

Final Report

**Digital Skills and Jobs Creation Strategy
with Implementation Plan in Malawi**

Project No.: P160533

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The study helped to throw light on the level of digital competencies of the Malawian population and preparedness of digital ecosystem of Malawi for digital empowerment while this Strategy formulation is intended to help in better policy making to make the ecosystem more conducive to digital skilling by addressing the social, economic and institutional challenges identified through the assessment study.

Foreword

(To be included by PPC)

Revision History

Version	Issue Date	Description
1.0	6 October 2021	Submission of Final Report (Version 1)
2.0		

Abbreviations and Acronyms

2G	Second-generation cellular network
3G	Third-generation cellular network
4G	Fourth-generation cellular network
ICT	Information and Communications Technology
GDP	Gross domestic product
AR	Augmented reality
B2B	Business-to-Business
B2C	Business-to-Customer
BPO	Business Process Outsourcing
BTS	Base Transceiver Station
COE	Center of excellence
G2C	Government to Citizens
GIS	Geographic Information System
Gol	Government of Indonesia
IoT	Internet of Things
IPR	Intellectual and Innovation Property Rights
ISP	Internet Service Provider
IT/BPO	Information Technology/ Business Process Outsourcing
LCD	Liquid Crystal Display
LEO	Low Earth orbit
MoU	Memorandum of understanding
NGO	Non-Governmental Organization

OER	Open Educational Resources
PWD	People with Disability
SAAS	Software as a service
SEZ	Special Economic Zone
SME	Small and medium-sized enterprises
STEM	Science, technology, Engineering and Mathematics
UN	United Nations
USD	United States Dollar
TTT	Train the Trainer

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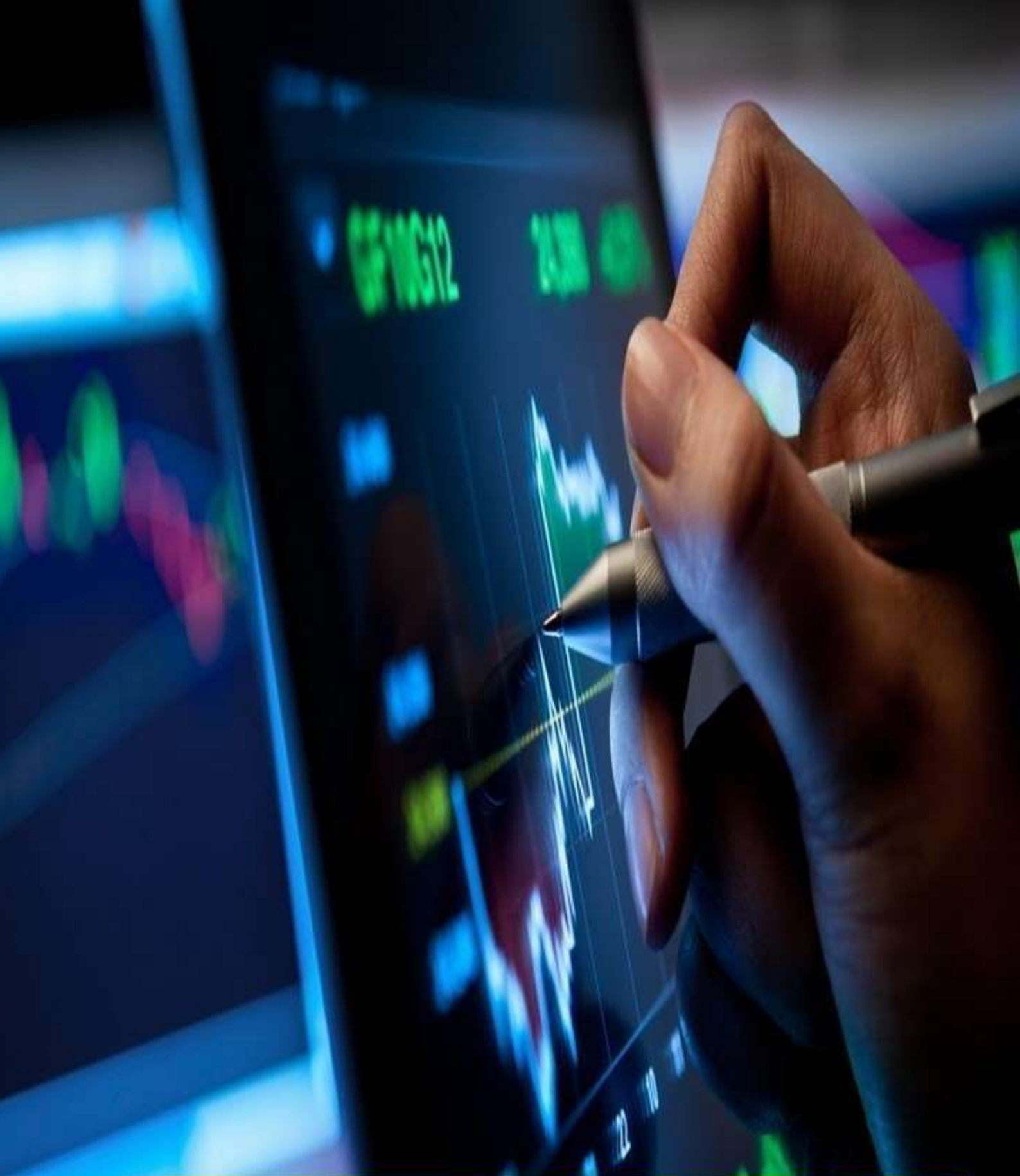
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**Overview of Malawi's
digital ecosystem**

1. Overview of Malawi's digital ecosystem

Digital technologies such as the internet and telecommunication devices have the potential to bring about transformation in the developmental journeys of the countries. The positive economic impact of ICT tools is well known to improve access to services across various sectors such as agriculture, retail, health, education and governance. Digitization facilitates faster communication, provides benefits of a global shared economy and access to information and services. The benefits of digital technologies, that is often termed as digital dividends, varies substantial across nations, where the more developed and advanced countries have benefitted from their relatively larger investment potential and generated digital dividends to that effect. Studies¹ in these subject areas have highlighted, *"countries that have increased their digitization level have realized gains in their economies, their societies, and the functioning of their public sectors. For instance, a 10% increase in telephone, mobile phone, internet and broadband usage respectively was seen to result in 0.73% - 1.38% increase in gross domestic product (GDP) of countries"*.

Malawi, a predominantly agrarian economy, with limited diversification has significant untapped potential to realize the benefits of a digital transformation and capitalize on its digital dividends. Increased impetus on strengthening its digital landscape, will enable the country to diversify, commercialize and urbanize at a faster rate in accordance with its Malawi 2063 action plan.

Lack of affordability, availability and quality of broadband connectivity, coupled with low human and institutional capacity, constrain access to digital technologies and services in Malawi and hold the country back from capitalizing on new opportunities².

Table 1: Some key facts and figures about Malawi's digital landscape

#	Indicators	Target	2020	2021*
1.	Voice Telephony Penetration raised (%)	75	54	60
2.	Internet Penetration increased (%)	25	37	40

¹ Solutions for Youth Employment (2018). Digital Jobs for Youth. Accessed from <https://documents1.worldbank.org/curated/en/503651536154914951/pdf/129757-S4YE-Digital-Jobs-Report.pdf>

² World Bank (2017). *Project Appraisal Document for DIGITAL MALAWI PROGRAM PHASE I: Digital Foundations Project*

#	Indicators	Target	2020	2021*
3.	Electronic Commerce Penetration increased (%)	55	NA	NA
4.	ICT contribution to GDP increased (%)	8	4.8	5
5.	Proportion of individuals who own a mobile telephone (%)	39	43.2	-
6.	Proportion of population covered by a mobile network (2G) (%)	99	83	-
7.	Proportion of population covered by a mobile network (3G) (%)	60	82	-
8.	Proportion of population covered by a mobile network (4G) (%)	45	65	-
9.	Fixed Internet Broadband subscriptions (Internet users per 100 people) (%)	0.001	<0.001	>0.001
10.	Proportion of individuals using the internet (%)	40	37	-
11.	Retail Price of Prepaid Mobile Broadband Monthly bundle 500MB (USD) Data Volume (USD)	3.50	2.70	-
12.	ICT development Index	167 (2017)	Not available	-
13.	Number of Telecentres/Public internet/Information Access Centres	-	137	-
14.	Number of licensed ISPs	-	42	-
15.	Number of active ISPs	-	19	-

Source: (*Projected by MACRA) Annual Economic Report 2021, Government of Malawi

Acknowledging the potential benefits of a digital economy, the Government of Malawi has set targets for the nation that place transforming into a digital economy as the key driver for accelerating growth in the country. Malawi has launched the national ICT plan 2014-2031, to operationalize the National ICT Policy 2013. Malawi also adopted the National Broadband Strategy and National Security Strategy in 2019. In a more recent endeavor, the country the Government has rolled out a 5 - year Digital Economy Strategy which sets the targets various aspects of the digital economy. The strategy focusses on creating an enabling ICT ecosystem to help spur growth opportunities in the ICT sector and empower sectors such as health and agriculture to enhance its outputs.

1.1. Key results from of Digital Skills Ecosystem and Gap Assessment in Malawi

The World Bank is supporting Malawi through digital transformation project being implemented by the Public Private Partnership Commission in Malawi. The objective of the Digital Malawi project is to expand the reach and improve the access of ICT infrastructure for the public and private sectors, improvement of e-governance, access to government services and enhancing public service delivery are the key drivers to the digital transformation of Malawi.

Table 2: Pillars of the Digital Malawi Program

 <p>DIGITAL MALAWI</p> <p>A Government of Malawi project supported by the World Bank Group</p>		<p>The program seeks to leverage digital technology to drive economic growth, innovation and job creation, access to services, information and markets, and to increase government efficiency and transparency</p>			
<p>Key pillars of the program</p>					
<p>Affordability and accessibility of ICT infrastructure</p>		<p>Demand-driven multi-layered digital skills and job creation strategy to bridge the digital divide</p>		<p>Digital ecosystem and connected economy through public-private collaboration</p>	
				<p>Effective e-Governance to support new initiatives</p>	

Countrywide digital transformation requires a pre-assessment of the population, labour market, public sector and education systems to understand their readiness to adapt to the technology influx and to address this requirement '*Digital Skills Ecosystem and Gap Assessment and Strategy in Malawi*' has been commissioned by the Government of Malawi through Public Private Partnership Commission (PPPC). In the first phase, a companion report called the *Digital Skills Ecosystem and Gap Assessment in Malawi*, carried out a diagnostic analysis of the digital skills landscape of the country - Digital Skill competency assessment of the Malawian population, Analysis of the readiness of the education and TVET institutes to address the digital skilling and learning needs of the country and estimation of industry demand for digital skills and competencies. The results yielded by the assessment report will consequently be the foundation of the strategy framework to be proposed through this *Digital Skills and Jobs Creation Strategy*

Table 3: Findings from the Digital Skills and Ecosystem Assessment

Results from the Digital skills competency assessment of Malawian population
<ul style="list-style-type: none"> ▶ Low levels of basic literacy, high dropout rates at the secondary and tertiary levels, limited basic digital skills and competencies among the Malawian population is a deterrent for its population to participate in and succeed in the digital economy ▶ <i>Digital gender disparity</i> observed across the country. Females were observed to have lower proficiency in digital skills than males in addition to differential access to ICT tools and facilities across the gender groups ▶ Costly data bundles and ICT devices is posing greater obstacle on affordability to access and use of technological tools ▶ Lack of tailored opportunities to develop relevant digital skills for effective usage by youth, women and disadvantaged groups (including PWDs) ▶ Limited awareness about cyber security and privacy ▶ Unavailability of content and services in local languages and formats make it more inaccessible to most vulnerable groups ▶ Lack of awareness on how digital skills can enable entrepreneurship in the digital economy
Results from assessment of education and TVET institutes for about digital skilling and learning
<ul style="list-style-type: none"> ▶ Lack of computers, laptops and internet facilities at schools ▶ Inadequate ICT tools (broadband, audio video tools, LCD screens) at tertiary and TVET institutes offering digital learning courses ▶ Limited/basic ICT skills, knowledge, and competency of ICT instructors at schools, colleges and TVET institutes have ▶ Limited training content available in Malawi for computer courses at school or ICT courses at higher education and vocational levels ▶ Limited network of train the trainer institutes and master trainers, especially for ICT skills ▶ Limited liaising opportunities and partnerships between education and TVET institute with industry to identify the demand for skills ▶ Lack of adequate information about ICT led jobs leading to lower aspirations for digital jobs in the country

Results from industry assessment in Malawi for demand for digital skills in Malawian workforce

- ▶ The companies participating in the survey revealed a relatively low level of usage of digital / ICT tools in organizations across Malawi.
- ▶ Industries feel less confident about supply chain optimization and emergence of a connected economy which indicates an urgent need to prepare the country for Industry 4.0 revolution.
- ▶ Only one-fourth of respondent organizations employ the services of independent / online freelancers. It is forecasted, demand for online freelancers to increase by 120% in the next 5 years.
- ▶ Government and private organizations are increasing investments in digital initiatives to enhance ICT usage mostly for basic purposes like owning a company website, or own email domain; hence, unable to yield enough digital dividends through advanced utilization of ICT.
- ▶ Only 8% organizations reported to be making more than 40% revenues through digital initiatives. Less than half of the organizations covered, were allocating 40% or above of their budget to digital initiatives. This highlights a poor ROI and fund utilization on digital initiatives by companies in Malawi.
- ▶ While many e-commerce and digital finance services are entering the Malawian market, expensive internet plan and lack of secured payment gateways and adequate data protection is resulting in low uptake of these services
- ▶ Industry reported digital skills as the top required skill in the subsequent years. Cognitive abilities, complex problem solving and social were among some of the other top skills to find increasing demand in future.
- ▶ Industry also reported that by 2025, 40-60% of the jobs in the country would need digital skills.

Source: Results from Digital Skills Ecosystem and Gap Assessment in Malawi



2

Benchmarking with countries with similar ecosystem

2. Benchmarking with countries having similar ecosystem

Before implementing any strategic initiative, it is prudent to benchmark the goals and learn from the experiences of countries who have implemented similar initiatives. Following case studies have been selected to cover a gamut of countries with similarities in terms of governance, economic growth trajectory, problem statement etc.,

2.1. Indonesia - Case Study

- ▶ With over 257 million people, Indonesia requires large-scale interventions and varied approaches for diverse topography.
- ▶ Gol (Government of Indonesia) has started programs to address digital infrastructure requirements, human resources capability, and to bridge regulation and incentive gaps.
- ▶ Digital infrastructure to improve access: Palapa Ring Project, Pipa Bersama, BTS Provision for Telecommunication Blankspot Area Project, and Wireless Connectivity Pilot Project for Rural Areas
- ▶ Digital government (e.g. for more online services—mainly in the planning stage)
- ▶ Human resources capability gap: Nongsa Digital Park program in Batam, improving skills of workers, creating jobs in technology-based entrepreneurship and revamping of vocational education institutions,
- ▶ Regulation and incentive: Presidential Decree No. 74/2017 on e-Commerce Road Map in which skills development is included and Tax incentives for start-ups and venture capital (KMK No. 1251 Year 1988 and KMK No. 250 Year 1995).
- ▶ E-readiness level: In 2017, over 143.26 million people (54.68%) from 262 million population are using Internet (APJII, 2017).
- ▶ The Indonesia e-Commerce road map does have a solid component of skill development. The e-Commerce road map was issued through Presidential Decree No. 74/2017.
- ▶ An MoU on vocational education development was signed on 29 November 2016 among relevant 5 ministries (Ministry of Industry, Ministry of State-owned Enterprises/BUMN, Ministry on Manpower, Ministry of Education and Culture, and Ministry of Research, Technology and Higher Education).

- ▶ The Ministry of Industry is working on Industrial 4.0 roadmap focusing on four technologies: IoT, E-smart SMEs, start-up incubation, and the use of digital technology for industries (big data, AR, Cloud, cybersecurity)
- ▶ Relevant ministries and National Professional Certification Body (BNSP) are preparing job competency standards based on SKKNI and KKNI.
- ▶ The Ministry of Communications and ICT - also supported by industrial and professional associations - has completed the national ICT occupation map to be launched in the near future with 9 levels of competencies and 16 occupation areas (e.g. Data Management System, Program & Software Development, Network and Infrastructure, etc).
- ▶ Focus group respondents acknowledge the worth of the digital economy policy as Indonesia's strong political commitment. (World Bank, December 13, 2017) E-commerce policy and road map is perceived as a demand driven regulation, an attempt from the government to keep up with the technology development and the private sector's trend. GoI is very open, fostering opportunities for start-up companies and ease of doing business. This is particularly true in finance sector.

2.2. Philippines - Case Study

Investing in people

Education for a digital economy while integrating ICT into the educational sector requires considerable investment. An ICT-literate nation will boost the Philippines' competitiveness and create new employment opportunities. ICT also greatly facilitates access to educational material, as well as encourages new forms of learning via the Internet. ICT skills in themselves are a critical part of education in today's globalized world. Investing in people creates a digitally inclusive society. ICT literacy can also build capacity and create opportunity among the poor and the marginalized in the country.

Creating jobs and real economic growth

- ▶ **Every 10% increase in broadband penetration boosts Gross Domestic Product (GDP) by an average of 1.3%**
- ▶ **Every 10% increase in mobile density correlates with a 0.7% increase in GDP**

The country's IT/BPO industry has created considerable direct and indirect employment and is poised to grow further, especially in regional cities. Its capabilities can also be used for local applications, like developing national electronic medical records or using animation talent for local e-learning applications. Small and medium-sized companies can integrate ICT into their production value chains, becoming more efficient, allowing for innovation and faster growth. Various key industry sectors can benefit from it, including tourism, agribusiness, manufacturing, retailing and health care. According to well-documented World Bank and academic studies, every 10% increase in broadband penetration boosts Gross Domestic Product (GDP) by an average of 1.3%, and every 10% increase in mobile density correlates

with a 0.7% increase in GDP. Similarly, online one-stop shops or similar e-Government services can streamline bureaucratic procedures for faster business registration and investments. ICT-related strategies can create conditions conducive for investments. Innovative mobile applications - such as market price and transaction platforms, agriculture value chain automation, micro-insurance for crops and other examples - have been shown to increase the productivity and income of rural farmers, fisheries and other agricultural activities.

Protecting the environment

Good broadband connections enable face-to-face meetings through video-telecons, reducing the need to travel and use cars, thus decreasing energy usage and the attendant pollution from vehicle use. This situation also helps decongest cities, as well as provide opportunities for teleworkers. Many Geographic Information System (GIS)-based ICT tools can help monitor the environment and natural resources more efficiently, allowing faster information updates and dissemination on environmental conditions. However, the government and the ICT industry need to ensure that the concept of "green ICT" is widely recognized and properly practiced. Green ICT covers practices in the design, use and disposal of ICT systems, products or services that are environmentally friendly thereby minimizing energy consumption and carbon emissions.

2.3. Singapore Case Study

Singapore has one of the most advanced telecommunication networks in the world with very high level of access and this has been possible due to small size of the country and rising level of income and government commitment to telecommunication excellence.

Government ministries are responsible for overall policy with subsidiary statutory boards providing technical support and day to day regulation. The Ministry of Communication and Information Technology (MCIT) is responsible for overall transportation, postal services and Information and communication technology (ICT) Policy.

Singapore was one of the first countries in Asia to get an Internet connection. This was the cumulation of many years of connectivity experience with academic networks preceding the internet.

In 2014, Singapore launched the Smart Nation Program. Its main goal was to leverage technology to improve the quality of lives of the people and to transform the economy by creating more jobs and opportunities. The Singapore Smart Nation Program is a nation-wide movement that aims to transform sectors like health, education, and transportation through a multi-pronged approach of Digital Government, Digital Economy, and Digital Society. The Digital Government initiative focuses on harnessing technology to enable efficient and user-centric public service delivery, Digital Economy focuses on guiding businesses and the workforce to leverage technology, and Digital Society aims to empower Singaporeans by increasing access to services, promoting inclusion and improving awareness and digital literacy.

The Digital Government Blueprint (DGB) had set forth a six-point agenda:

- ▶ Integrating services around citizen and business needs.
- ▶ Strengthening integration amongst policy, operations, and technology.
- ▶ Building common digital and data platforms.
- ▶ Operating reliable, resilient, and secure systems.
- ▶ Raising digital capabilities to pursue innovation.
- ▶ Co-creating with citizens and businesses and facilitating the adoption of technology.

Key Features and Learnings from Digital Government

- ▶ Digital Platform
 - Open data platforms built on open application programming interfaces (APIs) and open standards for interoperability

- Creating unbundled (reusable and shareable) digital building blocks to make service delivery time and cost-efficient
- Adopt an iterative methodology to develop and scale fast
- ▶ **Community**
 - Ensure universal access
 - Facilitate participation of individuals and businesses in the development process
 - Drive end-user adoption through multiple channels
- ▶ **Governance**
 - Creating a designated institution to provide strategic direction to Smart Nation objectives
 - Revised organization structure for effective coordination with SNDGG
 - Transparent data governance through a well-defined regulatory framework
 - Attracting technology talent by creating a thriving culture of innovation

2.4. India - Case Study

India's Information and Communication Technology (ICT) sector and digital economy are major economic drivers powering the growth and modernization of India's economy.

India's ICT sector contributes over 13 percent to India's Gross Domestic Product (GDP), and India's digital economy generates about \$200 billion annually from business process management (IT-BPM), e-commerce, domestic electronics manufacturing, digital payments, digital communication services (including telecom), etc. India aims to achieve a \$1 trillion digital economy and a \$5 trillion GDP by 2025.

Few facts about India's ICT growth story:

- ▶ India is a top global market offering tremendous opportunities with 1.35 billion citizens and a rising middle class
- ▶ India imported over \$2.2 billion in computer and electronic equipment from the U.S. in 2017 (NAICS code 334)
- ▶ India has emerged as the 2nd largest manufacturer of mobile handsets in the world
- ▶ India has the 2nd largest telecom network in the world in terms of subscribers
- ▶ 1.17 billion (1.15 billion wireless and 20 million wireline subscribers) telecom subscribers (as of January 2020)
- ▶ 673 million (654 million wireless and 19 million wireline subscribers) broadband subscribers (as of January 2020)
- ▶ 1.25 billion digital identity numbers issued to citizens (as of June 2020)

- ▶ The ICT market is forecast to reach \$191 billion in FY2020 and is projected to grow to \$350 billion by 2025

The Digital India initiative aims to improve digital infrastructure and internet connectivity. This and other major government initiatives will drive growth in the ICT sector and open opportunities for U.S. companies.

India's growing mobile economy is driven by widespread mobile adoption with 98 percent of all telephone subscriptions being wireless. This sector has been growing rapidly based on affordable prices for consumers, wide availability of services, roll out of 3G and 4G infrastructure and services, higher consumption of data, and a conducive regulatory environment. To advance the telecom infrastructure with a 5G system in India, the Telecom Regulatory Authority of India (TRAI) submitted its recommendations on the auction of spectrum recently.

The Indian government has a complex and often challenging regulatory environment. New regulations and industry promotion schemes are announced frequently at the national level. Recently, India has announced new bills and guidelines impacting data protection, privacy, cross-border data flows, and data localization. It introduced the Information Technology Intermediary Guidelines Rules 2018, a draft Personal Data Protection Bill, National Cybersecurity Strategy 2020, draft E-Commerce Policy, National Digital Communication Policy, National Policy on Electronics 2019 and National Policy on Software Products 2019 as it aims to develop the digital economy.

The National Digital Communication Policy (NDCP) launched in 2018 aimed to achieve objectives by 2022 which includes:

- ▶ Increase broadband internet availability
- ▶ Create 4 million additional jobs in the digital communications sector
- ▶ Enhance the contribution of the digital communications sector to 8 percent of India's GDP from 6 percent in 2017
- ▶ Increase manufacturing in India and enhance India's contributions to global value chains
- ▶ Ensure digital sovereignty.

Leading Sub-Sectors:

- ▶ **IT services:** The Indian IT services sector is expected to grow 6.7 percent from \$91 billion in FY 2019 to \$97 billion in FY2020 despite the pandemic. Major growth factors include digitalization and modernization of the services.

- ▶ **E-Commerce:** e-Commerce business recorded 25 percent growth from \$43 billion in FY2019 to \$54 billion in FY2020. India has emerged as a preferred destination for online marketplaces due to the large consumer base, diverse demography, low-cost digital infrastructure and services, and supply chain ecosystem.
- ▶ **Cyber security:** India's cyber security market is growing rapidly as India's digital economy and critical infrastructure sectors expand, and it is expected to reach \$3.05 billion by 2022, at a compound annual growth rate (CAGR) of 15.6 percent from \$1.97 billion in 2019.
- ▶ **FinTech and Digital Finance:** India is one of the fastest growing digital payments and finance markets globally, projected to cover \$1 trillion in transactions by 2029 - representing about 60 percent of retail transactions as well as small business credit disbursement.



3

Strategy framework for Digital Skills and Digital Jobs in Malawi

3 Strategy framework for Digital Skills and Digital Jobs in Malawi

Malawi aims to create a robust ICT infrastructure with a country wide coverage of reliable and affordable service packages fostering technological adoption and digital access. Country's long-term vision is to have a competitive and world class digital economy that enables E-commerce, E-learning, E-health and E-governance systems through investment in ICT infrastructure, telecommunications and deployment of modern financial services platforms.

- Malawi 2063, An Inclusively Wealthy and Self-reliant Nation³

While, Malawi aims to become an upper middle-income country over the course of the next few decades, the same can be better achieved if digital solutions are all pervasive across the economy and create ICT led jobs at scale for the youth while capacitating the population and the especially the youth with ICT skills. When an economy progresses towards an ICT led development, paradigm, the focus on industry, human development, and match between the two, to create the following impact:

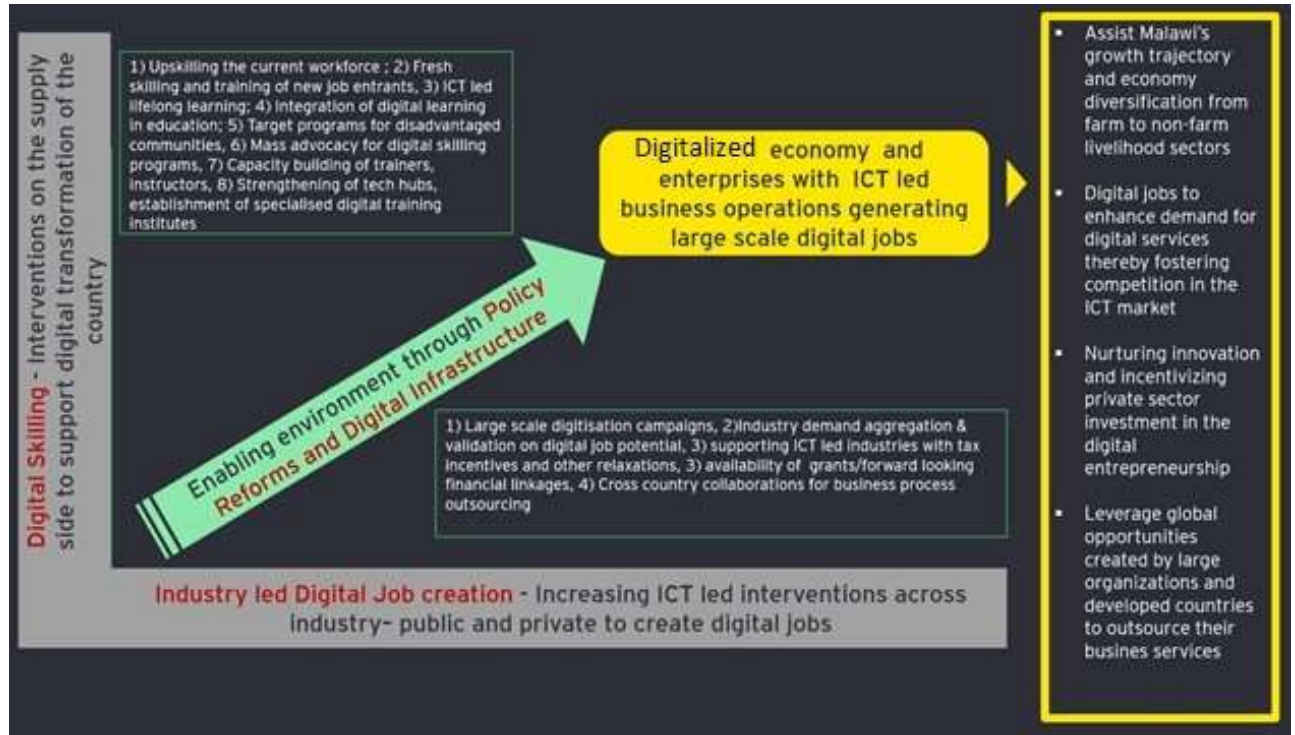
- ▶ Generation of incremental demand for skills and products in the economy related to ICT led businesses, that didn't exist during pre-digital phase of the economy
- ▶ Enhanced competency of the citizens as users of the digital services and participating in the economy as ICT training workforce
- ▶ Increased outreach across socially, economically and geographically distant communities for greater provision of public services in a more efficient and effective manner
- ▶ Businesses also benefit, as the use of internet enables them to increase the scale and reach of their products and services across geographies. It especially benefits to small and micro enterprises to build their customer base in an organic manner, saving the cost of advertisement and physical marketing that originally new business had to resort to

³ Malawi 2063, An Inclusively Wealthy and Self-reliant Nation (2020). *National Planning Commission (NPC)*. Accessed from [https://malawi.un.org/sites/default/files/2021-01/MW2063-%20Malawi%20Vision%202063%20Document.pdf#:~:text=The%20Malawi%202063%20\(MW2063\)%20is,see%20by%20the%20year%202063.](https://malawi.un.org/sites/default/files/2021-01/MW2063-%20Malawi%20Vision%202063%20Document.pdf#:~:text=The%20Malawi%202063%20(MW2063)%20is,see%20by%20the%20year%202063.)

Key pillars of the proposed strategy framework for fostering digital skills and creating digital jobs in Malawi

The strategy framework is created keeping in mind the overarching goal of increasing the digital skills among various segments of the society and increasing the job opportunities.

Figure 1: Framework for fostering digital skills and creating digital jobs in Malawi



3.1. Digital Infrastructure

Table 4: Issues addressed by Digital Infrastructure

Imperatives to be addressed by Digital Infrastructure Pillar
<ul style="list-style-type: none"> ▶ Upgradation of its infrastructure for internet provision that entails constant high value refinancing ▶ Poor infrastructure and high costs have led to low uptake of digital services such as e-commerce ▶ Likewise, financial banking facilities seldom received traction in the country due to low internet penetration ▶ High excise duty and revenue tax acting as deterrents for network providers ▶ Limited exposure of the larger Malawian population to ICT ecosystem due to affordability and accessibility challenges ▶ Low ICT integration in business and enterprise across public and private sector ▶ Global B2B and B2C opportunities remain highlight untapped ▶ Education and learning institutes unable to provide quality experiential training for digital subjects due to limited access to ICT services

Malawi lags its peers in the development of its market for telecommunications and other digital services, and this is preventing it from achieving wider digital dividends. The country is ranked 167 out of 175 countries in the 2017 edition of the International Telecommunication Union's (ITU) Information and Communication Technology Development Index.

Malawi Government has provided national guidance in the development and use of ICT through various medium-term policies such as Economic Recovery Plan (ERP), Malawi Growth and Development Strategy (MGDS) and long-term policies such as National ICT Policy (2014-2031). However, Malawi is unable to tap the digital dividends due to limited accessibility and affordability of ICT tools and services across commercial, non-commercial and domestic users across the state. In the companion report, the survey across schools, colleges and technical institutes highlights the need to improve the focus on the implementation of adequate ICT infrastructure for digital literacy and training. Out of the 417 schools surveyed by RBI, only about 96 were found to have computers, and a mere 45 of these 96 schools had internet connectivity. The availability of computers in the colleges and universities was much better with 43 of the 51 colleges claiming to have computer and 39 with internet connectivity.

Table 5: Key Objectives of Strengthening ICT Infrastructure

The key objectives of strengthening the ICT infrastructure in Malawi will be as follows	
▶	Reduce the geographical and social digital divides prevalent across Malawi & promote inclusive Internet connectivity
▶	Improve accessibility of digital devices such as mobile phones, tablets, computers for greater reach and adoption
▶	Enhance broadband affordability and accessibility for people of all abilities, gender and social standing to about 80 % of the total population
▶	Set up a digital learning ecosystem to create and share learning resources, information and digital content among teachers, academicians, institutes and the students
▶	Establish a labor market information system to integrate the supply and demand ecosystem and map the shortage of skilled manpower in Malawi
▶	Ensure secure, reliable and safe online experience for users
▶	Protect data privacy where appropriate
▶	Increase global competitiveness for industry and business

The digital infrastructure to achieve the goals stated above will have to focus their attempts at delivering low cost internet leveraging the national fibre backbone project that was extended in June 2021. The optic fibre backbone will solve a major problem ailing the infrastructure and provide access to international internet bandwidth and reliable foundation for a robust internet infrastructure. However, this is only part of the puzzle since the optic fibre cannot be a last mile connectivity solution for most cases due to cost considerations or laying problems. A variety of solutions needs to be considered to deliver internet to the individual consumer at educational institutions, personal devices, community centres. The following table will talk about all possible technologies that can be leveraged to deliver internet to the last mile. This can be part of the Last Mile Rural Connectivity Project.

Table 6: Technology recommendations for last mile delivery of Broadband with requirements

Technology	Speed	Infrastructure required	Suitability for rural deployments	Range	Wired or Wireless
LEO satellite	Up to 100	Buy the service from	Yes (Easily scalable)	Covers Malawi completely	Wireless

Technology	Speed	Infrastructure required	Suitability for rural deployments	Range	Wired or Wireless
	Mbit/s (Starlink)	existing operators			
Millimetre wave	Up to 20 Gbit/s	Expensive 5G network equipment	Moderately	500m from the towers	Wireless
Free-space optical communication	10s to 100s of Gbit/s	Low-start up and operational cost	Yes (but misses a few packets of data occasionally)	2 to 3 km	Wireless
White space internet	22 Mbit/s to 26 Mbit/s	Low Cost (Towers and radio equipment)	Yes	10 to 25 km	Wireless
Power line communications: fiber via overhead medium-voltage distribution lines	100 - 1,000 Mbit/s	Tower, poles, cabinets, active network equipment	Yes, but cost of optic fiber still high	100s of km	Wired

In line with the objectives mentioned above, the key actionable that will be critical to Malawi's digital infrastructure transformation are mentioned below. These will help in creating a conducive climate for all future digital investment and collaboration among the public, private and skills sectors-

Key focus areas of action

The broad action areas for setting up a robust digital infrastructure have been mentioned below-

Strengthen and utilize the fiber backbone set up under RCIPMW and ESCOM

- ▶ Create enabling environment for setting up of fiber network across the country
- ▶ Promote measures to encourage private sector participation in ICT infrastructure building & leverage existing backbone, including from alternative infrastructure providers such as power companies and cable TV
 - ▶ Consider PPP models for infrastructure development such Build, open and Operate (BOO), Build operate and transfer (BOT), Build and Transfer (BT), Build, Own, Operate and Transfer (BOOT) and Buy, and Build and Operate (BBO). Each of the aforementioned models will find a place in the ecosystem if the government demonstrates
- ▶ Provide incentives for private sector investment, for rural and unserved areas (incl. incentives review)
 - ▶ Reduced tax for a specific time period during the time span of the investment in marked areas and zones
 - ▶ Share government land with investors for a lock in period
 - ▶ Recognition of efforts through awards
 - ▶ Regulatory relief for a specific time, lesser inspections of sites for compliance to frameworks like environmental contribution, carbon footprint and tax filings
- ▶ Consider tax rebates or other fiscal measures to encourage ICT purchases from SMEs and private players for infrastructure that will be shared and zero-rated supply of ICT purchases for education initiatives
- ▶ Develop open access backbone policy
- ▶ Promote migration to Next Generation Networks (NGN)
- ▶ Broadband affordability measures
- ▶ Provision of procuring international bandwidth for extended access across the regions in Malawi

Provisioning of high speed and low-cost broadband services for government, citizens and businesses across Malawi

- ▶ Ensure infrastructure sharing of ICT providers and support proliferation of smaller ISPs to reduce highly competitive costs
- ▶ Assess existing broadband coverage and service levels & optimize allocation of spectrum to ensure sustained competition
- ▶ Reduce excise and other taxes on ICT provider turnover and mobile data prices

Develop and adopt an innovative digital learning ecosystem to create and share learning resources

Facilitate access to digital devices such as computers, low cost laptops, tablets etc. and improve basic ICT infrastructure across computer labs in schools and colleges

- ▶ Enable setting up of open Wi-Fi networks to improve the access to digital educational resources and repositories across educational institutions
- ▶ Consider tax rebates or other fiscal measures to encourage ICT purchases from SMEs and private players

Key Indicators

Table 7: Key Indicators of the Maturity of Digital Landscape

Improved and cost-effective broadband network	: ▶ Increase in the public and private sector investment for infrastructure development ▶ Improved Ease of doing Business (World Ranking) and enabling environment for ICT focused private businesses
Faster, more affordable broadband service at all usage level	: ▶ For businesses: and households, the broadband connectivity to be doubled ▶ Decrease in the average annual broadband prices
Greater internet penetration	: ▶ Higher internet penetration rate resulting in reduced digital divide between other developed countries and Malawi
Secure and reliable ICT	: ▶ Robust Data security and privacy regulations ▶ Cybercrime laws and a trained special task force within the police pursue cyber-crimes independently ▶ Coordination measures and procedures among stakeholders to protect vital ICT infrastructure

The following table gives a summarized view of the sub-components which will help enable ICT infrastructure development in Malawi

Strategic Pillar	Key Performance Indicator
Build a seamless, high quality and reliable last mile delivery infrastructure	<ul style="list-style-type: none"> ▶ Improved broadband network ▶ Improved ICT infrastructure across institutions, schools and universities ▶ Improved ICT infrastructure across communities e.g., Libraries, cyber cafés
Provisioning of high speed and low-cost broadband services for government, citizens and businesses across Malawi	<ul style="list-style-type: none"> ▶ Broadband prices for all segment of users as a percentage of average income ▶ Improved broadband speed and penetration of internet
Develop and adopt an innovative digital data governance model	<ul style="list-style-type: none"> ▶ Advancement in Data Quality Scores ▶ Compliance to Data Management regulatory framework ▶ Decrease in risk instances. ▶ Drop in Data rectification costs

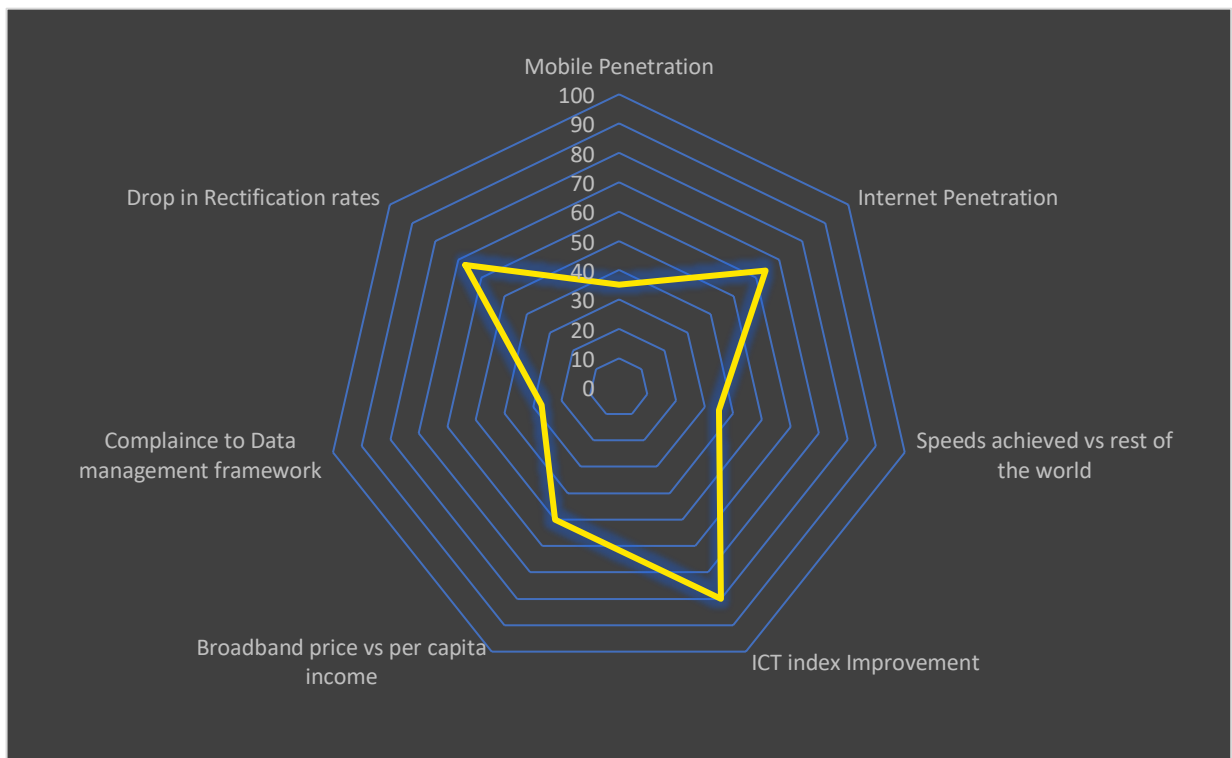


Figure 2: An Illustrative radar map of tracking KPIs

3.2. Industry led Digital Job creation

Imperatives to be addressed by Digital Job creation initiatives through digital innovation

- ▶ Only 39% of the central government employees leverage ICT for regular operations⁴
- ▶ Limited diversification to non-farm livelihood creation sectors
- ▶ Low uptake of digital skills and digital services by industry, there is a glaring disparity in the usage across different sectors.
- ▶ Capacitation of industry at large and upskilling of existing workforce to be able to perform digital tasks
- ▶ Limited opportunities for freelancing, digital microwork etc
- ▶ The overall level of usage of digital / ICT tools is on the lower side;

To stimulate digital jobs in a country, it is necessary to first identify the sectors of the economy where digital jobs are found, following are the key sector groups in focus where ICT led digital jobs are created

- ▶ **Core digital sectors**, such as IT-BPM, digital communication services, including telecom services, electronics and manufacturing.
- ▶ **Newly digitizing sectors** that are not traditionally considered part of the digital economy but have the potential to innovate and adopt digital rapidly, such as financial services, agriculture, healthcare, logistics and retailing.
- ▶ **Government services and labor markets activities**, which can be intermediated using digital technologies in new ways

Further, across the key sectors, following provided a typology of the key drivers for digital jobs created across various functions characterizing them

⁴ National ICT Plan 2014-2031

Table 8: Typology of the key drivers for digital jobs created across various functions

Typology of industry demand drivers	Baseline questions
▶ Availability of affordable digital and ICT infrastructure for all sectors across categories	
▶ Digitization of public sector agencies and e-governance services <ul style="list-style-type: none"> • Digitization of regular operations and functions in government departments and agencies (including record keeping, billing, human resources) • New e-public goods and e-governance using specialized software 	<ul style="list-style-type: none"> • Advanced • Intermediate
▶ Private sector (IT based) <ul style="list-style-type: none"> • Web development • Network administration • Cybersecurity • Application/content development using IoT 	<ul style="list-style-type: none"> • Advanced • Intermediate
▶ Private sector (Non-IT based) <ul style="list-style-type: none"> • Billing • Finance services • Digital records • Desktop publishing ▶ Inhouse ICT services	<ul style="list-style-type: none"> • Advanced • Intermediate
▶ Digital entrepreneurship <ul style="list-style-type: none"> • Application development • online” and “offline” digital education • Web hosting • Membership sites • On demand services 	<ul style="list-style-type: none"> • Advanced • Intermediate
▶ Online outsourcing (BPO services, virtual freelancing, microwork) <ul style="list-style-type: none"> • Complex tasks (translation, coding, web/graphic design, software development, technical writing), distributed via online platform • Microwork: Business processes are broken down into small tasks (e.g., data input, proof-reading, image tagging, and text 	<ul style="list-style-type: none"> • Basic • Advanced • Intermediate

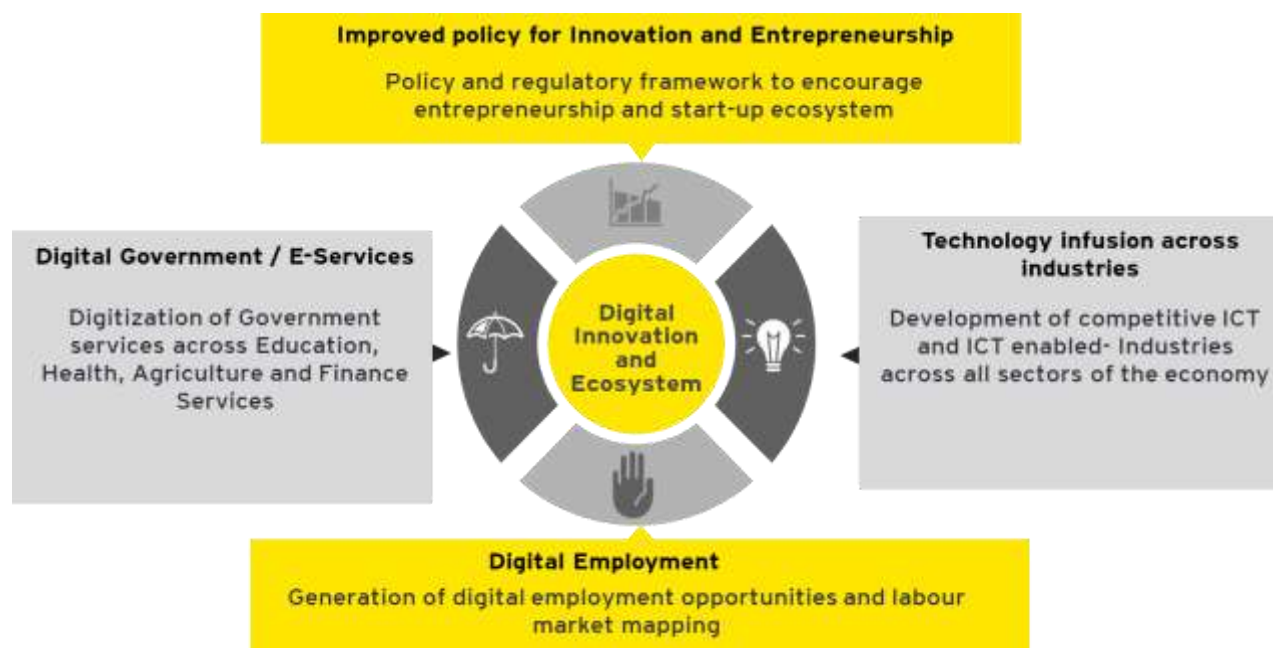
Typology of industry demand drivers	Baseline questions
transcription) which are then distributed to workers via an online platform	
<ul style="list-style-type: none"> ▶ Digital platforms for improving livelihoods • Online on-demand services that require ICT (rideshare, food delivery etc) • Online information services for farmers and small entrepreneurs, providing price and weather info, links to buyers, funding and technical services, online markets • Online services matching of job seekers and employers • Online career and job counselling 	<ul style="list-style-type: none"> • Advanced • Intermediate • Basic

Source: Adapted from Digital Jobs for Youth (2018), S4YE

- ▶ To rapidly introduce ICT interventions across Malawi, it will be essential to place innovation at the heart of the continuing digital revolution. Relentless innovation in the hardware, software, applications and networking fields including, Cloud Services, Artificial Intelligence, Blockchain, and the Internet of Things, 3D Printing, Digital Sequencing, Nanotechnology and sensors among others have been pivotal in driving change across many developing nations.
- ▶ Most of the efforts on development of the digital infrastructure and the digital skills across various education levels will be sustainable when an equal focus is laid on building a digital ecosystem comprising of **innovation, research and development and e-solutions** across all wings of the society.
- ▶ The Government of Malawi has identified **E-Governance initiatives** such as *eGovernment, eLearning, eAgriculture* etc., as aspirational outcomes of the digital transformation projects. These in turn, if achieved, will spur digital awareness, improved economic activity and a robust social service delivery, thus improving standards of living in Malawi.
- ▶ An ICT-enabled transparent government will empower citizens and stakeholders and allow them to have secure electronic transactions and access to information and services anytime, anywhere.
- ▶ Similarly, the digital entrepreneurial ecosystem can also take advantage of the innovations by generating new talent and ventures through vibrant or comprehensive commercial digital hubs to compete at the highest global level.
- ▶ This innovation ecosystem can be nurtured through efficient use or allocation of resources in the innovation ecosystem, key supports, policies, and other elements of a nurturing

environment, as well as through collaboration between public and private stakeholders to develop a complete ecosystem.

Figure 3: Drivers for digital employment creation in Malawi



The key objectives of industry led digital job creation efforts with a focus on innovation and entrepreneurship

- ▶ Develop effective legal, institutional and regulatory framework and policy agenda for supporting the development of digital innovation, entrepreneurship and research & development
- ▶ Create a conducive environment to empower people to innovate and facilitate access to finance and funding mechanisms for digital enterprises
- ▶ Support the development and growth of ICT and ICT enabled industries by promoting the production, use and management of technology and innovations across different sectors
- ▶ Encourage faster adoption of e-government initiatives with priority being placed on shared services and Government to Citizen (G2C) services
- ▶ Support the establishment of local digital innovation centers serving as a co-creation and innovation hub for digital solutions of tomorrow
- ▶ Facilitate robust and credible digital labor market platforms for job mapping and skill gap analysis between job seekers and employers

Key focus areas of action

Improve policy and create a conducive environment for stimulating a digital entrepreneurship and start-up ecosystem

- ▶ Draft legal framework to address any pressing barriers to development, operation and management of start-ups
- ▶ Provide incentives in the form of awards and national recognition to encourage innovation across all the sectors
- ▶ Introduce robust laws to protect the Intellectual and Innovation Property Rights (IPR)
- ▶ Facilitate access to funding for start-ups by local ecosystems (hubs) and public-private development partners
- ▶ Support the establishment of local digital innovation centers or incubators across colleges and universities for encouraging innovation
- ▶ Encourage small scale start-ups and digital enterprises by entrusting them with public projects and adopting their cost-efficient solutions to address local issues across agriculture, health, administration
- ▶ Organize Hackathons, Ideathons and Bootcamps to bring together innovative ideas and inculcate industry ready digital skills among the youth
- ▶ Support digital entrepreneurs to showcase their solutions outside of Malawi through international platforms and trade fairs

Support ICT enablement and innovation across traditional industries to generate jobs and encourage faster adoption of digital skills among youth

- ▶ Encourage and assist industries in the use of ICT to automate and modernize their business and industrial processes across production, logistics and delivery in traditional sectors such as agriculture, government services, and manufacturing
- ▶ Establish Technological Parks and Special Economic Zones (SEZs) to encourage industries to produce and trade at lower prices by offering lower taxation and easing other laws and regulations
- ▶ Promote joint ventures between local and foreign companies to facilitate the rapid development of the digital industry and service sector
- ▶ Incentivize firms to invest in more efficient digital solutions and encourage the entry of start-ups that can motivate the incumbent non- digital firms to innovate
- ▶ Boost ICT in agriculture as a business with enormous potential for employment, profitability and macroeconomic benefits

- ▶ Offer innovative financing mechanisms to agripreneurs and industrialists to catalyze growth and job generation

Digital Government and E-Services

- ▶ Develop national and regional policies, standards, and guidelines to facilitate the deployment of Digital Governance Services to the citizens
- ▶ Define a data interoperability framework to define the specifications for governing information flow between government departments and regions
- ▶ Facilitate the integration of e-services through common standards and a robust IT architecture
- ▶ Promote Public Private Partnerships in developing the digital services

Digital Employment

- ▶ Develop a dynamic national level database for all the citizens with verified background and qualification details such as a skills registry. *Skills Registry is a database to manage all explicit as well as tacit information pertaining to the labour market, which helps stakeholders to take informed decisions.
- ▶ It caters to the need for integrating, automating and presenting the labour market information available electronically to every stakeholder on a real-time basis.
- ▶ Design a single window labor market information portal to map skilled workforce with prominent industry across Malawi
- ▶ Enable user friendly features to facilitate collaboration between skilling, labour and industry bodies across the country
- ▶ Facilitate technology sector players in setting up technology hubs for Business Process Outsourcing (BPOs) to boost employment across the services sector
- ▶ Develop national and regional level platforms for aggregating apprenticeship and internship opportunities across local industries
- ▶ Draft a policy to encourage all the industries to regularly notify vacancies for full-time, internship and apprenticeship opportunities on these platforms

Key Indicators

- Increase in the registration and establishment of start-ups across Malawi** :
- ▶ Number of start-ups formally registered in a year, following the implementation of entrepreneurship friendly policies and frameworks
 - ▶ Number of Innovation centers and incubators set up across various regions
 - ▶ Number of hackathons or bootcamps organized in a year along with the participation rate in each of the events
 - ▶ Participation in international events from across various wings of education and age groups in Malawi
- Increase in the set-up and establishment of ICT specialized workplaces, shop floors and machinery across various industries** :
- ▶ Increase in the number of ICT job offerings across traditional industries
 - ▶ Number of organizations registered in the technological parks and SEZs area set up in a time period
 - ▶ Average number of ICT-focused or ICT-enabled jobs created / filled in a year
- Introduction of E-Services across various Government domains** :
- ▶ Number of services digitized in certain time period, following the implementation of the e-services
 - ▶ Number of citizens registered in a certain time period
 - ▶ Number of digital requests fulfilled, or grievances redressed in a certain time period
- Database of skilled manpower for digital employment opportunities** :
- ▶ Robust Data security and privacy regulations
 - ▶ Cybercrime laws and a trained special task force within the police pursue cyber-crimes independently
 - ▶ Coordination measures and procedures among stakeholders to protect vital ICT infrastructure

The following table gives a summarized view of the sub-components which will help enable ICT led employment generation in Malawi

Table 9: ICT led Employment generation in Malawi

Strategic Pillar	Key Performance Indicator
Improve policy and create a conducive environment for stimulating a digital entrepreneurship and start-up ecosystem	<ul style="list-style-type: none"> ▶ Number of start-ups registered in a year ▶ Number of Innovation centers and incubators set up across universities and technical institutes ▶ Number of bootcamps, ideathons organized
Support ICT enablement and innovation across traditional industries to generate jobs and encourage faster adoption of digital skills among youth	<ul style="list-style-type: none"> ▶ Increase in the number of ICT job offerings across traditional industries ▶ Number of organizations registered in the technological parks and SEZs area set up in a time period ▶ Average number of ICT-focused or ICT-enabled jobs created / filled in a year
Digital Government and E-Services	<ul style="list-style-type: none"> ▶ Number of services digitized in certain time period, following the implementation of the e-services ▶ Number of citizens registered in a certain time period ▶ Number of digital requests fulfilled, or grievances redressed in a certain time period
Digital Employment	<ul style="list-style-type: none"> ▶ Number of job seekers registered on the employment portal ▶ Number of industries registered on the employment portal ▶ Number of jobs created and offered to the job seekers

3.3. Digital Skilling

Imperatives to be addressed by Digital Skills and learning programs to empower the Malawian population

- ▶ Relatively low digital awareness across all the basic, intermediate and advanced digital skill competency
- ▶ Only about 37% of the respondents claimed to know how to access internet on the phone, while only about 31% knew the basics of computer
- ▶ Workplace related digital skills such as data analyses, word processing, and spreadsheets were also found to be low among the respondents (only around 25% claimed to be comfortable with them).
- ▶ Only around 10-20% of the respondents claimed to have a working knowledge of advanced digital skills such as programming languages, machine learning and other computing systems.
- ▶ Need for revamped curriculum development initiatives, low budgetary provisions for the in-service training/ continuous professional development of teachers⁵.
- ▶ Increasing the frequency and quality of teacher training and capacity building programs for ICT in their institutes.
- ▶ Computer Sciences courses offered in secondary schools are elective in nature and this is accompanied by shortage of ICT trained teachers and coordinators.
- ▶ TEVET in Malawi, primarily offers a standard Information and Communication Technology (ICT) Course across its various Technical Colleges in Malawi. The inclusion of emerging technology related courses or job-oriented courses need focus
- ▶ Capacitation of existing manpower through skilling, re-skilling and upskilling to improve digital competency level at workplaces

For youth to successfully perform digital work, they must develop digital skills. These skills qualify youth for jobs in traditional sectors while also empowering youth to thrive in emerging sectors and even launch their own businesses. As the nature of work continues to change, digital skills will become increasingly important for youth to engage in new forms of work, such as virtual freelancing, and participate in the gig economy and online job marketplaces.

⁵ UNICEF Education Brief 2018-19 for Malawi

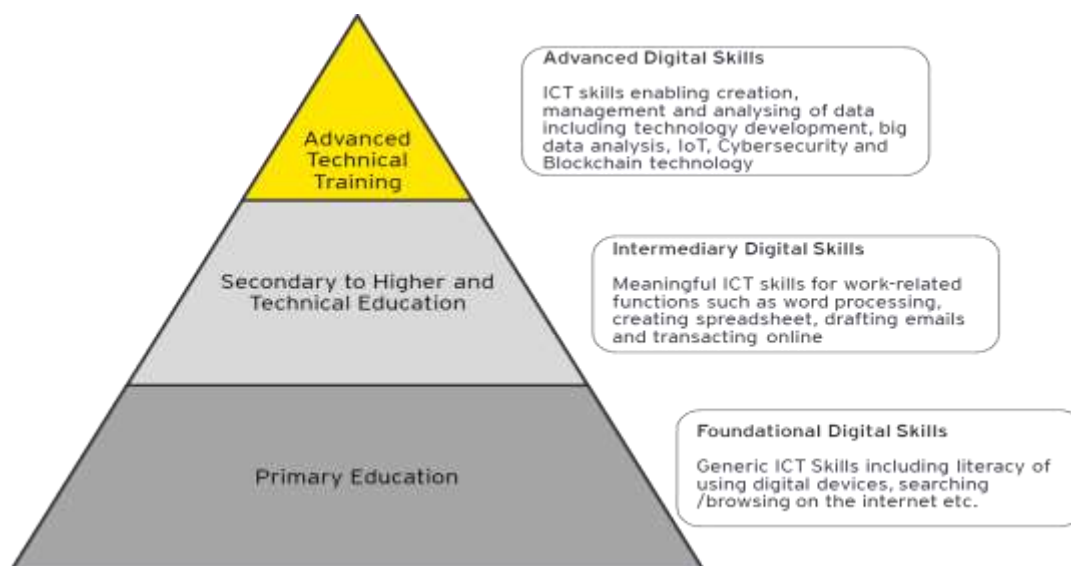
The UNESCO Digital Literacy Global Framework, which is based on European Union's DigComp 2.1, highlights different levels of proficiency in digital skills across 7 competency areas, namely-

- ▶ Device and Software Operation
- ▶ Information and Digital Literacy
- ▶ Communication and collaboration
- ▶ Digital Content Creation
- ▶ Safety
- ▶ Problem Solving
- ▶ Career related competencies

While the definition of these levels continues to update with the changes in technology, the four categories of skills proficiency levels- basic / foundational skills, intermediary skills, advanced skills and highly specialized skills still provide a range of digital skills that can be incorporated by the policy makers and digital skills providers in their training curricula and programs. Some of the approaches can be more structural, such as those related to education, and require systemic changes, while other may be simpler to implement and offer faster adoption of digital skills.

While formal means of education such as School Education, Higher and Technical Education bodies are the main channels through which the youth acquire foundational to advanced digital skills, many non-formal education channels such as private training programs, online training and certifications (MOOCs), and peer networks are also known to be successful in driving the acquisition and adoption of some of the advanced digital skills. A rough mapping of different levels of skill development across the education levels has been set out in the graphic below. This is only indicative and may differ as per the competency of the youth at that level.

Figure 4: Level of Skills across different Education levels



Foundational and Intermediary skills curriculum at primary and secondary learning levels

- ▶ To set the foundation of basic digital skills among the youth, integrating employability skills (including soft skills and business skills) into digital skills educational programs (refer chart below) can not only help them learn effective use of technology, but also ensure collaborative and effective work. Employability skills are likewise important, as youth with the right knowledge, skills and entrepreneurial mindset can find opportunities to start new business and thus, create more jobs
- ▶ Instruction in basic ICT skills, coding and computational thinking can be part of school curriculum at all grade levels. These foundational courses can help build basic programming skills and educate them about the technologies that drive change.
- ▶ Varying proficiency levels courses across intermediary digital skills such as fundamentals of computing and internet, word processing, spreadsheets, presentations and email creation etc. can constitute a part of the vocational training programs
- ▶ Appropriate course material in the form of self-instructional material to provide broad set of generic skills without mastering the use of specific application software
- ▶ Basic, foundational skills training beyond the school through public libraries can target out-of-school youth and offer a wide range of digital literacy skills, computer fundamentals and programming techniques to students to help them be up to date with the technological progress as they advance in years

Figure 5: Employability Skills as part of Foundational ICT Curriculum

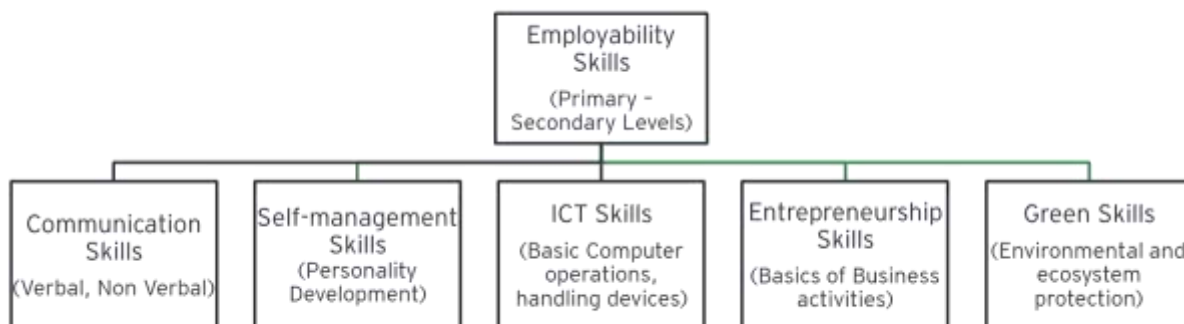
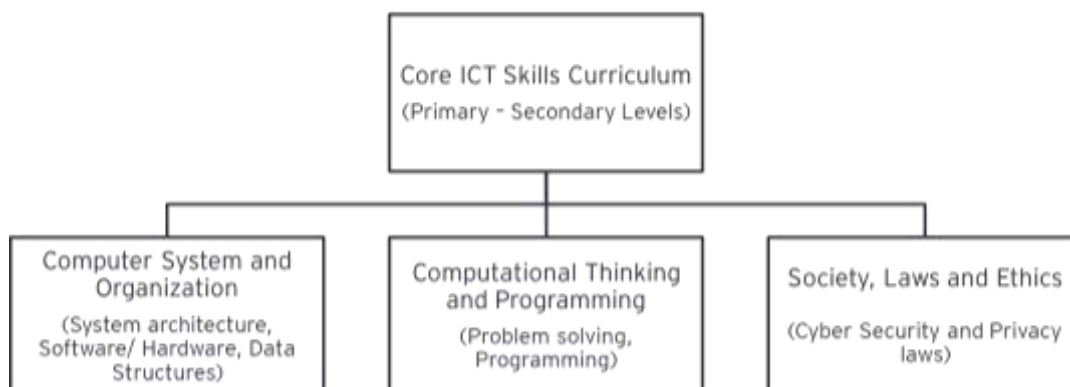


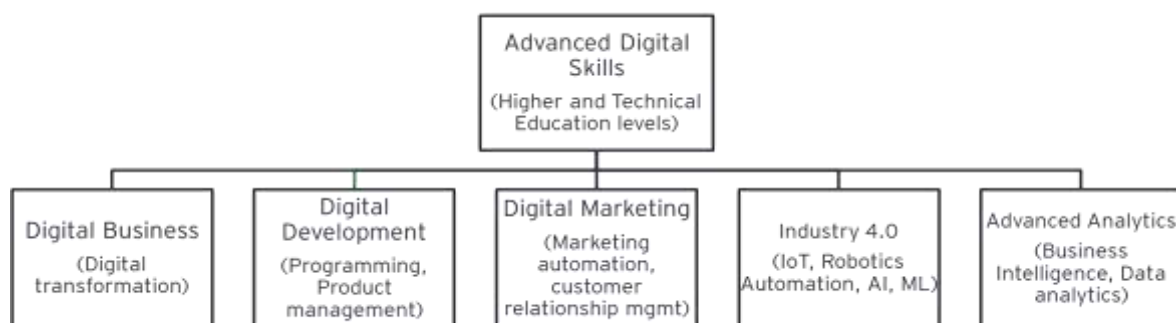
Figure 6: Core ICT skills curriculum



Advance skills curriculum at higher education levels for specialized skillset

- ▶ Specialized degree courses and certifications in different areas of Computer / Electrical Engineering, at Higher Education levels by factoring in requirements of different streams, including academic and vocational streams
- ▶ ICT focused curriculum for professional skills across key domains such as digital business, digital development, digital marketing, Industry 4.0 and advanced analytics (See Chart below)
- ▶ Courses across Science, Technology, Engineering, and Mathematics (STEM) subjects
- ▶ ICT Job oriented courses linked to the needs of the ICT enabled industries in the region

Figure 7: Advanced Digital Skills



Therefore, to bring a structural change in the wider adoption of digital learning and teaching skills among the students and teachers in Malawi, a comprehensive revamp is needed through **deployment of updated ICT curriculum in school education, use of Digital learning systems and through capacity building of teachers and instructors across general education and TVET.**

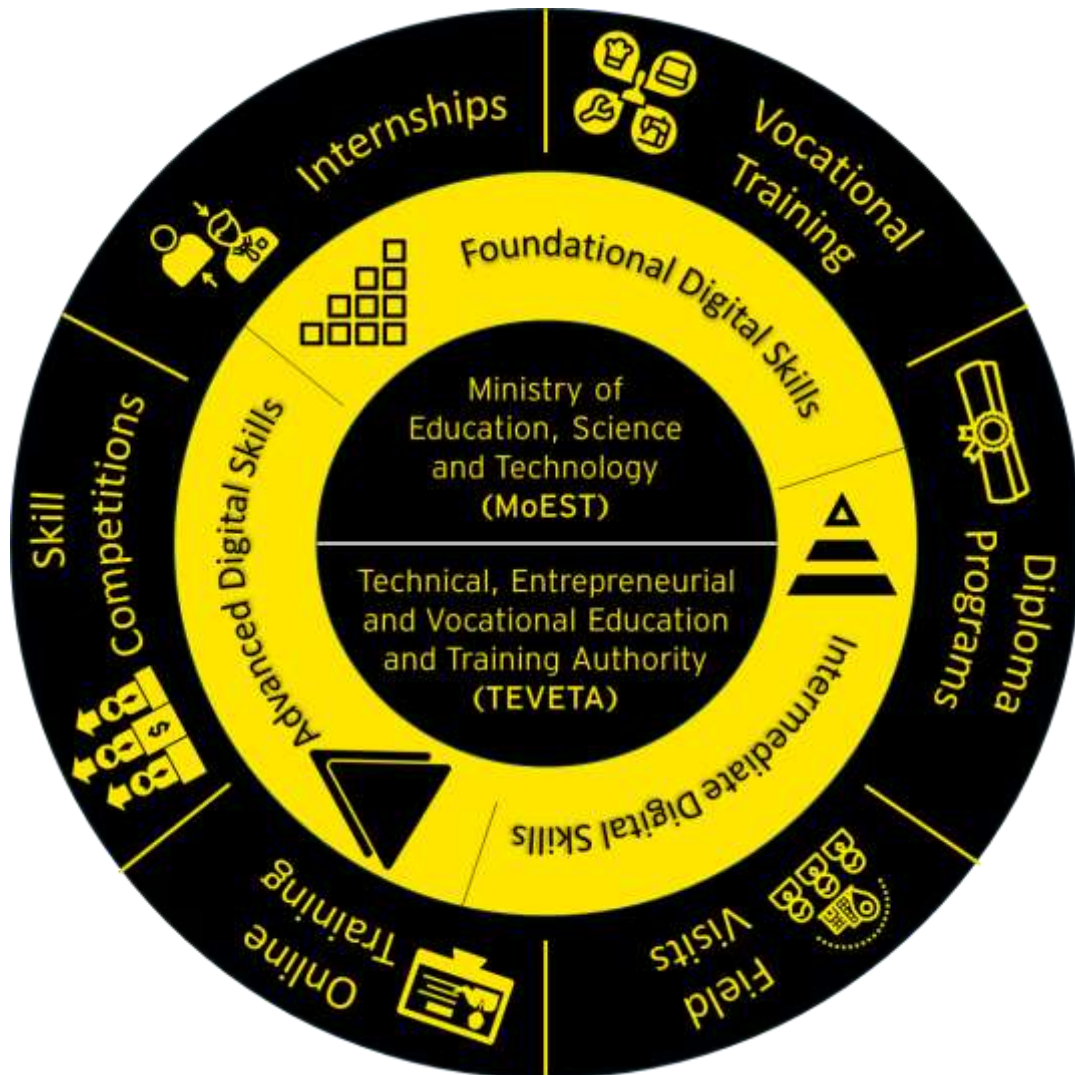
The key objectives of Digital Skills and learning programs in Malawi

- ▶ Design and develop a standardized curriculum and pedagogy for trainers and students with diverse ICT courses across all education levels (as highlighted above)
- ▶ Introduce more ICT enabled teacher learning material (Digital Learning Resources, structured learning plan and Assessment Tool) both in school and teacher training institutes / academies
- ▶ Identify the additional digital channels which can be utilized to deliver the proposed skilling programs
- ▶ Enable identification of students in need of remedial education, identification of skill set gap in teachers and students, focused and customized teacher training, faster feedback on teacher's performance and better monitoring of under-performing schools, teachers and students
- ▶ Design culturally appropriate, relevant skills and competencies that address barriers faced by the under-represented populations of Malawi

Key focus areas of action

The broad categories of actions to be undertaken to equip the Malawian population with relevant digital skills and competencies

Figure 8: Digital Skills Framework



Modernizing teaching content and curriculum to include industry linked ICT focused courses

- ▶ Establish a gender inclusive national database of school pass-outs and graduates mapped to the skills framework with focus on ICT skills- this should act as a Skills Registry and should be updated regularly
- ▶ Adopt a national standard performance and productivity measures for ICT skills, across every level of education from primary education to university level
- ▶ Introduce Computer Sciences as compulsory courses at the Primary and Secondary Education levels. The teacher-student ratio in the computer labs should be augmented

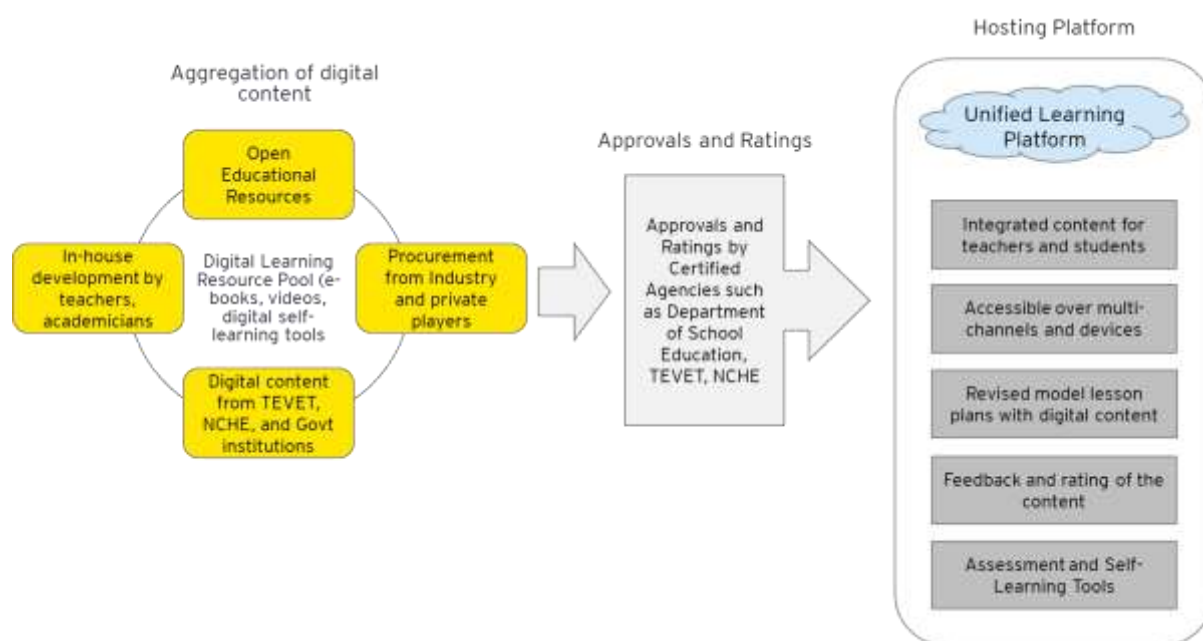
through increasing the number of computer science classes in a week and through scheduling smaller manageable batches

- ▶ At Higher and Technical education levels, facilitate design and development of a more dynamic ICT curriculum in line with the emerging technologies in the industry- across Malawi and globally. The curriculum should be reviewed and updated every few years through regular inputs from ICT industry experts
- ▶ While developing the curriculum for ICT skills across various levels, attention must be given to the teaching pedagogy and the assessment of these skills.

Design and develop the Digital Learning Resource Pool in line with high demand skills across sector

- ▶ Integrate model lesson plans with digital learning content to help trainer with recommended flow of communication, suggested examples, suggested use of digital content, exercises to better engage students etc.
- ▶ Include digital textbooks, video lectures, learning objects, assessment tools and self-learning tools in the curriculum plan across all levels of education
- ▶ Integrate all available digital channels by leveraging the various sources such as-
 - ▶ Open Educational Resources (OERs)
 - ▶ Procurement from Private Sector Players
 - ▶ In-House Development of Digital resources by trained teachers
 - ▶ Content developed by local Government entities
- ▶ Security policies for data governance including data controls on collection, storage, transfer and analysis of data
- ▶ Implement content standards for managing content platforms for sourcing, creating, sharing and usage of content in a structured manner
- ▶ Creating content metadata standards to make it easier to publish, discover, deliver quality educational resources on the web

Figure 9: Digital Skills delivery Model



Set up or share access to Learning Management Systems (LMS) portals, e-learning portals and digital library solutions through low cost satellite enabled hubs across Pan African e-Network

- ▶ Host all the existing digital learning resources existing in online / offline format on a central platform.
- ▶ Malawi currently utilizes a handheld interactive learning aid, slightly larger than a mobile phone which is used to play video and audio through either a loudspeaker or headphones. These devices can be leveraged to upload the revamped resources across various classes and levels⁶
- ▶ Explore the plan to engage private sector players by way of MOUs and partnerships to offer Massive Open Online Courses (MOOCs) and other digital learning programs
- ▶ Design blended training programs by merging classroom training with digital classrooms, workshops / laboratory to provide practical experience to students- for this both synchronous and asynchronous modes of delivery may be used
- ▶ Enable tools for teachers to develop customized content and lesson plans
- ▶ Act as a platform for discussion and foster collaboration through various discussion boards and forums
- ▶ Get feedback from users on improving the digital content and lessons
- ▶ Develop Assessment Tools / System

⁶ Source : ICTD2009Proceedings.pdf (washington.edu)

- ▶ Implement ICT based assessment tools to facilitate standardized measurement of learning levels
- ▶ Design and develop learning outcome against each level of digital competency
- ▶ Identify prevalent skills gaps in the learning outcome of the students and provide feedback with respect to the remedial action required to fill the gap
- ▶ Design appropriate training interventions that are required to close the gap
- ▶ Provision of aggregated reports and dashboards about the performance of the ICT based tools and curriculum

Capacity Building of trainers and training providers for development of resource content pool

- ▶ Building capacity in preparation of digital content, lesson plans, elicit responses and improve participation of students
- ▶ Digital Skills related conferences and workshops with multi stakeholder groups to enable idea sharing, feedback on lesson plans, and new developments
- ▶ Orienting the trainers in the use of digital mediums for delivery of the lessons prepared
- ▶ Train and deploy a pool of Master Trainers in each region in Malawi, who in turn will train the targeted trainers in elementary and secondary schools
- ▶ Strengthen the system of providing skills and training for teachers to provide career counselling to adolescents to understand the wide variety of employment opportunities that are possible

Ensure pathways from training to apprenticeship and finally employment

- ▶ Apprenticeship opportunities to youth completing advanced skilling programs
- ▶ Portfolio building of youth to attain and market industry-ready skills
- ▶ Incentivized partnership with prospective employers to share training costs and absorb youth in their industry
- ▶ Organizing bootcamps to select and train youth on advanced ICT skills
- ▶ Membership in specialized professional associations and networks
- ▶ Entrepreneurship support to candidates eager to explore and own new ventures

Digital skilling opportunities for the underrepresented and marginalized groups

- ▶ Create outreach plans for the marginalized groups -students, parents, employers and training providers about the importance of high demand digital skills, career options available for each group and long-term opportunities

- ▶ Conduct local and national level campaigns in line with well-known international campaigns to increase the outreach to such groups
- ▶ Incentivize private training providers and employers through tax rebates for offering free training programs to the under-represented groups through CSR and other funds
- ▶ Engage local training providers and campaigners with local dialect to increase trust factor and improve training outcomes
- ▶ Adapt the digital curriculum to appeal to the specific needs of the groups. For example, training program designed for People with Disabilities (PwD) can include higher practical component and simpler use of coding language. Similarly, programs for women can include women-specific skills and trades
- ▶ Create both physical and virtual accessibility roadmaps, for the marginalized section such as women and PWDs,
- ▶ Give priority to marginalized section on job portals in case all other things are considered equal
- ▶ Affirmative action for digital jobs for people with disabilities and other marginalized section

Key Indicators

Table 10: Key Indicators of Maturity of Skill Development Ecosystem

<p>Improved employability of digitally skilled workforce in ICT and ICT-enabled sectors</p>	<ul style="list-style-type: none"> ▶ Increased level of absorption rate of graduates by ICT specific industry ▶ National competency standard for the various job roles employed in the ICT and related industries <p>Larger number of customized training programs developed for women, minorities, indigenous peoples, persons with disabilities to a level 50% above current baseline</p>
<p>Availability of high quality, integrated resources across all major formal and non-formal channels</p>	<ul style="list-style-type: none"> ▶ No. of resources procured, created, crowd-sourced from trainers, private sectors, employers and training associations ▶ No. of lesson plans created, approved and adopted by trainers across the skilling ecosystem

- Standardized assessment tools and framework adopted** :
- ▶ Assessment standards adopted to measure the outcome against each level of digital competency
 - ▶ Overall improvement in the outcome assessment of various training initiatives across all education levels

The following table gives a summarized view of the sub-components which will enable ICT led skilling and learning in Malawi

Table 11: ICT led Skilling Initiatives

Strategic Pillar	Key Performance Indicator
Map the shortage of skilled workforce for the ICT and ICT-enabled Industries	▶ Improved employability of digitally skilled workforce in ICT and ICT-enabled sectors
Design and develop the Digital Learning Resource Pool in line with high demand skills	▶ Availability of high quality, integrated resources across all major formal and non-formal channels
Design cost effective digital platform freely accessible from internet, libraries and informal channels of education	▶ Availability of a robust scalable solution which caters to both online and offline model of communications
Develop Assessment Tools / System	▶ Standardized assessment tools and framework adopted
Capacity Building of trainers and training providers for development of resource content pool	▶ Competent and qualified ICT master trainers and trainer for each sector

Ensure pathways from training to apprenticeship and finally employment	<ul style="list-style-type: none"> ▶ Opportunities available for vertical and horizontal mobility of youth from mainstream education to skilling and to employment
Digital skilling opportunities for the underrepresented and marginalized groups	<ul style="list-style-type: none"> ▶ Participation rate of the marginalized group in various skilling programs ▶ Outcome achieved in term of placement provided to these groups

3.4. Digital Policy Reforms

Imperatives to be addressed by Policy Reforms Pillar

- ▶ Need for sector focused digitization plans,
- ▶ Establishing a robust mechanism for monitoring infrastructure set up
- ▶ Leverage cross border collaborations for infrastructure support, financing avenue, business outsourcing.

Focus of the policy makers in a digitizing economy must encompass the following through multi-fold interventions focusing on

- ▶ Ease of access
- ▶ Ease of use
- ▶ Efficiency of delivery
- ▶ Quality of service rendered
- ▶ Impactful collaboration
- ▶ A Robust feedback and monitoring mechanism

Government of Malawi has provided national guidance in the development and use of ICT through various medium-term policies such as Economic Recovery Plan (ERP), Malawi Growth and Development Strategy (MGDS) and long-term policies such as National ICT Policy (2014-2031) and Malawi Economic Strategy Plan, however, a systematic adoption and implementation of these ICT development plans in various sectors of the economy as mentioned in the ICT plan is needed. Furthermore, strengthening the regulatory framework for online platforms that may be offered under the planned initiatives will be crucial. Generally, the absence of such policies to support and safeguard the provision of online services in Malawi presents a major concern for most government and private agencies with regard to the nature of security and privacy on their information made available on websites and other online delivery systems.

The future focus of the Government should be on providing a strategic direction for the implementation and greater adoption of these plans highlighted in the National ICT Policy.

The key areas for speeding and ensuring faster implementation of various policy reforms have been highlighted below. The sections following the policy reforms will focus on specific strategic areas which will play a role in building the digital skills ecosystem in Malawi.

The key objectives of introducing policy reforms to bring about digital transformation in Malawi are:

- ▶ Ensure faster adoption of National ICT framework (2014- 2031) which is conducive to the development and sustainability of a digital program
- ▶ Promote national, regional, and inter-continental connectivity to support local digital ecosystem, attract equipment manufacturers to cut costs, and create conducive environment that supports networks, services and platforms
- ▶ Formulate the necessary security policies for use of internet, intranet and other services made available through the schools and other skilling institutions
- ▶ Ensure that the digital learning lifecycle for each learner is captured and mapped in a way that it can tracked to draw insights and make suitable changes
- ▶ Setting standards for content development, usage, storage management and intellectual copyright matters
- ▶ Institutionalization of standardized assessment for students and teachers
- ▶ Adoption of data governance to ensure efficient development and management of data for meaningful insights for all the stakeholder
- ▶ Setting up a Monitoring and Evaluation Framework to formulate parameters to be measured, map benchmarks against the monitored parameters and mode of measurement

The focus area of actions pertaining to Digital transformation is to create tailored, contextualized and high levels of engagement for end users at various stages of execution of said policies. The policies will have to be designed to scale well and in phases. One of the primary goals will be to not lose the incremental benefits gained during the initial phases, when the subsequent phases are being executed. It is also imperative that the phases feed into each other and are more than the sum of its individual effects.

The policy will focus see three broad pillars and as elucidated in the earlier will focus on building a strong foundation, sustain and build on top of that foundation and finally future proof the gains and maintain a competitive advantage.

The focus areas for each pillar are as follows

Digital Foundation Policies:

- ▶ These policies will focus on laying a strong foundation for creating a digital ecosystem such as creating a backbone of the fiber network, Mass literacy projects etc.,

Digital Growth Policies

- ▶ Policies that aim at reaching a larger section of the country through online portals, software-as-a-service (SAAS) models, and growing internet penetration
- ▶ Integrate online-to-offline (O2O) seamlessly (e.g., VR, AR, mobile app, based government services)
- ▶ Harness the data collected to create new personalized experience
- ▶ Respond to real-time data across the supply chain (e.g., AI-enabled inventory)
- ▶ Connect stakeholders and enhance collaboration with real-time and centralized data on business process
- ▶ Leverage data analytics to unlock insights

Future proofing Policies

- ▶ Diversify from core to explore new verticals for the future
- ▶ Access to game-changing partner technologies
- ▶ Build up a controlled ecosystem, accumulate first-party data through analytics, Internet-of-Things (IoT) and partnerships

Leapfrogging the ICT journey

As discussed in the digital infrastructure section earlier in the report, Government of Malawi needs to invest in next generation of networks to sustain the good work done so far in the infrastructure domain. The future of the connectivity is going to be 5G networks and the jobs that will be created while upgrading the network and jobs generated due to launch of such a technology will help Malawi leapfrog in their technology journey and catchup or surpass even the rest of the world.

Internet of Things (IoT) can also leverage the 5G networks, while 5G is gaining momentum across the world in virtually all sectors, many organizations are still fraught to zero-in on the right 5G vendor to fulfil their ambition for the technology. While enterprises value speediness and nimbleness in the execution, most of them think their current 5G interactions are largely tactical and transactional. Enterprises are finding it difficult to leverage 5G systems. There is huge potential to leapfrog the ICT journey if investment in technology is done right away.

While 5G can generate unlimited opportunities of innovation, some potential business models are likely to emerge as companies pursue 5G in a vastly different way across the scale of

business and cost of implementation dimensions. Sophisticated platform provider, for example, will build an ecosystem connecting consumers with suppliers of 5G-enabled IoT products or services through a cloud-based IT infrastructure. Creative businesses may endeavor to introduce groundbreaking 5G products to engage disruptive innovation. Other companies may offer professional slice to enable dedicated 5G use case scenario for customers in their industries. With a smaller investment, value extenders may use 5G to enhance customer experience via remote maintenance and improve efficiency in their operations.

Other areas of concentration would be as follows



- ▶ **Data analytics widely used in multiple areas**, including evaluating customer and employee experience, designing data-driven products and services, deriving real-time and value-adding business insights
- ▶ Companies are harnessing technology and internal simplification to drive efficiency. **Processes are being automated to free up human capital** and shift the focus to improving product and service delivery, thereby improving customer experience.

- ▶ The skills the workforce of today possesses are becoming less relevant over time, and a various task across different sectors are at the risk of being automated. To **fill up the skills gap and keep employees current**, employers look towards investing into training and development programs in order to reach full capacity.
- ▶ **Innovation must become a national priority** - Malawi can shift funding and tax deduction structures to encourage businesses to take up research and development, innovation, and building capabilities.
- ▶ Over the last 20 years, the average Malawian age has remained pretty much the same but population has increased by a substantial margin paving way to next generation participation in the job market without the jaded outlook of past generations and affinity towards the new technologies.
- ▶ AI is arguably one of the biggest technology trends of this day and age. The use of “technology that learns”, such as chat-bots, are expected to increase efficiencies. As implementation takes place, **business models, employment, and the relevance of skills will evolve as well.**
- ▶ Tailor-made skill text at TEVET and Engineering Colleges under Ministry of Education processing, representation, similarity computation, clustering, and skill community detection algorithms will also help



4

Governance and Implementation Plan

4 Governance and Implementation Plan

The governance structure for implementation of the strategic plan in Malawi will be as follows-

The key actors in the implementation will as follows-

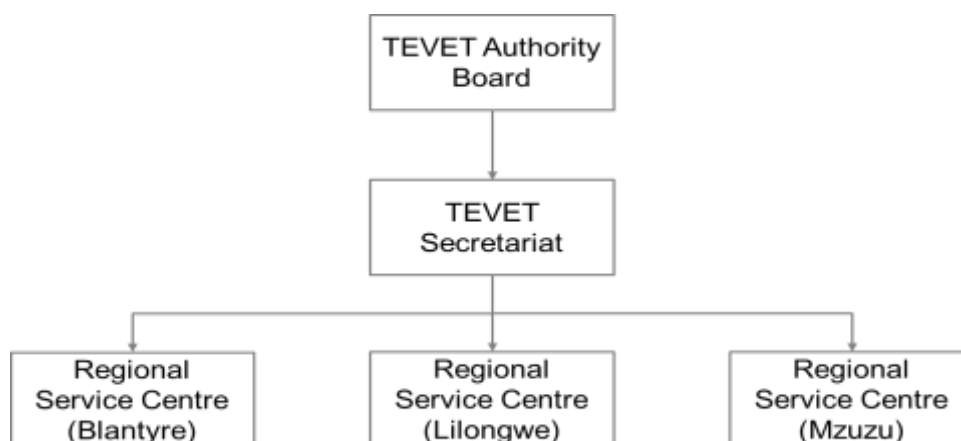
Central Level

- ▶ The Technical, Entrepreneurial and Vocational Education and Training (TEVET) Authority Board
- ▶ Ministry of Education
- ▶ Ministry of Industry, Trade and Tourism
- ▶ Ministry of Labor, Youth, Sports
- ▶ Ministry of Finance

Regional Level

- ▶ TEVET Secretariat
- ▶ Regional Service Centre for South, Central and North regions

Figure 10: Governance model



The role of each of the player has been detailed below-

The Technical, Entrepreneurial and Vocational Education and Training (TEVET) Authority

- ▶ The TEVET Authority is the independent, autonomous body responsible to the Government through the Ministry responsible for TEVET. It regulates, promotes and facilitates TEVET activities in Malawi. TEVET Authority implements its programs guided by the national development agenda and sectoral policies informing the TEVET Sector in Malawi and the region

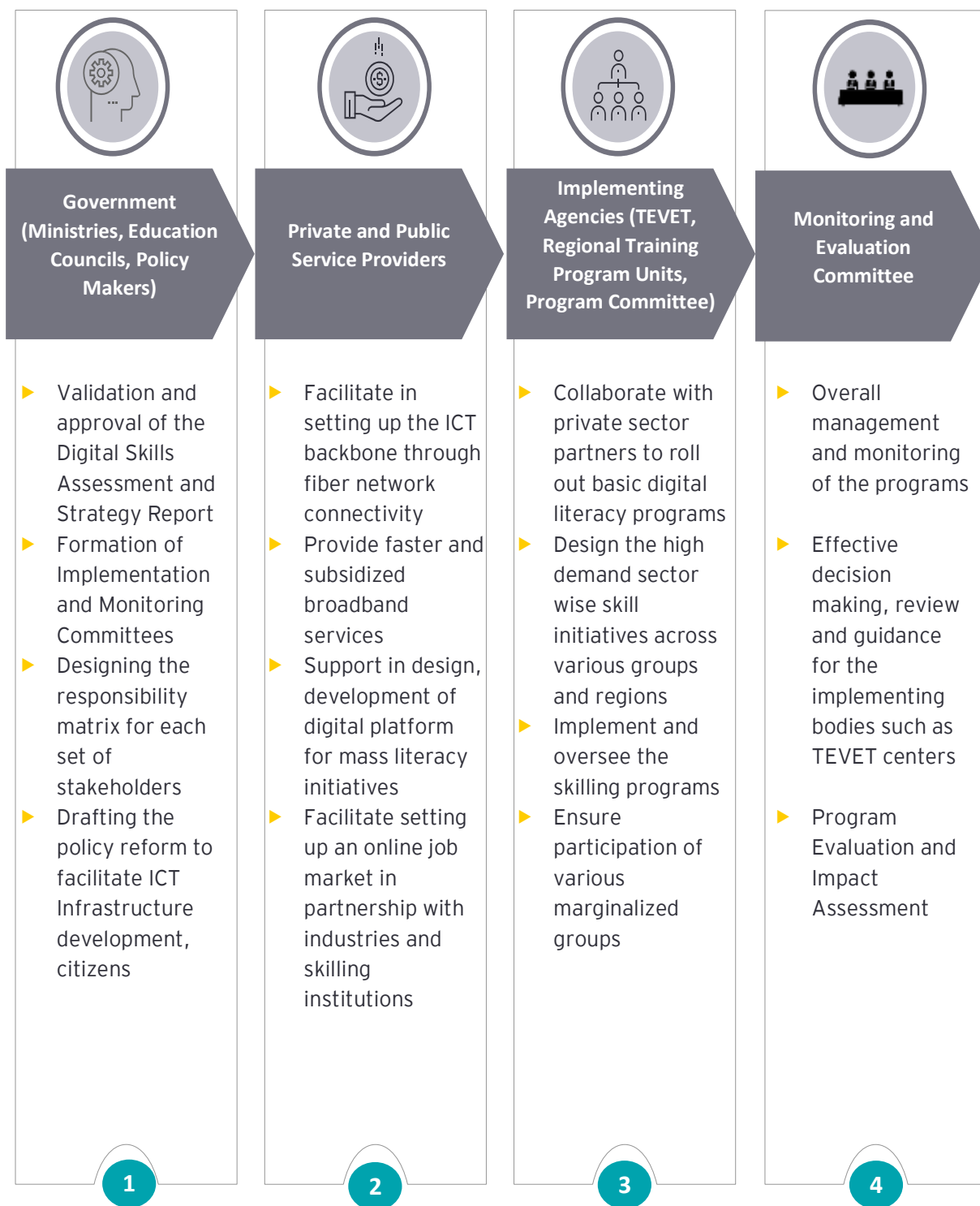
Key responsibilities -

- ▶ Central actor for developing, implementing and monitoring the digital skills program
- ▶ Utilize the funding received from public budgetary provisions, TEVET Levy Funds (paid by private and public employers), private households, international organizations such as World Bank, UN and NGOs
- ▶ Overall supervisory responsibility of the ICT centric schemes- in terms of the complex geographic spread, large number of implementation centers, identified digital platforms, technologies involved and responsibility matrix
- ▶ Preparation of implementation guidelines for the different regions in Malawi
- ▶ Monitor the management and progress of various performance indicators to review outcome

Ministry of Education

- ▶ Regulation of Student- Teacher digital platform
- ▶ Sourcing of content including setting up the ICT infrastructure in schools and online platforms
- ▶ Development and management of data standards for the area of ICT
- ▶ Provision of hardware / software at administrative offices/ supervisory offices/ skilling institutes
- ▶ Network connectivity to all implementation units

Figure 11: Key implementation pillars



This section highlights the key implementation plan in the sequential manner

Year 1 Project Milestones

- ▶ The first year of implementation will include setting up of implementation committee including members from TEVET, various Ministries such as Education, Labor and industries, Private Sector and Industry Associations etc.
- ▶ Drafting of policy reforms for ICT Infrastructure Development and enablement of broadband policies
- ▶ Preparation of implementation guidelines, Standard Operating Procedures (SOPs) and specifications for public and private sector under the program
- ▶ Defining the responsibility matrix to assign roles to each set of stakeholders
- ▶ Identification and preparation of procurement plan including ICT Infrastructure, digital resources, e-content, e-books etc.
- ▶ Invitation of funding proposals from different States / Regions in Malawi and approval of the same by the Ministry

Year 2 Project Milestones

- ▶ The second year will initiate the implementation of the activities planned in Phase 1
- ▶ Implementation of policies for provisioning of high-speed broadband services with the help of private sector
- ▶ Design and development of technology-led platforms and resources to be used to impart ICT trainings
- ▶ Mapping the industry wise skill gap assessment reports and analysis
- ▶ Setting up of the online job market to centralize all the labor market opportunities at one place
- ▶ Setting up processes to enable industries to advertise and interview for online part-time and full-time opportunities

Year 3 Milestones

- ▶ Collation and analysis the literacy gap assessment reports from Phase 1 and 2
- ▶ Design and development of relevant digital literacy content with the help of private sector partners
- ▶ Capacity Building of master trainers, trainers and training providers for content development, lesson plans and teaching pedagogy
- ▶ Establishment of ICT communities and centers of excellence (COE) across various regions
- ▶ Implementation and roll-out of the literacy programs for all marginalized and non-marginalized groups
- ▶ Regular co-ordination and analysis of the literacy levels achieved vs target to be achieved

Year 4 Milestones

- ▶ Once the ICT infrastructure and digital resources has been developed in previous phases, Phase 4 will include implementation of the digital skilling programs.
- ▶ Analysis of the outcomes achieved from digital literacy programs in Phase 2 and Phase 3
- ▶ Leveraging of the existing cost-effective digital platforms such as libraries, community centers etc. to impart skilling
- ▶ Identify new digital learning resources that are readily available and can be utilized for imparting the digital skilling programs
- ▶ Partnerships with various online job market players to offer map prospective employers and skilled manpower

Year 5 Milestones

- ▶ Year five will be for stabilization, monitoring and evaluation of the digital skills strategy deployed in Malawi
- ▶ Focus on improving data quality, continuous identification and development of additional digital learning resources, advanced analytics for decision making and reporting

Table 12: Suggestive Implementation Plan

Actionable	Key Initiatives	Year 1	Year 2	Year 3	Year 4	Year 5
Digital Infrastructure	Build a seamless, high quality and reliable fiber backbone					
	Provisioning of high speed and low-cost broadband services for government, citizens and businesses across Malawi					
	Implement data security measures (risk and cyber security) and privacy protection					
Policy Reforms	Policy reforms for Broadband and ICT Infrastructure Development					
	Policy Reforms for ease, usage and capacity building for using ICT enabled platforms					

Actionable	Key Initiatives	Year 1	Year 2	Year 3	Year 4	Year 5
	Policy Reforms for Data quality, Governance and Content Standards					
Digital Literacy	Integrate basic digital literacy skills along with soft skills and entrepreneurship skills in the educational and training programs to increase use of technology					
	Implement multi-stakeholder collaboration and public and private partnerships on Digital Literacy to reduce the digital divide and improve adoption					
	Implement an incentive-based Train the Trainer (TTT) program for teachers, educators and trainers					
	Address digital literacy and competency needs of marginalized groups such as women, PWD, indigenous people, among others)					
Digital Skills	Map the shortage of skilled workforce for the ICT and ICT-enabled Industries					
	Design and develop the Digital Learning Resource Pool in line with high demand skills					
	Design cost effective digital platform freely accessible from internet, libraries and informal channels of education					

Actionable	Key Initiatives	Year 1	Year 2	Year 3	Year 4	Year 5
	Develop Assessment Tools / System					
	Capacity Building of trainers and training providers for development of resource content pool					
	Design pathways from training to apprenticeship and finally employment					
	Digital skilling opportunities for the underrepresented and marginalized groups					



5

Proposed digital skilling programs and initiatives

5 Proposed digital skilling programs and initiatives

Road map for implementation of programs and initiatives for digital jobs and skills



Some of the proposed programs and initiatives for digital literacy and digital employment generation

5.1. Digital Literacy Program for Malawian population

Theme	Immediate action (0-5 years)	Medium term (5-10 years)	Long term (10+ years)
Digital Skilling / Literacy	<ul style="list-style-type: none"> ▶ Capacity building programs for teachers and instructors (offline) ▶ Mandatory ICT training at school level ▶ Basic literacy campaigns Malawian population across various groups 	<ul style="list-style-type: none"> ▶ ICT capacity building of existing workforce ▶ Short term-industry led skilling programs for youth ▶ Open education platforms/self-paced learning platforms for students, teachers, trainers etc 	<ul style="list-style-type: none"> ▶ Specialised/higher education institutes to encourage learning in advanced digital skills ▶ Long term courses in digital and ICT sector

Theme	Immediate action (0-5 years)	Medium term (5-10 years)	Long term (10+ years)
Digital employment	<ul style="list-style-type: none"> ▶ Govt. of Malawi led initiatives to bring BPO, to increase domestic demand for digital skills ▶ Adverts/radio campaigns to create awareness and advocacy for ICT and digital transformation 	<ul style="list-style-type: none"> ▶ Initiate sector agnostic digitisation campaigns, to create demand for skills (financial services, agriculture, healthcare, logistics, and retailing) ▶ Digital entrepreneurship, virtual freelancing 	<ul style="list-style-type: none"> ▶ Create a strong core IT sector with focus on emerging technologies - product/content development ▶ Digital platforms for improving livelihoods (on demand services, e-Gov, LMIS, job aggregators, gig economy platforms)

Digital literacy is the ability to search, find, interact with digital content through browsers and applications

Key features

- ▶ Program to reach as many citizens as possible
- ▶ Course designed for various age groups
- ▶ Raising awareness of the learning program and training delivery channels

Target population

- ▶ Program to reach as many citizens as possible
- ▶ Course designed for various age groups
- ▶ Raising awareness of the learning program and training delivery channels

Mode of Delivery

- ▶ Mobile Vans/kiosks with digital eLearning modules
- ▶ District training centres
- ▶ Awareness programmes
- ▶ Micro learning nuggets during regular television programming
- ▶ Weekend classroom sessions in Schools and Colleges for audience without access to digital infrastructure
- ▶ Anytime learning for people with reasonable access to mobile internet and Smartphones

Key features

- ▶ Increase in number of users availing digital services
- ▶ Increase in number of users on social media
- ▶ Increase in number of email accounts created from Malawi
- ▶ Increase in digital inclusion
- ▶ Increase in Digital services by PWD and other marginalized groups

What will be taught?

- ▶ How to operate a smart device
- ▶ Perform basic operations on the smart device
- ▶ Create, edit and format documents using a document processor
- ▶ Browse the Internet and discovering information
- ▶ Register for a web-based e-mail account and using it
- ▶ Opening of e-mail attachments
- ▶ Understanding the available e-Governance Services

a. Digital Literacy Program for Malawian population - Foundational Digital Skills to be imparted

Students

- ▶ Will be able to identify the basic components of computers and terminology
- ▶ Understand file management
- ▶ Create documents using word processor, spreadsheet & presentation software
- ▶ Understand computer networks, and browse the internet, content search, email and collaborate with peers

Entrepreneurs

- ▶ Use e-Governance applications; and use computer to improve existing skills and learn new skills
- ▶ Understanding Social Networking platform for marketing
- ▶ Develop knowledge about FutureSkills

Existing Workers

- ▶ Awareness in Computer Concepts, support Data entry operations, CRM operation, Basic Technical Support, Simple Testing of Digital technologies, basic Cyber security and privacy understanding,

Segments	Mode of Delivery
Formal Education	<ul style="list-style-type: none"> ▶ Schools ▶ Vocation training Institutes ▶ STEAM Colleges ▶ +online platforms
Out of school Students	<ul style="list-style-type: none"> ▶ Schools on weekend ▶ Government institutions with Internet Access ▶ Training Partners ▶ +online platforms
Existing Workers	<ul style="list-style-type: none"> ▶ Government institutions with Internet Access ▶ Training Partners ▶ +online platforms
Entrepreneurs	<ul style="list-style-type: none"> ▶ Government institutions with Internet Access ▶ Training Partners ▶ +online platforms

b. Digital Literacy Program for Malawian population- Intermediary Digital Skills to be imparted

Students

- ▶ Database Management Systems
- ▶ Cyber Security
- ▶ PC Maintenance & Troubleshooting
- ▶ Networking and Troubleshooting
- ▶ Application of Digital Financial Services

Entrepreneurs

- ▶ Latest trends in IECT & e-Governance
- ▶ Productivity Tools Basic Hands-on Expertise, Basic Digital Financial Management & Analytical Expertise, Online marketing, Agile Project management, ERP management and others.

Existing Workers

- ▶ Business/System Analysis, Cyber Security, Software Development Life Cycle and Agile, Business Development & Software/IT service Marketing & Selling Techniques, IT Service Management, Agile Project management, Web & Data Security, Cloud Computing & Cloud Development and others.

Segments	Mode of Delivery
Formal Education	<ul style="list-style-type: none"> ▶ Schools ▶ Vocation training Institutes ▶ STEAM Colleges ▶ +online platforms
Existing Workers	<ul style="list-style-type: none"> ▶ Government institutions with Internet Access ▶ Training Partners ▶ +online platforms
Entrepreneurs	<ul style="list-style-type: none"> ▶ Government institutions with Internet Access ▶ Training Partners ▶ +online platforms

c. Digital Literacy Program for Malawian population- Advanced Digital Skills to be imparted

Students

- ▶ Fundamentals of AI, Machine Learning, Programming Essentials, Data science, Python, Foundations of IoT, Web and Mobile Development, Digital Marketing, Design thinking, UI developer, Virtual Reality and others.

Entrepreneurs

- ▶ Productivity Tools Basic Hands-on Expertise, Basic Digital Financial Management & Analytical Expertise, Online marketing, Agile Project management, ERP management etc

Existing Workers

- ▶ Big Data Analytics, Cloud computing, Cyber Security Administration, IoT, Web and Mobile Development, Digital Marketing, Design thinking, UI developer, Virtual Reality and others.

Segments	Mode of Delivery
Formal Education	<ul style="list-style-type: none"> ▶ Schools ▶ Vocation training Institutes ▶ STEAM Colleges ▶ +online platforms
Existing Workers	<ul style="list-style-type: none"> ▶ Government institutions with Internet Access ▶ Training Partners ▶ +online platforms
Entrepreneurs	<ul style="list-style-type: none"> ▶ Government institutions with Internet Access ▶ Training Partners ▶ +online platforms

5.2. Long term (2-3 years) ICT/digital learning programs in higher education and technical education to impart intermediate and advance skill courses

Key features

- ▶ Program to promote
- ▶ Development of culturally relevant digital skilling content
- ▶ Increasing aspirations and awareness for digital jobs
- ▶ Address soft skills training need

Target population

- ▶ School Students choosing vocational digital training in schools
- ▶ Engineering Education and STEM students
- ▶ Industry workers with focus on digital transformation

Mode of Delivery

- ▶ Computers/ Laptops
- ▶ Tablets/ phones
- ▶ Face-to-face classrooms (if required)
- ▶ function specific advance course modules launched in all platforms
- ▶ On-line forum & chat for questions, voting, video, interactivity, gaming

Outcome

- ▶ Industry ready Digital economy workers
- ▶ Ideas fed into incubators
- ▶ New Age entrepreneurs
- ▶ Self-Sustaining trainer ecosystem

What will be taught?

- ▶ Advanced programming
- ▶ Data analytics
- ▶ Digital Marketing
- ▶ Digital Advertising
- ▶ Industry Allied Courses like Microsoft professionals, Amazon certification, Google certifications etc.
- ▶ Internet of Things

5.3. Malawi Digital Skill for Youth Program - Short term digital skills training program

Demand led government funded training and certification program for basic, intermediate and advanced digital skills

Key features

- ▶ 3-6 months duration program
- ▶ Industry certification certified youth to received preference in employment
- ▶ Private sector integration - infrastructure, placement
- ▶ Skill levels mapped to global benchmarks. Standardised curriculum

Target population	Age group of 16 - 36 years (fresh graduates, Form 1, 2,3,4 students, job aspirants etc)
Certification	Joint certification by TEVETA and Industry certificate
Program funding	Govt of Malawi (Ministry of Education, Science and Technology and/or Ministry of Information), leverage international funding

Program administration	(<i>proposed</i>) Technical, Entrepreneurial and Vocational Education and Training Authority (TEVETA)
Training centre infrastructure	Leveraging the existing TVET institutes and tertiary institutes with access to ICT infrastructure Capacity enhancement - PPP model, entrepreneurial led model through Govt. grant, leverage CSR funds for new centres etc
Partnerships / collaborations with industry	Centre development , leveraging industry equipment/space for training, industry experts as guest lecturers, subject matter expertise for course validations and content and curriculum development, placement demand, internships

Basic Digital Skilling Courses (3 months)

Awareness in Computer Concepts, Data entry operations, CRM executives, Jnr Technical Support, Voice and Non-Voice Technical Support, Testing executives etc, Cyber security and privacy,

Intermediate Digital Skilling Courses (3-4 months)

Data Analysts, Design/Hardware/Quality engineer, Software development, Coding basics, Master Trainers (Jnr. Software development), Network security, Basics of social networking, Graphic Design, Digital Marketing, Desktop publishing

Advanced Digital Skilling Courses (4-6months)

Fundamentals of AI, Machine Learning, Programming Essentials, Data science, Python, Big Data Analytics, Cloud computing, Cyber Security Administration, Foundations of IoT, Web and Mobile Development, Digital Marketing, Design thinking, UI developer, Virtual Reality etc.

5.4. Digital Upskilling Program - Digital Skills Capacity Building of Existing workforce

Digital competency enhancement of existing workforce in the country (especially middle management and leadership positions) to help build ICT led business acumen.

Key features

- ▶ 3-6 months duration program
- ▶ Industry certification certified youth to received preference in employment
- ▶ Private sector integration - infrastructure, placement
- ▶ Skill levels mapped to global benchmarks. Standardised curriculum

Training need analysis	Periodic TNA to assess short, medium, and long-term digital skill requirement of in-service professionals
Target population	Professionals with work experience of 3 years and above
Training certification	Industry certificate to be awarded to trainees, training to be at part with global skill set benchmarks
Training framework	Instructor led/classroom training and self-paced training modules
Program funding	Employer led funding
Program administration	<i>(proposed)</i> Technical, Entrepreneurial and Vocational Education and Training Authority (TEVETA)
Partnerships / collaborations	Industry equipment/space for training, industry experts as guest lecturers, industry experts as SME for course validations and content and curriculum development, certification

Foundational courses for all

Project Management, Marketing and Business Development, Business Communication Skills, Business Analysis & Business Processes, Digital Finance and Accounting etc

Technical modules for IT enabled sectors

Business/System Analysis, Cyber Security, Software Development Life Cycle and Agile , Business Development & Software/IT service Marketing & Selling Techniques, IT Service Management, Agile Project management, Web & Data Security , Cloud Computing & Cloud Development etc

Technical modules for non-IT sectors

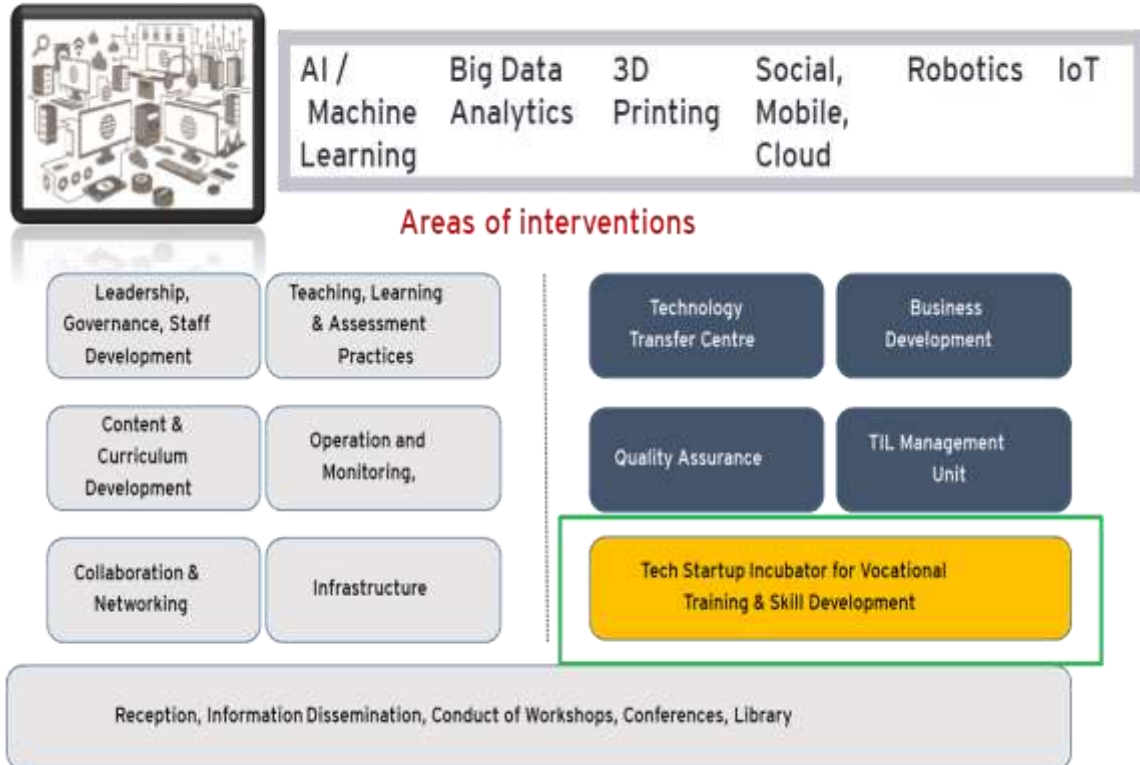
Basic Strategic management skills with Business model Generation, Productivity Tools Basic Hands-on Expertise, Basic Digital Financial Management & Analytical Expertise, Online marketing, Agile Project management, ERP management etc

5.5. Setting up of National ICT Academy in Malawi - Accelerate Malawi's Digital Transformation Journey

Strengthening the digital innovation landscape of Malawi by being the epicentre of training for new digital skills and capabilities, facilitating introduction new digital technology in industry and academia

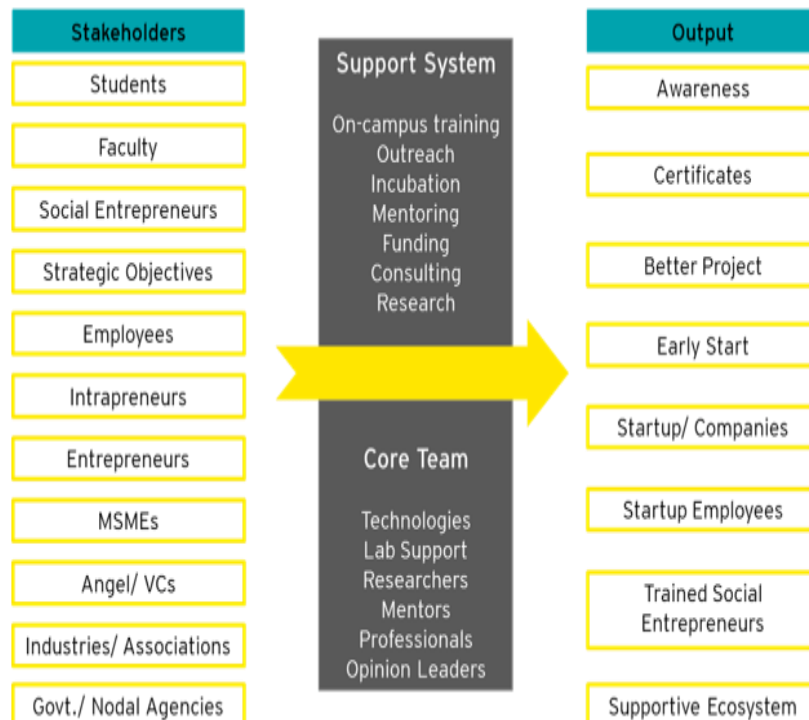
For better outreach and increased population coverage for these facilities, regional centres may also be developed by leveraging and strengthening the ICT infrastructure at Tech hubs, mHub and higher education universities and colleges etc.

ICT academy to house Centers of Excellence for future technologies



Industry incubation mechanism for tech entrepreneurs

Accelerator batch should be given the attention to drive incubated start-ups through a holistic approach, to offer end-to-end solutions,- grooming, incubation, mentoring, networking and funding



5.6. Program recommendations for Malawi's evolving digital landscape

- ▶ ToT platforms
- ▶ Master trainers
- ▶ ICT led pedagogy development
- ▶ Local Content Innovation
- ▶ Online work
- ▶ Provision of ICT tools to educational institutes
- ▶ MOOCs/Offline self-paced
- ▶ Online work
- ▶ e-Entrepreneurship
- ▶ Promoting multi-Country online work platform

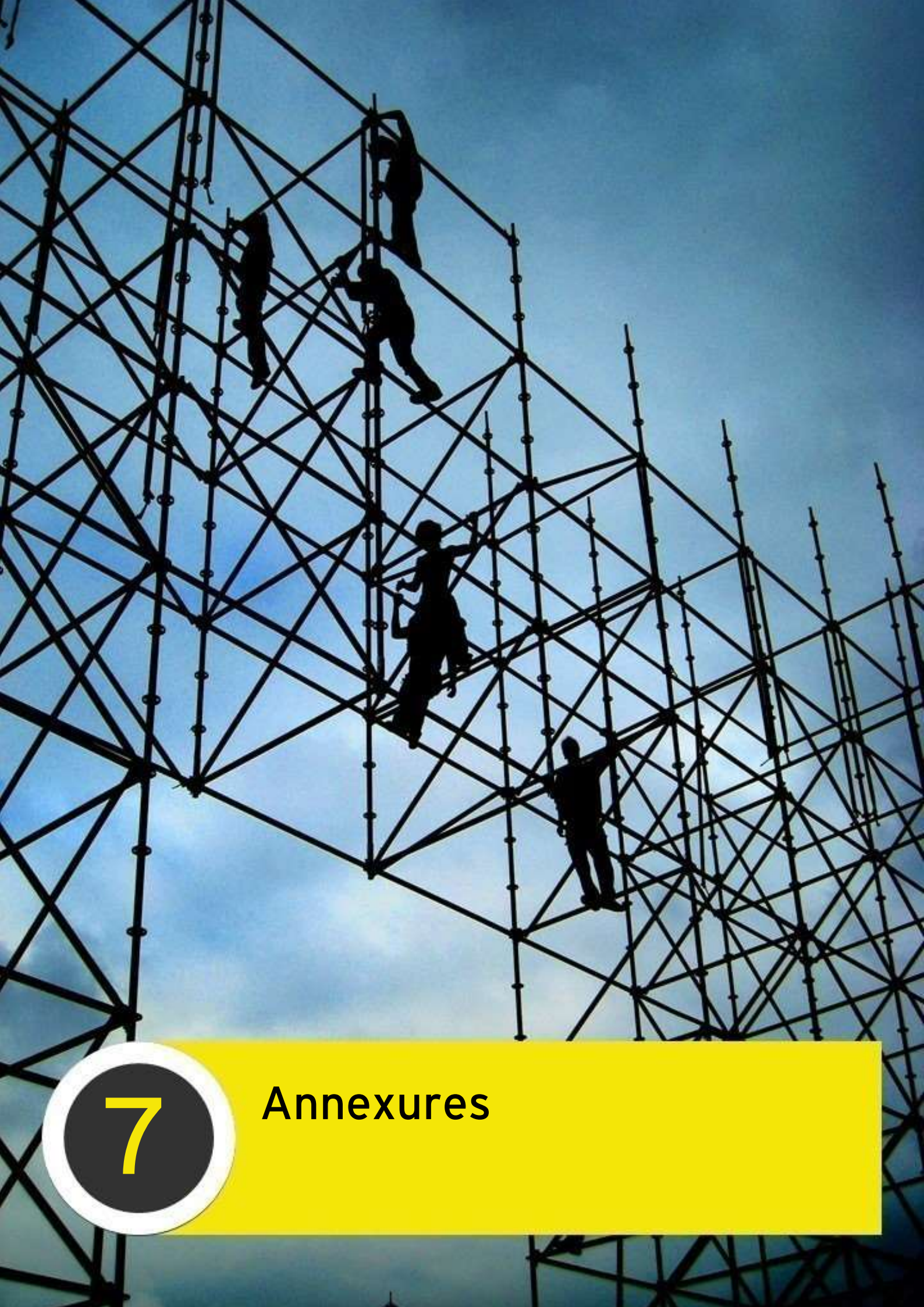
④ Last mile digital training in socially/geographically distant locations through social institutions such as schools, banks etc

④ Setting up digital support helpline to provide handholding to Malawian population while accessing digital platform services

④ Developing offline ed-tech solutions for educational institutes for standardised ICT learning

④ Open-source mobile platform and social network that provides young people who are not in education, employment or training, affordable access to knowledge, support and tools needed for career development

④ Community level advocacy programs showcasing use of digital tools, facilities etc. through innovative modes



7

Annexures

Annexures

A. List of ICT/digital skills job roles identified by enterprises in Malawi across various sectors

Table 13: Job roles in demand mapped to sectors

Sectors	Job Roles in Demand
Tele-communication/ICT	App Developer
	App and Cyber security Specialists
	Digital Marketer
	Animation and Graphic Designer
	ERP Specialists
	Cloud Computing Specialist
	Data Analytics (Data Entry Operator)
	Digital Typists
	Network Administrator
	IT Professionals
	Sales Agents
Finance, Banking and Accounting	Company Secretary
	Bank Teller
	Bank Manager
	ICT Specialists
	Cyber Security Specialists

Sectors	Job Roles in Demand
	Data Analysts
	Customer Service Assistant
Engineering and Manufacturing	Auto Electric Engineers
	Carpenter
	Typists
	Data Analytics (Data Entry Operator)
	Computer Box Specialists
	Hardware Engineers
	Technicians
	Sales Engineers
	IT Specialists
	Marketing managers
Agriculture	Accountant
	Cashier
	Data Entry Operators
	Digital Sales Specialists
	Sales Managers
	Tea Pluckers
	Engineers
	Seed Specialists
Business, consulting and management	Business Administrators

Sectors	Job Roles in Demand
	Computer Specialists
	Corporate Branding Experts
	Data Analytics (Data Entry Operator)
	ICT Specialists
	Digital Marketing Experts
	Hardware Engineers
	Web and Software Developer
	Media Production
	Typists
Health	Biotech Experts
	IT Specialists
	Computer Experts
	Data Entry Operators
	Doctors
	Sales & Marketing Professionals
	Network Administrator
	Inventory Management Specialists
	Laboratory Control Specialists
Services (others)	Accountant
	Cybersecurity Specialists
	Cloud Computing Specialist

Sectors	Job Roles in Demand
	ICT Specialists
	Marketing managers
	App Developer
	Sales & Marketing Professionals
	Technicians
	Receptionists
	Shop Managers

Our offices

Ahmedabad

2nd floor, Shivalik Ishaan
Near. C.N Vidhyalaya
Ambawadi
Ahmedabad - 380 015
Tel: +91 79 6608 3800
Fax: +91 79 6608 3900

Bengaluru

12th & 13th floor
"U B City" Canberra Block
No.24, Vittal Mallya Road
Bengaluru - 560 001
Tel: +91 80 4027 5000
+91 80 6727 5000
Fax: +91 80 2210 6000 (12th floor)
Fax: +91 80 2224 0695 (13th floor)

Ground Floor, 'A' wing
Divyasree Chambers
11, O'Shaughnessy Road
Langford Gardens
Bengaluru - 560 025
Tel: +91 80 6727 5000
Fax: +91 80 2222 9914

Chandigarh

1st Floor
SCO: 166-167
Sector 9-C, Madhya Marg
Chandigarh - 160 009
Tel: +91 172 671 7800
Fax: +91 172 671 7888

Chennai

Tidel Park
6th & 7th Floor
A Block, No.4, Rajiv Gandhi Salai
Taramani, Chennai - 600 113
Tel: +91 44 6654 8100
Fax: +91 44 2254 0120

Delhi NCR

Golf View Corporate
Tower - B
Sector 42, Sector Road
Gurgaon - 122 002
Tel: +91 124 464 4000
Fax: +91 124 464 4050

3rd & 6th Floor, Worldmark-1
IGI Airport Hospitality District
Aerocity New Delhi - 110 037
Tel: +91 11 6671 8000
Fax +91 11 6671 9999

4th & 5th Floor, Plot No 2B
Tower 2, Sector 126
NOIDA - 201 304
Gautam Budh Nagar, U.P.
Tel: +91 120 671 7000

Hyderabad

Oval Office
18, iLabs Centre
HITECH City, Madhapur
Hyderabad - 500 081
Tel: +91 40 6736 2000
Fax: +91 40 6736 2200

Jamshedpur

1st Floor,
Shantiniketan Building
Holding No. 1, SB Shop Area
Bistupur, Jamshedpur - 831 001
Tel: + 91 657 663 1000

Kochi

9th Floor "ABAD Nucleus"
NH-49, Maradu PO
Kochi - 682 304
Tel: +91 484 304 4000
Fax: +91 484 270 5393

Kolkata

22, Camac Street
3rd Floor, Block C"
Kolkata - 700 016
Tel: +91 33 6615 3400
Fax: +91 33 6615 3750

Mumbai

14th Floor, The Ruby
29 Senapati Bapat Marg
Dadar (west)
Mumbai - 400 028
Tel: +91 22 6192 0000
Fax: +91 22 6192 1000

5th Floor Block B-2
Nirlon Knowledge Park
Off. Western Express Highway
Goregaon (E)
Mumbai - 400 063
Tel: +91 22 6192 0000
Fax: +91 22 6192 3000

Pune

C-401, 4th floor
Panchshil Tech Park
Yerwada (Near Don Bosco School)
Pune - 411 006
Tel: +91 20 6603 6000
Fax: +91 20 6601 5900

Hyderabad

Oval Office
18, iLabs Centre
HITECH City, Madhapur

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