a global hub for light manufacturing exports is far from certain. From a global perspective, Ethiopia is still in the stage of breaking into the apparel sector with less than 100 firms operating in the country. In contrast, Bangladesh has 4,500 firms in the garments export sector, which constitute some 80% of the national budget. Moving up the value addition ladder toward evermore complex and lucrative products will be equally difficult. Most importantly, some future proofing of Ethiopia's apparel export sector is also needed. Competing on low-labour costs to break into labour intensive segments of global value chains of the least complex products has long served as a kick-starter to other countries' industrialization and catch-up development processes, however it has limited sustainability in the future of manufacturing.

4.2.2 Global Trends

How likely is it that jobs will be lost to automation in the manufacturing sector in the Fourth Industrial Revolution (4IR)? Currently automation of apparel manufacturing is technically too difficult, due to the dexterous nature of the work, and economically unfeasible (low cost, small margins). Yet, proponents of progress in the sector insist that fully automated apparel factories are possible and potentially viable. However, no clarity exists on how long this would take and how cost competitive it would be. Some bullishly claim that technological progress can happen within one decade (i.e. robots eventually sewing clothes completely autonomously), but most experts counter that, even if this were possible, the margins in this sector are too low to make such investments feasible (e.g. Kucera 2017[10]), and low- and lower-middle-income-country workers will remain cost competitive.

It thus seems unlikely that automated machines will replace low-cost apparel workers in Ethiopia in the near future. Ethiopia is also likely to benefit from early warning signs as labour replacement in low cost apparel would first happen in Eastern Europe (e.g. in Serbia), where large apparel sectors exist due to the proximity to Western Europe and the need for speed deliveries. This is where labour is currently more expensive, and little labour-replacing automation has yet occurred there to date.

In Ethiopia's apparel sector, more automation also does not instantly lead to more productivity as workers need to acclimatize to state of the art factories; and to absorb frontier technologies, the prerequisite would be to first strengthen the industrial workforce skills and discipline.

[10] Kucera, D. (2017). New automation technologies and job creation and destruction. International Labour Office https://www.ilo.org/employment/Whatwedo/Publications/WCMS_553682/lang--en/index.htm

SOURCE: Future of Jobs Survey 2018, World Economic Forum

Expected average reskilling needs across companies, by share of employees, 2018-2022

Efforts to build capabilities are at the forefront for leading organizations. These re-skilling endeavors are supported by the fact that new technologies are becoming easier to implement.

Without doubt, the 4IR has a huge disruptive potential on the workforce in manufacturing. It is essential that more organizations take an active role in reskilling their existing workforce; that individuals approach lifelong learning proactively; and that governments assist in these efforts; to ensure that the workforce and society will benefit from the opportunities that are brought by the 4IR.

Figure 8: Expected average reskilling needs across companies, by share of employees, 2018-2022

New forms of communication technologies will become increasingly important in the apparel sector. Apart from factory floor automation, factories are equipping themselves to sell more and more services; they not only buy and produce more services than before but also sell and export more services as integrated activities. This entails ever-greater needs for fast connectivity between production facilities and the global centres of innovation. **The countries whose governments realize this link between better Internet connectivity and future-oriented apparel manufacturing will have the best chance to pull ahead of the competition**. One or more of the following technologies will become important in this regard:

1. **Fixed telepresence conferencing:** this is high-resolution video telephony that reveals the smallest details so buyers can zoom into models wearing pieces of clothing ahead of scaling up their orders.
2. **Mobile telepresence robots**: this manifests in various different ways, such as screens on Segways, whose motions are controlled remotely by the person on the screen[11]. This can be used by experts to observe and instruct individual workers remotely. It can be used by floor managers to show certain bottlenecks to clients directly by taking them to the factory floor and allowing them to move around independently. It can be used by groups of workers from a newer production facility, such as Ethiopia, where labour is, as yet, less productive, to take virtual trips to join older production facilities in China or Bangladesh, where workers are more experience and thus labour is more productive.
3. **Virtual reality:** glasses and haptic gear that allow users to dive into lifelike virtual environments. This too, can be used for fashion shows and presentations of client expectations. It has also proved very useful for training simulations in various fields.

[11] See: https://www.youtube.com/watch?v=ho1RDiZ5Xew.

4.2.3 Where Ethiopia can succeed: Opportunities

Some future proofing of Ethiopia's apparel export sector is now needed. This model of competing on low-labour costs to break into labour intensive segments of global value chains of the least complex products has, long served as a kick-starter to other countries' industrialization and catch-up development processes[12],[13],[14]. But how future oriented is this sector today? And what concrete steps can Ethiopia take to build a competitive advantage in tomorrow's apparel global value chains?

Ethiopia can succeed through the Manufacturing Pathway by adopting and creating digitally enabled solutions to resolve its critical obstacles. Some level of automation and digitization is inevitable and must be accelerated for Ethiopia to become competitive in future global value chains.

It should be noted that Ethiopian factories are, however, technologically not behind. While most apparel factories in Ethiopia are considered lower tech, in terms of partial automation, some state-of-the-art work processes already exists in Ethiopian factories, especially with the arrival of investors in the latest industrial parks. Having state-of-the-art factories in Ethiopia will most likely have positive knock-on effects. There is, for example, a difference between mechanical engineering and electronic engineering. Some countries in the sector still work with decade-old machines. When they finally switch to newer, digital machines, their backward and horizontal linkages are disrupted, as mechanical engineers in local maintenance firms cannot repair the new digital machines when broken. Ethiopia can leapfrog this by moving straight to digital machines and embedding its young apparel sector with digital engineering graduates.

Knowledge spillovers are a benefit of already having such state-of-the-art production facilities in Ethiopia. As Ethiopian labour productivity increases over the coming years, the overall firm productivity of these more automated factories is likely to rise above that of the more analogue counterparts. This will then become quickly visible to other Ethiopian firms, and the necessary upgrading investments can be made sooner in Ethiopia than in competitor countries. If some of the worlds most advanced, and thus most productive firms are nearby (i.e. in the same industrial park), other firms need not go to expedition tours of trade fares to find out what works best in the sector. They can see it in action near their own factories. This knowledge transfer, from more productive to less productive firms, is one of the greatest benefits of cluster agglomeration.

4.2.3.1 Fast and Reliable Internet Connectivity to Enable the Adoption of New Communication Technologies

New forms of communication technologies will become increasingly important in the apparel sector thus better Internet connectivity and future-oriented apparel

[12] Akamatsu, K. (1962). A historical pattern of economic growth in developing countries. *The Developing Economies, 1*(s1), 3-25. https://doi.org/10.1111/j.1746-1049.1962.tb01020.x

[13] Oqubay, A. (2015). *Made in Africa: Industrial Policy in Ethiopia.* Oxford University Press. https://global.oup.com/academic/product/made-in-africa-9780198739890?cc=de&lang=en&#

[14] **Lin 2012** = Lin, J. Y. (2012). *New structural economics: A framework for rethinking development policy.* World bank. https://elibrary.worldbank.org/doi/abs/10.1596/9780821389553_CH04

manufacturing will have the best chance to pull ahead of the competition. Less-well connected countries have difficulty in communication with buyers as they cannot apply the most cost effective and time sensitive communication technologies, making them rely on out-dated methodologies such as sending samples back and forth to obtain buyers' approval. If connectivity is not an inhibitor, firms in Ethiopia can begin to adopt these improved technologies that accelerate production, thereby increasing job creation and foreign exchange earnings.

Communication technology will arguably be the biggest catalyst for sending Ethiopian workers and firms up the value-added ladder. This is because, more generally, new types of communication and long-distance learning will emerge with fast broadband internet that go far beyond bridging the bottleneck of needing to send samples back and forth.

Digital connectivity for sustained competitiveness is needed in the manufacturing export sector. To attract and retain smart and hard-working Ethiopians to the industrial parks, the initial analogue remedies of safe and affordable living conditions near the parks are important. Though in the 2020s, equally important will be to bring fast and affordable Internet connectivity to these workers' homes. Connecting the residential areas near the parks may play a surprisingly large role in their calculations on whether or not to come and work in the parks. This can also help solve many of the above analogue problems; safety and logistics are drastically improved with fast and reliable Internet connection (see the case of ride-hailing apps). Also, unexpected positive economic side effects can emerge in residential areas that have fast and affordable Internet connections (see the case of Kenya's Kahawa cluster of online workers).

The Ethio ICT Village could serve as a first prototype of experimentation with much more integrated "servisification" of manufacturing. This would be the one park with the lighthouse effect for all other industrial parks: mixing the old forms of manufacturing with the new forms of ICT services exports (see Pathway 3), as fast and reliable internet connectivity becomes the decisive factor for manufacturing global value chains in Ethiopia.

To become competitive in apparel global value chains, Ethiopian firms will sooner or later be pressured by global buyers to adopt state-of-the-art communication software. By that point, the necessary infrastructure needs to be in place. This is a chance for Ethiopia to use strong internet connectivity, coupled with lower labour costs, to progress past a country like Bangladesh, where internet connectivity is currently still worse than in Kenya and Rwanda.

Potential Timeline for Implementation: **Mid Term (18 months to 3 years)**

4.2.3.2 Enhance digitally enabled logistics management approaches to boost export

Digital transformation opens a new opportunity for translating Ethiopia's export-led industrialization vision into a reality. In the current highly volatile and fast changing global economic environment, it is evident that having low wages and cheap electricity alone is not sufficient for competitiveness. The ability to deliver products on record time and at an affordable cost, from the point of origin to final destination, has become an essential prerequisite for competitiveness. This is highly important when competing with countries with already established best practice trade logistics.

Ethiopia needs to take advantage of the opportunity that the new digital technologies offer for modernizing trade logistics and boosting exports. Indeed, in recognition of the critical role of trade logistics, Ethiopia has already introduced a number of initiatives to improve the infrastructure and policies on trade logistics. For instance, the country has heavily invested in improving transport infrastructure such as the new rail network linking Addis-Ababa and the port of Djibouti. Efforts are also underway to expand the dry-port at Modjo and introduce state-of-art logistics facility. These and other customs-related improvements will, no doubt, enhance Ethiopia's export performance, but it seems they are insufficient. Ethiopia has the least efficient trade logistics system in the East African region. The evidence is overwhelming. It is estimated, for example, transporting 20ft container of garments from Ethiopia to Germany costs 247% more than from Vietnam and 72% more than from Bangladesh. In 2016, Ethiopia scored 2.37 in the World Bank's Logistics Performance Index – significantly lower than neighbouring Uganda, which is also landlocked. According to benchmarks measuring how easy it is to export and import manufactured goods (**Trading across Borders**), Ethiopia is one of the least efficient, ranking 156 out of 190 countries.[15]

Moving forward, Ethiopia should continue to pay greater attention to trade logistics, in particular the interface between exports, digitalization and trade logistics. Successful export delivery of manufactured products involves many diverse activities and a wide range of stakeholders. As a priority, however, there are two areas where the Ethiopian government should pay extra attention.

1. **First, more and more manufactured goods are being sold digitally rather than physically, making E-Commerce a critical export channel that countries such as Ethiopia cannot afford to ignore.** Thus, Ethiopia needs to accelerate initiatives to close the E-Commerce readiness gap including policy and regulatory measures. The introduction of the electronic World Trade Platform (eWTP) by the Alibaba Group in November 2019 is an important first step and will serve as a catalyst for broader development of E-Commerce and the digital economy, which are both currently at a very early stage of development in Ethiopia. The eWTP will apply digital technologies for managing smart warehouse and a technology system, including E-Payment, for facilitating export trade. The government should formulate a strategy on how to assimilate and acquire E-Commence capability introduced through the eWTP initiative. In the same way the ECom@Africa initiative for Ethiopia with the Universal Postal Union (UPU) for the Postal Operation readiness for E-Commerce, the addressing system for door to door services, as well as the set up of a sorting and fulfilment centre for East Africa are all initiatives that are fundamental for the advancement of E-Commerce in the country.

2. Second, inefficiency and high cost of customs procedures represent a major logistical challenge to improving Ethiopia's export performance, especially in manufactured products. Digital technologies have made managing customs procedures easier, faster, transparent and predictable. UNCTAD's ASYCUDA (Automated System for Customs data), a computerized customs management system, covers practically all foreign trade-related procedures in a single-window using online services. The system handles customs-related declarations and verification

[15] World Bank (2020), Economy Profile of Ethiopia, Doing Business 2020 Indicators

procedures that exporters have to perform in the course of conducting trade. The ASYCUDA software is regularly updated to accommodate the evolution in trading patterns and to take advantage of latest developments in digital technology. Ethiopia will benefit greatly by applying the ASYCUDA programme, which will also make its customs-related procedures compatible with neighbouring countries such as Djibouti, which applies the ASYCUDA programme.

The above two initiatives use modern technologies to provide global solutions for logistics management. However, it is important to note that implementation will require an iterative approach to ensure that innovative solutions are localised and suited to the specific demands of Ethiopia. This will involve working with local content developers, who are currently at the nascent stage of technology entrepreneurship and the development of new technologies. Institutions, such as the Artificial Intelligence (AI) Research and Development Centre and the Addis Ababa University Artificial Intelligence & Robotics Centre of Excellence, can support local entrepreneurs in developing these new technologies that ensure Ethiopia is at the forefront of automated logistics systems. There are also a growing number of private sector firms investing in AI entrepreneurship, which is changing the technology landscape in Ethiopia and creating opportunities for Homegrown automated and robotic solutions.

Potential Timeline for Implementation: **Short to Mid Term (18 months to 3 years)**

4.2.4 Ensuring Inclusivity

Making factory work interesting and future oriented for potential workers and particularly women.

Investing in making this sector more future-oriented, and to create more productive workers, generates positive development outcomes as a direct side effect. Many of these secondary investments that need to be made to succeed in the global apparel sector are synonymous with socio-economic development. The direct incentive for undertaking them is to make the factories more productive. This happened in other world regions as well (for South Korea, see Kang 2002[16]). For example, Heath and Mobarak [17] found in a quasi-experimental setting that the opportunity of apparel manufacturing employment in Bangladesh significantly increased girls' education levels, and women's empowerment. Marriage and childbearing took place later in life, which leads to a positive generational ripple effect: children with older and financially independent mothers tend to experience better childhood development.

Improving the fundamentals around the industrial parks: The Government of Ethiopia has achieved great progress by erecting the Industrial Parks and the infrastructure for them. What needs to be improved has been widely discussed in 2018-2019: workers need adequate **housing, amenities, and particularly safety for women workers. Travel to and from the parks needs to be arranged and better coordinated for the women, especially** with the introduction of second and third shifts.

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[16] *Kang, D. C. (2002) Crony Capitalism: Corruption and development in South Korea and the Philippines. Cambridge University Press.* https://doi.org/10.1017/CBO9780511606175

[17] Heath, R., & Mobarak, A. (2014). Manufacturing growth and the lives of Bangladeshi women. *Journal of Development Economics 115*, 1-15. https://doi.org/10.1016/j.jdeveco.2015.01.006

Low education levels are problematic in Ethiopia but worker independence and aspirational attitudes can be an opportunity in the 4IR. To future-proof the sector targeted dialogue is needed between government, private manufacturing companies and educational institutions. Public–private collaborations can identify skills-gaps and appropriate training to prepare the labour market for the new demands the digital economy brings.

4.3 Ethiopia's Pathway 3: Building the IT Enabled Services Sector

The development of IT-Enabled services is a critical opportunity that warrants focussed attention. The sectors most interesting with respect to Ethiopia's development goals are IT-enabled services and IT services. Distinct from IT production (i.e. manufacturing and assembling of computer electronic or electrical equipment), IT services consist mainly of application development, programming, IT infrastructure services and maintenance (e.g. cybersecurity). IT-*enabled* services are a much wider spectrum of services that are not directly IT related but merely performed via information technology infrastructure.

4.3.1 Current Status

Globally, the export of IT-enabled services is a still comparatively small sector vis-à-vis agriculture or manufacturing, and it is particularly small in Ethiopia. Based on initial research, as of September 2019 very few Business Process Outsourcing (BPO) firms exist in Ethiopia thus far; the largest company has up to 50 employees. By comparison, Kenya employs some 12,000 in the BPO sector, and South Africa some 58,000, while the Philippines employ some 575,000 in the BPO sector.

***Infrastructure* is Ethiopia's most binding constraint for this fledgling sector.** The global nature of the IT-enabled services sector entails that the competition is fierce, and customer communications need to be reliable and in real time. Due to connectivity challenges, Ethiopian BPOs cannot reliably take on tasks that involve real-time communication, such as virtual assistance.

Human Capital: Ethiopia's urban population is fairly well educated with literacy rates of 80% in Addis Ababa. Additionally, Ethiopia's sheer size – several times larger than the average African country – means that there is a relatively large pool of educated, urban youth, who constitute a latent supply of knowledge workers for the global IT-enabled services sector.

By policy, 70% of University students in Ethiopia graduate in STEM subjects, which offers a unique advantage compared to countries like Kenya and Nigeria where more non-STEM university graduates are struggling to find work on online labour platforms. This difference could be openly and proactively communicated to the most coveted online labour platforms (e.g. Upwork and Fiverr).

It is difficult to assess the extent to which online work is practiced in Ethiopia, but comparative data via fieldwork triangulations with the University of Oxford's Online Labour Index suggests that 1,231 Ethiopians may be exporting services on online labour platforms, compared to Kenya's 36,442.[18]

4.3.2 Global Trends

As the Internet becomes faster and more reliable, it connects the near endless supply of young and well-educated citizens from across the globe with companies and individuals in different jurisdictions, who are looking to outsource work. This creates a unique opportunity for trade in labour, since, in cyberspace, given a fast and stable Internet connection, everyone in the world can be everyone else's virtual desk neighbour.

Global online labour is currently growing at about 26% per year, with most supply coming from developing economies and most demand coming from more developed economies. Software is automating various BPO jobs thus online labour platform tasks are threatened. But the rapid growth rates suggest that new forms of online work are constantly emerging. As with the classical BPO sector, some tasks will become victim to automation, but new tasks will keep evolving – especially those requiring creativity and empathy.

A twofold trend has emerged in ITES, away from classical Business Process Outsourcing (BPO), toward (i) individualised online labour, as smaller networks of 'virtual SMEs' are providing transcription, digitization, copy writing, marketing, virtual assistance (these smaller online labour platform workers are proving more flexible in the face of a rapidly changing landscape of tasks); and (ii) toward Impact Sourcing, where global non-profits or social businesses provide the needed link between global demand and a supply of digital services in Africa. Ethiopia can leverage these opportunities to meet its development goals.

Tradable services can include telecommunications, insurance, banking, aviation, tourism, IT services, and IT-enabled services. With regard to Ethiopia's goals to design the digital transformation as inclusive, job creating, and foreign exchange generating, there are certain sub-sectors that spell great potential for the near future.

Fast-improving communication technologies, such as virtual reality, will unlock international trade in complex and integrated services that used to require more face-to-face contact. The result is new opportunities in integrated business services, management advisory services, and services requiring soft skills such as empathy and judgment, that robots cannot easily supply. Relatively low wage costs mean developing countries are ideally placed to begin exporting these relatively labour-intensive services, which already employ a disproportionate number of women[19]

These IT-enabled services range widely in level of sophistication from guiding surgery remotely, to monitoring social media posts for nudity, violence, or hate speech. The extent to which the IT infrastructure is needed for the service also ranges widely, from remote transcription work where the

[18] Kässi and Lehdonvirta (2018)
[19] Dercon & Ndulu 2018

entire service takes place on online platforms, to place-based chauffeuring work where only the matching happens online but the bulk of the service is carried out physically.

4.3.3. Where Ethiopia can succeed: Opportunities

For Ethiopia, a combination of three factors makes this sector interesting:

- ***Demand***: as lives and work continually move deeper into the digital realm, the global need for digital services steadily grows. Online, new and old services can be provided via the internet and conducted from anywhere in the world. Services such as; transcription, writing and editing, translation, web design, virtual assistance, image annotation, or social media management.
- ***Supply***: income disparities between Ethiopia and a typical OECD country are still around 50-fold. Also, demographic trends and small domestic economies mean that many African countries' formal white-collar economies cannot absorb all university graduates. This means that Ethiopian university graduates are increasingly open for alternative types of income generation.
- ***Intermediation between demand and supply:*** as the internet becomes faster and more reliable, it connects the near endless supply of young, fairly well-educated and extremely price competitive Ethiopians with companies and individuals in more affluent countries, who are looking to outsource work that can be done from afar. This creates a unique opportunity for trade in labour, since, in cyberspace, given a fast and stable Internet connection, everyone in the world can be everyone else's virtual desk neighbour.

The quantity of jobs created in this sector is initially small, but growing fast. IT-enabled services still constitute a very small sector to date (even in India). Software is automating various kinds of BPO jobs, but as the numbers above clearly indicate, different forms of new jobs in this sector are continually emerging. As some tasks fall victim to automation, ever-more new tasks open up.

IT-enabled services, much like other forms of highly productive services, such as tourism, creative and ICT sectors, is predominantly urban and employs individuals with tertiary education. Thus, this sector is initially less inclusive than would be job-creating interventions in agriculture or light manufacturing. This Digital Transformation Strategy outlines the concrete steps needed to reduce the high educational entry barriers to this sector and make it more accessible for non-tertiary-educated youth.

4.3.3.1 Provide infrastructure to high potential talent centres

Online work sectors seem to evolve in geographic clusters. Online work has been shown to be a highly collaborative sector and clusters have emerged organically. In countries such as Kenya, the nucleus of online work sector is a cluster of young workers near the university campuses. The first online work entrepreneurs appeared around 2010 in the dorm rooms and student apartments in Kahawa, near Kenyatta University north of Nairobi. From there, online work later spread to the dorm rooms of other universities, particularly the University of Nairobi. By 2018, online work clusters had spread to other parts of Nairobi and had sprouted across the country, always near universities.

Targeting infrastructure investments at selected universities to foster online work: Ethiopia has long been successful at targeting support measures (e.g. in the manufacturing, or floriculture sectors), and it has had particular success in providing connectivity to important institutions across the

country (i.e. via WoredaNet). With the knowledge that online work tends to sprout at university dorms, EtherNET, as the intranet that connects Ethiopia's universities, can serve as an optimal facilitator for launching this sector. Focusing Ethiopia's efforts to first connect its tier one universities to fast, affordable, and reliable internet, can bring the online work sector to life in Ethiopia.

Potential Timeline for Implementation: **Short to Mid Term (18 months to 3 years)**

4.3.3.2 Reframe and operationalize the IT Park to attract leading BPO, specifically Impact Sourcing Service Providers (ISSPs)

The fledgling IT Park "Ethio ICT Village" could, if adequately connected to residential areas, serve as an initial BPO hub. This park would need to be serviced with all the necessary amenities – mainly very fast and uninterrupted Internet connectivity. **Promoting an "always on" policy for power and connectivity** at the ICT Village could insulate export-oriented BPO companies from infrastructure challenges.

Attracting ISSPs to Ethiopia is central to any successful strategy of developing an outbound BPO sector in Ethiopia. ISSPs are often non-profit, or semi-for-profit organizations with particular social business angles of targeting workers from underprivileged communities. These ISSPs will need to be enticed to come to Ethiopia.

ISSPs' advantages vis-à-vis local for-profit BPOs are threefold: (i) they serve a growing market of socially conscious clients in the global north who seek to pay fair wages (in line with the growing segment of FairTrade labels for agricultural products). (ii) They are nearly always headquartered in the global centres of innovation (mostly in Silicon Valley), which allows them direct access to the greatest demand market. And (iii), this embeddedness within Silicon Valley, the core driver of technological change and disruption, has allowed these ISSPs to stay ahead of the curve with the ever-changing nature of new tasks needed to prepare their workers.

Local ISSPs can create access to demand: The gap between Africa's supply and global demand of online work is often not related to technical expertise, but rather to lack of awareness regarding opportunities and risks faced by firms. Here, ISSPs are helping to mitigate these constraints. As large professional intermediaries, ISSPs tend to source larger contracts from direct clients, often in tasks that are not available to individual platform workers (e.g. image tagging, digitization, or data entry).

Increased task complexity and enabling domestic demand are necessary to keep ahead of the game. Besides allowing young Ethiopians to become involved in online work at the lower levels and enabling year-round demand for their services another central challenge is to sustain online work in a future of ever-greater task automation. As much as automation is threatening jobs in manufacturing floors around the world, software development is continually chipping away at the services export sector as well. This means that **Ethiopia will continually need to increase the value added in the sector to generate ever-more complex and high-demand services.** The most basic tasks are helpful for lowering the educational entry barriers to online work, but they are also the tasks that are most easily automated. Thus, quickly moving up the task complexity ladder is as important as is clinching the lowest rungs on that ladder.

Ethiopia needs to attract a part of the global innovation ecosystem, in order to facilitate adequate upward mobility. This can be done by investing heavily in an elite university; for example, Rwanda has attracted Carnegie Mellon University to operate an Africa campus in Kigali. It can also be done by attracting a global software development company like Microsoft or Andela, which trains and then rents out African coders to western start-ups on yearlong contracts. This model entails the best of both worlds: the brain gains of working at the global innovation frontier, without the brain drain of moving overseas. Andela coders tend to work for American tech companies during the day, and concentrate on their own innovations in the evenings and on weekends. Unlike emigrants who physically move to Silicon Valley, these software developers tend to stay in their African home countries while earning higher incomes. Therefore, they stay engaged with the problems and opportunities in their home economies. These well-connected coders are also the ones who can mentor younger, less-well connected aspirants on opportunities, for example on which programming language to learn or which up-and-coming area to focus on.

Bringing such a global ISSP to Ethiopia is core to this strategy (comparable to bringing a global apparel company like PVH was core to Ethiopia's manufacturing export strategy). ISSPs lower entry barriers, facilitate upward mobility, have access to global demand, and help women enter and prevail in this sector. All this is necessary to make Ethiopia a hub for digital services exports.

Potential Timeline for Implementation: **Short to Mid Term (18months to 3 years)**

4.3.4 Ensuring Inclusivity

Impact Sourcing Service Providers (ISSPs) are facilitators of upward mobility and can help address the gender gap in Ethiopia. Several large and small ISSPs have a bottom-of-the-pyramid model in the realm of online work. They specifically target non-tertiary educated youth and either provides them with scholarships or with 2-3 year contracts coupled with skills-development courses, as springboards to the formal services economy. Other ISSPs are less specific in their targeting and accept tertiary graduates. Most ISSPs adhere to strict women quotas (e.g. Samasource's minimum quota for women is 55%).

Basic digital tasks do exist that are accessible to under educated workers. The necessary basic skills can instead be provided on the job. One such task is the widely practices job of image tagging where human workers label the items depicted in still images. Hence, a "learning by doing" approach would enhance the development of digital skills within under educated employees.

Models need to be considered to protect online workers. Two models that are currently debated are (i) a FairWork: labour arbitrage by implementing a standards system that is similar to the well-known FairTrade label for agricultural produce: and (ii) cooperatives: could online workers unite to create a FairWork platform themselves, competing with the for-profit intermediaries?. Such an organisation would also be an ideal platform in Ethiopia to act as a mediator between online workers and multiple stakeholders, allowing online workers to build a collective voice.

Digital platforms such as those for mobile money and taxi hailing will reduce the cost of exchange within the informal economy, boosting its productivity. The informal sector

comprises many rural workers, smallholder farmers, and casual labourers. Linking informal workers to potential markets and the formal economy will likely be highly inclusive. In addition these links will also provide a route for progression into more formal parts of the economy for previously excluded workers and entrepreneurs, better connecting them to the potential opportunities of not just the formal economy but also the opportunities that stem from better social protection and social benefits[20].

4.4 Ethiopia's Pathway 4: Digital as the Driver of Tourism Competitiveness

Digital can help improve tourism competitiveness and drive change in the tourism value chain. Ethiopia is endowed with numerous natural and cultural attractions that are suitable for tourism. Based on the purpose of travel, tourism can be broadly classified into three categories (i) Leisure tourism: travel for relaxation, rest, and refreshment (e.g. vacation and holidaying, recreational events such as sports, pilgrimage), (ii) Business tourism: travel for business and professional reasons (e.g. Meetings, Incentives, Conferences, and Exhibitions - MICE), and (iii) Other specific interest tourism: travel for pursuing interests or for obtaining certain benefits and services (e.g. education, medical treatment, eco-tourism)

4.4.1 Current Status

Ethiopia's tourism industry has expanded rapidly as a result of strong growth in both leisure and business tourism but is yet to reach its full potential. Ethiopia witnessed ~933,000 international tourist arrivals in 2017, increasing 13% annually from 2007, faster than 7.3% annual growth for Sub-Saharan Africa[21]. This growth is largely driven by Ethiopia's relatively strong air connectivity in the region and rich tourism resources that includes nine UNESCO world heritage sites[22]. Specifically, leisure tourism has grown 15% annually, while business tourism has increased 11% annually in the last decade. Despite high growth rates, leisure and business tourism in Ethiopia lags behind other countries in Sub-Saharan Africa. Ethiopia receives only 2% of all leisure tourists to Sub-Saharan Africa[23], despite making up almost 9% of the region's population[24]. This is largely driven due to limited awareness on Ethiopia's tourism resources, resulting in most tourists preferring other destinations. In addition, Ethiopia has only 18% of tourists travelling for business purposes as opposed to 33% in Kenya, 44% in Tanzania, and 70% in Rwanda[25]. The low share of business travel to Ethiopia can be attributed to the lack

[20] Dercon & Ndulu 2018
[21] United Nations World Tourism Organization (2010-18). *Yearbook of tourism statistics*
[22] Retrieved from https://whc.unesco.org/. Accessed on 16th September 2019
[23] United Nations World Tourism Organization (2008-18). *Yearbook of tourism statistics*
[24] Retrieved from https://data.worldbank.org/indicator/sp.pop.totl. Accessed on 16th September 2019
[25] World Travel and Tourism Council (2017). *Measuring Business Travel*

of a strong private sector and conducive business environment. Moreover, between 2016-18, Ethiopia hosted fewer international events than other African countries such as South Africa, Kenya, and Rwanda[26]. This is largely a result of relatively expensive and poor-quality accommodation facilities, poorly skilled hospitality staff, and inadequate basic facilities such as water, sanitation, and hospitals.

Digital challenges such as lack of quality Internet connectivity and poor management of tourism data restrict the growth of tourism sector. Diagnostic of the sector to identify major and minor gaps was anchored in the digital economy framework which brings together the four interlinked elements – Infrastructure, Enabling System, Applications and the Broader Ecosystem – that make up the digital economy. Challenges across these elements hold back digitalization of the tourism industry, thus hampering overall tourism growth. Among these, stakeholders highlight challenges at the infrastructure and enabling systems levels as most restrictive. A summary of these challenges is presented below:

- **Infrastructure:** Tourists lack quality Internet connectivity in remote tourism locations, preventing the use of live social media sharing, geo-tagging, and other modern technologies. Limited connectivity also reduces access to real-time information and the ability to communicate during emergency situations, decreasing safety for tourists.

- **Enabling Systems:** There is low penetration of digital payments, ATMs, and Point of Sale (POS) machines at tourism destinations, hindering tourist experience. In addition, lack of standardized data frameworks across various stakeholders makes it difficult to consolidate data on tourism and derive insights to inform strategies for developing tourism destinations and product offerings.

- **Applications and Services:** Digital marketing of existing tourism destinations is ineffective due to limited use of targeted messaging and lack of adequate data on tourists. For tourists, there is no consolidated platform providing easy access to information. In addition, very few tourism SMEs list their services on online platforms, making it extremely hard for tourists to obtain information related to tourism offerings. There are also limited tourist service applications such as e-ride hailing and e ticketing, which impacts the overall tourist experience.

- **Ecosystem:** There is a lack of adequate digital skills among tourism SME employees leading to limited adoption of digital initiatives across various operations. Tourism SMEs also lack adequate funding mechanisms to expand their services to support the growth in demand arising through digitalization of the tourism industry.

Tourism Ethiopia is mandated to transform the tourism industry and has recognized digital as a key tool for growth of tourism in Ethiopia. Going forward, Tourism Ethiopia is keen on launching digital initiatives by incorporating learning's from global examples to drive digitalization across the tourism industry.

4.4.2 Global Trends

In recent years, tourism has grown faster than GDP and made a significant contribution to socio-economic development. Over the last decade, tourism GDP has grown 4% annually,

[26] Retrieved from https://www.iccaworld.org/. Accessed on 16th September 2019

outpacing global economic growth at 3.2%[27]. In addition, global international tourist arrivals have grown 5% annually between 2010-18[28], significantly faster than global annual population growth of 1.2% during the same time[29]. Tourism is a major contributor to the global economy, accounting for ~10% of the world GDP[30]. Tourism also creates a substantial number of jobs, accounting for almost 10% of total jobs around the world[31]. Beyond these tangible benefits, tourism fosters cultural exchange, international relations, peace, and security.

Tourism in Sub-Saharan Africa is low compared to other regions of the world and Ethiopia's tourism market continues to be less competitive than its peers. Sub-Saharan Africa has witnessed a 7.3% annual growth in international tourist arrivals, highest across all regions over the past few years[32]. Despite this growth, Sub-Saharan Africa accounts for only a 3% share in international tourist arrivals[33], while making up almost 14% of the world's population[34]. This can largely be attributed to Sub-Saharan Africa scoring the least among all regions on World Economic Forum (WEF) Tourism Competitiveness Index[35]. Within Sub-Saharan Africa, Ethiopia is ranked 18th on tourism competitiveness, scoring well below its East African counterparts such as Kenya (5th rank), Tanzania (8th rank), and Rwanda (10th rank)[36]. Moreover, Ethiopia has shown no improvement in the tourism competitiveness rankings in the last few years[37]. However, Ethiopia is keen on improving its tourism competitiveness and has set a bold target of becoming one of the top five tourism destinations in Africa by 2025.

Globally, countries are extensively utilizing digital technologies to improve tourism competitiveness. According to the ITU ICT development index, tourism competitiveness of countries increases with an improvement in digital developments[38].

[27] World Travel and Tourism Council (2019). *Travel & Tourism Global Economic Impact & Trends*
[28] United Nations World Tourism Organization (2010-18). *Yearbook of tourism statistics*
[29] Retrieved from https://data.worldbank.org/indicator/sp.pop.totl. Accessed on 16th September 2019
[30] World Travel and Tourism Council (2019). *Travel & Tourism Global Economic Impact & Trends*
[31] World Travel and Tourism Council (2019). *Travel & Tourism Global Economic Impact & Trends*
[32] United Nations World Tourism Organization (2010-18). *Yearbook of tourism statistics*
[33] United Nations World Tourism Organization (2010-18). *Yearbook of tourism statistics*
[34] Retrieved from https://data.worldbank.org/region/sub-saharan-africa. Accessed on 16th September 2019
[35] World Economic Forum (2019). *Travel and Tourism Competitiveness report*
[36] World Economic Forum (2019). *Travel and Tourism Competitiveness report*
[37] World Economic Forum (2017-19). *Travel and Tourism Competitiveness report*
[38] International Telecommunications Union (2017). *Measuring the Information Society*

Impact of digital on tourism competitiveness index[39, 40]

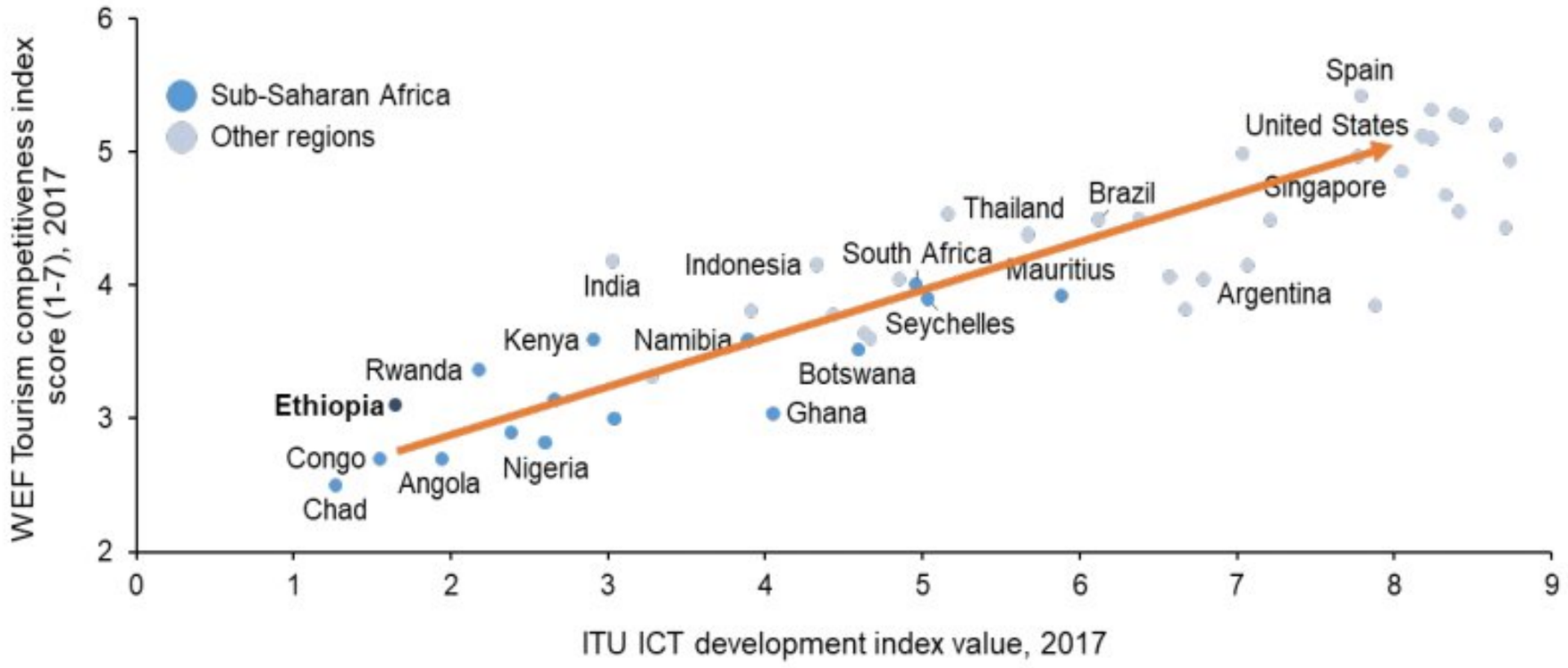

Figure 9: Impact of digital on tourism competitiveness index

The use of digital technologies is also becoming increasingly common among tourists with more than 70% of all travellers (and 90% of travellers aged below 25)[41] making travel bookings through digital modes. Across the tourism value chain, digital is becoming a key lever for growth by driving change for tourists, tourism agencies, and the government.

[39] International Telecommunications Union (2017). *Measuring the Information Society*
[40] World Economic Forum (2017-19). *Travel and Tourism Competitiveness report*
[41] Retrieved from https://www.thinkwithgoogle.com/marketing-resources/micro-moments/get-away-moments-travel-marketing/. Accessed on 16th September 2019

Role of digital across the tourism value chain

Tourism Value Chain	For Tourists	For Government/Tourism Agencies
Pre-arrival	Provide avenues to research, compare, and make online bookings to drive informed decisions, and save time/costs	Allow for user-specific and data-driven marketing of tourism destinations
In-country	- Improve ease, reduce transaction costs, and increase overall tourist spending through digital payments - Optimize travel through access to real-time information - Improve tourist experience through digital enhancement of tourist	Generate more revenue by adoption digital technologies (e.g. acceptance of digital payments, listing of service on online platforms etc.)
Post-departure	Enable sharing of experiences and reviews to inspire/help other travellers	Receive feedback and information to improve tourist experience and boost tourism marketing

Figure 10: Role of digital across the tourism value chain

Digital tourism initiatives in countries such as South Africa, Thailand, and Kenya offer valuable lessons for Ethiopia. Prior to digitalization, these countries had similar challenges in the tourism sector such as limited targeted marketing, poor management of tourism data, and inadequate capacity among tourism SMEs. Digital initiatives have helped overcome these challenges and driven growth of the tourism industry. Analysis of digital tourism initiatives across these countries present the following lessons for Ethiopia.

- **Focus on targeted (tourist-specific) digital marketing.** Design marketing campaigns that are customized to target specific tourists (e.g. tourists of a certain age group or region or purpose of travel). Undertake marketing campaigns through online channels (e.g. social media, blogs) coupled with in-person modes (e.g. videos in aircrafts, adverts in airports) to strengthen messaging and to increase probability of influencing target segments.
- **Setup integrated data systems to ensure data-driven decision-making.** Develop standardized data frameworks across various agencies (government, tour operators, hotels, and other tourism service providers) to monitor and track tourism data and other related metrics. Derive insights through advanced data analytics techniques to improve marketing efforts and to ensure informed policy and strategy formulation.

- **Develop product/service offerings based on tourist preferences.** Build mobile apps and online portals by incorporating user-centric design principles to enable easy usage for international tourists. Design product offerings and undertake development activities (e.g. introduction of digital payments, digital enhancement of attractions) at destinations based on tourist preferences to enhance the tourist experience and satisfaction.
- **Build capacity of tourism SMEs.** Develop human and tech capital for tourism SMEs to improve tourist experience and to ensure adoption of the latest digital innovations (e.g. acceptance of digital payments, listing services on online websites, and collecting/reporting tourist data).
- **Ensure collaboration between the government and private sector.** Collaboration among various government agencies, private sector companies, and private sector tourism associations will ensure effective implementation of existing strategies, and the development of robust policies that can ensure sustainable growth of the tourism industry.
- **Foster an innovative start-up ecosystem to adopt global trends.** The use of technology in tourism is rapidly changing with Augmented and Virtual Reality, virtual assistants, gamification, IoT, and Blockchain being the latest global trends. An innovative start-up ecosystem is key to bringing the latest global travel-tech trends to Ethiopia.

4.4.3 Where Ethiopia can succeed: Opportunities

Ethiopia could undertake three interventions to drive digitalization across the tourism industry. These interventions have been identified based on potential for impact and the feasibility of implementation.

4.4.3.1 Set up a tourism digitalization task force to implement digital initiatives

There is an immense potential for digitalization of the tourism industry in Ethiopia. However, effective implementation of appropriate digital initiatives across various regions, in partnership with relevant stakeholders stands out as a critical barrier in driving digitalization. Establishing a task force dedicated to identifying and implementing high opportunity areas through collaboration among various stakeholders, including the private sector and regional governments, can accelerate progress.

A multi-stakeholder approach is required to implement this initiative. Ministry of Culture and Tourism (MoCT) should develop policies and regulations that promote digitalization of the tourism industry as well as allocate required budget towards digitalization and support funding activities for various digital initiatives. MInT should facilitate the development of various digital initiatives by lending technical expertise and ensuring broad alignment with the National Digital Transformation Strategy. At the same time, private sector tourism SMEs and tourism associations should provide inputs on designing high impact digital initiatives for the sector and assist in driving implementation. Finally, Tourism Ethiopia should host the taskforce and offer strategic support as needed, while providing connections to relevant stakeholders in the sector, and facilitating to secure buy-in for various digital initiatives. Donors, multilaterals, and Development Finance Institutions (DFIs) should provide required funding for functioning of the taskforce and for implementation of digital initiatives. Finally, all other relevant stakeholders such as Ethiopian Airlines, regional governments, Ministry of Revenue, Ethiopian Investment

Commission (EIC), and Ministry of Trade and Industry (MoTI) should be engaged in the rollout and implementation of the program.

The taskforce should clearly define roles for all stakeholders to overcome potential overlap with existing organizations. Articulate objectives and clarify evolving role in the ecosystem through a participative workshop involving existing organizations to secure buy-in upfront. Ensuring constant engagement with other organizations to continuously redefine its role to address the most pressing challenges in the tourism sector is also important.

Limited ability to mobilize resources for large-scale rollout of digital initiatives may hamper the impact of the taskforce. However, launching pilots with a strong proof-of-concept to be able to raise investments and obtain appropriate resources for scale-up could reduce the adverse effect of this risk. By focusing on developing early successes to improve credibility, the task force could improve ability to mobilize resources for large-scale programs.

Potential Timeline for Implementation: **Short Term (18 months)**

4.4.3.2 Improve tourist inflow and increase tourist activity through targeted digital marketing strategies

Leveraging social media, Search Engine Optimization (SEO), and other promotional techniques could improve Ethiopia's image in the tourism map. Ethiopia is a largely unknown tourism destination and is seemingly unfavourable among tourists. There needs to be a focus on revamping the tourism brand and improving tourist perception of Ethiopia. Development of unique tourist-centric product offerings and targeting customers at influential touch points via innovative channels (e.g. social media, online search pop-ups) can improve overall brand, drive greater tourist inflow, and increase tourist activity within the country. This requires digital marketing strategies that leverage social media, search engine optimization, and other techniques to tailor messaging and content across tourist segments. To build a proof-of-concept for digital marketing, promote MICE tourism as a pilot initiative by refining the tourism brand and by kick-starting a digital campaign on MICE to offer discounts, linkages to meeting planners, and supplementary leisure tourism packages.

Implementation of the initiative will require different stakeholders to play their part in a seamless fashion. MoCT should guide the development of overall brand for digital channels and frame appropriate regulations to ensure a competitive market among various tourism SMEs. MInT should lend expertise in leveraging analytical techniques to target potential segments and advise on selecting appropriate partners for digital marketing and tourist data. Digital marketing agencies could provide tailored messaging and content to target segments as per the marketing strategy. Banks, financial institutions and other agencies with access to tourist data, share data and relevant insights to ensure the development of effective marketing strategies and product offerings. Private sector tourism SMEs and tourism associations should launch independent digital marketing campaigns aligned with the broader tourism marketing strategy. In addition, private sector tourism SMEs should form partnerships among each other to offer unique experiences with incentives such as discounts, loyalty programs, etc., to attract tourists. Finally, Tourism Ethiopia should lead the digital marketing campaign, formulate digital marketing strategy, coordinate among relevant stakeholders, and build partnerships with various tourism SMEs to develop unique product offerings.

In order to maximize impact, the marketing campaign should resonate with the target segment. Designing a pilot campaign and testing responses across multiple segments with varying types of tourist behaviour will help to ensure effectiveness of tailored messaging. Diverging customer reviews and poor word-of-mouth may negatively impact the campaign. As a result, there is a need to ensure the inclusion of tourist testimonials (e.g. quotes, pictures, videos) and experiences of tourists within the marketing content to improve credibility.

Potential Timeline for Implementation: **Short Term (18 months)**

4.4.3.3. Building capacity of tourism SMEs to 'go digital' and adopt digital technologies (including improving online presence and accepting digital payments)

In-country experience is a defining factor for overall tourist satisfaction. For international tourists, a key driver for a favourable in-country experience is the integration of digital initiatives across various aspects of tourism such as trip planning, payments, transportation, etc. Currently, there is limited adoption of digital initiatives among tourism SMEs such as tour operators, tour guides, and transport providers. To drive adoption of digital initiatives, building capacity of tourism SMEs is essential. This will require identification of key capacity gaps, development of relevant training materials, and continued monitoring to ensure successful adoption of digital initiatives.

Various stakeholders have an important role to play in building capacity of tourism SMEs. MoCT should develop regulations in the tourism sector that incentivize the use of digital initiatives by various SMEs. MInT should facilitate the development of content for training and capacity-building workshops by lending technical expertise as needed. Private sector tourism SMEs and tourism associations should provide input on the existing gaps in skills and capacity to inform the development of appropriate training curriculum. Researchers and curriculum developers should lead the content development by incorporating inputs from other stakeholders and by bringing in lessons from other countries. Donor, multilaterals, and DFIs should provide funding for training and capacity building of tourism SMEs. Lastly, Tourism Ethiopia should lead the training and capacity building initiative, coordinate with various stakeholders for developing content and delivering trainings, and ensure the adoption of digital initiatives.

Trainings and workshops should be relevant and impactful to SMEs to ensure improvements in capacity. Building application-oriented content and engaging local tourism SMEs during development of training modules is critically important. In addition, the trainings should actively respond to feedback and content must be revised accordingly. Some level of resistance to recognize the importance of digital in tourism can be reasonably expected. To overcome this challenge, awareness campaigns on the benefits of digital adoption for tourism SMEs such as increased labour productivity, increased revenue, lower transaction costs, and improved tourist or customer satisfaction should be conducted.

Potential Timeline for Implementation: **Short Term (18 months)**

4.4.4 Ensuring Inclusivity

Utilizing digital to stir growth of tourism requires collaboration among stakeholders. Several crossover areas exist along the value chain where different government ministries need to

collaborate to reduce duplication of effort as well as ensure continuity of implementation. The private sector would play an important role in introducing innovative digital solutions, thus rallying technology providers, application developers and SMEs in tourism is critically important.

Increasing the potential of tourism will create jobs and benefit communities. In-country experiences of tourists can only be improved if SMEs established around tourism destinations are able to provide quality services. Such SMEs should be supported to recognize the benefits of 'going digital' and be incentivised to use digital applications that improve tourists' experiences. In addition, communities living in and around tourism destinations must benefit from jobs created and services provided to tourists (e.g. as guide, coffee makers, handicraft sales, hospitality). Many of these jobs are lower skilled and will therefore help to address the gender gap in employment.

5. Where Ethiopia is: Assessing Ethiopia's Digital Readiness

Ethiopia's Digital readiness was evaluated against the four-part digital economy framework comprising of Infrastructure, Enabling systems, Applications and the broader Ecosystem. In addition, this strategy incorporates an action-oriented lens that includes the identification of targeted recommendations that Ethiopia can start implementing immediately to demonstrate impact in the short term.

5.1 Infrastructure

The following is about unlocking the digital economy by strengthening existing Infrastructure.

Connectivity is a foundational element of digital transformation and can drive socio-economic development. Robust connectivity enables citizens and businesses to participate in the digital economy by having access to affordable and high-quality Internet, through which they can engage in information sharing and online transactions. Improved connectivity also brings socio-economic development in multiple ways. A 10% increase in Internet penetration for example, can improve a country's GDP by 0.9-1.5%[42]. A direct outcome of improved core connectivity infrastructure (e.g. mobile towers, handsets etc.) and supporting infrastructure (e.g. power) further enables improved service access empowering both individuals and communities

5.1.1 Connectivity

Strong connectivity is crucial to a digital economy as other digital products and services are dependent on seamless and equitable access to Internet for their operation. This includes public welfare services such as E-Governance and emerging business models such as E-Commerce. On the other hand, lack of connectivity can be a strong barrier for introduction and adoption of digital products and services. It can also restrict productivity and growth in other economic sectors such as manufacturing.

[42] Katz, R. (2012). *Impact of Broadband on the Economy.* International Telecommunication Union. Retrieved from https://www.itu.int/ITU-D/treg/broadband/ITU-BB-Reports_Impact-of-Broadband-on-the-Economy.pdf

Current Status

Ethiopia has demonstrated rapid progress in improving connectivity but is yet to catch up to peer nations.

Investment in network expansion and the acceleration of mobile penetration resulted in an increase in Internet coverage from 1.1% in 2011 to 18.6% in 2017, demonstrating an annual growth rate of 45%. Despite the impressive growth rate, this still remains slightly below the Sub-Saharan African average of 22.1%. In contrast, populations in Rwanda (21.8%), Tanzania (25%), and Nigeria (27.7%) have greater access to the Internet[43].

Similarly, Ethiopia has evidenced a significant growth in mobile subscriptions in the last decade, but mobile adoption is still low compared to its African peers. In 2011, only 15.6% of Ethiopians had mobile subscriptions. This proportion grew to 60% by 2017 – though it's worth noting that only 41% were active subscriptions. Again, while improvements are being made, Ethiopia lags behind the sub-Saharan average of mobile subscriptions as a percentage of the population, which currently stands at 74%.

A similar pattern can be observed for broadband access where active mobile broadband subscriptions[44] in Ethiopia stand at 7.1%, compared to 23% in Uganda, 35% in Rwanda and Kenya[45] and 24.8% (on average) in the region.

Ethiopia has taken steps towards inclusive connectivity, but there is stillroom to improve to enable a digital economy. Poor Internet access is among the top five constraints in the manufacturing sector[46].

While Internet adoption has increased, use in economically productive activities remains limited. Currently much Internet activity is focused on social media rather than E-Commerce, business or education. This is largely a consequence of limited quality access. Thus, private sector players have difficulty identifying how they can use the Internet in an economically productive or commercial manner, given the lack of access and exposure within the local market. This lack of understanding is reported as a challenge for the private sector currently offering digitally enabled business services.

Identifying key challenges:

Large gaps across network coverage, affordability and quality exist in Ethiopia, ultimately contributing to low levels of adoption.

Ethiopian telecommunications market currently depends on one state-owned provider, and Internet services are offered with limited capacity and relatively high tariffs. Hence, Internet quality and reliability in Ethiopia is generally poor. Average download speeds and the international bandwidth per user are both lower compared to African peers. Ethiopians with access to Internet have an average of 2kb/s of international bandwidth per user, versus the Sub-Saharan African average of 11kb/s and the Kenyan average of 103kb/s.

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[43] International Telecommunication Union. (2018). *Measuring the Information Society Report* (Vol. 2).
[44] Different from subscribers some of whom may have multiple SIM cards used to access mobile broadband
[45] International Telecommunication Union. (2018). *Measuring the Information Society Report* (Vol. 2).
[46] UNDP (2017). *Growing manufacturing industry in Ethiopia.*

More problematically, Internet and mobile data costs have been among the highest in the world. 1 GB of monthly data in Ethiopia costs USD51 (at purchasing power parity) compared to USD25 in Rwanda, USD18 in Ghana and Nigeria, and USD8 in Kenya. Similarly, 1 GB data in Ethiopia costs 9.65% of the monthly GNI; the International Telecommunication Union (ITU) recommended benchmark is 2%. Ethio Telecom has slashed tariffs by some 40% in 2019, and the planned telecommunications reform is expected to induce further tariff reductions.

Network coverage has expanded rapidly in Ethiopia but continues to be poor with limited capacity to support subscribers per the national target. Even though 2G and 3G network currently covers 85.5% of Ethiopia's population and 4G access is available in certain pockets of Addis Ababa, the subscriber capacity of the network is limited with 2G network able to support only 51 million users and 4G network capacity limited to ~400 thousand users. Furthermore, sporadic Internet blackouts across the country bring uncertainty to the sector and negatively impacts Ease of Doing Business.

Imports of hardware, including mobile devices, face numerous challenges that rise there prices and constrain access to them. According to private firms, ICT is not a prioritized sector for imports licenses and foreign exchange allocation and as a result, they have more difficulties to import the equipment they need, such as longer waiting periods for imports licenses. Additionally, changes in regulation, measures to protect the local manufacturers (including the increase of tariffs for imported devices) and the lack of clarity for the lists of prices to set the duties lead intermediaries to transfer the costs and uncertainty to customers. All these factors increase costs and ultimately price for end consumers. Despite indications that consumer demand is high, limited access to devices and their consequent high prices have created a black market consisting of the re-selling of smuggled mobile phones.

Limited investments and a sub-optimal accountability have led to limited infrastructure. Limited capital availability due to high debt burden on Ethio Telecom as well as the government; lack of adequate foreign exchange reserves; absence of Foreign Direct Investment (FDI); and a state monopoly in the sector has slowed infrastructure development. The number of telecom towers deployed in Ethiopia is reported to be around 7000, which is inadequate to provide universal coverage and reliable services. Of the existing infrastructure, the network equipment is out-dated and consequently unable to extend reliable coverage or provide 3G/ 4G services.

An operational universal service fund, which can be leveraged for this purpose, is also missing. Several policy and regulatory gaps have also held back development. Currently, there is no operational universal service strategy, which sets coverage targets and holds providers accountable. Comprehensive tariff rules for telecom services, service quality norms and benchmarks, policy on customs and taxation for telecom equipment and devices are also missing or yet to be enforced.

Lack of effective technical roadmaps including for WoredaNet, the network designed to create connectivity across public institutions and become the central tool for E-Governance projects (including Ed-Tech and E-Health initiatives), have led to slow pace of infrastructure creation. WoredaNet is facing congestion, decrease of speed and degradation in its services. The main challenges are the limited bandwidth capacity and the lack of tools for monitoring its use that could inform a more effective

distribution plan. Currently, WoredaNet's capacity allocated to each Woreda is irrespective of demand or usage.

Current Initiatives

MInT is currently working on initiatives to improve bandwidth capacity framed within the National Backbone Roadmap. The ministry is also looking at a new method of rolling out connections to government institutions. Private sector engagements through PPP are being considered for project finance and development.

Ethiopia is embarking upon a series of bold reforms to accelerate development in the sector. The government is considering three primary reforms. These reforms are at various stages of development and the national telecommunications regulator, Ethiopian Communications Authority, has been set up to oversee and drive them -

- **Sector liberalization**: The government has announced its intention to liberalize the telecom sector by awarding licenses to two private players to start offering consumer services by 2020.
- **Infrastructure and service separation for Ethio Telecom**: Separation of infrastructure and service wings of Ethio Telecom is being considered to leverage cost and management efficiencies.
- **WoredaNet upgrade and modernization**: MInT is working on upgrading and modernizing the WoredaNet to create a fibre network backbone able to provide high-speed connectivity to public offices and institutions.

Addressing critical gaps

(i) Implementation and continuity of the reform of the sector

- High-level political involvement is needed to implement the reform of the sector and hence, involve international investors in the development of telecommunications infrastructure in Ethiopia.
- Develop comprehensive roadmap and regulations for the telecom sector, including for telecom sector liberalization.
- Identify current policy and regulatory gaps, which affect sector growth and take necessary action to bridge them.
- Establishing clear procedures for the entrance, regulation and evaluation of new players.
- Promote Foreign Direct Investment in the sector.
- Encourage PPP and private sector involvement to make efficient use of the current bandwidth capacity and increase the coverage of networks.
- Prioritise provision of reliable Internet by selecting zones to enable development of the IT industry and the attraction of FDI (e.g. the IT park).

(ii) Implementation of the Universal Service Fund

- Ensure affordability of Internet access to the most dispersed and vulnerable areas through the creation of a Universal Service Fund
- Develop a clear framework related to financing the scheme, resources management structure and targets
- Clearly define the profiles of the beneficiaries

(iii) Clear policy in relation to local vs. international devices access

- Ensure alignment between authorities and a clear framework to either develop the internal devices manufacturing or allow the imports of hardware under clear tariffs and procedures.

Recommendations

Internet & mobile phones

1. **Implementation and continuity of the reform of the sector**
2. **Implementation of the Universal service fund, owned by MInT and funded by private sector**
3. **Clear policy in relation to local vs international devices access**

5.1.2 Power

Current Status

Electricity access to households is on par with Sub-Saharan Africa but over 50% connecting informally. Electricity service in the country is currently accessible to only 44% of the population. This data indicates that Ethiopia is on par with the Sub-Saharan average (44.5%), but lower than leaders like Nigeria (54.5%) or neighbouring Kenya (64%). The last available national statistics show that around 33% of Ethiopians benefit from an on-grid electricity access, while 11% access to electricity through some forms of off-grid systems, such as generators, Solar Home Systems (SHS) and mini-grids. Electricity access data within Ethiopia evidences major differences between urban (96%) and rural areas (31%) and a high level of informality. Out of the estimated 6.9 million households considered as having access to electricity, only 3 million households have a legal connection, while 3.9 million are connected informally. This means that more than 50% of grid connected consumers need to be regularized.

Identifying key challenges

Unreliability of power is a key bottleneck to Ethiopia's digital readiness. Reliability of power supply remains very poor due to the high dependence on hydro resources for electricity generation, together with failures and maintenance problems on transmission and distribution networks. System losses are estimated at around 22%. Therefore, on global Reliability and Quality indices, Ethiopia scores zero, on a scale from zero to eight, in contrast to neighbouring Kenya and Rwanda, scoring four and five respectively. Recent works say that companies suffered from 200 hours per year of load shedding on average.

The power sector faces sustainability issues due to highly subsidized tariffs. Power tariffs in Ethiopia are currently very low around 4US¢$/kWh in relation to other African economies: US¢13 in Nigeria, US¢14 in Rwanda, and US¢21 in Kenya. Such tariffs are the result of subsidies from the Government and do not reflect the real cost of electricity services (generation, transmission and distribution). These imbalances between the cost of service and current tariff levels, together with the structural difficulties in efficient electricity billing and payments collection, puts high financial pressure on national utilities in Ethiopia. Consequently they are dealing with high debt costs and are yet to find a budgetary equilibrium.

New investments are needed to diversify national generation mix, extend electricity networks and support new customers' connections. However, too low tariffs will work as a disincentive for power investors limiting the attractiveness of the sector and the investments the sector needs.

Current Initiatives

Aware of the current power sector challenges and the threats that unreliable power supply poses to the economic development of the country, the Government is developing a roadmap to reform the sector to address access, technical and financial performance as well as private sector engagement. In addition, the following initiatives are underway:

PPP proclamation and reform of power generation procurement

With the introduction of a new framework the Government intends to support PPPs for new generation projects in the future, notably for renewable energy sources. Two solar projects have already been procured under this new regime and have been able to reach a high level of competition and lower tariffs (still to be officially announced). The Government plans to adopt the same procedure for the procurement of new hydro projects, and possibly also new wind projects.

The standardization of this procedure for the procurement of all new electricity generation projects may help the country to develop an important track record, which will enhance the attractiveness of the sector for private investments.

Utility restructuring and corporatization

The Government has announced its intention to restructure national utilities, probably starting with the unbundling of Ethiopian Electric Power (EEP) in two different entities: a generation company and a transmission system operator. Meanwhile, EEP and Ethiopian Electric Utility (EEU) are currently working on the restructuring of their debt to reach budgetary equilibrium. Supported by the World Bank, both utilities are exploring solutions to reduce the financial burden of their debt and increase transparency and accountability of their balance sheets. Those two measures are considered as necessary first steps in order to advance towards a potential privatization of the public utilities.

Ethiopian Energy Authority (EEA) is the sector regulator established in 2013. It is responsible for licensing all operators and service providers in the sector, issues certificates of competency, supervises the operations of licensees and reviews the national grid related tariffs submitted by a licensee and, submits its recommendation to government for approval. A Grid Code was developed in 2016 but has not been implemented. The code is designed to regulate the sector to facilitate private sector participation, enhance competition in the power sector and create an environment where Ethiopia could trade power with other African nations. The Code is designed to match similar codes in use in Africa and follows international best practice.

Issues impeding sector performance include the tariff structure as the cost of electricity production, transmission and distribution exceeds tariff revenue. The lack of metering between generation, transmission and distribution due to lack of meters at sub-stations complicates the issue. In addition, the lack of power purchase contract between EEU and EEP means payments collected from customers are arbitrarily divided 60% EEP and 40% EEU. Transmission and generation continue to be bundled together

in the same organisation, EEP, and planning remains uncoordinated among the different institutions. EEP is also highly geared and cannot meet debt-servicing obligations due to government using debt to fund the shortfall in tariff revenue against costs. Restructuring EEP and EEU, fully implementing the Code and requiring EEA to effectively regulate the sector would improve sector performance.

National Electrification Plan (NEP) 2.0

In 2017, the government launched the National Electrification Plan (NEP 2.0, an updated version of NEP 1.0)) to reach universal access by 2025. Specific targets include, 65% of the population to have access through the grid and 35% to have access through off-grid technologies (i.e. solar off-grid and mini grids). To scale-up the development of off-grid systems, notably mini-grids, the government wants to involve the private sector and has been open to PPPs in this field. As a result of the implementation of NEP 2.0, EEU has recently issued an invitation for bids to seek developers to deploy solar mini-grids in 25 villages, with the projects financed by the African Development Bank. Such tenders should also accelerate the issuing of mini-grid tariffs guidelines, on which the Government is working with EEU and EEA. This is considered as a cornerstone to ensure financial viability of mini-grids in the country.

Network Expansion

The expansion of the transmission network has been at the centre of a recent agreement between the Government and China. China has offered its help by lending close to USD2 billion to finance the expansion of transmission lines and substations to supply Industrial Parks (IPs) in Ethiopia. The already operational IPs are exposed to low quality power supply which undermines their productivity, and other parks are currently under construction as per the Government's strategy to further develop the national manufacturing industry. Reliability problems are mainly due to failures of Transmission and Distribution (T&D) networks which means that building new dedicated lines and substations to industrial park zones may solve or at least reduce these challenges

Addressing critical gaps

(i) Access: Investing in last mile connection upgrade

- Actively encourage the use of PPPs in electricity generation, transmission and distribution. Private sector crowding-in could be more financially sustainable than public utilities and represent an opportunity to diversify national generation mix, extend electricity networks and support new customers' connections.
- High-level political commitment from the Prime Minister, Minister of Finance and Minister responsible for the energy sector is needed to enhance a rapid reform and promote the involvement of the private sector.
- Address the sustainability issues in order to make the sector more attractive for private investors. This can be made by developing a transparent tariff structure, so they clearly reflect the cost components, and by implementing effective project management with defined timelines and allocation of responsibilities.

(ii) Inclusivity: Diversification of energy sources and off-grid solutions should be boosted

- Ethiopia's power generation mix needs to be diversified to reduce current dependency on hydropower.
- Encourage Independent Power Producers (IPP) projects on alternative energy sources and mini-grid and off-grid solutions.

Establish a targeted subsidies scheme

- The current tariff structure is not sustainable; however increasing tariffs would negatively affect the most vulnerable communities. Therefore, targeted subsidies should be considered.
- If government opens the sector to private players and determines that the tariff should be subsidised, it should consider a formal community service obligation framework where the costs of the subsidy are identified, and the provider of the subsidised service is compensated for the provision of that service through a performance-based contract.

(iii) Poor reliability: facilitate follow up and maintenance through measurement and monitoring systems

- Install meters at key points in the national network, including where generation connects to the grid, where the national grid connects to distribution networks and at Points of Sale (PoS).
- Manage the systems to protect prioritised zones from reliability problems such as for IPs
- The standardization of procedures for the procurement of all new electricity generation projects may help the country to develop an important track record.
- Separating generation and transmission would enhance transparency.

Recommendations

Power

1. **Access: Investing in last mile connection upgrade**
2. **Inclusivity:**
   - Diversification of energy sources and off-grid solutions should be boosted
   - Establish a targeted subsidies scheme
3. **Poor reliability: facilitate follow up and maintenance through measurement and monitoring systems**

5.2 Enabling Systems

Enabling systems are systems and platforms that allow remote verification and the creation of applications and services that ensure interoperability between them.

5.2.1 Digital ID

Current status

The most important form of identification is the Kebele ID card that is issued by local administrators in more than 16,000 administrative locations. The Kebele card confers legal identity as well as citizenship. It allows Ethiopian citizens to conduct almost any public or private transaction, including obtaining a passport, voting in an election or opening a bank account. It is very accessible and based on anecdotal

evidence. In many ways, it functions, as the de facto national ID yet there is no central registry, no way to ensure uniqueness, and an extremely weak credential that can be easily forged.

Identifying Key Challenges

The major identification programs for the different segments of the population - Kebele IDs, Tax Identification Number (TIN) cards, Passports, Driver's license, Productive Safety New Program (PSNP) cards, Birth Certificates – only cover less than half of the population and fraudulent versions of these documents are widespread.

As a result, every time an individual tries to access a benefit or service, they must undergo a full cycle of identity verification. Different service providers also often have different requirements in the documents they demand, the forms that require filling out, and the information they collect on the individual.

Such duplication of effort and 'identity silos' increase overall costs of identification, and cause extreme inconvenience to the individual. This approach is especially unfair to Ethiopia's poor and underprivileged residents, who usually lack identity documentation, and find it difficult to meet the costs of multiple verification processes.

Current Initiatives

Initiatives to issue a unique ID in Ethiopia are either nascent or have struggled to succeed so far. Some attempts to identify individuals with a unique number and systematize their information have been done for social programs (i.e. Ministry of Labour and Social Affairs). However, due to the lack of coordination and communication among authorities, individuals can end up with different "unique numbers" for different programs.

The introduction of a National ID was part of the Growth and Transformation Plan I (GTP I) as well as GTP II. After multiple attempts of National ID projects over eight years from 2010 to 2018, the Government has not been able to firmly establish a National ID. Currently, the Ministry of Peace (MoP) is setting the strategy for a National Digital ID.

A Digital ID program implementation has begun in Addis Ababa, which could potentially serve as a pilot for scaling up nationally subject to a review of its success. While there is consensus on the value of national ID, there is a heated debate on the risks and values of a national *digital* ID and each country must ultimately make a decision for itself. **A national digital ID can rapidly enhance a digital economy.**

Addressing Critical Gaps

In order to maximize developmental impact and minimize risks to privacy and exclusion, ID systems should—at a minimum—meet the ten *Principles on Identification for Sustainable Development,* shown below. These *Principles* have now been endorsed by over 25 international organizations, donors, NGOs, and private sector associations.

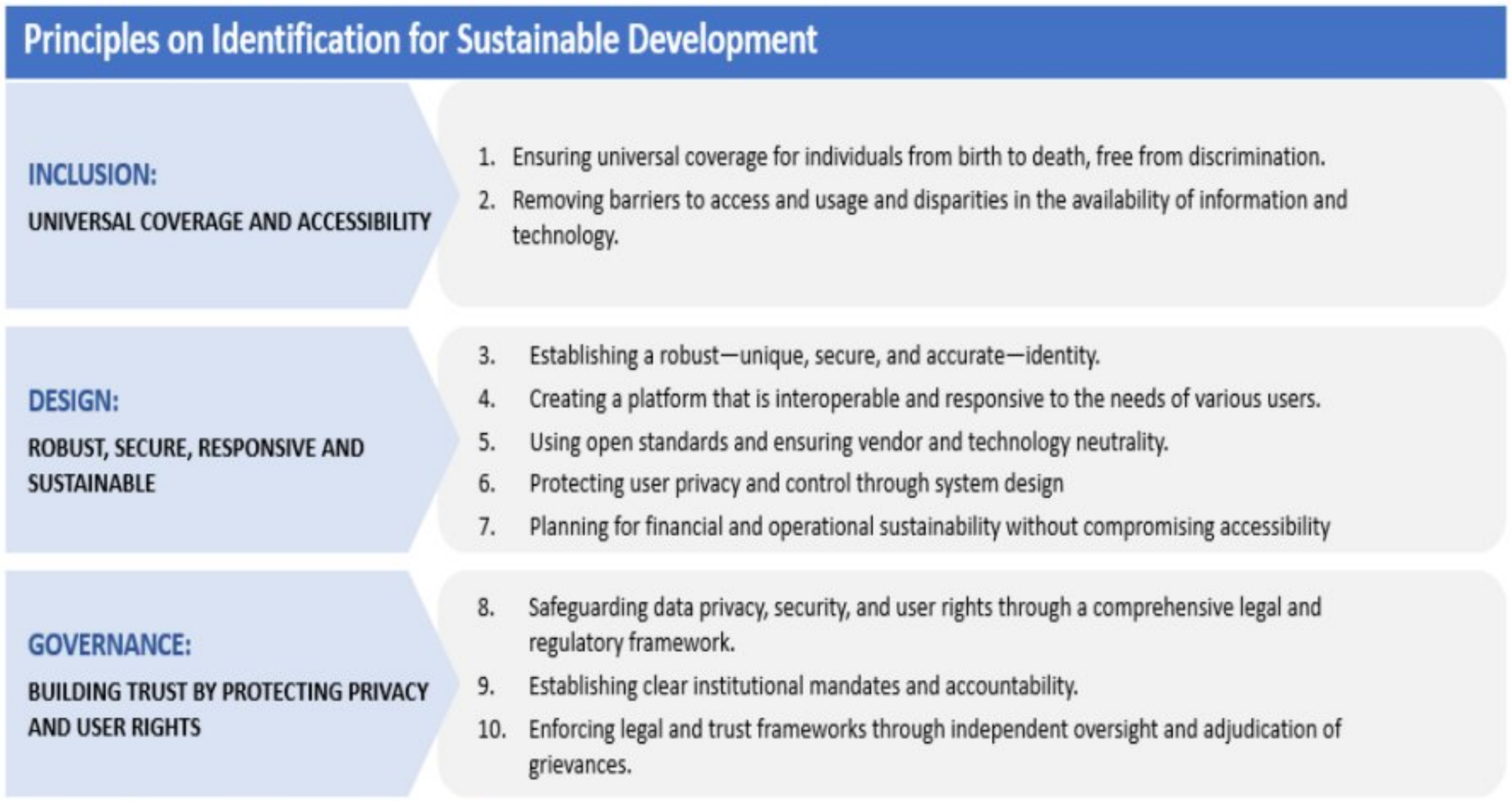


Figure 11: Principles on Identification of Sustainable Development;

Source: http://id4d.worldbank.org/principles

Box note: Best Practice Digital ID Considerations

Identity forms the basis of human activity and is a "right" - The benefits of a legal identity include gender equality, social protection delivery, financial inclusion, improved governance, safer migration, superior health delivery, enhanced and refugee child protection, reducing statelessness, and better access to land and property rights. The United Nations concept of "legal identity for all" supports the attainment of the SDGs and Agenda 2063: The Africa we want.

The rapid modernization and urbanization of African societies and the increasing sophistication of commercial transactions are increasing the need for legal identity. ID is required to obtain health services, tax certificates, travel documents, open bank accounts, exercise franchise, establish credit, etc. Further, conflicts in Africa have resulted in the internal displacement of large numbers of people, all of who need humanitarian assistance. Without legal identity, it has been difficult to deliver humanitarian assistance to them and to repatriate them to their communities/countries following the cessation of hostilities.

In a 2017 study, nearly one in five people without a bank account identified the reason as the lack of necessary identification documents. In low-income countries, **women disproportionately lack identification, which contributes to their higher levels of exclusion.** For example, 45% of women over the age of 15, lack identification in low-income countries, compared with only 30% of men.

Digital ID or the digitalization of identity is the unique identification of individuals through a digital channel. Digital ID can form the basis of a foundational ID as part of civil registration and on which other functional elements such as national ID, refugee ID, non-resident ID, etc.

can be "stacked" or built. By digitalizing ID and in particular using biometrics (fingerprint, iris, facial recognition, etc.) the ability to both positively and uniquely identify individuals becomes a reality in a way that paper-based identification cannot achieve.

Identity as a platform for development

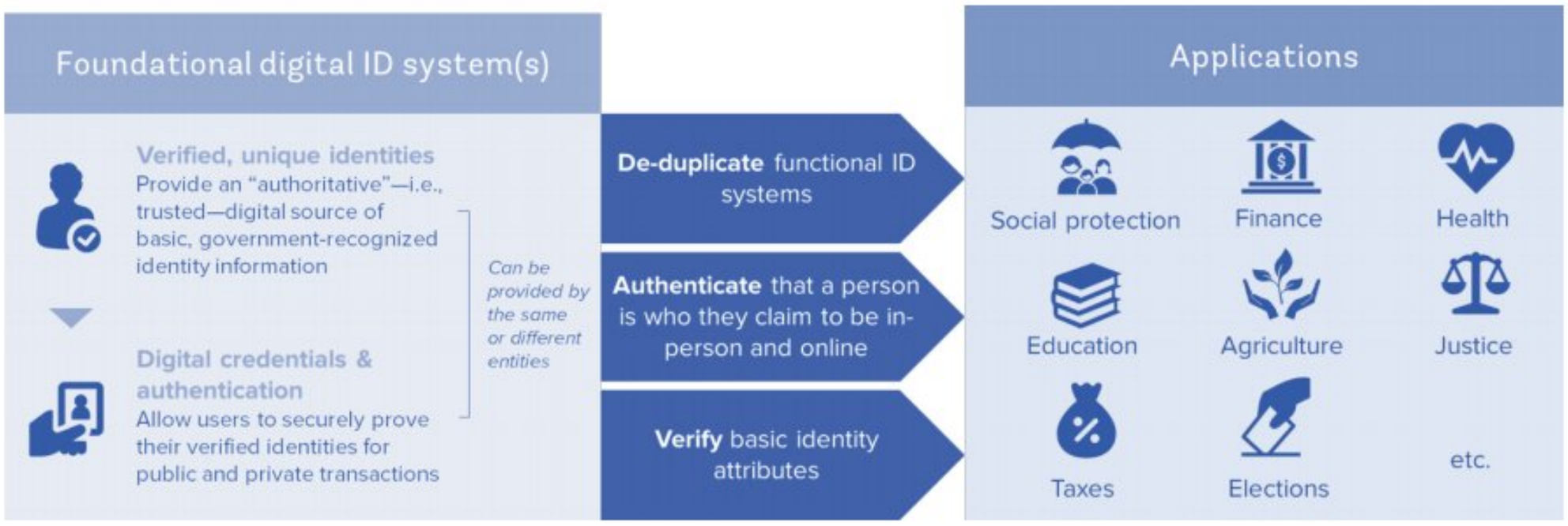


Figure 12: Identity as a platform for development

Recommendations
Digital ID

1 Adopt principles on Identification for Sustainable Development

5.2.2 Digital payments

Current Status

Ethiopia has significant room to expand in relation to the adoption of digital financial services. Although the adoption of digital mechanisms for financial transactions is still low in Ethiopia, it is higher than cards ownership. Thus, 12% of Ethiopians made or received digital payments during the last year, compared to the 4% of population that hold a debit card. Credit cards are not issued in Ethiopia and are used only by foreigners and diaspora (0.3% of population). However, while peer countries such as Kenya and Rwanda evidenced an increasing usage of mobile money as a solution for financial inclusion (73% and 31% of population), in Ethiopia it is less than 1% due to regulation restrictions.

Identifying Key Challenges

Low Internet adoption, low access to financial services and lack of awareness of existing digital financial services limit Ethiopians' use of digital payments. Limited infrastructure and unreliable connectivity affect the expansion of mobile financial services. This, together with the lack of awareness of these services and limited digital skills, exclude populations from their benefits. Additionally, customers do not see the added value of adopting transactional methods different to cash as the issuing of debit cards can take more than one month and inter-banking transactions are still

limited. Therefore, Ethiopians trust and rely on cash-based transactions as illustrated by the fact that accessing a physical cashier is the main withdrawal method (83%) compared to ATMs (1%).

Online payments are restricted due to lack of interoperability among banks and financial services. Interoperability for financial transactions is in a nascent stage and currently is limited overwhelmingly to analogue inter-banking transactions. These transactions require the customer to be physically present in the bank office as well as filling paper forms. While banks are implementing mobile wallet services – a positive step forward - they are also unfortunately lacking interoperability too. In order to access the current mobile wallet services, Ethiopians who already have a bank account need to open a parallel account, which would not be necessarily connected to each other.

Therefore, the combination of (i) lack of interoperability among and within banks and (ii) the public's lack of awareness and access to digital banking services has led to a very low adoption of digital payments. The few E-Commerce solutions in Ethiopia depend on 'cash on delivery' transactions.

Regulation has restricted the entry of players for mobile money. Mobile financial services are allowed only if they are linked to banks. Non-bank technology companies seeking to offer mobile payment systems are restricted to the role of "technology service providers", hence, mobile money is treated as a procurement system for banks and potential mobile money operators can only operate as providers of a technical system to a bank (similar to any other system, such as a human resources system). Therefore, mobile money players are not able to have direct access to the end customer and the unbanked population (65%) is automatically excluded of mobile wallets solutions, as they must be linked to bank accounts.

Restricted environment for innovation in financial solutions. Current regulation states that the 'technology service provider' would need to hand over all intellectual property to the bank within five years. This regulation is currently under review. The financial sector in Ethiopia is also restricted to national players, with restrictive entry requirements (i.e. shareholders) which are banking oriented, but are not suitable for the much smaller, much more agile and innovative fintech sector. This has made Ethiopia's regulatory environment comparatively restrictive for the development of innovative digital financial solutions.

Current Initiatives

Different actors are implementing mobile financial services but there is still space to grow: In a country of almost 110 million inhabitants, banks are offering mobile wallet solutions to almost 1 million previously unbanked clients (Dashen Bank, 700,000 customers and Commercial Bank of Ethiopia, 200,000). Non-bank companies – mBirr and HelloCash – have also been engaged but these operators are still comparatively small. HelloCash, has around 1 million customers and an agent network of 5,000, and mBirr currently has some 1.2 million customers and a network of some 6,500 agents.

There is a Retail Payment Interoperability Initiative led by Ethswitch; consultative sessions have taken place the objective is to achieve real time retail payments.

In response to the challenges, the regulatory environment is now rapidly changing in positive ways. In 2019, MInT produced a comprehensive all-in-one E-Transaction proclamation

encompassing digital services. This proclamation includes digital signatures, electronic receipts, consumer protection, and digital payments. The National Bank of Ethiopia has also amended its Banking Services Proclamation to include Digital Financial Service Providers as part of the institutions allowed to provide payments, remittances and insurance services. This significantly lowers the capital requirements and essentially allows smaller tech companies to offer mobile money services. In addition, it has recently released two draft directives namely a Payment Instrument Issuers Directive and an Agent Directive. These directives have been going through a consultative approach with relevant stakeholders - a critical first step in creating an enabling environment for online payments and mobile money. Another positive step is Ethio Telecom's recent public announcement to offer mobile money.

Addressing critical gaps

(i) Financial inclusion: Promote current financial services and evaluate the adoption of innovative solutions such as mobile money

- Increase access to the current financial services available (through traditional bank accounts and Micro-Finance Institutions (MFIs)) so people can register for Mobile Wallets.
- Alternatively, allow mobile money providers to access customers directly and ease the entry market requirements.
- Banks and MFIs to promote and ease procedures to get Mobile Wallet accounts. When new users open a bank account, Mobile Wallet accounts should be offered as part of the bank account.
- Promote the benefits of accessing the financial system through Mobile Wallets (i.e. by increasing the number of Mobile Wallet agents so people in dispersed areas don't have to travel to the bank branches).

(ii) Usage: Promote benefits of non-cash methods through Digital Ambassadors and encourage innovation in the banking system

- Identify Digital Ambassadors that educate users on the benefits of adopting non-cash methods. Create trust towards mobile wallets solutions taking lesson from Rwanda (See Annex II **for detail on Rwanda's experience)**
- Targeted pilots to promote digital payment adoption among specific user groups such as merchants, SMEs, and buyers.
- Encourage banks to accept start-ups and adopt innovative solutions for connecting and communicating the Ethiopian financial system.
- Encourage banks to automate operations related to inter-banking transfers.

(iii) Government Coordination: facilitation of digital payments by harmonizing crosscutting regulation

- Continuity on current initiatives to facilitate the development of digital payments.
- Early evaluation of the impact of initiatives to remove blockages for E-Payments.
- Establish a stable committee of stakeholders to follow up and evaluate status of development of the sector.

Recommendations

Digital payments

1. Financial inclusion: Promote current financial services and evaluate the adoption of innovative solutions such as mobile money
2. Usage:
   - Promote benefits of non-cash methods through Digital Ambassadors
   - Encourage innovation in the banking system
3. Government coordination: facilitation of digital payments could be blocked due to cross-cutting regulation

5.2.3 Cybersecurity

Cybersecurity is essential for a country that is preparing to introduce digital services, as the system needs to be protected from cyber threats.

Current Status

As Ethiopia is becoming more connected to the Internet, the threat of cyber-crimes is equally growing. The resources lost to various types of cyber-attacks are rapidly increasing throughout the world and in the African region. Cybersecurity costs rose from USD550 to USD649 in Nigeria, from USD175 to USD210 million in Kenya, and from USD85 to USD99 in Tanzania. Overall, the region's losses to cyber-crime rose from some USD2 billion in 2016 to some USD3.5 billion in 2017. Ethiopia is no exception. The Information Network Security Agency (INSA) counted 256 major cyber-attacks within a six-month period in 2017 alone (cited by EIU 2018).

Identifying Key Challenges

Ethiopia has not yet undergone a cybersecurity assessment. Without having done an assessment explicitly for Ethiopia, it is difficult to identify the most important vulnerabilities. Analysis suggests that the most important starting point for a country like Ethiopia would be awareness building.

Lack of cybersecurity experts of the calibre needed: Experts in the field are often difficult to find and even more difficult to employ permanently. Contracting external support may also entail a conflict of interest.

Lack of awareness among users. The single most dangerous devices today are USB sticks and government staff and private sector commonly use them. The moment an infected flash drive is connected to a computer, it can load malware up into the system without the knowledge of the user. Simple awareness training, or legislation against the use of unknown USB sticks could go a long way toward pre-empting cyber-attacks.

Shutting down the Internet as a measure for political stability can negatively affect the economy. The Internet can have a polarizing effect on democracies as self-reinforcing echo chambers emerge on both sides of debates. One technical risk is the evolution of social media platforms themselves, away from openly visible and easily observable Facebook groups, to publicly closed and end-to-end encrypted WhatsApp groups, which can be used for rapidly spreading incendiary political messages or facilitate illegal activities. However, regularly shutting the Internet down is obviously not a sustainable or suitably targeted countermeasure, as it comes at great economic disadvantages, not least for the ICT sector.

Cloud-based solutions require reliable Internet and significant investments. In other countries, State agencies have developed in-house cloud platforms. In Ethiopia, robust and stable Internet will need to be built before the cloud-based option is adopted (since cloud services can be accessed only via the internet).

No regulation of data centres. Many public and private organizations have setup in-house data centres. However, lack of regulation and certification of data centres results in poor management of these centres, especially physical security, that ensures data is protected from theft or damage from natural disasters and environmental factors, such as fires, floods, over-heating etc.

Additionally, in Ethiopia, it is currently difficult for SMEs to acquire such cloud storage services, as they need to be paid in US Dollars and often via credit card. Working with Cloud services includes automatic partnership with some of the world's most sophisticated cybersecurity experts who work for these global companies. In contrast, currently, Ethiopian companies have significant difficulty accessing such expertise. What is currently being done in Ethiopia is the provision of private cloud services over an Intranet (i.e. government networks such as WoredaNet).

Addressing critical gaps

(i) **Cybersecurity assessment: Conduct a coordinated, centralized assessment of Ethiopia's cybersecurity needs.**

Up to now this has not been a concern but as there is a plan to digitalize, an assessment needs to be conducted to identify potential vulnerabilities and prepare training materials and skilled experts that can work on ensuring cybersecurity. Thus, the need to:

- Engage development partners for the cybersecurity assessment
- Integrate current initiatives on cybersecurity assessments in the region

(ii) **Awareness building: establish a framework and roadmap for national awareness campaigns**

- Setting aside a cybersecurity budget for campaigns
- Awareness campaigns should be a layered scaffold, targeting the three important groups from the top down. At the top are the small group of government leaders, CEOs and board members of companies.
- Pre-emptively educating employees of companies and state agencies about the most basic cautionary measures for cyber threats
- "Test-educating" employees in tangible ways. One approach is for employers to hire cybersecurity experts to target their own employees directly with various phishing tactics.
- Employing or honing good relations with trusted cybersecurity experts.

(iii) Adopt and encourage cloud solutions and data centres

- Adopting an open data model sustained by cloud to tackle the vulnerability of physical servers in country (from cyber-crime attacks but also from natural disasters or accidents as well). Mainly,

cloud solutions outsource the maintenance and protection to some of the world's leading cybersecurity experts.

- Make the legal system open and attractive to certified data centre service providers capable to serve private and public organizations that need higher levels of performance, run mission-critical applications, or have strict compliance requirements
- Allow cloud-based solutions for the private sector and individual non-sensitive data. This is where a foreign-currency allowance for SMEs would help, or more granular regulation on the types of services that SMEs can more easily buy with foreign currencies.
- Support Software updates: extended usage of older software or software trial versions for government employees should be prohibited, since these trial versions do not include security updates. However, regularly updating software can be very expensive, especially since this can often only be done by regularly updating hardware as well.

Recommendations

Cyber Security

1. Cybersecurity assessment: Conduct a coordinated, centralized assessment of Ethiopia's cybersecurity needs.
2. Awareness building: establish a framework and roadmap for national awareness campaigns
3. Adopt and encourage cloud solutions and data centres

5.3 Digital Interactions among Government, Private Sector and Citizens

5.3.1 E-Governance

E-Governance (including Ease of Doing Business) can help expand service delivery (e.g. education, health) for hard to reach populations as well as improve effectiveness and efficiency of service delivery. It can help improve domestic revenue mobilization, which is a key macro-economic reform agenda by streamlining tax assessment, collection and compliance. Further, improving Ease of Doing Business to aid private sector development and attract more investments can be catalytic for the economy including for the sectors highlighted above. There is an urgent need to focus on removing bureaucratic bottlenecks to attract investments and improve SME effectiveness[47] - this is already a Government priority. Adopting digital solutions can help Ethiopia significantly improve its current ranking of 159 on the World Bank's Ease of Doing Business index[48].

Current Status

The Government of Ethiopia has progressed in its various E-Governance efforts, despite difficult human capital and infrastructural conditions. The UN's E-Government Development Index measures countries' use of ICT to deliver public services and consists of three sub-indices: human capital, infrastructure and government capacity to provide E-Government services. The OSI 2018 evaluates countries on a scale from 0 (lowest) to 1 (highest), Ethiopia scores 0.6, which is on par with

[47] Africa News. (2019, February 27). Ethiopia moves to boost ease of doing business. Retrieved from https://www.africanews.com/2019/02/27/ethiopia-moves-to-boost-ease-of-doing-business//.
[48] World bank (2019). *Doing Business 2019: Training for Reform.*

Kenya, higher than Nigeria (0.5), and just below Rwanda (0.7). Ethiopia is among the few countries in the world that scored higher on the OSI, than on the other indices. This suggests the Government of Ethiopia has progressed in its various E-Governance efforts, despite difficult human capital and infrastructural conditions.

For the overall E-Government Development Index (EGDI) score, the country also ranked 151 among 180 economies in 2018. Despite improvements in recent years, there is still room to improve as Ethiopia remains behind the global average score of 0.549.

Tax collection in Ethiopia is suboptimal at 11% of GDP, improving this to the African average of 17% could unlock significant public finance. Ethiopia's tax to GDP ratio is 37% below the average across Africa. If Ethiopia can match Africa's average tax to GDP ratio of 17%, an additional ETB 105 billion could flow into government coffers, ETB 18 billion for each percentage point improvement. With 70% of tax collections from only 800 large taxpayers, there is significant opportunity to generate additional revenue through formalization of medium-sized and small enterprises.

Tax revenue vs. GTP II targets for Ethiopia[49]

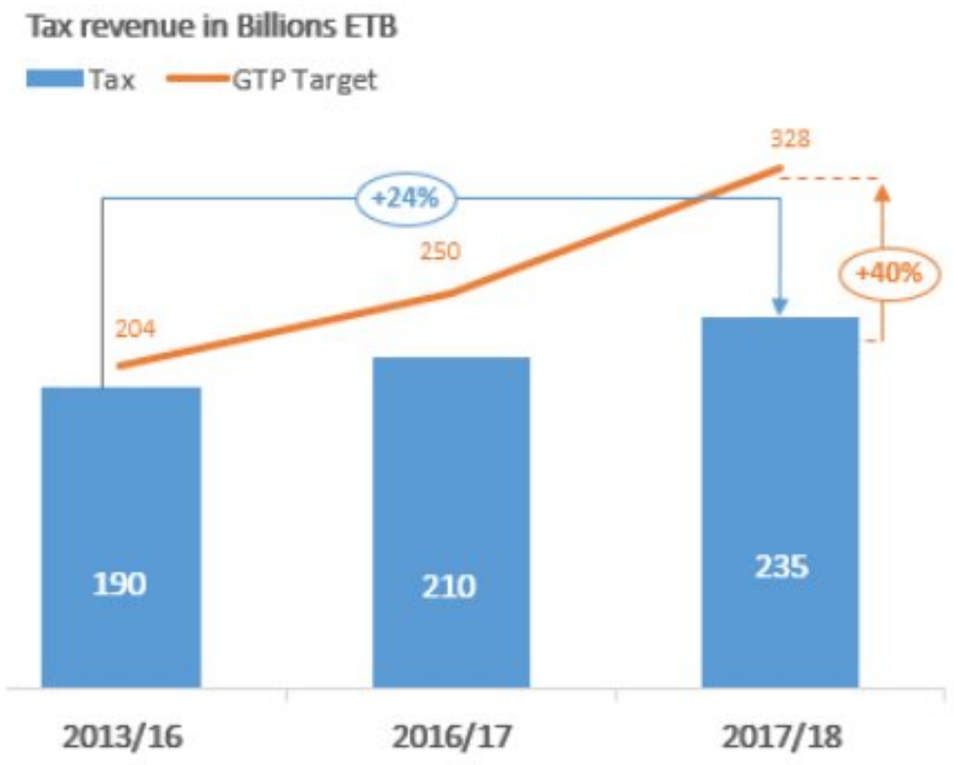


Figure 13: Tax revenue vs. GTP II targets for Ethiopia

Identifying Key Challenges

Gaps in infrastructure and human talent affect the delivery of E-Government services. Limited infrastructure and unreliable connectivity affect the consistent delivery of E-Services, limiting the expansion of the systems. Additionally, the lack of buy-in and uniformity among government institutions, and limited digital skills in both governmental employees and users can undermine the usage of E-Government services.

Despite the challenges, the government is determined to achieve its ambitious target of introducing and providing 278 E-Government services, from more than 25 institutions, by the end of 2020, up from the

[49] National Planning Commission, Ethiopia. (2016). *Growth and Transformation Plan II.*

current number of around 50 services. However, only six institutions have started offering E-Services. Misalignment between institutions, poor infrastructure connectivity, and limited digital skills are some of the challenges hindering full rollout of E-Services on the government's existing portal.

Tax collection in Ethiopia is increasing but constantly falls below targets. Ethiopia collected ETB 235 billion in 2017/18, a 12% increase from the previous year[50]. However, this achievement was 40% short of GTP target for the year due to several critical challenges[51]. These include increasing contraband trade, corruption (Ethiopia ranks 114 out of 180 economies in the Corruption Perception Index), lack of consolidated data on business operations, and cumbersome filing, payment, and compliances processes[52,53].

The current E-Tax architecture is under-utilised because poor integration between institutions involved in the taxpayers' journey delays transaction clearances, causing taxpayers to abandon using the E-Tax system and return to filing returns in-person and on paper. The absence of digital payment enabling regulations and systems is a major bottleneck to fully implement E-Tax, while the non-interoperability of banks has limited the potential of mobile payments as an alternative method for tax payments.

Over the past ten years, Ethiopia's Ease of Doing Business (EoDB) rank has been declining. The government undertook only eleven positive reforms since 2009, among which only one was a digital reform[54]. Ethiopia is ranked in the lowest quarter of economies at 159, a drop of 43 places since 2009 and the second lowest rank over the decade (Ethiopia was ranked even lower at 162 in 2018)[55]. From 2015 to 2019, EoDB scores for Ethiopia fell for seven of the ten indicators. Three indicators in particular – getting credit, protecting minority investors, and resolving insolvency – are especially underperforming with a score of 30 or less. The lack of improvements limits business growth, entrepreneurship, foreign exchange earnings, and job creation.

Current Initiatives

Government operation	Government services	Service delivery channels
• **WoredaNet (National Backbone Project) ***: Provision of connectivity for ministries and agencies for data sharing, and voice/video communication • **National Data Centre**: Consolidate all digital government service data and house ICT assets of various departments and agencies in	• **Agriculture services:** National Interactive Voice Response (IVR) system for farmers to access agronomy information, and E-Voucher system for farmers to buy inputs • **Trade and investments:** Public information for investors on labour costs, taxes, rents, transportation,	• **Online portal*:** Single-window portal aggregating around 50 government services across audit, foreign affairs, federal transport, and water/irrigation • **Phone (contact centers) *:** Proposal to provide 77 informational and 40 transactional services through call center agents and IVR

[50] National Bank of Ethiopia Annual Report. 2017/18.
[51] National Planning Commission Ethiopia. 2016. *Growth and Transportation Plan II*
[52] Interview with Ministry of Revenue. 2019
[53] Transparency International 2018. Retrieved from https://www.transparency.org/cpi2018
[54] Revision of Doing Business reports 2009 - 2019
[55] World Bank Group. Doing Business 2019. *Training for reform*

a secure environment

- **E-Procurement**: Common platform for ministries to transact based on demand aggregation, catalogue-based procurement, and dynamic pricing engine
- **Human Resource Management Service (HRMS):** Government-wide HRMS application to handle all functions related to leave, transfer, payroll, recruitment, etc.
- **E-Office**: To eliminate paper-based interactions even within the government, across different agencies
- **Management Information System (MIS) and data collection**: Tourism, Health, and Education ministries use MIS to gather data and inform decision-making

and other requirements of starting a business. Transaction services such as application/ renewals of investment permits

- **Tax:** Public information on tax rules and laws, including transaction services such as filing returns and online payment
- **Urban services (in Addis Ababa):** Online registration of construction permits and public information sharing regarding property transitions and information on property disputes
- **Passport and visa:** Services relating to application/renewal /replacement of passport, visa for foreign nationals

technologies. Some services (e.g. 8181) have started operation

- **Mobile-based gateways*:** Proposal to provide 77 informational and 40 transactional services through SMS-based technology, and mobile applications. Some ministries have already started using the gateway (e.g. secondary school exam results notification)
- **Government application store**: More than 50 applications are developed and can be accessed from http://www.app.gov.et/
- **Kiosks and community service centres*:** Provision of services such as information dissemination and acceptance of service requests

*These initiatives are under development with dedicated expansion plans in future phases.

Figure 14: Current E-Government initiatives deployed by the Government of Ethiopia

Addressing critical gaps

(i) E-Government services need to be designed with stronger coordination across government

- Introduce clear data sharing policies so ministries can share relevant information
- Strengthen existing open data initiatives
- Raise awareness of the different E-Government services available to citizens
- Implement a Human Centred Design approach to new service design to improve e-portals so they better respond to both users needs and increase government employee's efficiency

(ii) Leverage digital technology to reduce regulatory complexity and costs around EoDB and E-Tax initiatives

- Create an enabling legal and system framework for E-Services
- Design electronic portals and piloting enablers such as E-Payment, E-Signature and E-Receipts.
- Fully integrate E-Services with end-end transactions.

Recommendations E-Governance

1. **E-Government services need to be citizen centric and designed with stronger coordination across government**
2. **Leverage digital technology to reduce regulatory complexity and costs around EoDB and E-Tax**

5.3.2 E-Commerce

E-Commerce adoption can help improve market access (domestic as well as international) for Ethiopian businesses including SMEs, while delivering improved convenience for citizens. It can also help attract significant investments in the country and drive innovation. The Government recognizes this potential and has included it accordingly within the National Economic Reform Agenda, clearly stating its commitment to develop the sector. The Prime Minister in a recent interview mentioned that launching services such as E-Commerce where African peers like Kenya are ahead is more important than focusing on the state monopoly to earn cash[56]. Currently, Ethiopia ranks 141 on the E-Commerce preparedness index, far behind other Africa nations such as Nigeria (75), South Africa (77) and Kenya (89) but focused efforts can drive rapid progress[57].

Current Status

E-Commerce of all types has had a slow start in Ethiopia, significant potential for growth exists.

E-Commerce in Ethiopia is in its nascency with very few organizations present. However, the opportunity for growth is significant, Ethiopia has the second largest population on the continent and a large domestic market. Recognizing this potential, the Government of Ethiopia has reiterated its intention to support E-Commerce development at multiple forums. Even though Ethiopia scored 17.8 out of 100 on UNCTAD's B2C E-Commerce Index 2018 (lower than Nigeria, 54.7; Kenya, 46.2; Rwanda, 32.7), instances of informal E-Commerce activity over social media channels such as Telegram exist, indicating a strong growth potential. Ethiopian products such as coffee, textiles, and leather goods enjoy a favourable reputation internationally, and E-Commerce could open new markets for local SMEs. Further, capturing just 0.5% of the domestic retail online could create close to 100,000 jobs.

E-Commerce growth in Africa and Ethiopia's standing on E-Commerce preparedness index[58, 59]

[56] Pilling, D. (2019, February 24). 'My model is capitalism': Ethiopia's prime minister plans telecoms privatization. Retrieved from https://www.ft.com/content/433dfa88-36d0-11e9-bb0c-42459962a812.
[57] UNCTAD (2018). *B2C E-Commerce index 2018: Focus on Africa*
[58] UNCTAD (2018). *B2C E-Commerce index 2018: Focus on Africa*
[59] McKinsey Global Institute. (2013). *Lions go digital: The Internet's transformative potential in Africa*.

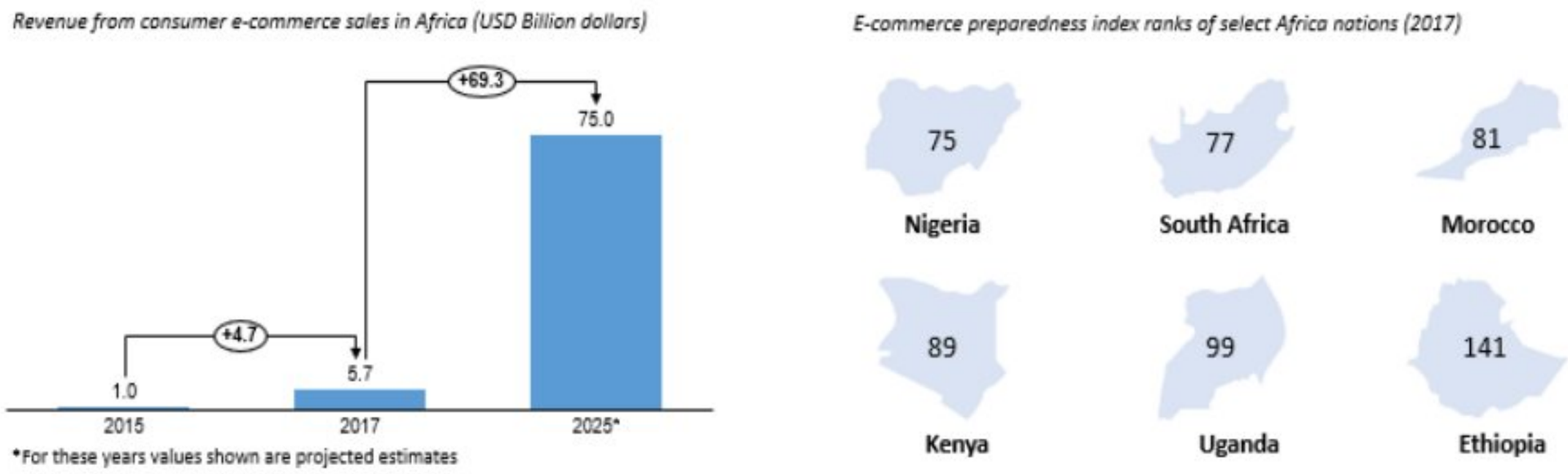


Figure 15: E-Commerce growth in Africa and Ethiopia's standing on E-Commerce preparedness index

Identifying Key Challenges

Under-developed financial and logistics sectors are critical challenges to the upscale of E-Commerce services. Ethiopians have far less access to modern financial services than most regional peers. This particularly stifles E-Commerce opportunities. Thus, in Ethiopia, credit cards are not distributed by local banks at all and debit card ownership as a percentage of the population is much lower than in Kenya (38%) or Nigeria (32%). This hampers any form of digital payment, which is crucial for well-functioning E-Commerce platforms. Additionally, regulatory restrictions limit interoperability between different banks and digital wallets, resulting in increased design and operational costs for E-Commerce.

Logistics infrastructure to support E-Commerce operations at scale (i.e. warehouses and modern fulfilment centres, poor roads) is missing while the postal service enterprise lacks capacity to serve E-Commerce value chains. Arbitrary customs processes such as unclear duty structure and large clearance times further increase costs for E-Commerce operators and affect their ability to scale.

The lack of a national addressing system represents significant transactional costs. An addressing system could serve as a geographical and human database to be used for increasing efficiency in service delivery, facilitate mapping and improve urban management. In urban centres like Addis Ababa, last mile delivery is a labour intensive task, as personnel must call people for directions typically more than once before locating the address.

Regulation and coordination have critical roles in removing blockages and decreasing bottlenecks. A comprehensive policy and legal framework to support E-Commerce has been drafted (i.e. the E-Transaction proclamation). This is yet to be approved and until it is, a lack of clear policies regarding E-Commerce regulations (e.g. E-Receipts, product returns, restrictions on foreign investment, and weak intellectual property laws) lead to an uncertain operating environment and adversely affect entrepreneur morale.

Additionally, communication among authorities is still a key point to address. Due to the crosscutting nature of the sector, restrictions, banning and unpredictable regulatory changes are challenging the consistent growth of E-Commerce business in Ethiopia.

Low internet adoption and unreliable service is a key challenge to address for E-Commerce to be developed in Ethiopia

Low Internet adoption, limited availability of high-speed Internet, and a lack of secure servers adversely affect user and business ability to adopt E-Commerce. This is further affected by high data and hardware costs (high net import tariffs). Businesses also highlight poor telecom reliability and service as a cause of frequent disruptions to their operations.

Current Initiatives

Initiatives launched by the Government and other actors are building momentum for the sector. MInT has prepared a comprehensive proclamation to govern E-Transactions, E-Receipts, E-signatures while the National Bank of Ethiopia (NBE) has prepared regulations to promote digital payments by allowing private sector players to offer digital financial services, set up interoperable payment systems and bring more transparency to the sector. Logistics oriented initiatives also include Ethiopian Airlines investment in warehouses near Addis Ababa Bole International Airport and the forging of a partnership with DHL Global Forwarding[60] to offer modern logistic services which can help E-Commerce operators, while the Universal Postal Union (UPU) has signed an MoU with the government to set up an E-Commerce focused logistics hub in the country. E-commerce start-ups are also beginning to emerge as well as key international partnerships. The Government of Ethiopia has been enhancing commercial missions and high-level meetings with key E-Commerce players in China, in order to create linkages for knowledge sharing and collaborative initiatives towards the development of E-Commerce and the SMEs in the country.

Addressing critical gaps

(i) Policy action: Enact clear policies, regulations and standards to enhance a conducive environment for E-Commerce development

- Implement and follow up the E-Transaction proclamation written by MInT
- Evaluate and implement the legal recognition of e-receipts
- Consider Public Key Infrastructure (PKI) measures to authenticate identities and secure electronic communication for online transactions
- Stronger coordination and communication between authorities to prevent the introduction of regulation that impedes E-Commerce companies
- Dynamic design of regulation and methods for customs to tax new products accessing the market.

(ii) Logistics: Public and Private players need to work together to build a robust logistics sector

- Focus efforts to assess infrastructure and policy gaps. Government needs to prioritise development of the road network, so products can be transported across the country.
- Attract investment to create the necessary infrastructure (warehouses and fulfilment centres).

[60] DHL and Ethiopian Airlines confirm African joint venture. (2019, March 29). Retrieved from https://www.aircargonews.net/freight-forwarder/dhl-and-ethiopian-airlines-confirm-african-joint-venture/.

- Build and strengthen capacities of local logistics players such as the Ethiopian Postal Service Enterprise (EPSE) to serve domestic and cross-border E-Commerce in the country.
- Establish joint workstreams to build upon the detailed diagnostic and implementation framework proposed by Universal Postal Union (UPU) for the E-Commerce hub to leverage synergies.

(iii) Implementing a model of national addressing will be a critical foundational step to creating the right enabling environment for Ecommerce

- A nationwide systematic postal system needs to be developed. Private players could be included to implement digital solutions (e.g. What3Words)
- Choosing the best approach for a national addressing system will need to be the decision of the government, after conducting a thorough assessment of alternatives. MInT and EPSE are best placed to start the assessment process.

(iv) E-Commerce marketplaces: Unlock high impact market opportunities through targeted programs to attract capital and build marketplaces.

- Existing E-Commerce marketplaces lack capital and capacity to adopt or scale. Championing high impact value chains by attracting investments to them can bring much needed capital and know-how, as well as accelerate E-Commerce adoption. This would require carefully evaluating market opportunities and business models, building the platforms, and scaling them.

Annex III provides additional recommendations, which was identified in the E-Commerce gap assessment conducted by the Universal Postal Union (UPU).

5.4 The Digital Ecosystem

5.4.1 Finance

Current Status

Access to finance has consistently remained one of the top business constraints for enterprises and is a critical facilitator to dynamism across the economy. 40% of the enterprises included in a World Bank Enterprise survey identified access to finance as a major constraint to development, far ahead of any other constraint (e.g. constraints related to electricity, tax rates etc.) Accordingly, Ethiopia scores low on ease of getting credit (15) in relation to its regional peers Kenya (90), Nigeria (85) and Rwanda (95). It also underperforms more unstable African countries such as Chad (30) or the Democratic Republic of the Congo Domestic (30).

In Ethiopia, access to credit for the private sector is very low (12%) compared to countries such as Kenya (29%) and Bangladesh (48%).[61] Therefore, the sources of finance for SMES in Ethiopia are overwhelmingly personal savings or networks. Official sources like banks represent less than 1%; credit associations represent 2%; and microfinance institutions 5% [62].

A more recent survey also referenced by the Homegrown Economic Reform Agenda, identifies Access to Finance as one of top three constraints – appearing this time after foreign exchange regulation and Corruption.

Figure 16: Constraints to doing business in Ethiopia

Identifying Key Challenges

Regulatory constraints are the main challenge for financing the development of a digital ecosystem

Restricted sectors and limitations for foreign ownership block investment for the nascent IT sector and limits economic externalities like learning and exposure for local players and labour force. Since Ethiopia is one of the few countries, which has, until very recently, limited its financial sector to local ownership, potential external investors can only enter the Ethiopian market through joint ventures with local firms who need to set up separate entities. While on-going liberalization, privatization and related regulatory changes are being completed; foreign-owned firms are blocked from operating in a variety of other sectors, such as telecommunications and logistics. Until recently, for example, this list also included advertisement, which essentially kept industry giants like

[62] TBI analysis based on *Main Features of manufacturing MSEs in Ethiopia, AACCSA & DAB DRT (2014) Survey of Ethiopian Manufacturing Firms*

Google and Facebook from setting up local branches in Ethiopia. Other sectors continue to suffer from an injection of capital and knowledge.

Current regulation impedes investors from hedging bets and facilitating investment in higher risk innovative areas. Once in the market, it is impossible for investment companies in Ethiopia to write off losses in some investments against wins in others. For a high-risk-high-return industry such as tech start-ups, this is extremely limiting, as the rule of thumb states that for every successful tech start-up at least 10 others fail. Investors that carry 100% of their losses on every one of their 10 tech start-ups that fails but are fully taxed on their wins from the one that succeeds are unlikely to remain in Ethiopia (especially since neighbouring countries such as Kenya and Rwanda have much more investor-friendly solutions).

There is a trade-off between protecting local players versus enabling rapid learning and exposure to new services to the local market, as well as enhancing the labour force. While there can be good reasons to protect the local economy from international entrants, there is a major trade off with enhancing learning and exposure that creates both greater demand for such services and a more skilled labour force. This is particularly true in the rapidly evolving digital economy.

High collateral requirements from banks as well as restrictions for foreign investment means local digital companies are starved of funding

Tech start-up funding in Ethiopia is among the top-10 in Africa. But investments in the frontrunner countries are around 10 times higher than in Ethiopia. Kenya (USD156m), Nigeria (USD138m), and Tanzania (USD111m), all significantly outperform Ethiopia (USD13m).

New enterprises find it difficult to access loans from banks, due to unrealistic collateral guarantee requirements and high interest rates. These requirements from the banks are partly a consequence of lack of reliable credit scoring data, which would otherwise enable financial institutions to more fairly estimate risk and thus offer loans at a lower interest rate to more businesses. The minimum amount allowed to invest in Ethiopia recently reduced from USD200,000 to USD150,000. However, this amount of initial investment is still excessive and difficult to absorb for tech-based start-ups. Additionally, restrictions on foreign ownership make it difficult for IT companies to get strategic partnerships with international players as a way of funding.

Foreign exchange regulation affects the attractiveness of investing in Ethiopia. If wins are to be made in Ethiopia, the current foreign exchange regulations make it extremely difficult for investors to repatriate their investments (i.e. paying dividends to their shareholders abroad).

Rigid regulations, bureaucratic procedures and difficulties in accessing foreign exchange contribute to higher costs associated with starting a company, especially in innovative sectors. Thus, some Ethiopian firms decide to operate from Kenya or Rwanda instead.

Accordingly, Ethiopia scores low in global rankings such as the 2018 Global Entrepreneurship Index (rank 110 out of 137), which in turn also affects it attractiveness as an investment location. Technology entrepreneurship usually requires larger early-stage risk capital and higher skilled human capital than other forms of entrepreneurship to undertake R&D and to develop a competitive product or service. Lack

of a supporting regulatory environment and limited access to risk capital hampers the development of innovative ideas at early stages.

Whereas regulation makes it difficult to access international sources of finance, lack of awareness and understanding keeps local investors away from the digital ecosystem. The limited understanding of IT business among local investors and financial institutions has led them to focus on more stable and tangible businesses such as real state. As a result, there are no domestic venture capital firms, and few other investment firms could take on the role of incubators.

Government advises there is funding available but enabling access to these funds is a challenge. The lack of knowledge among entrepreneurs around accessing funding through available sources such as the innovation fund, Development Bank of Ethiopia and other investment channels should be addressed to improve the access to finance.

Commercial banks have been requested to provide funding to MSMEs focusing on ICT as part of the National Job Creation efforts but are challenged on disbursement. They are looking at alternatives to tangible and intangible assets such as Intellectual Property or the ability to provide clean loans base on business plans.

Ethiopia's gender gap in access to finance seems to be much larger than in other African countries. In the World-Bank survey published in 2015, the percentage of firms that identified access to finance as a major constraint was below 19% if the top manager was male, and above 49% if the top manager was female. Regional differences also exist in submission and acceptance rates for loan applications, with firms in larger cities, Addis Ababa, Dire Dawa and Mekelle having better access, as these are the country's businesses centres.

Current Initiatives

Despite of the comparative lack of access to finance, technology entrepreneurship is gaining momentum in Ethiopia through an initial wave of technology start-ups and supporting initiatives from the government. Ethiopia's 80 technology start-ups managed to raise USD 11 million as of 2018[63] through private equity and venture capital investors registered in Ethiopia (e.g. Novastar, Cerberus, RENEW, etc.).

Crucial for this has been the establishment of around 15 start-up incubators and accelerators[64] (e.g. BlueMoon, IceAddis, Start-up Factory). They provide a plethora of supporting services to technology start-ups. Recognizing the immense potential of technology entrepreneurship, the government has launched multiple initiatives such as the national incubator program, the national innovation fund, annual ICT expo, science cafes, and innovation hubs, among others.

The Ministry of Innovation and Technology has an influential role in the technology entrepreneurship space, not least through the national business incubator program and several other associated initiatives. MInT has a mandate to develop a thriving nationwide

[63] Partech Africa Fund. (2018). *African technology start-ups.* Retrieved from https://partechpartners.com/.
[64] Ethiopia's Technology ecosystem map. Retrieved from https://briterbridges.com/ecosystem-maps

technology start-up ecosystem and has kick-started several initiatives. Among these, the national incubator program and national innovation fund have gained significant momentum, with the establishment of an in-house business incubator in Addis Ababa and through the mobilization of ETB 100 million for the innovation fund. Going forward, MInT is keen on learning from incubators around the world, which have adopted successful models and offer valuable lessons for Ethiopia. Incubators across India, Myanmar, Kenya, Rwanda, and South Korea have been identified in achieving desired outcomes as a result of certain key success factors.

MInT is working with the Commercial Bank of Ethiopia in identifying mechanisms to disburse loans to projects that have gone through MInT due diligence. This will allow tech entrepreneurs to access their starting fund.

Addressing critical gaps

(i) Encourage local investors to invest in the ICT sector

- Matching investments by the government to ensure an equal share of risk liability between the private sector and the government will encourage greater interest from the private sector. Provision of zero return capital by the government can ensure higher rate of returns for private investors, compensating for long timeframes for materialization of returns.
- Introduce credit referencing for companies seeking finance.
- Create a revolving fund that small local investors can contribute towards, and expand the governments existing revolving fund to include the ICT sector.
- Recognise IP as an asset for valuing a company, so business owners can use it as collateral when seeking investments.
- Directing the National Innovation Fund to provide early-stage risk capital to start-ups can unlock tech entrepreneurship.
- Exploring other funding mechanisms for provision of risk capital through private sector investors, diaspora, and multilaterals can ensure development of innovative ideas.
- MoTI should enable easy access to investor permits and ensure smooth regulatory compliance for investors; should coordinate the overall innovation fund program; facilitate partnerships between various incubators, investors and start-ups; and provide strategic and implementation support as needed.
- Promote local venture capital specifically for the IT sector.
- Create awareness among local investors about the IT sector, and the associated investment opportunities.
- Private sector investors including angel, venture capital, and private equity players, should be leveraged to provide seed and growth funding, while facilitating technical and business expertise towards fund disbursement.
- Existing incubators should provide access to high quality pipeline of early-stage technology-start-ups.

(ii) Consider policy changes to facilitate more international investment

- Emphasize the need to further lower the minimum investment threshold for international investors in the ICT sector.
- Introduce regulation for venture capital investors.

- Introduce a national stock exchange so investors can buy shares in Ethiopian companies
- Allow investors to write off losses against gains made in their investments.
- EIC should ease regulations on foreign investments and facilitate linkages to international investors and the diaspora.
- To counteract Ethiopia's current low rankings in investment climate, creating early successes by showcasing market potential can improve trust and credibility. Strong assurances from the government, along with reforming the most problematic regulatory policies can improve investor confidence.

(iii) Public-Private engagement to mitigate the lack of direct access to finance

- MInT has already kick-started engaging with the private sector (e.g. ICT ET conference in August 2019). Going forward, MInT should build on this progress to understand needs and undertake reforms suggested by the private sector. As the private ICT sector matures and evolves to undertake cutting-edge innovation, Ethiopia could consider adopting a regulatory sandbox approach towards policy making.
- Private sector ICT companies should identify their needs, challenges, and policy priorities to provide inputs to the government as needed. Private section ICT associations (e.g. ICT ET) should consolidate inputs from the broader ICT sector and liaise with the government for overall enhancement of the ICT industry.
- To avoid biased policy formulation, favouring certain companies and excessive lobbying efforts, government must engage with as many stakeholders as possible to develop a holistic view of the industry. In addition, maintaining transparency on all key policy decisions by setting up an open forum to address grievances and to provide rationale behind key decisions.
- Investment in a credit history and scoring system will better enable banks to make better strategic bets and thus reduce risk of loans. This will then allow banks to offer lower cost loans to more businesses.
- To ensure government agencies will undertake initiatives supportive of the private sector, ensure a top down push for engaging with the private sector coupled with rigorous monitoring by a special taskforce to ensure government departments actively undertake initiatives and reforms suggested by private sector.

(iv) Incubation: Circumventing the lack of direct access to finance

- MInT has established an in-house business incubator offering basic services such as administrative support, office space, and other infrastructure facilities. Refining the incubator to provide services centred around start-up needs will ensure maximum value add for start-ups. This will require careful evaluation of start-up requirements by engaging with various start-up founders and partnering with relevant stakeholders such as private investors, and technical advisors to provide the required services.

Recommendations

Finance

1. Encourage local investors to invest in the ICT sector
2. Consider policy changes to facilitate more international investment
3. Public-Private engagement to mitigate the lack of direct access to finance
4. Incubation: Circumventing the lack of direct access to finance

5.4.2 People

Digital skills are crucial to enable current and future workers (especially youth) to meet the employment requirements of a digital economy, embrace innovation and help maintain a competitive edge. For the general population, digital skills enable meaningful access to government (through E-Government portals), businesses (through E-Commerce), and society (through social media). Lack of digital skills can adversely affect competitiveness and employment creation in the economy. Ethiopia currently ranks 112 out of 149 countries on the World Economic Forum's digital skills index[65].

The Government of Ethiopia aims to create three million jobs in 2019/20 and expand this to 14 million jobs in five years [66]. MInT's objective to create 300,000 digital jobs by 2020 will require looking beyond improving basic digital literacy to meet this target. This section focuses largely on literacy and digital skills as key enablers for digital transformation.

Current Status

Investments in health and education have shown significant improvement but Ethiopia lags behind peers in literacy. This is a major limiting constraint for an inclusive digital transformation. Ethiopia has a healthier population than ever before. Health indicators are growing at a steady rate of 2.5% per year. Health outcomes in Ethiopia have experienced significant improvements in recent years, with under-five child mortality rate dropping rapidly, from above 11% in 2005 to below 6% in 2017. At the same time, the number of births per woman in Ethiopia is dropping equally rapidly: from 7 in 1995 to 4 in 2016.

However, as is typical across sub-Saharan Africa, education outcomes have not experienced the same positive benefits. While the number of literate people in Ethiopia has increased significantly from 33% in 2005, to 52% in 2013 (population aged 10+), this is still low when compared to other African countries – Nigeria's is at 70%, Rwanda's is at 71%, and Kenya's is at 79% (WEF 2018, based on UNESCO 2017). Literacy levels are a key metric for measuring a people's digital readiness.

Ethiopia's largely rural population entails that agriculture and rural development are key for inclusive digital transformation. Ethiopia is the second most populated country in Africa, with the latest census recording 105 million citizens. 80% of Ethiopia's population live in rural areas, which is substantially higher than the Sub-Saharan African average. As **agriculture and rural development** play a significant role in Ethiopia's economic development, they feature heavily in ensuring inclusive digital transformation.

At five times larger than the average Africa country, there is also a large absolute urban population. Ethiopian cities and their large pool of urban workers will be crucial for breaking into new sectors, as this demographic is important for Ethiopia's comparative advantage in newly emerging urban sectors, such as IT-enabled services. Ethiopia's typically better-educated urban population offers an opportunity for IT enabled service exports. Yet, while agriculture employs the bulk of the population,

[65] World Economic Forum (2018). *The Global Competitiveness Report 2018*.
[66] Retrieved from https://fanabc.com/english/2019/07/ethiopia-plans-to-create-14-million-jobs-in-five-years/

Ethiopia's comparatively large pool of university graduates in urban areas provides a foundation for breaking into the IT-enabled services export sector.

Africa in general, and Ethiopia in particular, can make use of its comparative advantage in young workers. It is estimated that two million youth are entering the domestic labour market every year. For Ethiopia, as a large and particularly low labour-cost country, this trend has distinct implications. It plays a key role for Ethiopia's development trajectory within the global economy and is of vital importance for Ethiopia's development strategy.

Digital skills play an important role as enablers of digital transformation and job creation. According to the Global Competitiveness Index, Ethiopia ranks at 112 from 138 economies on the metric of digital skills among population[67]. Ethiopia lags behind peer countries such as Kenya, Ghana and Rwanda and indicates there is much that needs to be done to improve digital skills[68].

Identifying key Challenges

Gaps across the framework need to be addressed to enable the growth and development of digital skills. Firstly, the low access to electricity and poor connectivity is a fundamental barrier that negatively affects digital skills improvements, even in urban areas. To compound this, international online training providers (e.g. Coursera) are difficult to access due to lack of payment methods to register, even for those with access to power and connectivity.

Significantly lower female literacy rates and large regional disparities are a critical challenge for inclusive development. Women are some 20 percentage points below men, i.e. the +15 literacy rate for Ethiopian women is 29%, whereas it is 49% for men. This range, too, is significantly lower in neighbouring countries (Kenya's +15 literacy rates for women and men are 74% and 84% respectively).

Great regional disparities exist in literacy levels. A 2014 survey found that while fewer than 10% of the Somali adult population could read and write, more than 80% of Addis Ababa residents were literate. This shows that different preconditions exist for different Pathways for Prosperity.

The overall low literacy rates are particularly problematic when using digital technology for improving the productivity of rural agricultural sectors, as most farmers are not literate so are unable to leverage technologies available.

Developing digital skills requires a basic level of literacy. However, Ethiopia has a low literacy rate at 52%[69]. As most technology interfaces require knowledge of English, poor knowledge of English has created a barrier towards developing digital skills. There is also a lack of demand-driven

[67] World Economic Forum 2018. *The Global Competitiveness Report.* Retrieved from http://www3.weforum.org/docs/GCR2018/05FullReport/TheGlobalCompetitivenessReport2018.pdf
[68] World Economic Forum 2018. *The Global Competitiveness Report.* Retrieved from http://www3.weforum.org/docs/GCR2018/05FullReport/TheGlobalCompetitivenessReport2018.pdf
[69] United Nations Educational, Scientific and Cultural Organization. 2017. Retrieved from http://uis.unesco.org/country/ET

training programs and consumer facing apps to create critical demand for digital skills in both urban and rural Ethiopia.

Education institutions face a multitude of challenges exacerbating the digital skills shortage. The **lack of standardized digital training and skills assessment systems** throughout the whole education system has resulted in students with poor digital skills. There is also a lack of entrepreneurship education in the educational curriculum at all levels except TVET. Generally, tertiary education is geared largely towards creating employees rather than potential job creators.

TVET graduates currently experience high unemployment rates, with only 60% employed one year after graduation. A low-quality perception of TVET institutions has resulted in reluctance among the industry to provide apprenticeship and internship opportunities to TVET students. Consequently, often companies prefer to train workers on the job rather than employ TVET graduates.

Apprenticeship and internship opportunities are limited, especially in the digital field; so many students are forced to seek non-digital work experience. Linkages between TVET institutions and industry are weak, reducing employment and apprenticeship prospects; and besides engineering degrees, where a work placement is mandatory, internships for university degrees are not common.

Despite increases in university enrolment, higher education curriculums have not evolved to match the needs of the workplace, where there is demand for graduates to possess digital skills and an entrepreneurial mindset encouraging graduates to become job creators. Currently there are not enough jobs for the number of youth entering the labour market each year.

For job seekers, access to information about jobs and vacancies is fragmented and costly. Public employment agencies provide job matching, career counseling, skills training and data collection services, but implementation is poor. Most job seekers use public sector central job boards, particularly in the urban areas, but accessing these job boards involve high travel costs.

Current Initiatives

MInT has established a separate directorate; Technology and Knowledge Expansion and Management Directorate, to introduce digital programs and help 70% of Ethiopians become digitally literate by 2025.

In order to achieve this goal, MInT is designing digital literacy programs around training, device penetration and relevant local content. Considering the existing momentum of this initiative, the following section will analyse global learning's focusing on digital literacy program.

There are many Ed-Tech services that target teachers, empowering them with new teaching methods, so through digital technology learners' benefit from improved educational outcomes without ever directly needing to use a mobile device. These technologies can be used to overcome human capital challenges in even the most challenging environments where there is a severe lack of infrastructure and health and education outcomes are low, and if applied effectively Ethiopia can leapfrog the traditional development challenges of insufficient resources and infrastructure.

The Government of Ethiopia is investing heavily in tertiary education, allocating 48% of the total education expenditure to tertiary education (2015). Universities are a key mechanism for up skilling the workforce, and as such University enrolment has risen with a 9% CAGR between 2012 – 2018, reaching 902,000 enrolled students in 2018; three times higher that the TVET enrolment rate.

Ed-Tech is currently niche but offers opportunity to leapfrog in educational attainment and provide more tailored thus more inclusive opportunities. Ed-Tech is better as an augmentation to good quality traditional teaching, rather than a replacement.

Ed-Tech initiatives active in Ethiopia range from interventions targeted at learners to those targeted at teachers, or the usage of data analytics for informed decisions in teaching or training. The sector has shown great promise in terms of the reach, with some app-based products reaching up to 20,000 users. However, beneficiaries have largely been confined to urban settings, with some donor-funded projects targeting areas outside of the capital, and even refugee camps. Those interventions operating outside of urban areas tend to use SD card or satellite connection to deliver content, to overcome connectivity challenges.

Addressing critical gaps

(i) Ed-Tech: The government should support and cultivate the Ed-Tech sector

- Invest in teacher training and development to ensure teachers are digitally skilled and play a prominent role in ICT integration in teaching and learning
- Invest in local talent, so Ed-Tech content can be created that is culturally accessible and in local languages.
- Invest in data gathering on ICT access and usage by both learners and students, across all levels of education.
- Encourage access to Massive Open Online Courses (MOOCs) and Open Educational Resources.

(ii) Education: Primary and Secondary education should prioritise basic literacy and digital skills

- Revisit teaching curriculums and integrate digital literacy within formal and informal systems
- Promote technology-supported learning and provide teachers with digital training and tools.
- Incorporate entrepreneurship education-to-education curriculum at all levels.
- Re-orientate education and training around both cognitive and non-cognitive skills.
- Recreate and expand short-term training programs on digital literacy for ICT-enabled jobs.
- Develop and promote a range of online services that are relevant to citizens across the full spectrum of digital skills.

(iii) Universities: Universities should better prepare graduates for the realities of the domestic labour market, where there is a job deficit and new employment opportunities are demanding digitals skills

- Promote internships as part of university degrees.

- Introduce more business education at universities, to promote entrepreneurship and to nurture a mindset that graduates can be job creators, and not just employees.
- Establish business incubators at universities to support entrepreneurial students with their business ideas.
- Invest in digital skills to prepare university graduates for innovative ICT sectors such as data science and analytics, and software development.

(iv) Digital skills: designing job-oriented digital skills programs

- Design and pilot a holistic digital literacy initiative to ensure impact of the device distribution program.
- Create a job-oriented digital skilling program and accompanying job-matching platform to help build digital skills, create jobs, and digitalize the economy.
- Identify key digital skills relevant to the jobs market and design practical training program.

(v) Job Seekers: Adopt new tools and models to address the skills mismatch

- Leverage data to strengthen linkages between job seekers and employers, in both the formal and informal sectors.
- Strengthen linkages between TVET institutions and industry, to encourage more apprenticeship opportunities.
- Promote job seeking agencies that adopt innovate models and provide wider ecosystem support, such as providing access to loans, credit, and training courses.

(vi) Government Employees: Provide targeted digital skills trainings for relevant government employees

- Government should employ more ICT specialists and graduates.
- Promote a culture within the government of continual learning, to ensure that staff remain up skilled within the ever-evolving ICT sector space.
- Government should procure high quality ICT sector training for regulator and front-line staff.
- Government regulators should be provided with regular and on-going training to be kept up to date with the most recent trends within the ICT sector, covering topics such as: data sharing, cybersecurity, E-Commerce, digital payments.
- Government front line staff (tax officers, customers officials) should be provided with training to better understand government regulation.

Recommendations

People

1. EdTech: The government should support and cultivate the EdTech sector
2. Education: Primary and Secondary education should prioritise basic literacy and digital skills
3. Universities: Universities should better prepare graduates for the realities of the domestic labour market, where there is a job deficit and new employment opportunities are demanding digitals skills
4. Digital skills: designing job-oriented digital skills programs
5. Government Employees: Provide targeted digital skills trainings for relevant government employees

5.4.3 Policy & Regulation

A vibrant technology entrepreneurship ecosystem requires enabling policies and regulations that embrace innovation and allow tech entrepreneurs to thrive. This will be crucial to drive innovation and economic growth in the 21st century economy. Such an ecosystem can catalyse development of solutions across sectors and drive greater adoption of 'digital'. On the other hand, failure to build such an ecosystem can lead to low level of innovation, fewer businesses being started and ultimately low adoption of digital products and services. Ethiopia currently lags far behind peer nations in both breadth and depth of the technology start-up space - it is home to only 50 start-ups, far less than to Kenya and Rwanda, despite them being home to only a fraction of Ethiopia's population.

Current Status

Governments, world over, are struggling with regulating the ICT sector and its dynamic, disruptive nature, and Ethiopia is no exception to this. Policy and regulatory challenges to digital transformation in Ethiopia are mainly a result of traditional regulatory approaches that do not match innovative sector trends, compounded by the lack of adequate stakeholder consultation in policy development.

A recent IFC report on the ICT sector in Ethiopia highlights that Ethiopia's business and regulatory environment, and uncompetitive IT infrastructure, creates major obstacles for investors. The Sector Scan also suggests that the targeting and promotion of the ITeS (IT enabled Services) sector provides the opportunity for a "Ethio Tech" or "Digital Ethio" type country brand that can reposition Ethiopia in front of the global IT business players and align local stakeholders with the digital transformation agenda.

A lack of legal and regulatory framework has been one of the contributing factors to Ethiopia's slow growing innovation and entrepreneurship ecosystem. To address this challenge the Government of Ethiopia is currently drafting a Start-up and Innovation Business Act. This Act will impact innovation by creating a knowledge base, inclusive prosperity, and job creation. This will build upon the entrepreneurship strategy adopted in July 2019, which aims to establish an ecosystem conducive to sustainable, green, social and inclusive entrepreneurship. Such regulation will empower individuals to become job creators and innovators that will produce new solutions to ensure that Ethiopia is not left behind in the 4IR.

Identifying Key Challenges

There is limited understanding of the ICT sector and how to regulate it. Regulators and policy makers have limited understanding of global digital trends and their regulatory requirements. This has resulted in policies that do not provide for sector necessities; regulators that cannot enforce the correct laws; and implementing institutions that cannot meet the requests of sector players.

Traditional regulatory approaches that do not match dynamic nature of sector limiting innovation. Regulatory approaches for the ICT sector in Ethiopia have not evolved with sectoral developments. Regulations are designed with an 'allowed sectors/areas' approach, as government has a pre-defined list of areas that are eligible for business license. This model requires the government to be one-step ahead of all technological developments to regulate accordingly, which is not in-line with the nature of the ICT sectors dynamism and unpredictability. Business models in the digital age are

challenging traditional business sense and hence, are difficult to predict. This has resulted in a preventive regulatory environment in Ethiopia that hinders innovation and business development in the ICT space.

Lack of consultation and communication in policy and regulation development, resulting in an unpredictable operations environment. Policy and regulation development in Ethiopia are characterized by limited consultation with relevant stakeholders, particularly the private sector. Regulations developed in such a way have limited practicality and may, at times, be counterproductive - as evidenced in a few customs regulations and transportation bans.

A related challenge is the lack of adequate communication and advance notice prior to roll out of regulations. Businesses are not provided advance notice before the levying, or lifting of regulations, limiting their ability to plan. **This has resulted in an unpredictable regulatory environment disincentivizing investment and innovation.**

A good example for these is the banning of motorcycles in the city of Addis Ababa without prior public consultation, resulting in the disruption of business operations.

Doing business within the ICT sector is challenging, as the full life cycle of businesses faces bottlenecks.

1. **Out-dated intellectual property regulations that do not match ICT sector developments** have resulted in entrepreneurs innovations being copied without due compensation. This has wider impact to the country, as potential innovators will opt out of creating new solutions for fear of having their hard work being copied at no cost.
2. **ICT sectors are not well defined in the trade license listing.** The government's pre-defined list of areas that are eligible for business license has meant that potential businesses must navigate through the regulations to find how best they could fit into the existing systems. For example, most of the incubators in Ethiopia are registered as 'consulting companies' due to the lack of proper business category for incubators. Although the Ethiopian Investment Commission has recently moved from the old model to a 'restricted list' model, this is yet to be reflected in other trade regulations.
3. **High foreign investment entry barrier limiting potential investment in early stage start-ups.**
   Ethiopia's investment policy provides for a minimum foreign investment cap of USD 200,000. However, for most ICT sector companies USD 200,000 is an amount that would be raised during the latter stage of a company's development. Early stage start-ups require much less investment to keep the operations going. (See figure below). The lack of adequate finance during the earlier stages of IT Business development has resulted in the failure of numerous start-ups.

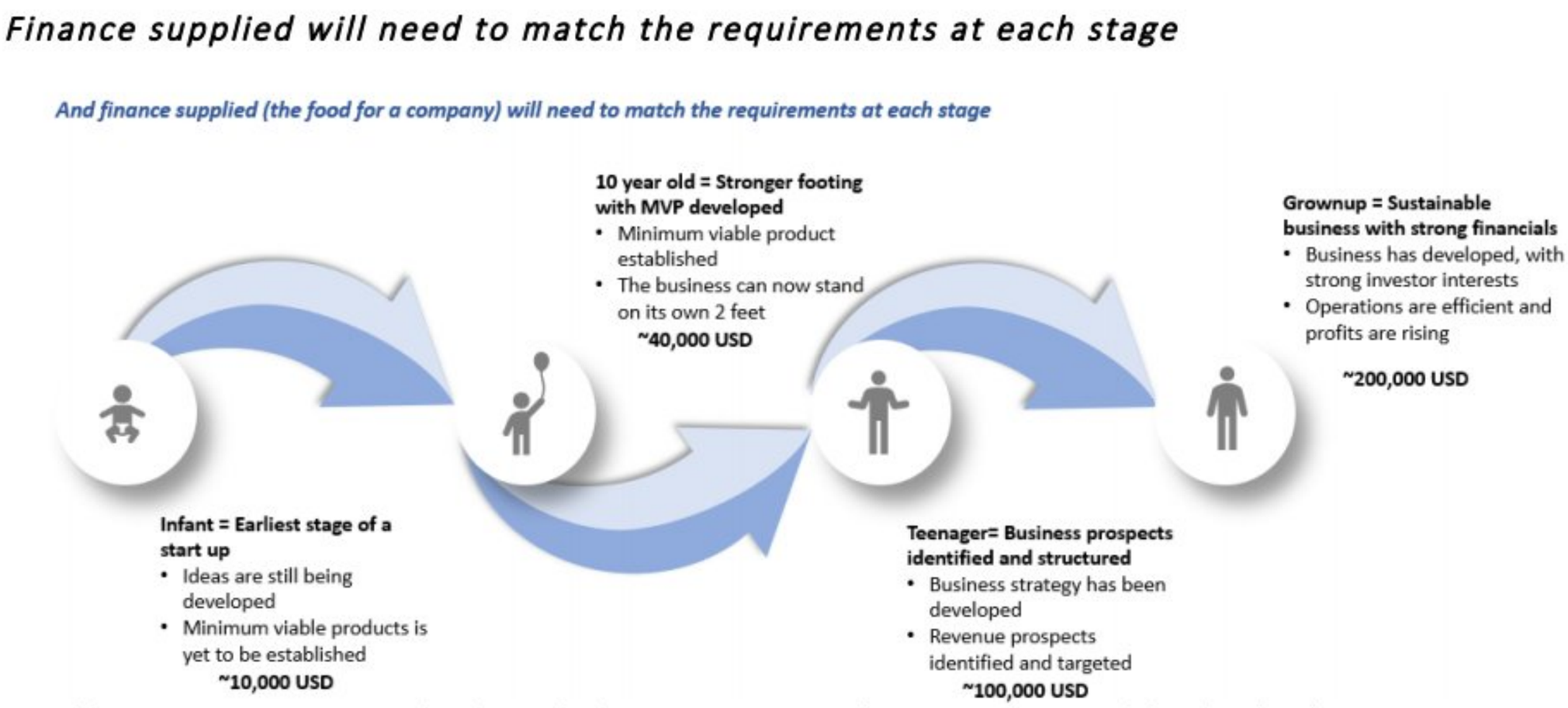


Figure 17: An illustrative life of a Start-up business

4. **ICT service exports are misunderstood, resulting in ICT sector companies being wrongly categorized as 'Net Importers'**. In the digital age, services are inherently intangible nature due to lack of physical proof. The intangibility of the ICT services export is yet to be recognized by the Ethiopian customs authorities. This has far reaching implications for companies in Ethiopia, where incentives are provided for export-oriented companies.
5. **Limited access to foreign exchange has severe impacts for ICT sector businesses and has forced numerous start-ups to relocate out of country. I**t is particularly challenging for ICT sector businesses to hire international talent working remotely or in country, and to pay for international IT services, such as Microsoft licenses, webhosting. These restraints limit the ability of the ICT players to transact globally. Current foreign exchange regulation allows for special foreign exchange accounts for specific companies that meet the government's incentive requirements. This regulation enforces a separate account system for companies; one for Ethiopian Birr and another for foreign currency. However, many ICT companies have reported various challenges with accessing the money in the foreign exchange account, encouraging numerous Ethiopian start-ups to relocate operations to Kenya so they can triangulate the payments and avoid the foreign exchange constraints in Ethiopia.
6. **Uncertainties on taxation of imported IT equipment due to out-dated customs equipment list, results in operational difficulties.** Importing equipment into Ethiopia requires the item to be categorized in one of the many categories on the customs log and which determines the import tax to be levied. This log is not frequently updated; resulting in modern IT equipment not fitting into existing categories. Such uncertainties hinder smooth business operations and contribute to higher transactional costs for business owners.
7. **High import taxes, resulting in expensive equipment that are hard to access by start-ups and the general public.** IT equipment, such as laptops, servers and printers as

well as components such as boards and chips are not prioritized for 'input incentive schemes', resulting in a full suite of import taxes being levied on the equipment. This results in expensive IT equipment, limiting the possibility of start-ups to utilize the latest technology. A second layer for this challenge is that equipment is expensive for the general public to access; this limits the potential demand for the ICT businesses, stifling sector growth.

8. **Exiting an investment in Ethiopia is very challenging due to the foreign exchange regulations.** Investing in ICT start-ups is a very risky endeavour, with more failures that success. For this reason, investors in the space tend to invest early in the development of a company where the cost is low and then exit the business if it flourishes. This means that investment needs to flow in and out of the economy regularly. However, profit repatriation is not allowed for foreign investors exacerbating the challenge to attract investment.
9. **Generic and outdate public procurement regulations challenge successful implementation of government funded digital initiatives.** Goods and services procurement for government institutions is governed by the public procurement law (Proclamation No. 410/2004 as amended by Proclamation No. 872/2014). This law is applicable to all goods and services and lacks contextualization to the ICT sector. There are 2 main challenges associated to this:
    a. The Proclamation enforces annual renewal of service procurement through a re-tendering process. Although useful to ensure fair distribution and avoid monopoly contract ownership, this does not match ICT service provision context where some services could last for multiple years.
    b. Amendments to contracts are limited to a maximum cap of 25% of initial contractual value. This does not match the complexities of ICT service procurement, which may require long-term contracts and maintenance costs higher than original costs, such as the operation and maintenance of a software system that a government agency may purchase.
10. **Lack of data sharing policy limits data use efficiency.** Lack of data sharing regulation has created inefficiencies in data analysis and digital initiative roll out across various public and private sector players. On the public sector front, ministries and agencies are forced to collect and analyse data separately, resulting in operational redundancy. Private sector players are also keen to work with other sector players or with public sector institutions to use data and enable innovative solutions to challenges being faced.

Addressing the gaps

i. **Adopt Innovative and consultative approach to policy making**

- Set up an innovation office at the Ministry of Innovation and Technology
- Develop a detailed regulatory sand box regulation.
- After the adoption of the sandbox regulation, morph the innovation office into necessary components of the sandbox, as illustrated in the graphic below.

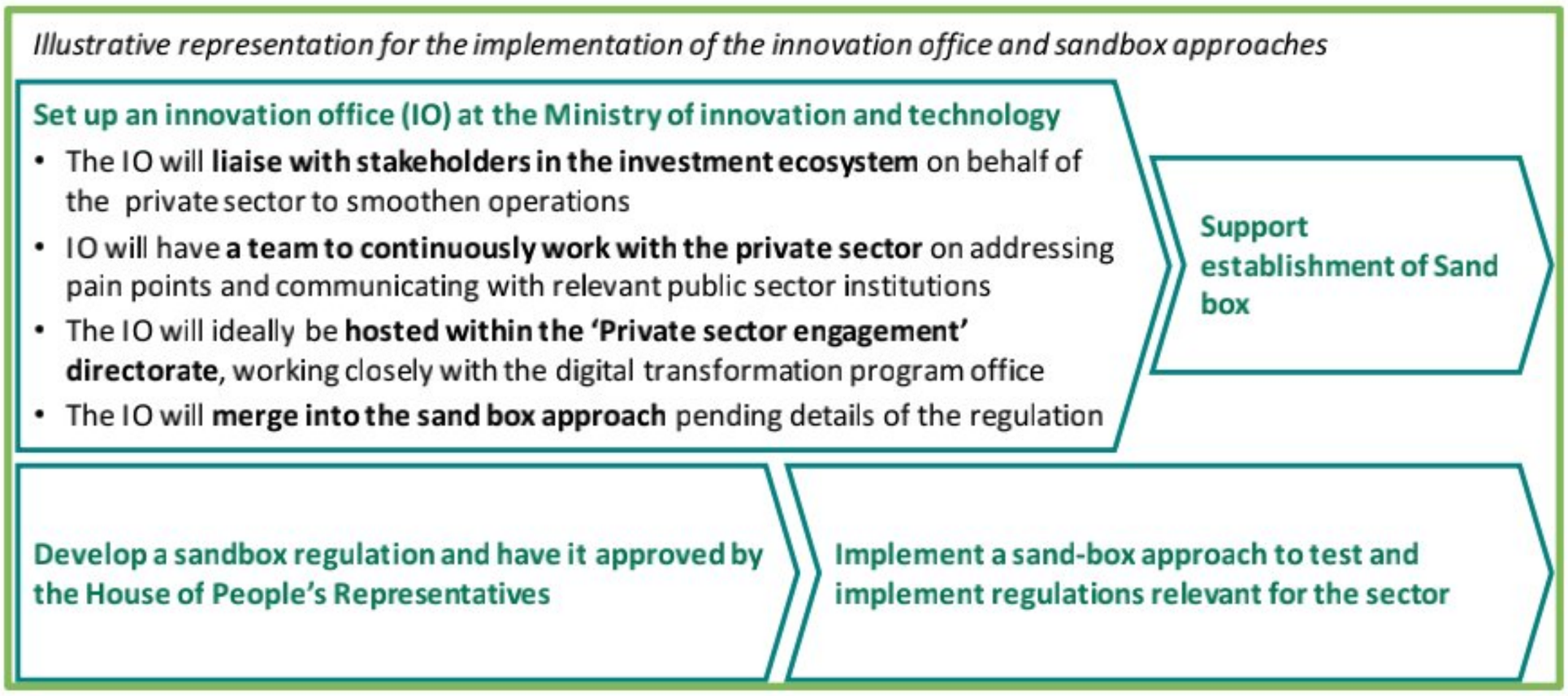


Figure 18: The process of implementation for an innovation office and sandbox regulatory approaches

ii. Stronger government coordination and multi-stakeholder engagement

- Strengthen the linkages and alignment with ministries, government agencies and among government-industry-academia leading different sector strategies.
- Engage Civil Society Organizations and community groups to ensure consultation with various types of end users to learn from their experiences on the ground and ensure practical policies are developed.

iii. Design new regulatory solutions for investment and doing business

- Update IP regulations to meet requirements for the ICT sector, including provisions for IP registration as an asset.
- Update trade license registry to incorporate new ICT sector business categories including Incubators, accelerators, E-Commerce players, ride hailing applications, etc.
- Revise trade policy from 'approved' list to a 'restricted' list.
- Revise foreign investment minimum entry cap to reflect start-up investment requirements.
- Roll out a capacity building and awareness creation program with institutions that directly work with ICT sector players, including customs.
- Update customs import item list with ICT equipment categories.
- Consider promoting IT equipment use through import tax cuts.
- Resolve the exit barrier challenge for investment will require a broader strategy at a national level looking at the foreign exchange regulation the government is following. This strategy will not attempt to address these challenges.

iv. Revise public procurement regulation to meet ICT sector requirements

- Shift from a capital expenditure base (where agencies buy distinct goods such as computers) to the operating expenditure model, to take advantage of scalable, on demand services (such as public cloud infrastructure or data analytics).
- Create a centralised digital marketplace, for government agencies, to simplify the current multi-layered procurement systems

Large amount of funding has been approved by the IMF, World Bank, development partners, and European Investment Bank for the economic reforms. Out of the USD 10 Billion required close to 80% is close to being secured and that will go towards stabilizing the macroeconomic, structural and sectoral reforms.

Recommendations

Policy & Regulation

1. Adopt Innovative and consultative approach to policy making
2. Stronger government coordination and multi-stakeholder engagement
3. Design new regulatory solutions for investment and doing business
4. Revise public procurement regulation to meet ICT sector requirements

Key Imperatives for Digital Readiness

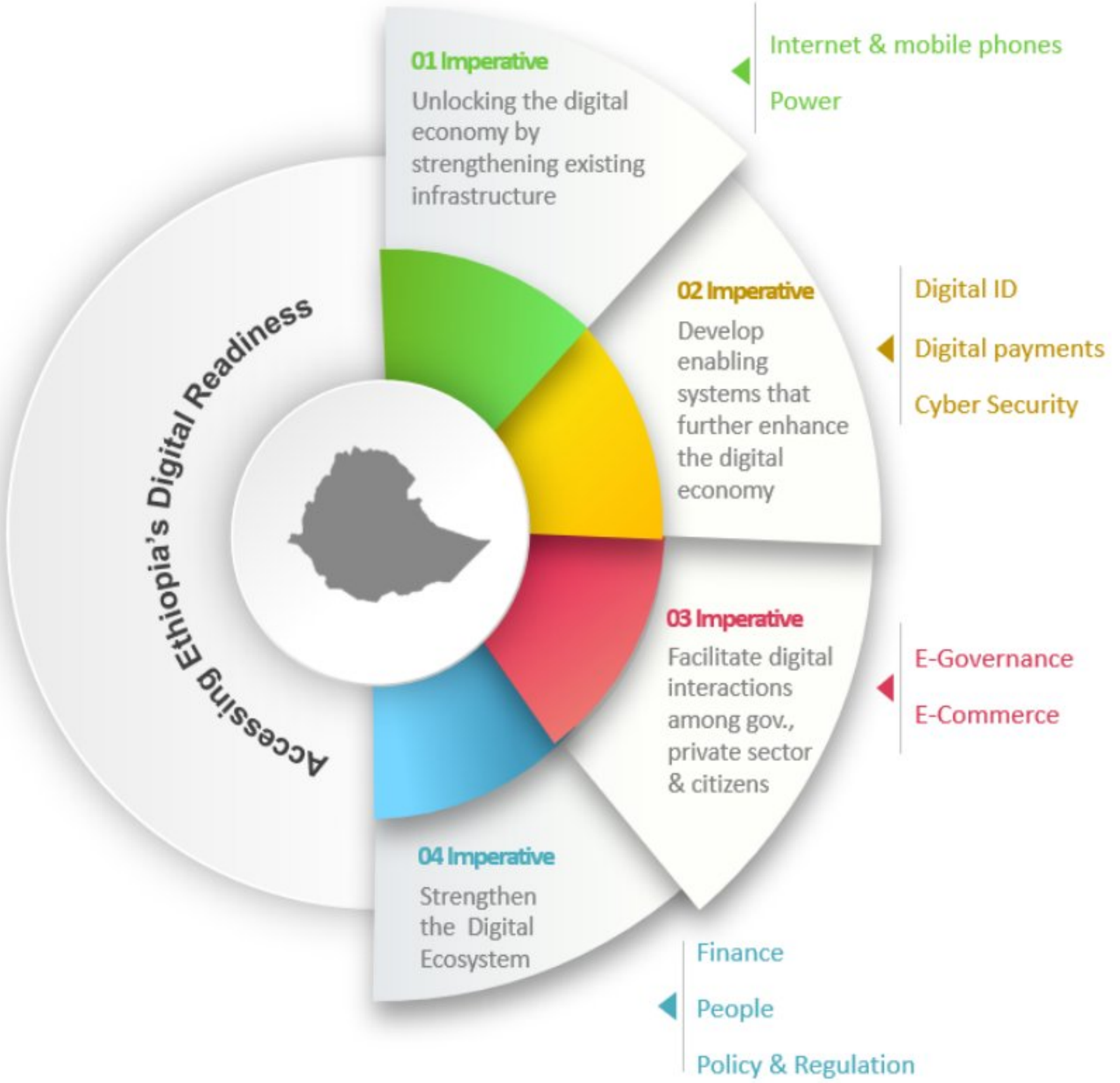


Figure 19: Key Imperatives for Digital Readiness

6. What needs to be done

The digital transformation strategy incorporates an action-oriented lens to help build momentum for the broader digital transformation agenda. Incorporating the action-orientated lens includes identification of targeted initiatives that Ethiopia can start implementing immediately to demonstrate impact in the short term. Such a lens can help bring to life this broader umbrella strategy by building the pre-requisites (e.g. improved connectivity, digital payments) for transformative change and enabling Government to empower private sector players. At the same time, demonstrating impact across key sectors or priority areas can serve as a key lever in building buy-in across various government, private and non-government actors and help bring them on-board. Such successes can also help build greater awareness and nationwide momentum for the broader digital transformation agenda. Finally, enabling and managing digital transformation is a complex endeavour. Implementing targeted projects in the short term can help Ethiopia build capacity by gaining the necessary experience and institutionalizing processes and systems to lead and manage this transformation. Specific sector strategies and action plans will need to be derived from this national umbrella strategy in order to realise all the potential benefits and for actors to have the necessary level of detail for their roles. This collectively can help ensure that this national strategy delivers on its long-term objectives.

6.1 Short Term Foundational Projects (up to 18 months)

Priority initiatives that can be implemented in the short term have been identified across focus sectors. These focus sectors include Connectivity, E-Government (including EoDB), E-Commerce, Technology Entrepreneurship and Digital Skills.

These focus sectors:

1. **Align with macro national objectives**; Current macro national priorities include employment and wealth creation, driving inclusive economic growth, increasing foreign exchange reserves, improving public service delivery and facilitating private sector growth. These priorities feature prominently in the national agenda as crucial to improve the quality of life and help Ethiopia become a lower middle-income country by 2025[70]. *Initiatives in E-Commerce, technology entrepreneurship and E-Government can help Ethiopia make significant strides towards these macro-priorities.*
2. **Lay a foundation for the digital economy.** Digital initiatives in the sectors highlighted above as well as others need to be backed by a strong digital economy foundation, which enables adoption of 'digital', and enhance productivity. *Connectivity and digital skills are crucial elements of building this foundation.*

A rigorous approach underpins the identification of priority initiatives across the six sectors. For each of the sectors highlighted above, a three-step approach was followed to arrive at the detailed recommendations around priority initiatives, which Ethiopia could implement:

- **Deep dive into current status and challenges.** Current status, growth trends and gaps were assessed to develop a comprehensive picture for each sector. In-depth review of existing

[70] National Planning Commission, Ethiopia. (2016). *Growth and Transformation Plan II*.

literature and data was undertaken which ensured development of a strong baseline for the sectors and performance benchmarking across peer nations. This was supplemented by close and iterative consultations with key stakeholders to validate the understanding from desk research and develop a nuanced understanding of various gaps and challenges. More than 60 stakeholders were consulted during the process, including relevant government ministries and agencies (e.g. MInT, Tourism Ethiopia, Ministry of Transport, EIC, Ministry of Revenue [MoR]), private sector actors (including industry associations such as ICT-ET, start-ups such as Deliver Addis and ETTA and incubators like BlueMoon) and development partners (e.g. World Bank, International Finance Corporation). Engaging such partners helped gather different perspectives and develop a well-rounded understanding of the challenges.

- **Identify relevant global learnings.** Digital transformation journeys of countries, which have demonstrated a strong trajectory, were studied to draw relevant lessons for Ethiopia. More than ten countries were identified including peer countries (e.g. Kenya, Nigeria, Rwanda) as well as aspirational ones (e.g. China, India, Singapore, South Korea). National and sector specific case studies were developed to identify targeted approaches and lessons for Ethiopia. In addition, emerging technological trends were also identified and incorporated to help develop a future-oriented strategy.

- **Identify and develop priority initiatives.** Priority initiatives were identified based on the potential for impact and feasibility of implementation. These criteria helped filter initiatives, which deliver on the national priorities, highlighted above (advancing the digital agenda, employment creation, economic growth) and are readily implementable (minimal resource requirement, buy-in with stakeholders, synergy with existing programmes and initiatives) to achieve impact in the short term (12-18 months). High level roadmaps covering crucial activities and potential impact, roles and responsibilities of various stakeholders and a risk plan were then developed for each of the identified priority initiatives.

The priorities identified below are tied to specific focus areas as they are either directly relevant or anchoring implementation pilots to a certain focus sector, but they may have significant implications for other focus areas as well as the broader digital economy.

6.1.1 Prioritized Projects to unlock the digital economy by strengthening existing infrastructure

Background and Context

Connectivity is a foundational element of digital transformation and can drive socio-economic development. Robust connectivity enables citizens and businesses to participate in the digital economy by having access to affordable and high-quality internet, through which they can engage in information sharing and online transactions. Improved connectivity also brings socio-economic development in multiple ways. A 10% increase in internet penetration for example, can improve a country's GDP by 0.9-1.5%[71]. It further enables improved service access and can empower individuals and

[71] Katz, R. (2012). *Impact of Broadband on the Economy*. International Telecommunication Union. Retrieved from https://www.itu.int/ITU-D/treg/broadband/ITU-BB-Reports_Impact-of-Broadband-on-the-Economy.pdf

communities. It is a direct outcome of improved core connectivity infrastructure (e.g. mobile towers, handsets etc.) and supporting infrastructure (e.g. power).

Globally, connectivity is on the rise driven by increasing mobile broadband penetration in developing nations. Over half of the world's population currently uses the Internet, with internet penetration increasing to ~51% in 2018 compared to 34% in 2012. Mobile broadband subscription penetration in 2018 reached 69% compared to ~22% in 2012 and has driven much of this growth in Internet access. Mobile broadband subscriptions in fact increased at a rate three times faster than fixed broadband subscriptions (9% in 2012 to 14% in 2018)[72]. Further, this growth has been driven by rapid adoption of broadband in developing countries including Least Developed Countries (LDCs), which reached a near 61% active mobile broadband subscription in 2018 compared to almost zero in 2007. By contrast, developed countries are experiencing a slowdown in growth due to saturation effects[73].

Africa is the least connected region, but in recent years improvement in connectivity has outpaced global average. Africa's Internet penetration in 2018 was ~24.4% and was the lowest among all continents with only 210 million individuals using the Internet[74]. However, it is increasing annually at a rate of 16%, compared to a global rate of increase in penetration of 5%. Similar to global trends, mobile broadband subscription has shown substantial increase from 5.9% in 2012 to 29.7% in 2018 and is driving overall growth[75]. The increase in mobile broadband penetration in turn is driven by high network coverage (94% for 2G, 72% for 3G and 64% for 4G)[76] and falling mobile prices (56% drop in prices since 2012)[77].

[72] International Telecommunication Union. (2018). *Measuring the Information Society Report* (Vol. 1).
[73] International Telecommunication Union. (2018). *Measuring the Information Society Report* (Vol. 1).
[74] International Telecommunication Union. (2018). *Measuring the Information Society Report* (Vol. 1).
[75] International Telecommunication Union. (2018). *Measuring the Information Society Report* (Vol. 1).
[76] (n.d.). Retrieved from http://www.mobileconnectivityindex.com/
[77] GSMA. (2017). *Accelerating affordable smartphone ownership in emerging markets. Accelerating affordable smartphone ownership in emerging markets*.

Internet penetration across continents (2018)[78]

Average percentage of the total population using internet (%)

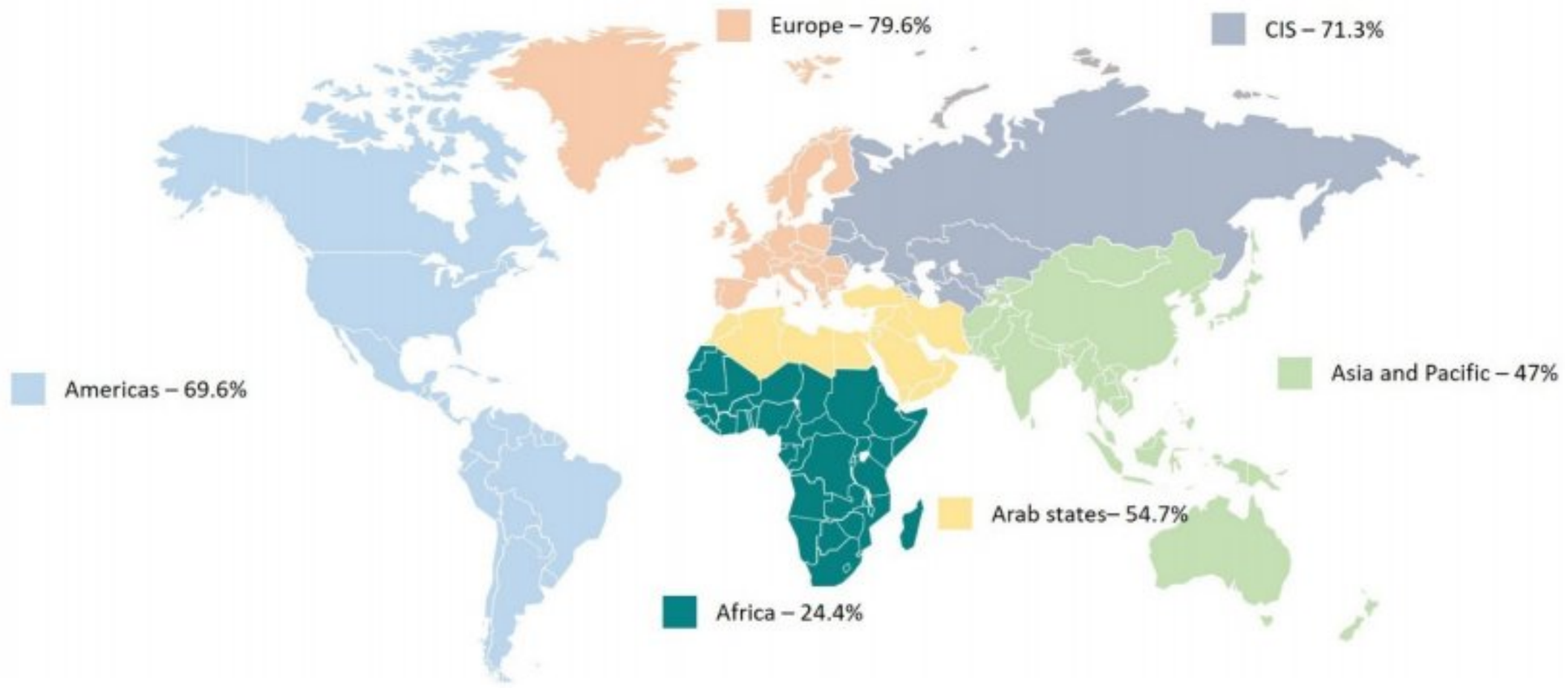
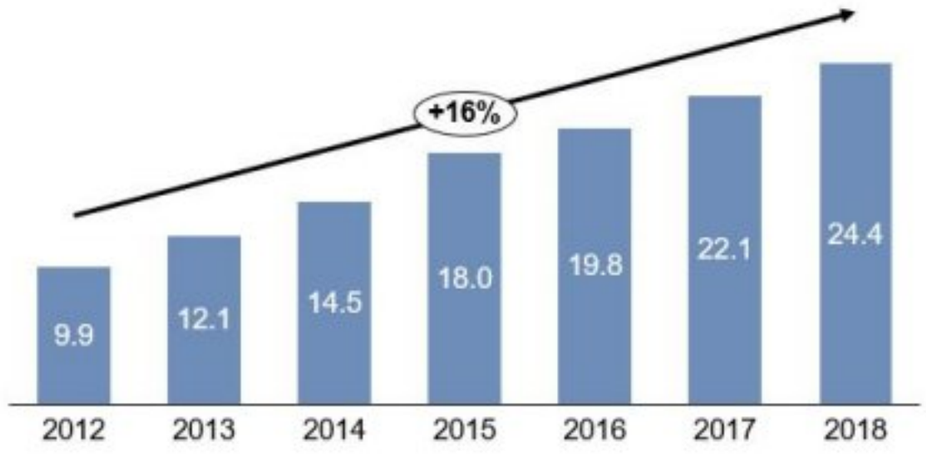


Figure 20: Global Internet penetration

Internet penetration and broadband subscription growth in Africa[79]

Individuals using internet in Africa as a percentage of total population (%)



Active fixed and mobile broadband subscriptions in Africa (%)

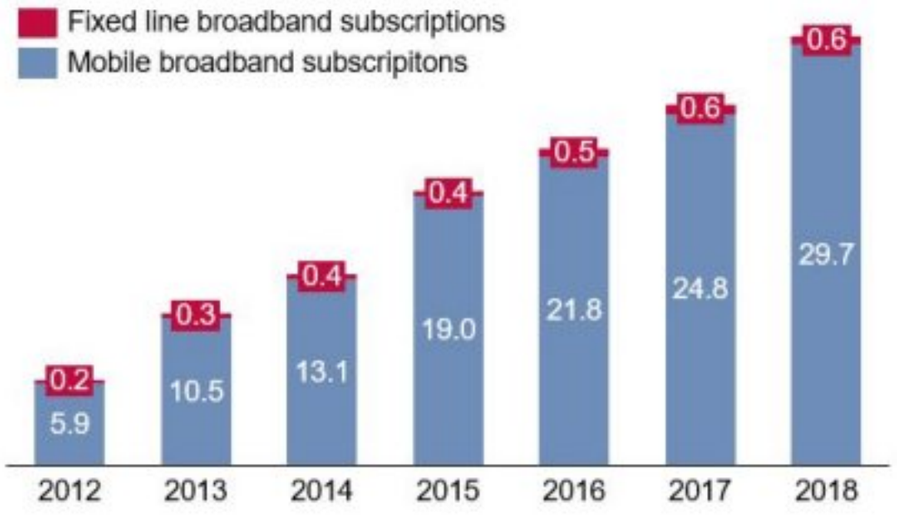


Figure 21: Internet penetration and broadband subscription growth across Africa

Ethiopia has demonstrated rapid progress in improving connectivity but is yet to catch up to peer nations. Gaps in broadband access can be a key differentiator in reaping the benefits of a digital economy since high speed, stable Internet is crucial for service delivery including for E-Government.

[78] International Telecommunication Union. (2018). *Measuring the Information Society Report* (Vol. 1).
[79] International Telecommunication Union. (2018). *Measuring the Information Society Report* (Vol. 1).

Active mobile and fixed broadband subscriptions across major Africa nations[80]

Active mobile broadband and fixed broadband subscriptions per 100 individuals

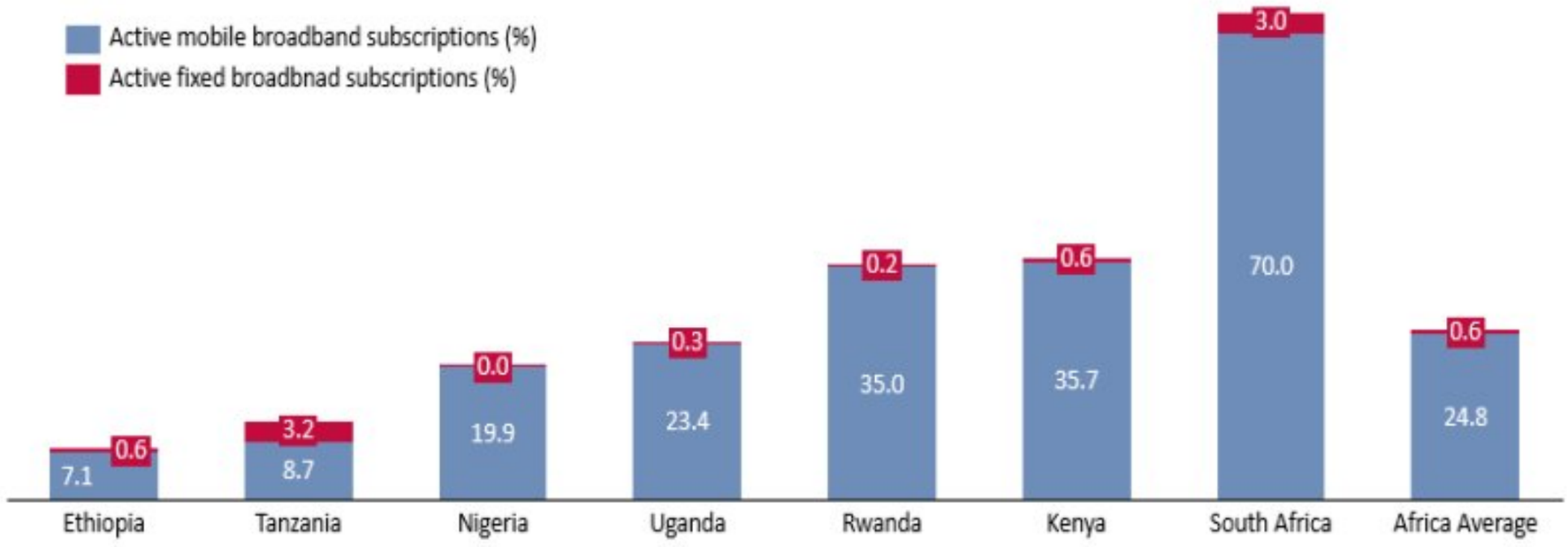


Figure 22: Active mobile and fixed broadband subscriptions across major African nations

Key Learnings from Global Examples

Countries such as India, Myanmar and Nigeria offer valuable lessons on connectivity expansion for Ethiopia. These countries had similar market structure as Ethiopia prior to introduction of sector reforms; specifically, telecom sector was either entirely run or dominated by state-owned enterprises, overall voice and data penetration was low and a strong regulator was missing. Further, these reforms, cantered around liberalization, market competition and innovative infrastructure models, are especially relevant for Ethiopia (see Annex for more on these reforms).

The following lessons from these countries are important for Ethiopia:

- **Create supportive policies and ensure political alignment.** Private player entry in the sector should be supported by clear policies and legal framework. Right policies (e.g. spectrum allocation and tariff) with broad based political alignment can galvanize the sector and facilitate investments.
- **Create a strong regulator.** An empowered regulator is crucial to provide strong governance by defining technical standards, setting tariffs, regulating service and quality provision, managing competition and help set the direction for policy reform.
- **Adopt universal service targets.** Universal service targets help define a clear path for network expansion. It can enable rapid infrastructure creation when accompanied by mandatory targets for service providers and government directives for financial assistance.
- **Allow infrastructure sharing.** Infrastructure sharing can lower operating costs for service providers leading to price reduction, simultaneously attracting more investments in infrastructure. Allowing independent tower companies to operate can also improve management of infrastructure.

[80] International Telecommunication Union. (2018). *Measuring the Information Society Report* (Vol. 2).

- **Develop supporting infrastructure.** Adequate and reliable supporting infrastructure (e.g. power, roads) is crucial for installation and operation of core infrastructure such as mobile base stations. Power shortages can increase operating costs and adversely affect service quality.
- **Plan for future ready networks.** Network expansion should be in line with evolving technological trends, national targets and anticipated demand, including emerging use cases and data traffic.
- **Create demand linkages.** Linking connectivity expansion to demand through specific use cases or services (e.g. E-Government) is crucial to drive adoption and improve infrastructure monetization.
- **Involve private sector.** Involving private sector in design, rollout, operation and maintenance of infrastructure can ensure best of technological and management know how is leveraged. Adopting public private partnership (PPP) models can significantly reduce burden on public funds.

In addition, emerging global technology trends are important to consider as Ethiopia charts its own infrastructure course. These are depicted in the figure below.

Emerging technology trends in connectivity

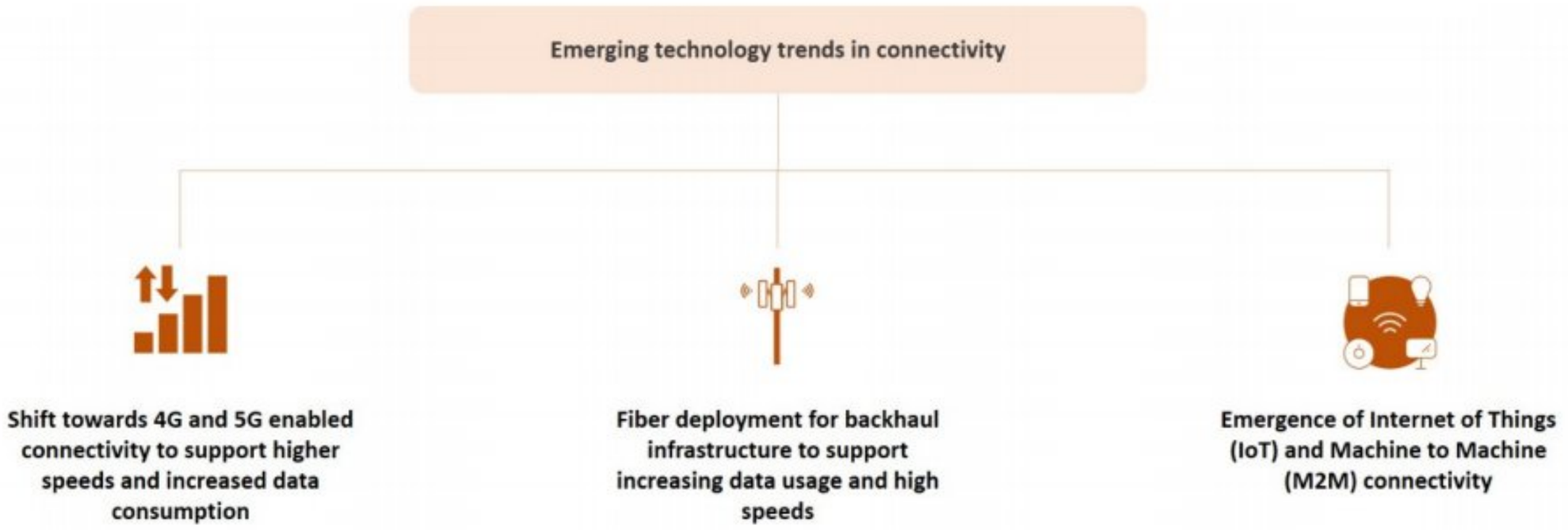


Figure 23: Emerging technology trends in connectivity

Wavelength Services as an opportunity to address the connectivity gaps

Ethio Telecom has over 20,000km of fibre thus does not need to rely only on mobile networks for connectivity but can also explore an alternative that will meet the need for cost effective high bandwidth requirements. Wavelength services are designed to send several streams of digital information on different wavelengths of light and provides anywhere from 1Gbit/s to 100Gbit/s bandwidth secure connectivity. It is ideal to run private cloud-based platforms such as e-government services or content distribution to deliver a rich customer experience across multiple devices. It can foster Virtual reality and edge computing.

A key area of innovation as a result of improved connectivity will be streaming and cloud services, which will become a norm for many more people. It will support more online businesses, enable people to access many more products online and could make a real impact on people's lifestyle.

People will have access to better healthcare, by connecting specialists from the cities to doctors or clinics in smaller towns or rural areas. Similarly, children will have access to better education by getting online education from teachers living outside of the smaller cities and rural areas.

Prioritized Short-Term Projects

Robust connectivity is fundamental to digital transformation and Ethiopia must undertake well-thought, comprehensive measures to develop the sector. These critical activities/projects are detailed below.

6.1.1.1 Project 1: Telecom sector reform

Description: The government has announced the partial privatisation of Ethio Telecom (EthioT) and the split of EthioT infrastructure and services to support open and transparent pricing and facilitate open access. The sector regulator will issue full operating licenses, including the ability to invest in infrastructure, to EthioT and two new operators. Full open access to existing communication infrastructure will be provided to the new licensees. Therefore, it is critical that the Government complete the partial privatisation and introduction of full competition as announced. Accordingly, it is required that the Ethiopian Communication Authority (ECA) can be fully established to enable it to act as an effective communications regulator.

Potential Impact: Reform will allow private sector to operate and the administration by the Authority will ensure that the private sector operators will access existing infrastructure allowing for better service provision.

Risk Mitigation:

- **Lack of execution and follow-through on sector liberalization reforms.** Understand causal factors behind failure of previous efforts to liberalize the sector. Leverage these lessons to ensure buy-in across all key stakeholders including federal and regional governments, existing operator, other government agencies etc.
- **Lack of buy-in and ownership across government agencies may slow down implementation progress.** Engaging relevant government stakeholders though an inter-ministerial body such as Digital Task Force at each step of roadmap development can help incorporate each stakeholder's perspective and ensure broader alignment.
- **Sub-optimal selection of technology options, competition and regulatory structure can limit potential impact.** Engaging experts to carefully map global technology trends and study telecom markets in other countries can help draw relevant lessons including for the right technology options, number of players to be licensed, ideal governance structure and regulatory best practices, to select options best suited for Ethiopia's context.

6.1.1.2 Project 2: Deregulate the mobile phone market

Description: ICT is not a prioritized sector for import licenses and foreign exchange allocation and as a result, there are difficulties importing the equipment the sector needs, such as mobile phones. Additionally, changes in regulations; measures to protect the local manufacturers (including the increase of tariffs for imported devices); and the lack of clarity for the lists of prices to set duties lead

intermediaries to transfer the costs and uncertainty to the customers, increasing prices. Policies to protect local assemblers distort the market and limit the availability of new technology.

Potential Impact: Deregulating will enable full competition between local assemblers and imported handsets to improve access to, and reduce cost of, mobile telephone units.

Risk mitigation: **Sub-optimal selection of technology options, competition and regulatory structure etc. can limit potential impact.** Engaging experts to carefully map global technology trends and study telecom markets in other countries can help draw relevant lessons including for the right technology options, number of players to be licensed, ideal governance structure and regulatory best practices, to select options best suited for Ethiopia's context.

6.1.1.3 Project 3: Government Backbone upgrade and modernization

Description: The Government Backbone currently known, as WoredaNet needs to be upgraded and modernized to improve institutional connectivity which can lead to increased government efficiency. However, poor infrastructure choices, lack of a sustainable business model and low adoption can lead to sub-optimal outcomes. Thus, tying infrastructure creation to a strong technical and business plan, which takes into account existing infrastructure, expected usage and revenue recovery can help provide seamless institutional connectivity. In parallel, incorporating demand side linkages through service-oriented pilots can drive adoption among public offices and institutions.

Potential Impact: In the next 1-2 years, upgraded infrastructure along with a well-functioning and user tested service layer could be implemented in majority of woredas, while having a distilled set of learning's which can accelerate rollout to remaining woredas.

Risk mitigation: Potential risks and suggested mitigation steps are listed below:

- **Lack of political buy-in can slow down progress especially on the required policy changes.** Articulating the scope and value add of the initiative for all stakeholders clearly and engaging in advocacy across various levels of the government can help build necessary alignment and ownership.
- **Poor technical design can lead to challenges with implementation, operationalization and utilization of the infrastructure created.** Leveraging private sector expertise and carefully evaluating different technology options against the scope and objectives of the initiative can help develop a robust design.
- **Coordination failure between different government agencies and implementation agencies can lead to delays and cost overruns.** Monitoring of the initiative by an inter-ministerial group (e.g. Digital Task force) and developing a dashboard which is accessible to all stakeholders to view progress can create necessary momentum and also provide a forum to resolve implementation challenges.
- **Lack of effective demand side linkages can lead to poor infrastructure utilization.** Investing upfront in mapping user segments, identifying the right business model and designing pilots alongside building synergies with other demand side programmes (e.g. E-Government) can improve WoredaNet uptake.

6.1.1.4 Project 4: Implement Universal Access

Description: The Communications Service Proclamation (No 1148/2019) establishes a universal access fund and the requirement for the ECA to develop universal access objectives (Article 49). The universal access objectives must be drafted to support universal access through the use of digital communication services. The fund should be funded through a levy on service providers and an allocation from the partial privatisation of Ethio Telecom and sale of telecommunication licenses. Hence, MInT should develop the appropriate policy to establish the Universal Access Fund, including the source of funding and application of funds (projects the Fund will be able to support) for Council of Ministers approval. Additionally, it is required that ECA develop rules for the administration of the Universal Access Fund for MInT approval.

Potential impact: This would ensure that the fund would be immediately available to invest in infrastructure and services to support universal access to digital communication services. As the partial sale of Ethio Telecom and sale of two additional licenses are expected in 2020. The fund would have a sizeable balance in 2020 enabling the rapid mobilisation of priority projects. If the allocation from the partial sale of Ethio Telecom and the two additional licenses was just 2% of net proceeds, the fund could be as large as USD 40 million.

Risk mitigation:

- **Lack of execution and follow-through on sector liberalization reforms.** Understand causal factors behind failure of previous efforts to liberalize the sector. Leverage these lessons to ensure buy-in across all key stakeholders including federal and regional governments, existing operator and other government agencies.

6.1.2 Prioritized Projects to Develop enabling systems that further enhance the digital economy

6.1.2.1 Project 5: Introduce a National Digital ID

Background and Context

Ethiopians currently have analogue ID at Kebele level, which is insecure and lacks usefulness for a digital economy. Moreover, due to the analogue nature and bureaucracy that surrounds Kebele ID, most people have more than one Kebele ID leading to false information and intractability. Initiatives to issue a unique ID in Ethiopia are at a nascent stage and face a lot of challenges. For instance, attempts to introduce unique numbers have been put for social program (Ministry of Labour and Social Affairs) and tax purposes but due to lack of coordination and communication among authorities, individuals can end up with different "unique numbers" for different programs.

Key Learning's from Global Examples

Digital economy is expanding and growing in Africa and hence different actions have been taken to support the efforts put by governments to introduce a legal identity for their citizens. With this in view, a Centre of Excellence on Digital Identity, Trade and Economy has been established by ECA. This organ has undertaken different tasks and identified three major areas to create an inclusive and empowering ID system, which Ethiopia needs to take learning from. They are:

- **Inclusion** which addresses the need for universal coverage and accessibility;
- **Design** which addresses the need for a robust, secure, responsive and sustainable system; and
- **Governance**, which addresses building trust by protecting privacy and user rights.

Description: The Ministry of Peace is currently developing a strategy for a Digital ID. This strategy will define key actions to be taken in the launch and technologies to be used. MInT being the lead in the technological sector needs to support the Ministry of Peace in all aspects involving technology and ensuring alignement with key principles for sustainble devlopement.

Potential impact: Introduction of a Digital ID can significaly boost financail inclusion and the Digital economy as a whole.

Risks Mitigation: **Lack of alignment and coordination between institutions.** Establishing a steering committee can help consolidate efforts and ensure that ther will not be a redundency of efforts.

6.1.2.2 Project 6: Strengthen Cybersecurity

Background and Context

With the planned rapid expansion in the use of digital services, and in the range of digital services being offered, there will be many who will use digitally based activities and services for the first time. The risks that new users will be exposed to cyber threats will increase. For instance, for African countries that are advancing digitally, cybersecurity costs are high and are growing at a faster rate. Hence, as Ethiopia advances digitally, it will become a more attractive hunting ground for cyber criminals and others who wish to use digital systems inappropriately.

According to the experience of 20 Sub-Saharan African countries, which recently introduced digital activities and services, Cybersecurity Capacity Maturity Model for Nations (CMM), has been identified as a learning for Ethiopia.

Key Learnings from Global Examples

- CMM, developed by the Global Cyber Security Capacity Centre (GCSCC) at the University of Oxford is used internationally to assess cybersecurity status. Since its inception in 2015, the CMM has been applied to assess over 70 country's cybersecurity strengths and weaknesses (among them 20 Sub-Saharan African countries, 11 completed, and 9 on-going in 2019).
- There is a major need to identify **policy and strategic gaps** when adopting cybersecurity.
- For countries that are new for cybersecurity there is a need to understand the **culture and society of cybersecurity** as lack of awareness makes vulnerability higher.
- **Cybersecurity education, training, and skills** are unique for each country based on vulnerability and hence content can be developed and be prioritised on a need-based approach.
- Countries need to develop a well-informed **legal and regulatory framework, which will make the implementation and protection of citizens from cybercrime** legitimate.

Description: To rapidly progress across this priority area, two short-term priority initiatives have been identified.

- The commissioning of a GCSCC survey to guide the development of a cybersecurity education program. Funding could be sought from the Universal Access Fund as the development and implementation of a cybersecurity program will mitigate risks associated with greater use of digital services.
- The undertaking of a public awareness campaign focusing on the most common cybersecurity risks and steps users can take to protect themselves.

The adoption and strengthening of cybersecurity systems, particularly across different administrative levels, from federal to kebele, will be an ongoing process that will not fully be achieved in the short term. However, it is vital that the implementation of these systems starts immediately, with the above-identified initiatives.

Potential impact: Ethiopia undergoing the GCSCC assessment will allow identification of the most important cyber vulnerabilities. These will also inform the education program to produce capable cybersecurity experts and contribute to the cybersecurity awareness campaigns. Having a robust and trust-worthy cybersecurity system will allow E-Commerce and other Internet based transactions to flourish.

Risks Mitigation: **Regulations may fail to adequately address concerns around user privacy, online fraud, and market competition.** Hence, it is crucial to develop comprehensive proclamations and standards by leveraging international benchmarks and best practices.

6.1.3 Prioritized Projects to facilitate digital interactions among different actors

Digital Applications: E-Government

Background and Context

E-Government refers to the use of digital technology to deliver government services. In broader terms, it implies government-owned or operated systems of information and communications technologies (ICTs) that transform relations with citizens (G2C), the private sector (G2B), and other government agencies (G2G)[81]. The major purpose of E-Government is to promote citizen empowerment, improve service delivery, strengthen accountability, increase transparency, and improve government efficiency[82].

Countries pass through different maturity models until a fully functional E-Government system is in place. While these models differ by approach and are responsive to unique objectives, E-Government commonly journeys through (i) *static sites* where government institutions provide basic information about regulations and services (e.g. about tax laws and filing procedures); (ii) *online government portals* where individual institutions provide E-Services including electronic filings and transactions (e.g. online tax filing and payment); which eventually leads to (iii) *integrated government*,

[81] The World Bank. (2012). *Electronic Government and Governance: Lessons for Argentina*
[82] The World Bank. (2012). *Electronic Government and Governance: Lessons for Argentina*

implementing fully digitalized systems with seamless cross-agency integration and end-end electronic transaction (e.g. accessing tax clearance electronically to renew business license)[83].

To evolve across these maturity models, E-Government requires digital improvements across three areas; government operations, government services, and service delivery channels.

- **Government operations:** digitalization can streamline internal government procedures and administrative processes, leading to increased efficiency, accountability, and transparency. This process includes upgrading and modernizing processes such as data storage and management, procurement, and human resource management.

- **Government services:** the types of government services offered (whether G2C, G2B, or G2C) can be expanded and improved through digitalization. Through processes such as E-Verification of identity and digital payments, the government can build new services or enhance existing ones. Further, taking a human centred approach to delivering government services can reduce transaction costs and increase user satisfaction.

- **Service delivery channels:** the government can employ innovative technology to deliver services efficiently in existing and new geographies. By allowing the government to overcome the barrier of physical distance, digitalization can help bring services to hitherto under-served areas that were previously off-limits due to requirements of a large physical presence. Online portals, mobile technologies, and other internet applications should be extensively utilized for greater user experience and convenience

Implementing digital initiatives across these three areas can accelerate maturity of E-Government, thereby improving competitiveness and efficiency of government services, reducing cost, and increasing public satisfaction.

Learning's from Global Examples

Countries such as Rwanda, Singapore and Estonia offer valuable lessons on implementing E-Governance for Ethiopia. The following lessons from these countries are important for Ethiopia:

(i) **The importance of behavioural changes:** a strong political will and mindset (i.e., recognizing taxpayers as voluntarily compliant as opposed to dodgers and evaders), influenced mindset shift of both government and taxpayers in Singapore. Digitalization was also considered as a natural extension to improve the work process and this has increased keenness to apply digital technologies in government offices. Sufficient training enhanced technical capacity of employees and digital skills of taxpayers, reducing resistance to changes.

(ii) **Improving infrastructure:** these governments focused on improving Internet penetration. This included building community centres with internet access to increase adoption of internet in the lives of citizens.

[83] Phillip J. Windley, PhD. (2002). *eGovernment maturity*. Retrieved from http://www.windley.com/docs/eGovernment%20Maturity.pdf

(iii) **Adopting digital technologies:** in order to optimize and modernize government services, leveraging digital is critical for integrating systems such as accurately calculating tax obligation or business license renewal.

(iv) **Focus on enhancing digital skills:** in 1995, at the beginning of the digital revolution, all Estonian schools got wired up to the internet and computer laboratories were built to encourage free public use[84]. School curricula were designed to have a "technology and innovation" theme, including teaching children coding from the age of seven. This has significantly increased digital literacy in the country. Currently, one in ten students study information technology.

(v) **Unlocking the enabling ecosystem**: national ID, digital signatures, and E-Banking played an instrumental role in the launch and expansion of E-Services, increasing penetration and public satisfaction.

Priority Short-term Projects

6.1.3.1 Project 7: Employ a human centered approach to designing portals, helping maximize uptake and utilization

Description: Efficient E-Government should start with understanding the experience of users seeking government services online. These interactions usually require multiple touch points and cut across different departments and/or institutions. As a result, mapping users journey's is critical to designing appropriate models for E-Services. In addition, taking a human centred approach in designing portals will help the government identify procedural challenges users face, and advise on appropriate navigation pathways, thus making end-to-end user interaction more efficient and satisfactory. Employing such a human centered lens requires a thorough assessment of users needs, expectations and barriers, and synthesis of key learnings to be translated into detailed journey maps. Further, the architectures of E-Portals needs to be based on these journeys to create a set of navigation pathways that illustrate different scenarios.

Potential impact: Electronic portals commissioned basis human centered approaches could improve user experience, ensuring uptake of E-Services

Risk mitigation: Major risks and possible mitigation steps are discussed below:

- **Lack of alignment and coordination between stakeholders could slow down implementation progress and limit impact.** Engaging relevant stakeholders from the start and establishing a shared steering committee can help consolidate efforts and increase buy-in.
- **Redundant procedures and processes may reduce the effect of a streamlined user experience.** Introducing policies to reduce procedural redundancies and remove needless institutional barriers can improve user experience and increase public satisfaction.

[84] Raconteur. 2018. Retrieved from https://www.raconteur.net/technology/estonia-digital-society

6.1.3.2 Project 8: E-Transactions enabled E-Government: Pilot an electronic portal using E-Transaction technologies and ensuring user centricity

Description: Citizens and businesses need to periodically interact with government agencies to receive various services, and expect a transparent, easily accessible, and swift service delivery from the public sector. Fully digitalized, end-to-end E-Service reduces the cost and time of completing such services. Although Ethiopia has started E-Services, poor design and lack of transaction capabilities have limited effectiveness. In order to fully roll-out and expand E-Government services, the current electronic portals need an overhaul to ensure user centricity and integrate E-Payments, E-Receipts, and E-Signature technologies. Developing a transaction-ready portal will also set a benchmark and serve as a model for other government institutions to adopt. Existing portals such as E-Tax could be used as a pilot.

Potential impact: Ensuring user centricity of portals and piloting E-Transaction technologies will reduce cost and time of services, increase convenience, and have a direct impact on improving EoDB.

Risk mitigation: Major risks and possible mitigation steps are discussed below:

- **Insufficient capacity of portals may discourage adoption.** Conducting a robust technical assessment and ensuring the portal has sufficient capacity to accommodate demand (especially during peak seasons) will reduce system failures and encourage use.
- **Poor integration of various systems could disrupt processes and increase user frustration.** Involving all relevant stakeholders early in the process and creating a joint implementation taskforce will increase buy-in and streamlining of services of multiple agencies under one portal. Further, integration of systems should take the forefront of the design to ensure swift, consistent, and reliable processing of transactions.
- **Lack of reliable infrastructure connectivity and power supply could slow down implementation progress.** Dedicating a separate connectivity line for government service providers or building an offline connection network could ensure continuation of services during internet breakdown or power outage, increasing reliability of E-Government systems.
- **Poor digital skills may impact uptake and utilization.** Ensuring user centricity of the portal, providing recurring trainings and offering incentives for usage may encourage users to utilize the portal more frequently. In addition, supporting users by establishing an efficient call center or setting up government-approved internet cafes could make using the portal easier and increase uptake.

6.1.3.3 Project 9: Digital Applications: E-Commerce

Background and Context

E-Commerce is a broad term referring to transactions enabled digitally or conducted online. More specifically, sale of goods and services over the Internet, through methods developed to facilitate receiving and placing of orders, is termed as E-Commerce. Pioneering global businesses such as Alibaba (B2B), Amazon (B2C), and Uber (C2C) are all examples of E-Commerce operations. A typical E-Commerce business involves four distinct elements coming together to enable online transactions. These include (i) *marketplaces* where buyers and sellers can engage; (ii) *payment systems* or platforms to enable digital payments; (iii) *logistics* including warehousing, fulfilment, packaging, and delivery of goods;

and (iv) *data* which is crucial to drive growth and manage operations. Together, these four elements serve to increase trust in online transactions and their seamless functioning can help reduce transaction costs.

E-Commerce can be transformational for businesses and brings several advantages to consumers and businesses alike. E-Commerce enables businesses and consumers to transcend geographic boundaries enabling greater market access, allows greater convenience in transactions, and enables businesses to innovate by leveraging data to drive product design and merchandizing. More importantly, starting-up costs associated with selling online are low, which can boost SME activity, and hence job creation.

E-Commerce has demonstrated strong growth over the last few years and is increasingly gaining ground in Africa, though Ethiopia continues to lag behind its peer nations. E-Commerce sales (B2C and B2B) in 2017 reached USD 29 trillion demonstrating a 13% growth[85]. The B2C (i.e. the E-Commerce retail sector) accounted for approximately USD 3.9 trillion in global sales. This segment is growing at a rate of 21% annually and is expected to reach USD 4900 billion by 2021. Simultaneously, share of E-Commerce in retail is expected to rise from 7.5 % in 2015 to 17.5 % by 2021[86]. Africa's E-Commerce retail is expected to reach USD 75 billion by 2025[87], increasing from USD 6 billion in 2017[88]. The number of online shoppers in Africa is increasing by 18% annually[89], and currently more than 250 E-Commerce marketplaces are operational[90]. Nigeria, South Africa, and Kenya are the largest E-Commerce markets in Africa, with bulk of online shoppers. Ethiopia still lags behind other countries such as Uganda and Morocco on the E-Commerce preparedness index below[91]. This is driven by underdeveloped connectivity and logistics and payments infrastructure, which restricts the ability of businesses and consumers to engage in online transactions.

Learnings from Global Examples

E-Commerce development in other countries offers several lessons for Ethiopia. E-Commerce development journeys of countries such as China, India, and Nigeria highlight several building blocks crucial to E-Commerce development.

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[85] Press Release. (n.d.). Retrieved September 25, 2019, from https://unctad.org/en/pages/PressRelease.aspx?OriginalVersionID=505.
[86] Global retail E-Commerce market size 2014-2023. (n.d.). Retrieved from https://www.statista.com/statistics/379046/worldwide-retail-E-Commerce-sales/.
[87] McKinsey Global Institute. (2013). *Lions go digital: The Internet's transformative potential in Africa*.
[88] UNCTAD (2018). *B2C E-Commerce index 2018: Focus on Africa*
[89] UNCTAD (2018). *B2C E-Commerce index 2018: Focus on Africa*
[90] Written on 20 Dec 2018. (2019, March 27). African digital platforms and the future of digital financial services. Retrieved from https://i2ifacility.org/insights/articles/african-digital-platforms-and-the-future-of-digital-financial-services?entity=news.
[91] UNCTAD (2018). *B2C E-Commerce index 2018: Focus on Africa*

Building blocks for E-Commerce development

Category	Building Block	Description
Infrastructure	Expanding mobile connectivity	Expanding mobile network coverage and ensuring reliable speeds can rapidly bring a large number of users online through smartphones and drive E-Commerce usage
Enabling systems	Advancing digital payment	Digital payment solutions lead to reduced transaction costs in E-Commerce, which can drive value for all participants
	Developing a stronger logistics sector	Strong logistics infrastructure and services to manage fast turnarounds and handle reverse logistics (e.g.: product returns) is crucial in E-Commerce

Figure 24: Building blocks for E-Commerce development

Clear government intent, coordination between different agencies, and consultative, evidence-driven policymaking are crucial to develop the building blocks listed above.

<u>Priority Mid-term Projects:</u> E-Commerce marketplaces: Unlock high impact market opportunities through targeted programmes to attract capital and build marketplaces.

In the mid-long term, Ethiopia could undertake three interventions to drive E-Commerce expansion. These intervention areas have been identified based on potential for impact and the feasibility of implementation from a long list of potential solutions (see Annex I) and are described below. These fall into mid-long term opportunities as logistics remains a critical binding constraint and will require time to unlock.

<u>Description</u>: Analogue markets such as coffee and existing E-Commerce marketplaces lack capital and capacity to adopt or scale E-Commerce. Championing high impact value chains by attracting investments to them can bring much needed capital and know-how, as well as accelerate E-Commerce adoption. This would require carefully evaluating market opportunities and business models, building the platforms, and scaling them.

<u>Potential impact</u>: In the next two years, Ethiopia could look to create 1-2 such platforms, each providing access to E-Commerce market for 5000 or more sellers as well as attract significant investments for other platforms and players.

<u>Risk mitigation</u>: Critical risks and possible mitigation steps for the initiative are included below:

- **Lack of alignment across different government partners can delay decision-making and restrict implementation progress.** Ensuring buy-in across different ministries

by leveraging an inter-ministerial group such as the Digital Task Force can help achieve necessary alignment.

- **Unfavourable investment climate due to lack of investment protection mechanisms can deter investors from coming on-board.** Creating the right policy environment (e.g. reduced restrictions) and incentive structures (e.g. investment safeguarding mechanisms) can improve investor confidence.
- **Lack of demand or user adoption of the platforms can lead to lack of sustainability and failure of the marketplaces being created.** Building capacity of marketplace actors to create user-centric platforms and adopting creative user acquisition approaches to increase traction can help ensure that critical user demand is achieved.

6.1.4 Prioritized Projects to Strengthening the Digital Ecosystem

Ecosystem: People (incl. Digital Skills)

Background and Context

Digital skill is the knowledge and technical ability to utilize digital tools for various activities. Digital skills vary in purpose and depth, beginning from basic digital literacy where users are able to use mobile phones, browse internet and process digital transactions to content processing that requires efficiently using computer functions and tech machines. In the advance stage, digital skills include content creation and management, requiring tertiary education in areas such as software and application development, programming and IT support.

Basic digital skills are essential elements of a digitally empowered society. When digital skills are developed, citizens are empowered to interact better with government, businesses and society. Accessing government services, education, business and trading, sharing information and getting involved in society are all made easier with application of digital skills.

The importance of digital skills is highlighted by the increasing number of jobs requiring this skillset. Globally, new jobs requiring digital skills have increased by 63% between 2012 and 2017[92], while total job growth over the same period was only ~6%[93]. This is driven by increasing purely digital jobs – requiring the use of ICT as a tool receive, process and distribute information, and digitally enabled jobs – those that entail using ICT to support interaction and non-ICT activities. By 2025, 85 – 90% of jobs are expected to require some sort of digital skills[94].

Digital skills play an important role as enabler of digital transformations and job creation. Opportunity areas highly impacted by digital skills in Ethiopia include E-Government, E-Commerce, technology entrepreneurship, tourism and connectivity infrastructure. According to the

[92] Burning Glass Technologies. 2018. *The New Foundational Skills of the Digital Economy: Developing the Professionals of the Future.* Retrieved from https://www.burning-glass.com/wp-content/uploads/New_Foundational_Skills.pdf
[93] Retrieved from ILOSTAT
[94] United Nations Commission on Science and Technology for Development. 2018. *Building digital competency to benefit from emerging technologies*

Global Competitiveness Index, Ethiopia ranks at 112 from 138 economies on the metric of digital skills among population[95]. Ethiopia lags behind peer countries such as Kenya, Ghana and Rwanda and indicates there is much that needs to be done to improve digital skills[96].

Learnings from Global Examples

Global examples such as India, Rwanda and Kenya illustrate the importance of considering the impact of infrastructure, program design and content to make digital literacy program effective. Where such programs were fruitful, the following common success factors are observed.

- **Result oriented program design:** Distributing devices alone could not bring the desired outcome of improving digital skills. Consequently, program design should focus on the purpose of device distribution i.e. upskilling digital literacy and should include good content, effective delivery mechanism and continuous digital skills development programs.

- **User centric content:** Developing and deploying content that resonates with users in terms of language, relevance and complexity of information is essential.

- **Effective delivery mechanism:** In addition to content, training delivery needs to be user-centric, delivered in a manner that is suitable for cultural sensitiveness, local adoptability and scalability.

- **Functional infrastructure and hardware:** Lack of access to supporting infrastructure such as connectivity, electricity and quality of devices can derail program implementation and affect adoption.

- **Overcoming cultural barriers:** Cultural barriers should be accounted in program design and implementation to ensure inclusivity and enable all members of society including women and children in rural communities to benefit from the project.

Ethiopia should take these valuable lessons when implementing initiatives that require distributing digital devices and improve digital literacy in the country.

However, while improving basic digital literacy is critical, it has limited impact on increasing employability. The Government of Ethiopia aims to create three million jobs in 2019/20 and expand this to 14 million jobs in five years[97]. MInT is targeting to create 300,000 digital jobs by 2020, so looking beyond improving basic digital literacy is important to meet this target. Job-oriented digital upskilling including trainings on typing and printing, advance Microsoft office skills, data analysis and graphics could create jobs in data entry, marketing, creative design and Business Process Outsourcing.

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[95] World Economic Forum 2018. *The Global Competitiveness Report.* Retrieved from http://www3.weforum.org/docs/GCR2018/05FullReport/TheGlobalCompetitivenessReport2018.pdf
[96] World Economic Forum 2018. *The Global Competitiveness Report.* Retrieved from http://www3.weforum.org/docs/GCR2018/05FullReport/TheGlobalCompetitivenessReport2018.pdf
[97] Retrieved from https://fanabc.com/english/2019/07/ethiopia-plans-to-create-14-million-jobs-in-five-years/

Priority Short-term projects

In the short term, Ethiopia could implement two initiatives to improve digital literacy and create jobs. They are summarized below:

6.1.4.1 Project 10: Designing and piloting a holistic digital literacy initiative

Description: MInT is designing a holistic digital literacy initiative. However, there is limited knowledge and strategy within the program regarding how to approach and overcome critical challenges such as device penetration, connectivity and electricity infrastructure, building relevant use-cases and designing relevant and appropriate content. Designing a holistic digital literacy program and piloting multiple scenarios could help to address these gaps and ensure success of the project. A careful study of biography, literacy level and culture of beneficiaries, identifying and deploying mechanisms to reduce impact of lack of electricity and internet connectivity and evaluating and selecting the most effective program delivery are critical steps to consider during product design.

Potential impact: Using a holistic approach could maximize effectiveness of the program, increase uptake, open opportunities to provide skills trainings beyond basic digital literacy and create digital enabled jobs.

Risk mitigation: Major risks and possible mitigation steps are discussed below:

- **Low devices penetration could impede program implementation.** Encouraging local manufacturing and carefully assessing hardware and design features, and balancing trade-off between cost and functionality is critical to ensure durability and effectiveness of the devices.
- **Low quality and appropriateness of content and training delivery may reduce impact of the program to improve digital literacy.** In order to select relevant content, though discussion and reiteration of relevant materials is important. Valuable lessons from other countries (e.g. Google Internet Saathi program) can be adopted. Cultural and educational influences should also be carefully considered when selecting delivery mechanisms.
- **Lack of consistent internet connectivity and power could impact effective utilization of devices.** Alternatives to accessing internet and charging power, such as solar chargers and community internet cafes need to be made available to allow recipients make good use of the devices.
- **Poor stakeholder coordination may slow down program implementation.** Defining and aligning on program objectives and expected impact, specific roles and responsibility of stakeholders and progress and impact measuring tools could increase buy-in and collaboration between stakeholders.

6.1.4.2 Project 11: Creating a job-oriented digital skilling program and accompanying job matching platform

Description: Most jobs require intermediary digital skills and knowledge of operating basic to advanced computer applications and necessitates adequate infrastructure. Thus, implementing a jobs-oriented digital skills program, building capacity of infrastructure and creating access to available online jobs could unlock several job opportunities for Ethiopia. In order to ensure success of this initiative, identifying key digital skills relevant to the jobs market and designing practical training program is critical. An innovative way of overcoming connectivity and infrastructure challenges should also be implemented. In addition,

the government and private sector institutions need to forge partnerships to identify and create online jobs and build a platform that connects jobs seekers with employers. Development organization and internal outsourcing companies should support implementation of the initiative by offering human and financial resources and opening access to market.

Potential impact: Improve competitiveness local youth in order to enable them to compete and find digital jobs online (e.g. through online portals such as Upwork)

Risk mitigation: Major risks and possible mitigation steps are discussed below:

- **Incomplete need assessment could impede appropriate program design and employment potential of jobseekers.** Prior to program design and implementation, The Job Creation Commission (JCC) should conduct a thorough assessment of demand and supply of digital jobs, critical skill sets to improve competency of job seekers and methods of delivering digital upskilling programs.

- **Poor and inconsistent Internet connectivity and power disruption could hamper developing digital skills and competitiveness of Ethiopia-based employees.** Establishing well-connected training centres and workstations may reduce impact poor infrastructure.

- **Inefficient electronic job platforms could slow down market growth of digital jobs.** Taking a human centered approach to designing job portals could increase utilization, inflow of digital jobs and access to quality talent

6.1.5 Prioritized Projects to enhance Tech Entrepreneurship

Ecosystem: Policy & Regulations

Background and Context

Conducive policy and regulation are essential for the cultivation of enterprises that create value through an innovative technology idea. Technology entrepreneurship is the process of transforming a technology idea into an enterprise. The idea can either be the creation of a new technology or usage of a prevailing technology in an innovative way to address an existing challenge or a need. Pioneering global businesses such as Airbnb, Netflix, LinkedIn, and local businesses such as Zeamat, MBirr, and Yazmi are all examples of successful technology entrepreneurship. Transformation of a technology idea into an enterprise is a four-step process, which includes:

- **Research and ideation**: Identification of a technology idea through research or innovative thinking
- **Design and validation**: Development of a product or service by understanding market dynamics and testing for market fit
- **Enterprise establishment**: Formulation of an operating strategy, formalization of an enterprise (e.g. enterprise registration), and launch of operations
- **Scale-up**: Expansion of product or service offerings across geographies and consumer segments

Technology entrepreneurship usually requires larger early-stage risk capital and higher skilled human capital than other forms of entrepreneurship to undertake R&D and to develop a competitive product or service that needs to be accommodated in policy and regulatory frameworks of a state.

Technology entrepreneurship is driving global economic growth and creating jobs, while also improving quality of life through cutting-edge innovation. Technology start-ups are also a source of livelihood for over 17 million people[98] around the world. These create more livelihood opportunities than other types of start-ups due to a higher multiplier for indirect and induced jobs[99]. Beyond direct contribution to the economy and jobs, technology start-ups play a major role in driving innovation across society thereby, enhancing efficiency, reducing costs, and improving comfort. Social media, home automation, online shopping, and micro credit are some examples of products and services that have emerged through technology start-ups, transforming several aspects of day-to-day life.

Technology entrepreneurship has grown significantly over the last few years and has seen a strong upward trajectory in Africa, but Ethiopia continues to lag behind its peer nations. Globally, around 18,000 technology start-ups were established in 2018, increasing 15% annually between 2010-18[100]. Technology start-ups have attracted significant interest from investors, raising USD 190 billion of funding, increasing 21% annually between 2010-18[101]. In Africa, technology entrepreneurship in still very nascent, with technology start-ups receiving only ~0.5% of the overall global funding[102]. However, number of technology start-ups and the associated funding has increased rapidly in the past few years, with overall funding towards African technology start-ups crossing USD 1 billion in 2018[103]. Africa also has around 450 active technology incubation hubs, with Lagos and Nairobi emerging as the fastest growing technology epicentres[104]. Despite this strong growth trajectory across Africa, Ethiopia is relatively far behind other countries in terms of number of technology start-ups and overall funding received[105]. This is largely driven by the lack of a nurturing environment for growth and development of technology start-ups.

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[98] Kauffman Foundation Research series. (2013). *Tech Starts: Technology Business Formation and Job creation*
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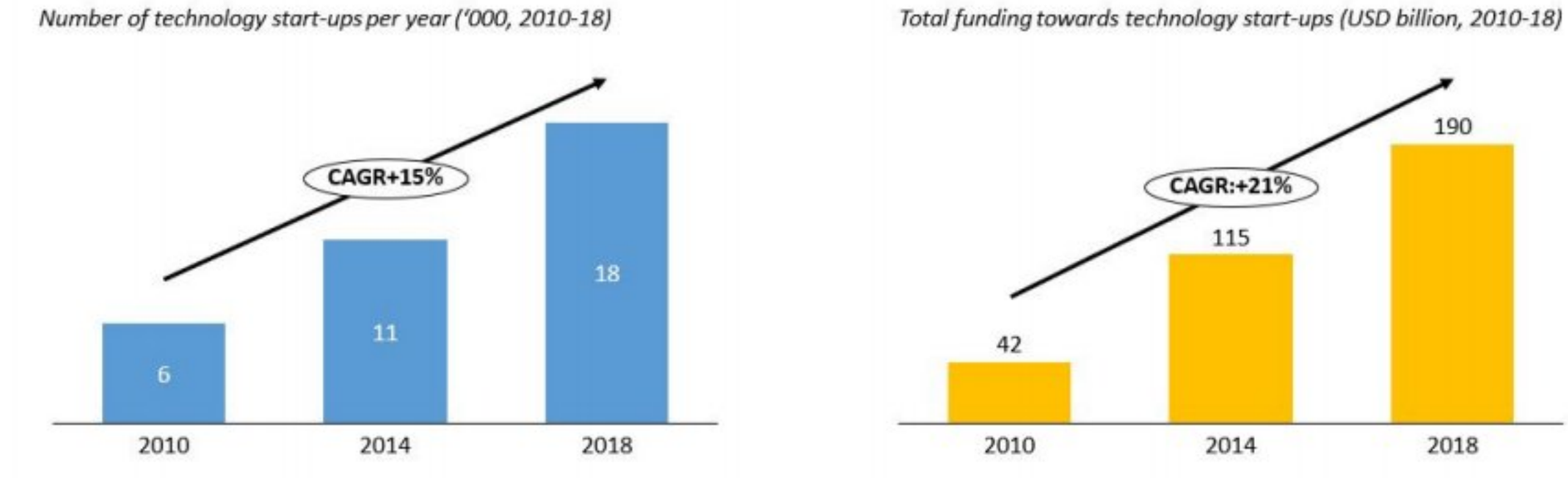
[103] Partech Africa Fund. (2018). *African technology start-ups.* Retrieved from https://partechpartners.com/.
[104] Global System for Mobile Communications. (2018). *Tech Hubs Landscape.* Retrieved from https://gsma.com/.
[105] Partech Africa Fund. (2018). *African technology start-ups.* Retrieved from https://partechpartners.com/.

Growth of technology start-ups across the world

Figure 25: Growth of technology start-ups across the world



Key Learning's from Global Examples

A few incubators around the world have adopted successful models and offer valuable lessons for Ethiopia. Incubators across India, Myanmar, Kenya, Rwanda, and South Korea have been successful in achieving desired outcomes as a result of certain key success factors. Below are examples of a few successful incubators and the associated success factors.

Key success factors from effective incubators across the world

Country	Example incubator models	Key success factors
India	1. Start-up Village, a not-for-profit incubator that is jointly funded and managed by the government, corporates, and private investors 2. Rajasthan Techno Hub, T-hub, Technology Innovation Zone are not-for-profit incubators owned by the government with technical and investment partnerships with the private sector	• Clearly defining the role of government and various stakeholders can enhance service provision through targeted areas of engagement and reduced duplication of efforts (e.g. Government can coordinate overall service provision, while private sector offers support as needed) • Collaboration among government and private sector allows various actors to bring in relevant expertise and offer a diverse portfolio of value-add services for start-ups (e.g. government actors help start-ups navigate through various regulations, while private actors lend business insight and technical know-how) • Incubator partnerships with private investors can enable start-ups to obtain long-term investments post the incubation program
Myanmar	1. Project Hub Yangon, a not-for-profit incubator owned by the government that primarily focused on developing early successes 2. Phandeeyar, a for-profit incubator operated by the private sector with strong partnerships with local universities	• Establishing credibility in the initial stages is crucial to attract funding support from investors, thus ensuring long-term sustainability of the incubator program and incubator graduates • Developing metrics centred around 'quality' rather than 'quantity' can shift focus towards championing early successes as opposed to graduating a certain target number of start-ups • Partnerships with universities and schools can lead to a strong pipeline of potential incubates and ensure access to technology-skilled human capital
Kenya	1. Nailab, TUMI, C4D Lab, iHub, Nairobi Garage are for-profit incubators funded and managed by private investors with strong support from the government	• Targeted support from the government to reduce regulatory burden can minimize political risk and improve investor perception • Collaboration among incubators can lead to knowledge sharing, improving the broader technology start-up ecosystem
South Korea	1. Seoul Global Start-up incubator, a for-profit incubator owned by the private sector focusses on providing best-in-class mentorship	• Identifying the needs of innovators and providing services in accordance to those needs will ensure greater start-up satisfaction and improve incubator outcomes • 1-on-1 mentorship is more effective as opposed to 1-to-many mentorship, allowing space for discussion and providing opportunities to obtain advice on specific challenges and individual needs • Creating a culture of peer-to-peer mentorship can help young founders support and guide each other, while also providing an opportunity to learn from successful start-up founders
Rwanda	1. ThinkRwanda incubator, a not-for-profit incubator owned by private investors with incubates receive matching investments from the government 2. Rwanda Technology and Business Incubation facility, a not- for-profit government incubator partnering with the Rwanda Innovation fund	• Catalytic government support through matching investments minimizes risk and can encourage private sector engagement • Linking government innovation fund to support incubator graduates can help streamline funding into high quality start-ups • Access to blended risk capital through an innovation fund and private investors can help early stage prototyping of disruptive ideas • Availability of technology-skilled human capital through partnerships with universities can ensure progress of ideas into actual prototypes and pilots, thus improving chances for success

Figure 26: Key success factors from effective incubators across the world

Priority Short-Term Projects

In the short term, Ethiopia could undertake three interventions to ensure success of incubators and associated initiatives, thereby enhancing technology entrepreneurship. The interventions have been identified based on potential for impact and the feasibility of implementation. The interventions will build upon existing initiatives such as the national incubator program and national innovation fund, and are described below:

6.1.5.1 Project 12: Refine incubator services and expand to regions based on the needs of start-ups and innovators

Description: Incubators are beneficial for start-ups during their early stages. However, most incubators fail to satisfy start-up expectations due to limited focus on providing services catered to start-up needs. MInT has established an in-house business incubator offering basic services such as administrative support, office space, and other infrastructure facilities.

Potential Impact: Refining and expanding to regions the incubators to provide services centred around start-up needs will ensure maximum value add for start-ups so they may thrive and make meaningful contribution to economic objectives more effectively. This would require careful evaluation of start-up

requirements by engaging with various start-up founders and partnering with relevant stakeholders such as private investors, and technical advisors to provide the required services.

Risk mitigation: Critical risks and possible mitigation steps for the initiative are included below:

Lack of alignment across different government partners can delay decision-making and restrict implementation progress. Ensuring buy-in across different ministries by leveraging an inter-ministerial group (such as a Digital Task Force) can help achieve necessary alignment. Additionally, defining expectations and roles upfront, and ensuring a constant line of communication can lead to greater alignment.

Failure to undertake current and evolving market dynamics can lead to suboptimal business model and product or service design. Set-up an in-house team for tracking industry needs or partner with consulting or research firms to map market trends and industry dynamics.

6.1.5.2 Project 13: Formalize government engagement with existing private sector ICT companies (future incubator graduates)

Description: Private sector ICT companies in Ethiopia face several challenges due to poor connectivity and lack of supporting policies. Engagement with the government is essential to overcome these challenges. Additionally, government can benefit from engaging with the private sector by obtaining industry inputs on national policies and strategies, leading to holistic growth of the sector. MInT has already kick-started engaging with the private sector (e.g. ICT ET conference in August 2019). Going forward, MInT should build on this progress and continue engaging with the private sector in a meaningful way to understand needs and undertake reforms suggested by the private sector. It is essential for MInT to encourage the building of a strong and well-organized ICT association to serve as the apex body for the Ethiopian IT industry. This association would work with diverse stakeholders to build focused initiatives that catalyse the growth of the sector through policy advocacy, skill building and talent development, research, start-up programs, facilitating business and increasing industry outreach.

Potential Impact: As the private ICT sector matures and evolves to undertake cutting-edge innovation, businesses will grow and create jobs faster if government regulatory services are applicable and agile, potentially through adopting a regulatory sandbox approach towards policy making. Formal and continued engagement with the private sector can ensure government systems are moving at the pace of technological change.

Risk mitigation: Critical risks and possible mitigation steps for the initiative are included below:

Potential for biased policy formulation, favouring certain companies and excessive lobbying efforts. Engage with as many stakeholders as possible to develop a holistic view of the industry that is free of any bias. In addition, maintaining transparency on all key policy decisions can build mutual trust and credibility. The government can maintain transparency by setting up an open forum to address grievances and to provide rationale behind key decisions. Lessons from India with the success of NASSCOM can be adapted.

Lack of accountability from the government to undertake initiatives relevant to the private sector. Ensure a top down push for engaging with the private sector coupled with rigorous monitoring by a special taskforce to ensure government departments actively undertake initiatives and reforms suggested by private sector.

6.1.6 Prioritized Projects to enhance Digital Payments

6.1.6.1 Project 14: Develop regulations for mobile money

MInT should fully implement the E-Transaction Proclamation, which encompasses digital services, developed by MInT in 2019. The Proclamation includes digital signatures, electronic receipts, consumer protection, and digital payments.

The National Bank of Ethiopia should also complete the drafting of the planned Payment Instrument Issuer and Agent directives that includes a provision that creates a new class of financial institution, a 'payment instrument issuer'. This will significantly lower capital requirements and allow smaller tech companies to offer mobile money services. This proclamation is a critical first step in creating an enabling environment for online payments and mobile money.

Digital payment solutions being implemented may not reflect user realities such as connectivity challenges and lack of digital skills. Leveraging human centered design studies to understand user needs, concerns and challenges can inform the design of pilots including technology selection, product design, and target use cases, and lead to robust solutions.

6.1.7 Prioritized Projects to enhance E-Commerce

6.1.7.1 Project 15: Enact clear policies, regulations and standards to enable electronic transactions and launch digital payment pilots in E-Commerce to accelerate adoption.

Lack of fundamental enablers for E-Commerce such as legal recognition of E-Receipts and digital payments has resulted in lack of a conducive environment for E-Commerce development. Comprehensive policy and regulatory changes, which can create a strong framework for governance and reduce uncertainty, can help catalyse the market. However, regulatory changes alone may not accelerate development as users may lack skills, trust or incentives to adopt digital payments. Hence, such changes must be accompanied by targeted pilots that will promote digital payment adoption among specific user groups such as merchants, SMEs, and buyers.

In 1-2 years, apart from comprehensive policy reform, which galvanizes the private sector, targeted pilots could result in an increase in financial inclusion by 10-15% and approximately three million users adopting digital payments, which will directly benefit E-Commerce.

Involvement of critical government ministries, financial institutions, and fintech players is important for the success of the initiative. NBE should draft the digital payment Proclamation, notify design and operation standards for digital payments as well as create robust systems to ensure enforcement. Financial institutions should actively engage with NBE to help develop a strong policy and regulatory framework.

MInT should support the initiatives and coordinate design and overall implementation of pilots as well as undertake efforts to create a strong ecosystem for digital payments. Fintech players and financial institutions should actively adopt digital payments and support the design and implementation of pilots for digital payments. Other stakeholders like Ministry of Trade and Industry and Ministry of Revenue can help create the right incentive structures for private sector to adopt digital payments while various industry and merchant associations can support implementation and capacity building of their respective members for adoption of digital payments.

Summary of Prioritized Projects (Short Term)

1

Unlock the digital economy by strengthening existing infrastructure

Connectivity

- **Project 1**: Liberalization of the telecommunication sector: Government to fully implement the telecommunication sector reform by end of September 2020
- **Project 2**: Deregulate the mobile phone market: to increase accessibility and ensure affordability
- **Project 3:** Build a government backbone and upgrade/ modernize WoredaNet: Rollout infrastructure tied with demand side linkages
- **Project 4**: Implement Universal Access: Setting up the universal access fund to ensuring access for all

2

Develop enabling systems that further enhance the digital economy

Digital ID

- **Project 5**: Introduce a National Digital ID

Cyber security

- **Project 6**: Strengthen Cyber Security: accessing the current status and developing awareness campaigns and trainings

Digital economy

- **Project 14**: Develop regulations for mobile **money**

3

Facilitate digital interactions among government, private sector and citizens

E-Governance

- **Project 7**: Employ a human-centred approach to designing portals, helping maximize uptake and utilization
- **Project 8**: E-transactions enabled E-Governance: Pilot an electronic portal using E-Transaction technologies and ensuring user centricity

E-Commerce

- **Project 9**: Digital Applications: E-Commerce marketplaces: Unlock high impact market opportunities through targeted programmes to attract capital and build marketplaces
- **Project 15:**Enact clear policies, regulations and standards to enable electronic transactions and launch digital payment pilots in E-Commerce to accelerate adoption.

4

Strengthening the Digital Ecosystem

People

- **Project 10**: Digital literacy pilots: Designing and piloting a holistic digital literacy initiative
- **Project 11**: Workforce digital skills development: Creating a job-oriented digital skilling program and accompanying job matching platform can help build digital skills, create jobs, and digitalize the economy

Policy and Regulation

- **Project 12**: Incubator services: Refine incubator services based on the needs of start-ups and innovators
- **Project 13:** Private sector forums: Formalize government engagement with existing private sector ICT companies (future incubator graduates)

Figure 27: Summary for Prioritized Short Term Projects

6.2. Mid Term (3 years) to Long Term (5 years) Foundational Projects

6.2.1 Power Infrastructure

6.2.1.1 Project 16: Improve power reliability and create environment to facilitate private sector investment

The unreliability of the electricity sector is a major impediment to the expansion of a digital economy. A holistic approach is required to reform the power sector. If government implements the actions identified in this project, improvements in electricity reliability will be seen within 6 months of implementation and,

importantly, innovators and investors confidence in the sector will increase resulting in accelerated investment decisions.

Currently EEP and EEU are established under their own Regulations. To perform better, EEP and EEU need to be structured as Share Companies under the Commercial Code. This will provide a range of benefits. It will assist in debt restructuring as share company structure provides a more certain and more standard legal framework for lenders and provides a mechanism to develop more sophisticated quasi debt/equity options, such as preference shares. EEP could also more easily enter into public private partnerships and concessions to reduce total debt[106] and utilise private sector capital. It facilitates separation of generation from transmission and allows greater private sector participation and it will enhance governance, transparency and accountability. Legal status, reporting requirements, shareholder rights and administration rules, would also be standardised.

Meters will need to be installed at key connections points throughout the distribution network and a transparent tariff structure will need to be developed so that the cost components are clearly identified. Subsidized tariffs must be determined through a formal community service obligation framework where the costs of the subsidy are identified, and the provider of the subsidised service is compensated for the provision of that service through a performance-based contract. In addition, separating generation and transmission would also have many benefits including enhanced transparency.

6.2.1.2 Project 17: Fully operationalize the Ethiopian Electric Authority (EEA)

EEP's and EEU's legal mandate is currently determined through their establishing laws. If EEP and EEU were restructured as companies, their mandate would be set out in the license issued by the EEA rather than their establishing laws. Their establishing laws could therefore be repealed. This will require the EEA to effectively regulate the electricity sector and undertake the process to issue licenses for EEP and EEU.

6.2.1.3 Project 18: Adopt the Grid Code 2016

The Grid Code provides guidelines and rules for private participation in the Ethiopian power sector and trades with other countries. Government needs to implement the Grid Code and empower EEA to operationalize the Code. Implementation of these reforms would result in reliable, cost effective and sustainable supply of electricity to current users, improved access to distant communities and facilitate debt restructuring supporting the digitalisation strategy. There are key risks that need to be mitigated;

- **Resistance from public utilities management and personnel to engage in the restructuring and transformation in Share Companies.** Ensure public acceptance of the reform through a consistent communication strategy able to highlight benefits for consumers in terms of security of power supply and increased access to power.
- **Resistance to power tariff increases to achieve full cost-reflectiveness.** Develop a transparent subsidy scheme to ensure affordability of power supply based on customer's ability to pay.
- **Coordination failure between different government agencies and implementation agencies can lead to delays and cost overruns.** Clearly define reform champion for the

[106] In some cases, debt raised through a public private partnership where there is no recourse to the public party can be treated "off balance sheet".

restructuring of public utilities and power sector governance (e.g. Ministry of Water, Irrigation and Energy), monitoring the initiative by multi stakeholders' group (e.g. Power sector reform task force) and developing a dashboard to overview progress.

6.2.1.4 Project 19: Develop E-Commerce logistics through policy measures, attracting infrastructure investments and building sector capacity.

E-Commerce logistics differs from conventional logistics and requires focused efforts to develop the necessary infrastructure. Such focused efforts would entail assessing infrastructure and policy gaps, undertaking relevant policy measures, attracting investments, creating the necessary infrastructure (warehouses and fulfilment centres), and building the capacity of local logistics players such as the Ethiopian Postal Service Enterprise to serve domestic and cross-border E-Commerce in the country. Ethiopia could build upon the detailed diagnostic and implementation framework proposed by Universal Postal Union (UPU) for the E-Commerce hub to leverage synergies.

In 1-2 years, this could double the reliability of parcel delivery services in Ethiopia leading to an improvement in UPU postal index rankings and attract USD 10 million investments in infrastructure. A multi-stakeholder approach can help seamlessly implement the initiative. The Ministry of Transport and its associated agencies should draft a targeted policy for E-Commerce logistics. They should also support infrastructure creation as well as capacity building of enterprises (including EPSE) engaged in the sector.

A baseline study should be commissioned to assess E-Commerce infrastructure, inform policy measures, and coordinate with relevant ministries and agencies. EPSE and other logistic service providers should invest in upgrading systems, creating necessary facilities and building their capacity to serve E-Commerce. To aid investments, EIC should also ease investment restrictions such as on FDI and facilitate partnerships between international players and local logistics firms. UPU can provide inputs on policy measures to the government, help forge necessary partnerships, facilitate investments, and help build sector capacity. Other stakeholders who could be involved include international postal service providers, logistics associations, and development finance institutions.

Policies and regulations drafted to enable online transactions may not reflect industry concerns or may contain provisions, which restrict innovation and implementation. This would require engaging industry stakeholders throughout the drafting process and post notification to seek feedback, address concerns, and make necessary modifications.

Narrow focus on general logistics development can lead to underdevelopment of E-Commerce-oriented logistics infrastructure. Therefore, it may be necessary to enact a separate policy or updating the current policy to include a specific E-Commerce focus can help mitigate this risk. Suboptimal models for infrastructure creation may also adversely affect development. Leveraging learning's from leading E-Commerce markets such as China and India and adapting them to local contexts to select the right model can ensure cost-effective models that are suitable for Ethiopia are adopted and created.

6.2.2 Finance

6.2.2.1 Project 20: Improve Regulatory Environment Impacting investment

It is currently not possible for investment companies in Ethiopia to write off losses in some investments against profits in others. For a high-risk-high-return industry such as Tech start-ups, this adversely impacts upon their willingness to invest in higher risk activities. Furthermore, current foreign exchange

regulations make it extremely difficult for investors to repatriate their investments. New enterprises find it difficult to access loans from banks, due to unrealistic collateral guarantee requirements and high interest rates. Rigid regulations, bureaucratic procedures and difficulties in accessing foreign exchange contribute to higher costs associated with starting a company, especially in innovative sectors.

Customs Commission needs to develop policy allowing business losses to be offset against profits within linked corporations. NBE should review policy options to improve ability for foreign investors to repatriate profits and returns from investments and to facilitate high value domestic start-ups' access to foreign currency. NBE will also need to assess the merits of developing a personal property security law that would enable borrowers, firms and individuals secure loans by providing a registered charge against moveable property/assets, such as stock, agricultural products, assets used in the production of goods and services and machinery.

6.2.2.2 Project 21: Facilitate investment in IT sector

EIC should implement the current initiative that proposes lowering the minimum investment threshold of USD 200,000 for international investors in the ICT sector although further reduction will be necessary at later point. While the new proposed Investment Proclamation frees up foreign investment in some sectors, it does not go far enough, such as in postal services. While the proposed Proclamation allows private sector to provide postal services, they can only do so in partnership with the government.

EIC should review the proposed Investment Proclamation and assess whether, considering the opportunities to develop and expand the digital economy, foreign investment should be further liberalised. For example, private sector should be able to operate postal services without government partnership. The ECA has effective regulatory oversight for postal and other communication services; there is therefore no justification for requiring government involvement in postal services.

Long timeframes for obtaining financial returns also make it unviable for private sector investments. Matching investments by the government to ensure an equal share of risk liability between private sector and the government will encourage greater interest from the private sector. Provision of zero return capital by the government can ensure higher rate of returns for private investors, compensating for long timeframes for materialization of returns.

6.2.2.3 Project 22: Develop an Ethiopian Stock Exchange

The lack of a domestic equity market significantly limits the ability of local firms to raise capital to invest in new businesses and expand existing businesses. A stock market would also expand the digital economy as company information and trades would be facilitated through digital platforms. In 2019 government announced plans to develop an Ethiopian Stock Market by 2020, but little progress has been achieved.

Government should establish a Commission mandated to design a domestic stock exchange and develop an implementation plan with the target of opening a domestic stock market by 2021.

Summary of Mid to Long Term Projects

1 — Unlock the digital economy by strengthening existing infrastructure

Power

- Project 16: Improve power reliability and create environment to facilitate private sector investment
- Project 17: Fully operationalise the EEA: To regulate the power sector
- Project 18: Adopt the Grid Code 2016: to guide and provide rules for private sector participation in the power sector

2 — Facilitate digital interactions among government, private sector and citizens

E-Commerce

- Project 19: Develop E-Commerce logistics through policy measures, attracting infrastructure investments and building sector capacity.

3 — Strengthening the Digital Ecosystem

Finance

- Project 20: Improve Regulatory Environment Impacting investment
- Project 21: Facilitate investment in IT sector
- Project 22: Develop an Ethiopian Stock Exchange

Figure 28: Summary of Mid to Long Term Projects

7. Summary of the Foundational Projects: Timeframe and Key Stakeholders

Summary of Prioritized Projects (Short Term - < 18 months)

Foundational	Projects	Lead Enabling Government Institution	Key Stakeholders
To unlock the digital economy by strengthening existing infrastructure	**Project 1:** Liberalization of the telecommunication sector: Government to fully implement the telecommunications sector reform ensuring it is service oriented	ECA/ MoF	Private sector telecoms, Ethio Telecom
	Project 2: Deregulate mobile phone market: make mobile phones affordable and more accessible	MoF	Relevant Government agencies, MoR, Customs, EIC, private mobile phone suppliers.
	Project 3: WoredaNet upgrade and modernization: Rollout infrastructure tied with demand side linkages to modernize and upgrade WoredaNet	MInT	MoF, Regional Gov., EthioTelecom, relevant private sector players
	Project 4: Implement Universal Access: Setting up the universal access fund for ensuring access for all	ECA	MoF
To develop enabling systems that further enhance the digital economy	**Project 5:** Introduce a National Digital ID	MoP	MInT and the various owners of the use cases MoE, MoH, MoA, MoF, NBE, MoLSA,…
	Project 6: Strengthen Cybersecurity: accessing the current status and developing awareness campaigns and trainings	MInT/ INSA	Development partners, private suppliers
	Project 14: Develop regulations for mobile money:	NBE	MInT, mobile money providers, banks and microfinance institutions
To facilitate digital interactions among different actors (government, private sector and citizens) E-Government & E-Commerce	**Project 7:** Employ a human centred approach to designing portals, helping maximize uptake and utilization	MInT & Product owner institutions	MoTI, MoR, AACA, Regions, private companies
	Project 8: E-transactions enabled E-Governance: Pilot an electronic portal using E-Transaction technologies and ensuring user centricity	MInT & Product owner institutions	NBE, MoTI, ETSwitch, other Ministries, trade associations
	Project 9: E-Commerce marketplaces: Unlock high impact market opportunities through targeted programmes to attract capital and build		MoF, MoTI, MoR, EthioPost, EIC, MoT, UPU, Customs

	marketplaces This implies operationalizing and starting the following: - eWTP for smart warehousing and potentially e-payment - UPU ECom@Africa project that includes o Postal Operations readiness o Addressing system for door to door services o Building Sorting and fulfilment centre o Automation customs processes	MInT/ EIC EthioPost Geospatial Inst TBD Customs	private sector suppliers including logistics
	Project 15: Enact clear policies, regulations and standards to enable electronic transactions and launch digital payment pilots in E-Commerce to accelerate adoption.	NBE	MInT, MoTI, Banks & MFI, mobile money providers and microfinance institutions
To strengthening the Digital Ecosystem	**Project 10:** Digital literacy pilots: Designing and piloting a holistic digital literacy initiative	MInT, MoE, NBE & Private Sector	Regional Government Offices, non profit and private education suppliers
	Project 11: Workforce digital skills development: Creating a job-oriented digital skilling program and accompanying job matching platform can help build digital skills, create jobs, and digitalize the economy	JCC	
	Project 12: Incubator services: Refine and expanding to regions incubator services based on the needs of start-ups and innovators.	MInT & Private Incubator	MoTI, EIC, start up companies and existing private sector incubators
	Project 13: Private sector forums: Formalize government engagement with existing private sector ICT companies (future incubator graduates)	MInT & an ICT Association	MoTI, EIC, IT sector companies, trade associations, Chamber of commerce

Summary of Proposed Mid Term (18m – 3 Years) and Long Term (3 – 5 Years) Projects

Imperatives	Projects	Timeframe	Lead Enabling Government Institution	Stakeholders
To Unlock the digital economy by strengthening existing infrastructure	**Project 16:** Improve power reliability and create environment to facilitate private sector investment	MT	MoF	MoWIE (EEU & EEP), EIC, private Investors
	Project 17: Fully operationalize the EEA: To regulate the power sector	MT	MoWIE	EEA
	Project 18: Adopt the Grid Code 2016: to guide and provide rules for private sector participation in the power sector	MT	MoWIE	EEA
To facilitate digital interactions among different actors (government, private sector and citizens)	**Project 19:** Develop E-Commerce logistics through policy measures, attracting infrastructure investments and building sector capacity.	LT	MoT	MInT, EAL, MoF, UPU, EPSE, private investors and logistics suppliers
To Strengthen the Digital Ecosystem	**Project 20:** Improve Regulatory Environment Impacting investment	MT	MoF	EIC, private investors
	Project 21: Facilitate investment in IT sector	MT	EIC	MInT, ECA, IT companies and trade association
	Project 22: Develop an Ethiopian Stock Exchange	LT	MoF	Private companies and investors

Enabling Government Institutions includes their respective Directorates and Institutes. For example, the Technology and Innovation Institute will be one of the key enabling government institutions within MInT.

Government stakeholders and timeline mapping of all 22 projects to facilitate accountability of Government leaders in creating the enabling environment for the private sector

8. Government stakeholders and timeline of all 22 projects and Summary of the Digital Opportunities for Economic Drivers

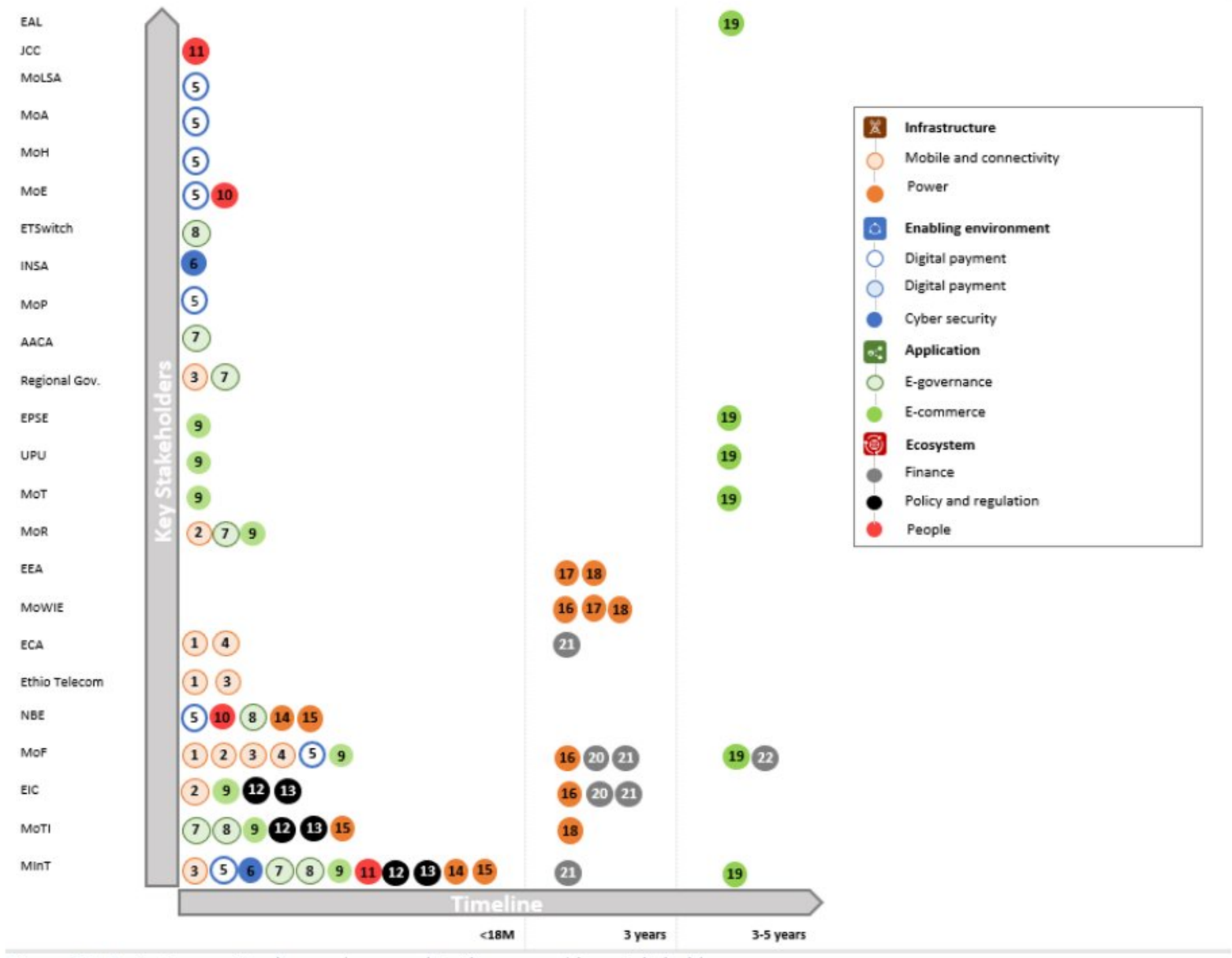


Figure 29: Projects on a timeline and mapped to themes and key stakeholders

Major Opportunities created through each pathway and timeline for implementation

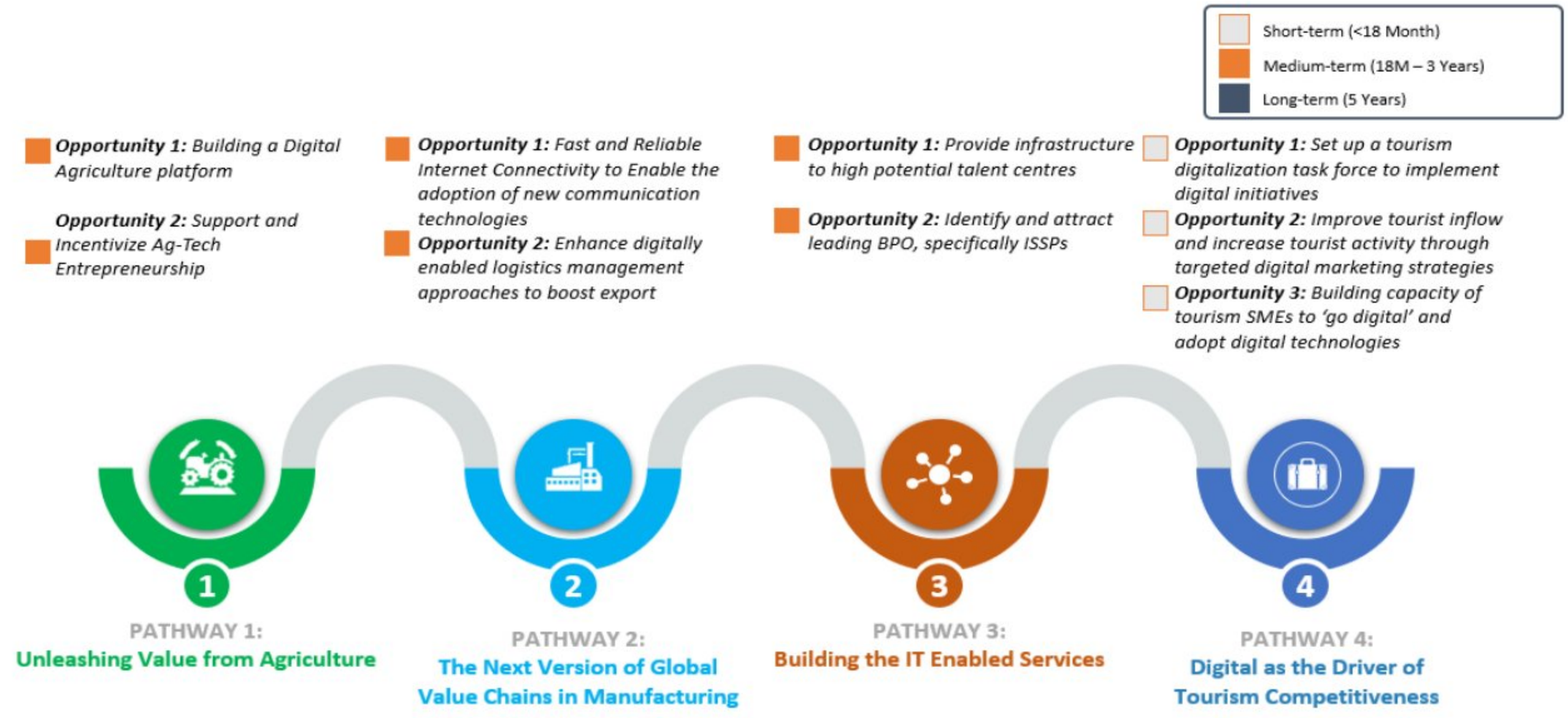


Figure 30: Major Opportunities created through each pathway and timeline for implementation

Note: The above outlines digital opportunities identified for Ethiopia. It is unlikely that all will come to fruition at the same time or with the same economic and job benefits, but based on investor interest, time will tell where the best opportunities exist. To unlock opportunities regulatory flexibility will be required to enable investments in these areas. Private actors must drive these opportunities and as suitable anchor investors emerge, at scale for earnings or job creation, more direct public support may be appropriate.

9. Conclusion and suggested success measures

Worldwide, technological changes are fundamentally altering the way people live, communicate, produce, work, and trade. This umbrella strategy assessed Ethiopia's digital readiness; how digital technologies can be expanded in the economy; how they can support agriculture, manufacturing, tourism and other sectors; and improve government operations. It also explored how digital technologies can be used to promote socially inclusive development and enable the country to export and become a competitive supplier of goods and services.

Further dialogue and action planning will certainly be required before implementation, however, concrete suggestions have been proposed for the pursuit of an inclusive digital economy to catalyse Ethiopia's planned vision and objectives in line with the key national objectives of job creation, increasing foreign exchange earnings, and inclusive prosperity. The urgency has been emphasized in addressing the fundamental foundations and specific projects have been suggested to accelerate development of effective solutions.

The Homegrown Economic Reform Agenda highlights that the move to an inclusive digital economy can unlock significant growth and productivity gains for the country, but also notes that, if the country wants to make the most of the opportunity, it is important for all the different efforts to come together as a coherent, coordinated whole. This strategy maps how that can be achieved identifying how the different stakeholders can best work together to achieve the goals, outputs and outcomes identified in this strategy. Unlike a traditional sector-specific strategy, this document aims to act as a visionary umbrella strategy from which sectors and institutions can then design and co-create specific action-oriented plans with relevant budgets, timelines and key performance indicators,

Key to unlocking the benefits of a digital strategy is to transition from government led investment to a private sector led economy. This transition will require government to play a very different role in enabling a digital economy. This role is more about creating an enabling environment and less about direct implementation. **From a regulatory perspective, it requires a shift from 'risk-manager' to 'development enabler'.** This will also require that government adopt a more optimistic and trust-based relationship with the private sector and non-government actors. This strategy emphasises and enables that transition.

This strategy contains several recommendations and priority projects, many of which the Ministry of Innovation and Technology will not be able to undertake on its own. It will need to spearhead the transformation journey with utmost consistency and persistency and establish effective monitoring mechanisms for timely delivery. However, the major responsibility remains with other government institutions driving the implementation, garnering and serving the private sector as well as mobilizing donors as necessary.

This strategy presents a plan for implementation and identifies the roles that different stakeholders need to play to achieve the outcomes sought. If adopted the plan will generate significant benefits for the Ethiopian economy, create opportunities for private sector growth, which is the engine of job creation and forex earnings; and ensure the role of digital in fuelling inclusive prosperity is maximized.

Measuring the digital economy

This National strategy has provided evidence-based guidelines on how to drive Ethiopia towards a digital economy. It has put people at the centre of the digital future; it has outlined the foundations required for a digital economy, provided insight on how to reach everyone and be inclusive, it has clearly outlined the role of government in building an enabling ecosystem whereby all the different actors of the economy can harness change.

From the above, performance indicators can be derived for the next 5 to 10 years. Many references exist on how to measure the digital economy from OECD, UNCTAD, The World Bank, ILO, ITU, IMF and others, that can be adopted but all essentially measuring:

1. National Innovation Index
2. National Digital Adoption
3. National Digital Economy Adoption

The following indicators are some of the key performance indicators to be adopted:

Indicators	Measuring
National Digital Access measuring	1. People enrolled in the Digital-ID system, % of Population 2. Number of Smartphones per 100 Population 3. Total Active Fixed Broadband subscriptions per 100 individuals 4. Total Active Mobile Broadband subscriptions per 100 individuals 5. Number of Cashless Transactions per person 6. Monthly Data Consumption per Unique Connection 7. Price of 1GB data as proportion of GNI (%) 8. Machine to Machine (M2M) SIM card penetration per 100 inhabitants 9. Individuals using the Internet (%) 10. Household with Internet Access (%) 11. International bandwidth per Internet user (kbit/s) (%)
Financial Sector Digital Indicators	12. People with an Account (%) 13. Used the Internet to pay for something (With in the given year, %) 14. Used the Internet to buy something online (With in the given year, %) 15. Debit Card Ownership (%) 16. Used a mobile phone or the internet to access a financial institution account (With in the given year, %) 17. Credit Card Ownership (%) 18. Made or received digital Payments (With in the given year, %) 19. Made digital Payments (With in the given year, %) 20. Receive Digital Payments (With in the given year, %) 21. Mobile Money Account (With in the given year, %)

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Adopting Digital Strategy as part of Institutional Strategy of Public Institutes and Private Firms	22. Digital Stratgey: ▪ Forms that have a digital strategy that is fully integrated with the overall National Digital Transformation Strategy ▪ Has changed core operations in response to disruption ▪ Believes they invest more in digital than peers do 23. Digital Organization ▪ Has a centralized, company-wide digital organization ▪ The executive supports and is directly involved in digital initiatives ▪ Has a distinct, stand-alone analytics team with the appropriate talent 24. Digital Capabilties ▪ Uses the National Payment Gateway for interbank transfers ▪ Has implemented a Customer Relationship Management system ▪ Makes extensive use of digital channels to reach customers
Improve Services offering through Digital Utilization, in Public Institutions and Private Firms)	25. Digitization Level, ICT Sector and Services 26. Digitization Level, Financial Services 27. Digitization Level, Real Estate and Construction Services 28. Digitization Level , Professional Services 29. Digitization Level , Education and Health Sectors and Services 30. Digitization Level , Manufacturing Sector 31. Digitization Level , Trade Services and Sector 32. Digitization Level , Transport Services and Sector 33. Digitization Level, Tourism and Hospitality Services
Digital Economic Value Addition	34. Core Digital services (IT BPM, BPO, Mobile industry, Digital Communication Services: Electronics Manufacturing. 35. Newly Digitizing Sectors (Financial services, Agriculture, Education, Healthcare, Retail, Transport and logistics, Tourism and Hospitality, Utilities)
Digital economy Adoption - Firms Adopting relatively simple digital solutions to close Gap	36. Make use of Technologies for digital marketing 37. Conduct Sales thur Digital Channels 38. Payment Methods 39. Make use of Basic Digital Solutions 40. Indicators for Digital Transaction and ePayment System

Note: all of these indicators will need to be further developed adapted and agreed upon with relevant institutions and periodically monitored as success measures

ANNEX

Annex I: List of Acronyms

AACA	Addis Ababa City Administration
CSC	Common service centers
DFI	Development Finance Institutions
ECA	Ethiopian Communications Authority
EDGI	E-Government Development Index
EEA	Ethiopian Electric Authority
EIC	Ethiopian Investment Commission
EoDB	Ease of Doing Business
EPSE	Ethiopian Postal Service Enterprise
ETC	Ethiopian Telecommunications Corporation
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GNI	Gross National Income
GTP	Growth and Transformation Plan
HRMS	Human Resource Management Service
ICT	Information and communications technologies
IFC	International Finance Corporation
IRAS	Inland Revenue Authority of Singapore
ISP	Internet service providers
ITU	International Telecommunication Union
IVR	Interactive Voice Response
KPI	Key Performance Indicators
LDC	Least Developed Countries
MCIT	Ministry of Communication and Information Technology
MFI	Micro Finance Institute
MICE	Meetings, Incentives, Conferences, and Exhibition

MIS	Management Information System
MoCT	Ministry of Culture and Tourism
MoE	Ministry of Education
MoR	Ministry of Revenue
MoST	Ministry of Science and Technology
MoTI	Ministry of Trade and Industry
MoU	Memorandum of Understanding
MoWIE	Ministry of Water, Irrigation and Energy
MSME	Micro, small, and medium enterprises
MVNO	Mobile virtual network operator
NBE	National Bank of Ethiopia
NGO	Non-Governmental Organizations
POS	Point of Sale
PPP	Public private partnership
SEO	Search engine optimization
SME	Small and medium enterprises
SPV	Special purpose vehicle
UAE	United Arab Emirates
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNWTO	United Nations World Tourism Organization
UPU	Universal Postal Union
WEF	World Economic Forum

Annex II: Country Case Examples

Connectivity reforms and development in select countries

India: Policy reforms focused on liberalization and introducing hyper competition transformed India into among the fastest growing telecom markets globally. Government relaxed the state monopoly to allow private players to offer fixed line as well as wireless services. The country was divided into 23 service regions[107]. Private players were allowed to selectively acquire licenses in one or multiple regions, and multiple providers were allowed in each region leading to hyper competition and price reduction. A strong regulator was created to establish tariffs, set technical standards and manage competition. Infrastructure sharing was allowed, and spectrum auctions helped facilitate network expansion. This was supported by relaxation of FDI limit in the sector (currently at 100%)[108] and measures such as preferential electricity tariffs for network infrastructure etc. As a result, the internet penetration increased from 7.5% to 34.5%[109] and number of broadband subscribers increased from 10.5 million to 340 million[110] between 2010 and 2017. Between 2014 and 2017 data prices also fell by 93%[111].

BharatNet (India): It is the largest optic fibre deployment programme in the world initiated by the Government of India to extend high speed broadband connectivity (>100 Mbps) to the last mile. The govt. created a designated special purpose vehicle (SPV) to lead design and implementation of the effort. The responsibility of rollout was divided between union government (up to the sub district level), state governments (from sub-district to the gram panchayat which is the smallest administrative unit in India) and private sector (last mile connectivity). Existing infrastructure was fully leveraged during rollout. At the same time, several Memorandum of Understanding (MoUs) were signed upfront to resolve right of way issues and accelerate rollout. The programme was funded through the Universal Service Fund. To catalyse demand, common service centres (CSCs), which are entrepreneur run kiosks offering government services, were created using the fibre infrastructure. The govt. provided viability gap funding to private sector to start offering services in commercially unviable areas. Over 360, 000 km of fibre optic cable has been installed and more than 120, 000 of the 250, 000 Gram Panchayats have been covered since launch in 2014[112].

Myanmar: Telecom sector reforms in the country were introduced in 2013 and since then the country has seen rapid connectivity expansion. Two private players were awarded licenses to start operating in the country in 2013 based on a competitive bidding process as part of sector liberalization. Since, then two more licenses to full-service operators and another license to a mobile virtual network operator (MVNO) have been awarded. The government also adopted universal service targets and a

[107] Licensing Framework for Telecom: A Historical Overview. (n.d.). Retrieved from https://cis-india.org/telecom/resources/licensing-framework-for-telecom

[108] Brand India. (n.d.). Retrieved from https://www.ibef.org/industry/telecommunications.aspx

[109] Individuals using the Internet (% of population). (n.d.). Retrieved from https://data.worldbank.org/indicator/IT.NET.USER.ZS

[110] (2017, December 12). Retrieved from https://main.trai.gov.in/release-publication/reports/telecom-subscriptions-reports

[111] www.ETTelecom.com. (2018, March 29). Data tariffs fall 93% in last three years: Telecom department - ET Telecom. Retrieved from https://telecom.economictimes.indiatimes.com/news/data-tariffs-fall-93-in-last-three-years-telecom-department/63537339

[112] Bharat Broadband Network Limited. (n.d.). BBNL, Ministry of Communications & Information Technology, Govt. of India. Retrieved from http://www.bbnl.nic.in/

minimum network coverage target of 75% in 5 years[113] was set as part of the license award for private operators. To facilitate rapid expansion, infrastructure sharing was allowed and taxes on handsets and SIM registration were drastically reduced. As a result, network coverage improved from 12% to 90%, mobile penetration from ~13% to 89% and internet penetration from ~1% to 30% between 2013 and 2018[114, 115]. However, lack of a service focus and poor digital literacy has led to limited use cases.

Nigeria: Private player entry and focus on infrastructure investments has led to increased coverage and transformed Nigeria into Africa's leading telecom markets. As part of liberalization, licenses were awarded to 4 mobile operators and over 100 internet service providers (ISPs). Clear targets were identified for the sector and designated implementation (NITDA) and regulatory agencies (NCC) were set up. Government also allowed infrastructure sharing and issued licenses to last mile infrastructure companies to offer internets services. Investments in international bandwidth expansion were encouraged and made a policy priority. As a result of these measures, the internet penetration in the country improved from 11% to 27% between 2010 and 2017[116,117], and ~USD 16 billion were received in FDI between 2001-2011[118]. However, lack of political alignment has resulted in delayed approval of critical telecom sector legislations as well as multi-layered taxation restricting growth. Further, infrastructure vandalism and unreliable power supply has led to high operating costs for service providers.

Rwanda – The biggest reformer of EoDB moving up 110 places in ten years[119]

Rwanda: As the biggest reformer in the history of EoDB, Rwanda has made more than 70 reforms over the last decade. Digital was utilized to implement more than 20% of the reforms introduced by the government. The aggressive EoDB efforts have successfully lifted Rwanda to #29 in the global ranking in 2019, the second highest in Africa (next to Mauritius at #20). More importantly, the impact of improving EoDB has borne fruit in many aspects of the Rwandan economy. Since 2009, the numbers of new, limited liabilities have increased by 23 times, while FDI grew 5 times. Export trade showed an annual 20% increment, while export of services grew 7 times in value. Digital has also helped the country reduce corruption. In 2018, Rwanda became the first African country to join Alibaba's Electronic World Trade Platform (eWTP), which allows Rwandan SMEs to participate in global trading.

Singapore – Re-engineering IRAS to reach 95% taxpayers' approval

Singapore: When the Inland Revenue Authority of Singapore (IRAS) was established in 1992, the organization had the sole purpose of transforming itself into an efficient tax administrator. Some 25 years later, owing to a series of digital initiatives implemented, IRAS has become one of the most

[113] GSMA. (2013). *Sizing the opportunity: Green telecoms in Myanmar*.
[114] International Telecommunication Union. (2012). *Measuring the Information Society Report*.
[115] International Telecommunication Union. (2018). *Measuring the Information Society Report* (Vol. 2).
[116] International Telecommunication Union. (2012). *Measuring the Information Society Report*.
[117] International Telecommunication Union. (2018). *Measuring the Information Society Report* (Vol. 2).
[118] U.S. International Trade Commission. (2017). *Nigeria's Services Economy: The Engine for Future Growth*.
[119] Revision of World Bank Group – Doing Business reports from 2009 - 2019

digitalized tax administrators globally[120]. Singapore's successful tax transformation can be attributed to several factors that include behavioural changes, improving infrastructure, and adoption of digital technologies[121].

- **Behavioural changes:** a strong political will and mindset i.e., recognizing taxpayers as voluntarily compliant as opposed to dodgers and evaders, influenced mindset shift of both government and taxpayers. Digitalization was also considered as a natural extension to improve the work process and this has increased keenness to apply digital technologies in government offices. Sufficient training enhanced technical capacity of employees and digital skills of taxpayers, reducing resistance to changes
- **Improving infrastructure:** The Government of Singapore focused on improving Internet penetration. This included building community centres with internet access to increase adoption of internet in the lives of citizens
- **Adopting digital technologies:** in order to optimize and modernize government services, IRAS leveraged digital for integrating systems as well as accurately calculating tax obligation.

These improvements have enabled IRAS to overcome taxpayers' reservations. More than 97% of tax records are e-filed, and 95% of taxpayers are satisfied with the IRAS's service[122]. According to a 2017 report, tax revenue per capita has reached USD 8,038[123]. In addition, Singapore has achieved one of the lowest errors per net tax assessed at 0.68% and the government has recovered USD 240 million through audit[124].

Estonia – Digitalizing 99% public services

Estonia: According to Toomas Hendrik Lives, former president of Estonia, 'only getting married, sale of real estate and divorce requires citizens to show up at government offices' in Estonia[125]. Since becoming an independent nation in the early 1990s, the Estonian government has committed to continually evolve its E-Governance system to become "the most advanced society in the world"[126]. Estonia was able to achieve such progress due to a combination of factors including the right leadership mind-set and focusing on improving digital skills, connectivity infrastructure, and enabling ecosystems[127].

- **Leadership mind-set:** the Estonian government had early on understood the impact digitalization could have on improving competitiveness of the state and well-being of citizens. Policy

[120] Smart Nation and Digital Governance Office Singapore. 2018. *A Singapore government that is digital to the core and serves with heart*
[121] Inland Revenue Authority of Singapore 2017. *25 years of IRAS's transformation*
[122] Inland Revenue Authority of Singapore 2012. *Taxes redefined – 20 years of excellence in tax administration*
[123] Inland Revenue Authority of Singapore. 2017. Retrieved from https://www.straitstimes.com/sites/default/files/attachments/2017/08/27/st_20170827_iras2_3376649.pdf
[124] Inland Revenue Authority of Singapore. 2017. Retrieved from https://www.straitstimes.com/sites/default/files/attachments/2017/08/27/st_20170827_iras2_3376649.pdf
[125] Retrieved from https://www.imf.org/external/pubs/ft/fandd/2018/03/trenches.htm
[126] Retrieved from https://www.wired.co.uk/article/estonia-e-resident
[127] Review of https://e-estonia.com/

reforms and mandatory standard requirements shaped how government institutions should be set up and operate and citizens were encouraged to adopt digitalization. The government was also willing to partner with the private sector in implementing critical projects

- **Improving connectivity infrastructure:** Launched in the mid-1990s, the Tiger Leap project heavily invested in the development and expansion of computer and network infrastructure. Data integration and implementing cloud systems have also enabled the government to provide e-services seamlessly
- **Focus on enhancing digital skills:** in 1995, at the beginning of the digital revolution, all Estonian schools got wired up to the internet and computer laboratories were built to encourage free public use[128]. School curricula were designed to have a "technology and innovation" theme, including teaching children coding from the age of seven. This has significantly increased digital literacy in the country. Currently, one in ten students study information technology
- **Unlocking the enabling ecosystem**: national ID, digital signatures, and e-banking played an instrumental role in the launch and expansion of e-services, increasing penetration and public satisfaction

Currently, 99% of public services are available online in Estonia[129]. Digitalization has increased government efficiency and decision-making by 10X[130].

Case Studies - E-Commerce development in international markets

China: China transformed into a USD 1.3 trillion E-Commerce market (B2C), expected to reach ~USD 2 trillion by 2020[131], because of policy and infrastructure creation oriented specifically to E-Commerce. It is the largest B2C E-Commerce market globally, growing at a rate of more than 20% annually with more than 550 million online shoppers[132]. This growth is a result of several targeted measures. The government adopted a series of five-year plans focused on E-Commerce and laid down a clear pathway for E-Commerce development. Support for the sector led to investments and emergence of national champions such as Alibaba leading to greater adoption. Further, the government encouraged investments in logistics by providing concessional land leases to set up warehouses and created free trade zones to encourage cross-border E-Commerce. E.g.: It has set up a free trade zone in Hangzhou accompanied by adoption of integrated online systems which has led to faster processing and clearing of customs. Thirteen such zones have been set up so far in China. Forums to regularly engage with the industry and policy measures to drive digital payments have further aided growth.

[128] Raconteur. 2018. Retrieved from https://www.raconteur.net/technology/estonia-digital-society
[129] Retrieved from https://e-estonia.com/
[130] Retrieved from https://e-estonia.com/
[131] Melton, J., Nolan, J., Chu, F., Bloomberg News, Bloomberg News, … Bloomberg News. (2019, January 24). Online retail sales in China grew almost 24% in 2018, its government says. Retrieved from https://www.digitalcommerce360.com/2019/01/24/chinas-online-sales-grew-almost-24-in-2018/.
[132] Lavin, F. (2018, April 18). Selling to China: Cross-Border or In-Country Solutions? Retrieved from https://www.forbes.com/sites/franklavin/2018/04/18/selling-to-china-cross-border-or-in-country-solutions/#2997082716c4.

India: India is the world's fastest growing E-Commerce market with significant entrepreneurial activity in the space. The B2C E-Commerce market stood at USD 40 billion in 2017[133] and more than five start-ups in the sector have achieved unicorn status. This has been enabled by reforms such as legal recognition for electronic transactions and receipts, progressive increase in FDI for E-Commerce (currently at 100%), push for digital payments, rapid growth in mobile and internet penetration, and finally, comprehensive E-Commerce policies with due recognition to consumer protection. E.g.: The government has increased the FDI limit to 100%[134] for pure-play marketplaces connecting sellers directly to consumers, which has led to significant investments in the sector. At the same time, policy measures have been adopted to ensure fair competition and protect SMEs on E-Commerce channels as well as arrest sale of counterfeit products. These measures, along with integrated online systems shared by port, customs, and post authorities to streamline E-Commerce, have increased trust in E-Commerce among buyers as well as sellers.

Nigeria: Nigeria is Africa's largest E-Commerce market, home to ~40 %marketplaces on the continent. Its E-Commerce preparedness index rank is 75[135]. Beginning with a push to support entrepreneurship, Nigeria allowed FDI in retail and E-Commerce sectors as well as enacted policy measures to legitimize electronic transactions and receipts. A push towards digital payments through the Cashless Nigeria Policy and regulations for protection of consumer data has further driven growth. E.g.: Support for entrepreneurship and a digital payment has led to a reduction in transaction costs, driving E-Commerce growth. Improvements in postal reliability (Nigeria is among the top 25 percentile nations on postal reliability) have also led to improvements in E-Commerce logistics.

Device distribution – not a standalone solution: lessons from unsuccessful projects

Aakash table distribution program (India): The program aimed to distribute 10 million digital devices to students in India. The program had an initial budget of USDS 150 million, with each device projected to cost USD 10 to manufacture[136]. However, the projected device manufacturing cost was unrealistic and impeded feasibility of the program[137]. In addition, the devices were designed too small and did not offer relevant content. Consequently, the program did not go beyond its pilot phase.

One Laptop Per Child program (multiple countries): Led by a non-profit institution, the program aimed to improve digital skills of children in middle school by distributing two million XO laptops[138]. The project was undertaken in multiple countries including Ethiopia, Rwanda, Ghana, Nigeria, Uruguay and Brazil. However, the project made little impact in improving digital literacy in

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[133] E-commerce industry in India. (n.d.). Retrieved from https://www.ibef.org/industry/ecommerce.aspx.
[134] Phartiyal, S. (2019, January 31). Explainer: What are India's new foreign direct investment rules for E-Commerce? Retrieved from https://in.reuters.com/article/india-ecommerce-explainer/explainer-what-are-indias-new-foreign-direct-investment-rules-for-E-Commerce-idINKCN1PP1XS.
[135] UNCTAD (2018). *B2C E-Commerce index 2018: Focus on Africa*
[136] Forbes India. 2014. *What Went Wrong with the Aakash Tablet.* Retrieved from http://www.forbesindia.com/article/real-issue/what-went-wrong-with-the-aakash-tablet/33218/1
[137] Forbes India. 2014. *What Went Wrong with the Aakash Tablet.* Retrieved from http://www.forbesindia.com/article/real-issue/what-went-wrong-with-the-aakash-tablet/33218/1
[138] Retrieved from http://one.laptop.org/about/mission

some countries[139] and was halted due to a number of challenges listed below.

- *Lack of infrastructure*: lack of electricity and intent connectivity in rural areas made charging laptops and updating content difficult
- *Poor content*: lack of relevant content made the program difficult to integrate with existing curriculum[140]
- *Quality of devices:* due to poor quality, devices depreciated faster before recipients were able to sufficiently develop digital skills
- *Cost:* each device cost USD 100 to manufacture, making the project difficult too expensive to scale
- *Cultural barriers:* students feared damaging their devices and preferred to keep them at home safely instead of using them efficiently[141]. In countries like Ethiopia, children were able to master digital skills faster than teacher, and this created some frictions
- *No skill development and evaluation standard:* lack of predetermined set of standards to measure progress made tracking impact difficult post device distribution

Chhattisgarh mobile phone distribution program (India): The program was designed to reduce the digital divide by distributing 4.4 million smart phones at a cost of USD 17 per device[142]. During the project duration, five million devices were distributed to women. However, the project had little impact on improving digital skills due to low quality of devices and insufficient awareness creation about the purpose of uploaded content (recipients perceived its contents as politically motivated).

Employing holistic approach: lessons from successful projects

Digital literacy program (Kenya): The program aimed at developing IT Skills of children in public primary schools through digital learning enabled by tablet distribution to every child[143]. In order to ensure integration with existing school curriculum, relevant content was preloaded on the devices and teachers received robust training. In addition, infrastructural facilities such as routers and solar chargers were distributed to ensure continuous usage of devices. The program has been implemented in 23,051 primary schools in Kenya.

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[139] Retrieved from https://citizentv.co.ke/news/govt-drops-laptops-project-adopts-a-more-elitist-programme-89778/

[140] World Bank blog. 2012. Retrieved from https://blogs.worldbank.org/impactevaluations/one-laptop-per-child-is-not-improving-reading-or-math-but-are-we-learning-enough-from-these-evaluati

[141] IBD Education. 2011. *Evaluation of the "Una Laptop Por Niño" Program in Peru: Results and Perspectives* Retrieved from http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=36750450

[142] Retrieved from https://www.ndtv.com/india-news/free-phones-loaded-with-benefits-for-chhattisgarh-women-students-1888379

[143] Retrieved from https://citizentv.co.ke/news/govt-drops-laptops-project-adopts-a-more-elitist-programme-89778/

Digital ambassadors' program (Rwanda): The program appointed 5,000 young Rwandans as digital ambassadors and that were empowered to provide digital literacy training in rural areas[144]. Developing locally relevant and technology enabled content (using mobile phones) has increased demand for developing digital skills and eased delivery of training. The project aims to improve digital skills of 5 million Rwandans in five years and has created jobs for the youth.

Google Internet Saathi's (India): The program trained rural women in India as *Internet Saathi's* to provide digital and internet literacy to other women in their communities[145]. The program went through different iteration during its development phase.

1 Helping Women Get Online

Helping Women Get Online (HWGO)

- In 2012-13, Google acknowledged the stark gender gap in Internet usage in India and the need for intervention
- Initiated HWGO – providing curated content for housewives and mothers in urban areas

2

Training women beneficiaries directly

- In the next line of intervention, Google targeted rural women by collaborating with colleges to train batches of local women to use the Internet
- This initiative had limited scalability, and witnessed turnout issues and lack of knowledge retention among women

3

Internet Saathi Pilot: Kiosk model

- A tricycle kiosk fitted with smartphones and tablets was staffed with a male saathi
- This Kiosk was stationed from village to village to overcome the mobility challenges often faced by rural women.
- However, women were found to not be too receptive to a male saathi

4

Internet Saathi Pilot: Cycle model

- Female saathis were trained and provided a specially designed cycle fitted with smartphones and tablets
- However, women faced difficulties while riding cycles in sarees, and lack of proper road infrastructure was a deterrent

5

Present Day Internet Saathi model

- Built after iterations on the pilots basis Saathi feedback
- The cycles were removed, and device was restricted to smartphone only
- Improved training content

Until April 2019, 81,500 Internet Saathis have helped over 28 million women develop basic digital skills across 289,000 villages[146]. The program has this success due to several factors including the following.

- *Good program design:* The program has multiple design iterations and pilots to ensure the training models and content are technically and culturally appropriate. Voice search capabilities in nine languages have also supported to overcome literacy challenges
- *Strong delivery mechanism:* The program recruited, trained and incentivized women/Saathis to go

[144] World Economic Forum. 2017. *Rwanda's digital ambassadors are boosting computer literacy.* Retrieved from https://www.weforum.org/agenda/2017/02/rwandas-digital-ambassadors-are-boosting-computer-literacy/
[145] Retrieved from https://internetsaathiindia.org/
[146] Retrieved from https://internetsaathiindia.org/

door-to-door and train other women in their communities, an approached that worked well in launching and scaling the program

- *Strong stakeholder alignment:* A smooth coordination between the program implementer (Tata Trust), logistics partners, trainers and (Non-Governmental Organizations (NGOs) has enabled the program to utilize sufficient human, financial and organizational resources to sustain project impact

Ajira – creating one million digital jobs in Kenya

Ajira Digital Program (Kenya): Launched in 2016 by the Ministry of ICT, Ajira Digital Program is a digital upskilling and employability program that aims to introduce young Kenyans to online work and provide the necessary tools and trainings to become competitive[147]. The trainings area tailored to help young Kenyans improve English language competency, digital skills including design and creative, writing, data analysis, accounting, web and mobile application development[148]. A job portal managed by the Ministry enables job seekers to find work and earn income. The program targets to create one million jobs by 2022[149]. The pilot of the program started in 2016 and has created more than 21,650 online jobs, 74% sourced internationally[150]. Helped 21,700 youth find employment online by creating linkages with local and international outsourcing companies[151]. The program is working to close gaps in three areas (i) lack of awareness about online jobs opportunities, (ii) infrastructure limitation such as internet connectivity and computer devices, and (iii) digital skills gap to compete internationally. Initiatives are underway to overcome these gaps as well as address systemic supply, demand and access to market challenges through establishing training hubs to improve digital skills and provide free internet services, improving government outsourcing and supporting private blue-collar job platforms.

Annex III: Universal Postal Union Gap Assessment on E-Commerce

(15 Oct 2019)

POLICY, REGULATORY AND GOVERNMENT PERFORMANCE CONCERNS IN ETHIOPIA IMPACTING VIABILITY OF E-COMMERCE INVESTMENT

The business climate in Ethiopia shows signs of strengthening. Under the leadership of Prime Minister Abiy Ahmed, reforms are being initiated and implemented. There is reason to believe that the issues outlined below can be resolved. Government has announced its ambition to privatize state-owned enterprises in telecom, shipping and aviation. Our efforts with regard to E- Commerce in Ethiopia and the policy, regulatory and government performance issues associated with it, along with our prospective investment structure, are well-timed to take advantage of the culture of reforms and innovation now shaping Ethiopia.

Nonetheless, as a practical matter, the following issues have been identified and must be addressed effectively to support the viability of e-commerce investment in the country.

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[147] Retrieved from https://www.afritechmedia.com/ajira-digital-program-aims-to-create-over-1-million-jobs-online/

[148] Retrieved from https://www.ajiradigital.go.ke/home

[149] Retrieved from https://www.afritechmedia.com/ajira-digital-program-aims-to-create-over-1-million-jobs-online

[150] Retrieved from https://www.ajiradigital.go.ke/home

[151] Retrieved from https://www.ajiradigital.go.ke/home

TRANSPORT/LOGISTICS ISSUES

CARGO HANDLING IN DJIBOUTI	
KEY ISSUES	**ACTION REQUIRED**
POOR SERVICE; NO ALTERNATIVES. Since Djibouti is the only port Ethiopia is using currently the logistics process is fully at the mercy of the level of the service, price, weather conditions as well as work and religious customs of the country. Additional key issues lie in terms of availability of trucks, lack of efficient coordination between Ethiopian and Djiboutian authorities/customs, technology not advanced and swift.	High-level bi-lateral intervention to streamline systems in Djibouti for transshipment; possible 3rd. party facilitation (Multilateral institution?)
LACK OF ACCOUNTABILITY. Most delays of clearance of goods result more on the ET exhaustive procedures that need corrections; There are anecdotal stories about staff at ports not being available because it is too hot in the afternoons and because of khat/chat chewing sessions that take the whole afternoon and not working on Thursdays.	Implement track and trace technology with integrated; electronic data exchange; improve training and education
LAND TRANSPORT TO ETHIOPIA FROM DJIBOUTI	
KEY ISSUES	**ACTION REQUIRED**
GOVERNMENT MONOPOLY. Only Ethiopia Shipping Lines (ESL) can manage commercial road transportation. As it does not have its own trucking operation, it contracts with private contractors, which it cannot and does not supervise. This lack of accountability means that whenever failure or delay occurs, the owner of the cargo absorbs the cost.	Allow new entrants to market. More financing of forwarders to invest in transport; Allowing of forwarders to enact their roles as door to door service providers; ESL to be reduced in its main activities of shipping/carrier rather of forwarding, transport and Inland port management company
MANAGEMENT BY ESL. ESL has to be free to operate without excessive government intervention. According to some industry practitioners, ESL's area of expertise is not road transportation, nor is it equipped to manage this area, as it does not own its own trucks or have professionals to oversee the management. By inserting itself in this transaction, ESL invariably closes the door for the market to efficiently perform and reflect the reality on the ground, forcing prices on both the customer and the service provider. It also opens the door for its staff members to be involved in corruption, abuse of power or mismanagement resulting from lack of knowledge.	Allow new entrants to market
UNRELIABLE TRAIN SERVICE. The train from Djibouti to Addis Ababa has been running for one year. The service intermittently breaks down and when it does work, it	Open procurement for new operations and management

only runs one train a day. (The logistics professional who commented on this compared the performance with that of Kenya which runs trains from Nairobi to Mombasa 8-9 times a day. Although the distances are not the same (1000 Kms from Djibouti to Addis Ababa and 483 Kms from Nairobi to Mombasa), it is still indicative that the line is under performing for a route that has been running for more than a year.)	

CUSTOMS POLICIES AND PROCEDURES

KEY ISSUES	ACTION REQUIRED
STEPS & DELAYS. A 2019 World Bank Doing Business Report stated that documentary compliance during import to Ethiopia averaged 194 hours as compared to 97.7 hours in Sub-Saharan countries and 3.4 hours in OECD (Organization for Economic Cooperation and Development) high-income countries.	New systems designed for e- commerce transport and logistics with transparency and accountability; Full data capture from origin, exchange of customs attribute messages, smooth pre- clearance on advance customs declarations, standard return procedures
POOR CUSTOMER SERVICE. Significant costs and losses result because owners of cargo and businessmen are forced to spend most of their time travelling to and from Modjo and Kaliti (dry ports of Customs Authority outside Addis Ababa and at the periphery of the city) and stay at the offices of the customs authority while trying to solve problems.	New training and systems, with monitoring and accountability
LACK OF KNOWLEDGE. Lack of knowledge of clearance officers. (Case study: Ethiopian Business Review[1] ran a story about an officer who insisted on opening a box of photo films which he had already checked through the x-ray machine. He ignored protest that exposure to sunlight would destroy the items, opened the box anyway and damaged them, costing owners a 4,000 ETB loss. Another importer shared his experience of an officer who insisted that a compress packed stack of 60 mattresses be decompressed and checked even though he was told the handling of the items would be too complicated afterwards. Once the mattresses were decompressed, 60 units of 24 centimeters mattresses shot up to the roof and required many more runs by trucks to be delivered. The additional cost had to be covered by the importer.)	New training and systems, with monitoring and accountability
LACK OF ACCOUNTABILITY. There is evidence of very little acceptance of responsibility for mistakes or mishaps at the Customs Authority. When the process of clearing is interrupted for any reason or the authority fails to get the job done as a result of its own problems,	Link accountability with new liability standards that can be enforced; initiative ISO quality certification for Customs (or other international standards organization)

there is no easy way of making it responsible for costs and delays.	
CARELESS GOODS HANDLING. Many traders and individuals who were interviewed also commented at the carelessness with which officers handle items when they are inspecting them. Many have had their property damaged and since the officers are not held liable, damages could not be covered.	Greater monitoring and surveillance; labor policies to allow consequences for employee actions; ISO quality certification
LACK OF CLARITY ON VALUATION OF GOODS SET BY CUSTOMS. A report by the US Department of Commerce in May 2018 (https://www.export.gov/article?id=Ethiopia-Import-Tariffs) indicates that rate of customs duty in Ethiopia ranges from 0% to 35% with an average rate of 17 percent and despite recent reductions, duties remain "exorbitantly high". The article also stated that other taxes such as excise duties, surtaxes and VAT may be added on certain imported items increasing the overall payment. A table of average tariff percentages by key sectors is attached for information.	Establish clear policies and transparency in pricing; streamline appeals process
ARBITRARY CUSTOMS OFFICER PRICE-SETTING. Customs officers have the right to apply their own price to imported items when they feel that the invoice presented by the importer is not legitimate. They routinely do that and many people complain that they select the most expensive prices from the internet and apply that price to items and ignore the actual invoices	Establish clear policies and transparency in pricing; streamline appeals process; SGS means of valuation should possibly be reinstated
MANUAL DATA EXCHANGE BETWEEN AIRPORT/BOLE CUSTOMS AND ETHIOPIAN POST. Customs officials are stationed at Bole Airport in Addis to ensure clearance of imports and exports. Data exchange between Customs and the Ethiopian Post remains manual despite availability of Automated System for Customs Data.	Customs has new systems; the Post needs to implement Customs Declaration System
OUTDATED AGREEMENT BETWEEN CUSTOMS AND AIRLINES.	Modernize agreement; integrate with other Customs reforms and improved procedures

AIR FREIGHT

KEY ISSUES	ACTION REQUIRED
GENERAL CARGO TERMINAL DELAYS. A study commissioned by the UNDP in 2017 indicates that Ethiopian Airlines' general cargo terminal is not functioning as efficiently as it should as it suffers from delays in removal of goods, congestion and low productivity. The reasons given for these is the fact that	Improved standards must be set and met; improved tracking and systems for transparency; accountability for mistakes; coordination between departments

some companies do not clear their goods because of pricing disputes, tax hikes, standards and quality disputes and inspection delays	
VIRTUAL MONOPOLY OF AIR CARGO. Since few carriers have cargo flights from Ethiopia to the Middle East, the companies don't have options to negotiate better prices, which make the service almost monopolistic.	Allow new entrants to market; more bilateral agreements required
COLD CHAIN INCONSISTENCY. Some airlines have failed to maintain the proper temperature in the cold chain area of the aircraft. Some export products ended up being spoilt at destinations, and as a result and companies had to make claims for these damages. One company currently uses a temperature logging tool that records temperatures throughout the flight. Using the temperature records during the flight, the company has been able to claim damages from the airlines and get compensation when they failed to properly maintain the required temperature for the meat. Though the process takes time, payments have been made when such failure was proved to be the fault of the airline.	Improved standards must be set and met; improved tracking and systems for transparency; accountability for mistakes
IMPROPER CLEARING. Improper clearing has been identified as a problem for exported products. This is a result of the fact that Ethiopian Airlines handles exporting processes including all customs, documentation and pricing issues either by itself or through its affiliated cargo agencies. When the airline fails to provide the necessary documentation for clearing exports at destinations, it results in dire consequences such as delays in supplies to customers of the products that expect deliveries at specified times as well as spoilage of perishable goods.	Improved standards must be set and met; improved tracking and systems for transparency; accountability for mistakes

BONDED FACILITIES

KEY ISSUES	ACTION REQUIRED
ALLOWING FOREIGN OWNERSHIP OF BONDED FACILITIES. Guidelines approved in 2019 allow private logistics operators, for the first time, to apply for licenses to own/operate bonded warehouses. The key issue is the implementation of this policy, ensuring new investment can build capacity with confidence the bonded facilities can improve speed and quality of service.	Public and private sector cooperation to ensure efficient implementation of the new policy; training and education to ensure effective utilization and management of the new capabilities
CUSTOMS POLICIES AND PROCEDURES FOR BONDED WAREHOUSES. It is critical to ensure the ability to move goods in/out nationally & regionally as a super hub -	High-level oversight by Government, in support of e- commerce "Just in Time" logistics requirements, to guarantee efficient

with expeditious facilitation for local duty payments where applicable & duty exemption for inward (inside Ethiopia) deliveries to other destinations beyond Addis. This is likely a key barrier preventing Ethiopia from being an enabler for local & regional distribution. It must be fixed in order for e- commerce to flourish. According to the Customs Proclamation "Proclamation no. 859/2014," all customs warehouses and goods therein are considered to be under the control of the Customs Authority and no one may handle the goods except those authorized by the authority may enter the warehouse. Thus, the burden is on Customs to ensure these facilities can operate without burdensome, costly or time-consuming regulation	movement of goods in/out; public and private sector cooperation to monitor and ensure efficient implementation of the policy; training and education to ensure effective utilization and management of the new capabilities
ALLOWING PRIVATE OWNERSHIP OF BONDED FACILITIES. The revised export trade duty incentive scheme establishing proclamation, no. 543/2007, was drafted to encourage indirect exporters. It also allows those exporters who have a manufacturing license and fulfill certain criteria, to benefit from having their own bonded manufacturing warehouse. There are several companies, which have benefitted from this scheme including foreign manufacturers; however, foreign logistics companies were restricted from ownership until recently in 2019. https://addisfortune.net/articles/turkish-company-to-supply- textile-factories-through-bonded-warehouse/	Public and private sector cooperation to monitor and ensure efficient implementation of the policy; training and education to ensure effective utilization and management of the new capabilities

E-COMMERCE MARKET & INVESTOR POLICIES

KEY ISSUES	ACTION REQUIRED
LACK OF GOVERNMENT COORDINATION ACROSS MULTIPLE DISCIPLINES. The logistics sector in Ethiopia has no clear owner, manager or institution that is fully and individually accountable for it. Ethiopian Maritime Affairs Authority is the regulating body. EMAA needs to do more to regulating and supporting. Instead, it is being bogged down to daily operational fire-fighting activities. The Ministry of Transport, the Customs Authority (previously Ethiopian Revenues and Customs Authority-ERCA) and the Ethiopian Shipping Lines are all involved in different aspects and do not coordinate efficiently to deal with issues. Therefore, overlaps occur and "planning executing, monitoring is next to impossible, and everyone just reacts to situations" as per a logistics professional that was interviewed (See	Single window policy for e- commerce import, export and re-export; transparent and clear government tax and fee policy; special zone status for e- commerce fulfillment activities

Story 5 in Attachment).	
LACK OF INVESTOR INCENTIVE PACKAGE DESIGNED FOR NEW E-COMMERCE INDUSTRIAL INVESTORS. Private sector investment will not be mobilized without a clear set of incentives from the Government, covering tax and regulatory issues, to make e-commerce feasible, bankable and profitable.	De minimus level of exemption (for e-commerce); duty/tax/tax exemption for e-commerce investments; "Made in Ethiopia" incentives for value-added investments
RESTRICTED ACCESS TO CONSUMER CREDIT. Ethiopia does not allow credit cards, making international e-commerce payments very difficult; will stunt development	Either loosen restrictions or allow alternative methods for international payments (i.e. e-commerce voucher); should improve in 2020
RESTRICTED ACCESS TO FOREIGN EXCHANGE. Private sector access is severely limited. Currency policies are not in line with requirements of international e-commerce.	Either loosen restrictions or allow alternative methods for international payments (i.e. e-commerce voucher)
LACK OF GOVERNMENT PROCUREMENT SYSTEM UTILIZING E-COMMERCE. Currently, the Procurement Office of the Ethiopian Government does not operate a coordinated e-commerce method of ordering goods and does not utilize the Ethiopian Post for delivery	Design and implement government policy to "jump start" e-commerce in the country, and leverage its procurement to build the e-commerce industry

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Annex V: Documents and MInT Directorates consulted to develop the strategy

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MCIT GTP II Plan

MInT 4th 100 Days Plan

MInT Annual Report, 2011 E.C.

MInT Annual Plan, 2012 E.C.

Innovation Action Plan 2012

Guideline for Incubation Centre

Prototype Guideline

Annual Green Tech Report May 2019

Green Tech Directorate 2012 BSC Plan

High level Impact of Incentive for Indigenous ICT Companies

ICT Sector Incentives Proposal v2, September 2019

Policy, Regulations and Directives

Consultation on the Recommendations and Working Text of the National Open Data Policy of The Government of Ethiopia, Draft, January 2018

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Regulation No. 270_2012 Investment Incentives and Investment Areas Reserved for Domestic Investors 2005

Guidelines to Implement Public - Private Partnerships (PPP) Projects

Directive No. 2/2003 Private Visat Permit

Proclamation No. 769/2012 Investment Proclamation

Proclamation no.1049/2017 Vital Events Registration and National Identity Card

Proclamation No. 360/2003 Ethiopian Information and Communication Technology Development Authority Establishment Proclamation

Proclamation No.760/2012 Registration of Vital Events and National Identity Card Proclamation.

Proclamation No. 804/2013 National Intelligence and security Service Re-establishment Proclamation

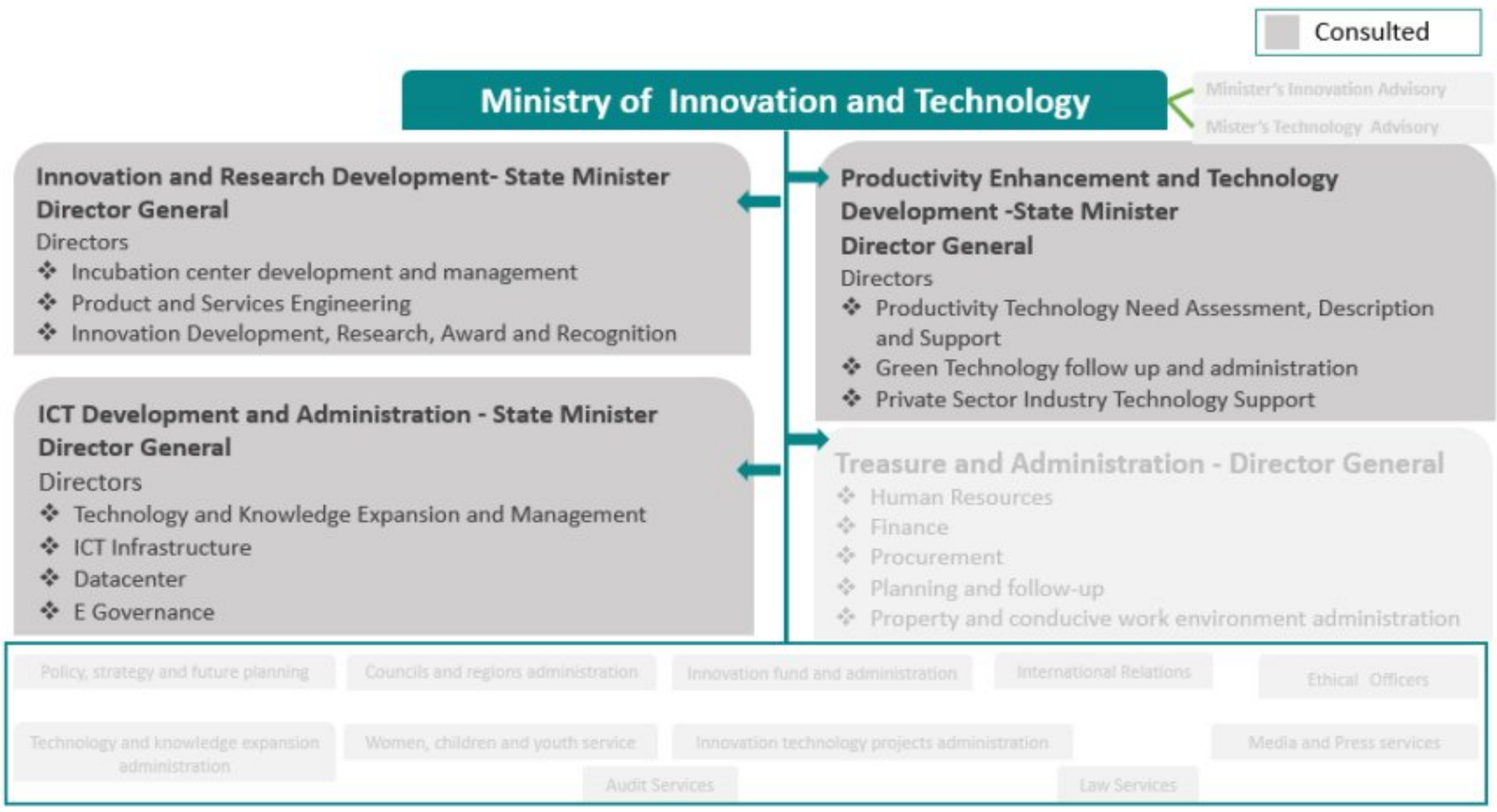
Proclamation No. 849/2014 Investment Amendment Proclamation

Proclamation-No.1076/2018 Public Private Partnership Proclamation

Proclamation No. 49/1996 Telecommunication Proclamation

Proclamation No.281/2002 Telecommunication Amendment Proclamation

Directorates with in MInT that were consulted as they have initiatives that are in line with the digital transformation strategy



DIGITAL ETHIOPIA 2025

Federal Democratic Republic of Ethiopia