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The Landscape of Artificial Intelligence Implementation in Ethiopia

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Abstract
This study aims to assess the landscape of Artificial Intelligence (AI) implementation in Ethiopia and provide recommendations for Ethiopia's AI policy and strategy development. This is done by surveying data and computing infrastructures, robotic infrastructures, organizational level AI policy and strategies, and AI skill development in Ethiopia. Studies have been conducted employing semi-structured interviews, a physical review of infrastructures, web visits, and literature studies. The data collection involves 32 government organizations and private companies in Ethiopia. The study revealed that the data center service in Ethiopia has many opportunities to grow. There are also promising attempts by government organizations in establishing enterprise-based data centers and implementing associated policies within their organizations. The study identified that the country's lack of AI policy and strategy affects AI stakeholders to design and create short and long-term action-oriented strategies. Further, the survey revealed that the Ethiopian government started encouraging efforts in directing universities for AI skill development, digital technology implementation, and infrastructure development. This study implies that focus must be given to data, legal framework, skill and infrastructure development, research and development investment, inter-organizational cooperation, and AI startup support while creating AI policies and strategies.
Keywords: Artificial Intelligence, infrastructure, Ethiopia, Data center, Policy

1. Introduction
Artificial intelligence (AI) has evolved as an emerging technology, capable of delivering large incremental value to a wide range of sectors (Ho *et al*., 2021). It has a significant future to stimulate economic growth by making processes smarter, faster, and cheaper. AI technology has also the potential to impact individual lives, organizations, and society by transforming global economic sectors and creating substantial innovation and economic growth (Berente *et al*., 2021; Agrawal, 2017). Potential AI innovations include boosting health and quality of life, enhancing education for remote students, transforming national defense and security, improving agricultural productivity, reinventing business innovation and competitiveness, effective natural disaster response, rapid materials discovery, monitoring the supply chain, and generating resilient cyber security (Gil and Selman, 2019).

All these innovations require an inclusive national ecosystem suitable for a range of fundamental research advances and the adoption of innovation outcomes. This can be facilitated by setting national AI policy and strategy which can support data acquisitions, AI infrastructure, and skill development, create a regulatory framework, and continuous support for research activities and AI startups (Ho *et al*., 2021; Talaviya, 2020; Gil and Selman, 2019). Tackling appropriate resources needed for AI technology innovation will facilitate the sustainable utilization of AI for economic and societal growth. Infrastructure and the talent pool are critical issues in the current AI ecosystem. AI infrastructure is the collection of hardware and software elements needed to enable AI applications. It includes computing power, networking, and storage, as well as an interface for users to access those resources (Parsaeefard *et al*., 2019; Jordan, 2019). According to the global AI talent report, AI talents include data engineers, data scientists, machine learning engineers, and artificial intelligence engineers (Haynes and Gbedemah, 2021). Globally, the need for AI expertise far exceeds the supply, and the gap will only continue to grow unless supported with immediate solutions.

Finally, there are many concerns related to the security risk of AI systems, data privacy, and ensuring ethical uses of AI. Thus, factors will affect AI innovation and deployment by governments, organizations, and individuals. The nations which act to overtake AI innovation challenges at an early stage and harness its opportunity faster will have a chance to lead AI technology revolutions.

Recently, AI has gained priority in the policy directives of developed nations as well as developing countries. Countries are focusing on using AI technologies for development and economic growth, fostering research and development, strengthening the AI ecosystem that includes AI infrastructure investment, supporting AI startups, and AI skills and knowledge development (America, 2017). All nations around the globe started paying due attention to AI and creating institutional competencies. Some countries are in the race for AI technology dominance and working on developing their stances towards AI by capitalizing on their comparative strengths and ensuring the risk of AI (Chatterjee, 2020).

Similarly, the Ethiopian government recognizes the vast opportunities AI offers to the entire economy and considers AI as one of the focus areas in the national digital transformation agendas. Accordingly, the Ethiopian government implemented digital transformation policies and strategies (Kemp, 2023; Digital Ethiopia 2025, 2021), start mobile money (https://www.gsma.com/mobileeconomy/wpcontent/uploads/2021/09/GSMA_ME_SSA_2021_English_Web_Singles.pdf), established an ICT park that attracts investors that provide data infrastructure services and Ethiopian artificial intelligence institutes that lead AI tech communities (Artificial Intelligence Institute Establishment Council of Ministers, Regulation No. 510/2022, 2022; Digital Ethiopia, 2021). However, Ethiopia lacks a policy and strategy that guide AI, an enabling data ecosystem that facilitates access to intelligent data, sufficient high-quality talent working on cutting-edge AI algorithms, and computing infrastructure capable to handle AI algorithms. Moreover, the data center market in Ethiopia is at an early stage and one of the business areas getting focus recently by the government and private sector.

In this study, we are going to assess the Ethiopian government's potential to adopt AI, the challenges the government face in the race of AI technology adoption, the digital research infrastructure the nation needs to support the development and use of AI by surveying data and computing infrastructure, policy and strategies towards AI adoption, and potential trained workforce capable to develop and maintain these powerful resources for evaluating the state of AI in Ethiopian.

2. Methodology

The data used for this study were collected using semi-structured interviews conducted in person by two members of the data collection team with informants selected by the head of the organization followed by physical assessments of the AI and robotic infrastructure in Ethiopia between January 1 and 30 2023. Interview-guided questionnaires were shared with the selected organization for data collection 15 days before semi-structured interviews were conducted to provide time to prepare and collect figurative data by data-providing organizations. Data were collected from 10 governmental organizations (ministries/offices/ research institutes), 18 universities, and 4 private data infrastructure service providers located in Addis Ababa, Oromia, Amhara, Sidama, and Dire Dawa regions. The collected data is used for assessing organizational and national AI policy and strategy, data and computing infrastructure, robotics infrastructure, and human force to run AI infrastructure. These organizations were selected based on a preliminary survey of the organization, the time required for data collection, the expenditure involved for travel, and the scope of the study. In certain cases where there was inadequate information from the interview-guide questionnaire, organizational document review, web visits, and personal communication with assigned representatives were conducted to get the required information.

3. Result and discussion

3.1. Opportunity for data center industry in Ethiopia

a. Government Effort on the digital economy

The digital economy is driving data center industry growth by facilitating digital data consumption. Digital infrastructure such as data center service is crucial to foster countries' economic development and

prosperity. Recently, the Ethiopian government working to create policies that support a conducive environment for ICT and digital technologies (Digital Ethiopia 2025, 2021). To support this effort the country designed and implemented a digital foundation project with a loan received from the World Bank for the implementation of digital transformation projects designed by Ethiopia. The project aims to create an enabling policy and regulatory system, build digital infrastructure, and improve the quality of broadband connections to grow Ethiopia's digital economy. In addition, it focuses on supporting the expansion of digital business creation and digital entrepreneurship skills by building the infrastructure for government services to be delivered to the user through electronic means. This project will help to create new opportunities for creating creative works, jobs, and resources, and will support the implementation of the national strategy to ensure the benefit of the people.

b. Increasing drivers for the data center market

With emerging of Ethio Telecom competitors such as Safari com and the falling data cost and affordability, more people are gaining access to the Internet and smartphones. Ethio Telecom customer has 68.9 million mobile voice users, 33.4 million data and internet users, and 584,300 broadband internet users with a total of 71.3 million customers as of March 2023 (https://www.ethiotelecom.et/). Ethiopia had more than 44.5 million smartphone users in 2020. More than 40% of the Ethiopian population is under the age of 15 and young consumers looking for a mobile phone which will remain the primary source of growth for the foreseeable future. This has led to an ever-growing amount of digitized data, which drives the adoption of data center services in Ethiopia. Ethiopia's smartphone adoption is forecasted to reach 58 percent in 2025 from 44 percent in 2020. Safaricom plans to spend $8.5 billion over 10 years on network infrastructure and services and will be keen to introduce many of its services, including M-Pesa, and data center services to Ethiopia (https://www.gsma.com/mobileeconomy/wpcontent/uploads/2021/09/GSMA_ME_SSA_2021_English_Web_Singles.pdf). In another dimension, Ethiopia is the marketplace for social media platforms like Facebook which was the most popular social media platform in Ethiopia, with almost 6.9 million users and Messenger followed with nearly 6.5 million accounts. Social media companies store and manage customer data from all of the data produced by billions of people on social media (Kemp, 2023). The need for a data center will continue as existing social media applications grow and new social media apps are created and government needs to store its population data within its territory. Moreover, the beginning of e-commerce requires storing data with enhanced data security & privacy and needs data center industry expansion as it is the backbone of this vast and ever-expanding trading. The data center segment is expected to get revenue from E-commerce in Ethiopia as young consumers prefer online spending. Additionally, the mobile app market is booming and innovators are engaged in creating new services each day. The app industry has seen immense growth in the past couple of years all over the world and its growth is forecasted to continue shortly. The rise in technology-driven start-ups is boosting this market and app market growth is a catalyst for the data center market growth.

c. Growth for data colocation service

The Ethiopia colocation market has tremendous potential to grow since key customers such as banking, insurance, financial services, and media require strict data confidentiality and complete management control of their operations. Colocation services leveraging levers like multi-tenancy where multiple independent instances of one or multiple applications operate in a shared environment, scalability, and reduce capital expenditure amongst other things. In addition, cloud service providers are also generating new demand for colocation for third-party facilities to host their infrastructure for providing services to customers. Licensing data center services is a cost-efficient and reliable option in comparison to establishing private data centers

3.2. Ethiopian AI Policy and Strategy

Ethiopia has not yet developed an AI policy and strategy that drive AI adoption and directs national AI-based research and development, supports AI startups, and guides ethical regulation that comes up with new technology utilization (Kutima *et al.,* 2023). Ethiopia in developing AI policy and strategy has fallen

behind when compared to AI's usage by start-ups who have so seamlessly blended AI into the services provided to customers. Even though policies and strategy are not developed and shared with AI stakeholders; most of the universities working on AI has identified research area that planned to give priority to developing AI solutions. Those organizations set AI research priority areas as natural language processing, machine learning, AI, robotics, and data science for providing AI solutions to agriculture, education, health, manufacturing, and services sectors. For example, The Ethiopian agriculture sector is accompanied by small-scale farmers, who often lack access to the technology and resources needed to optimize their crop yields and detect crop diseases. A research project conducted by Jimma University aim in developing an AI-powered drone that could collect data on crop health and yield, the researchers hoped to provide farmers with the information they need to make more informed decisions about their crops. Similar projects were conducted by other universities in AI to solve issues of small farmers with AI solutions.

The policy and strategy can help AI stakeholders to design and create action-oriented strategies align with national strategies for achieving national AI targets with relevant budgets, timelines, and key performance. The policy and strategy also ensure Ethiopian efforts to reorganize resources towards the most pressing Ethiopian AI need. The Ethiopian government needs to consider the best approach to AI policy and strategy development to create fostering AI ecosystem that contributes to national development priory agendas. Hence, we are recommending six key policy considerations for developing AI policy and strategy in Ethiopia which includes skill and capacity development, infrastructure development, investment in research and development, access to data, creating a regulatory framework, and advancing cooperation. The current landscape for each of these drivers' as mentioned by the survey respondents shows crucial features of the strategy and needs more work to become successful in harnessing the benefit of AI.

3.3. Data and computing infrastructure service providers in Ethiopia

AI applications have become started growing into the daily lives of Ethiopian citizens in the form of app-based applications and digital assistants on smartphones. Few IT service providers and software developing companies in Ethiopia have begun thinking, talking, and launching AI platforms. AI application developers need data center services for data storage and computing services. There is high interest from the private sector in Ethiopia in building data centers and providing services such as colocation and cloud service. Ethio Telecom is one of the leading institutions in Ethiopia in providing data center services for customers and started colocation data center service in 2021 as shown in Fig.1. Ethio Telecom's data center service start flourishing and the company is diversifying its data center service as demand for the service grows due to trust in connectivity and securities of Ethio Telecom data center service by customers. The company data center utilization is 100% and currently, it has more than 90 customers subscribed to its service. The major data center service subscribed by the customer is colocation service and the banking sector is the major customer of the organization's data center service. Ethio Telecom also started providing cloud services called telecloud services which include Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) for both private and governmental organizations that require high data storage and utilization (https://telecloud.ethiotelecom.et/). Like Ethio Telecom, four private sectors have been investing in data center infrastructure in Ethiopia. For instance, Wingu Africa (https://www.wingu.africa/our-locations/addis-ababa-ethiopia/), RedFox solution group (http://redfoxsolutionsgroup.com/), and Raxio (https://www.raxiogroup.com/services/) have been invested in data center facilities to meet the growing demand for colocation, cloud computing, and other digital services in the country. As seen in Fig.1, data center service in Ethiopia is at an early stage of development and most private data center service is focused on colocation services. All those private data services providing companies' data center is located in the ICT Park in Addis Ababa city and expansion to other region is currently limited. Some companies like Wingu Africa and Redfox, plan to expand their data center located outside of Addis Ababa city. Additionally, third-party cloud service providers also started growing as colocation services start flourishing. Private companies that started providing data center services mainly focus on industries such as Enterprise, Financial, Telecoms, and Media sectors as a business target market.

But these are just small steps towards achieving the ultimate goal of AI's contribution to the economic growth of the nation. Private data center service expansion will enhance the decentralization of organizational IT services by moving data, processing, and resources away from the organization's local data center or corporate hub to the data center service provider's infrastructure to enable faster processing, reduce cost, sustainability, scalability, and security.

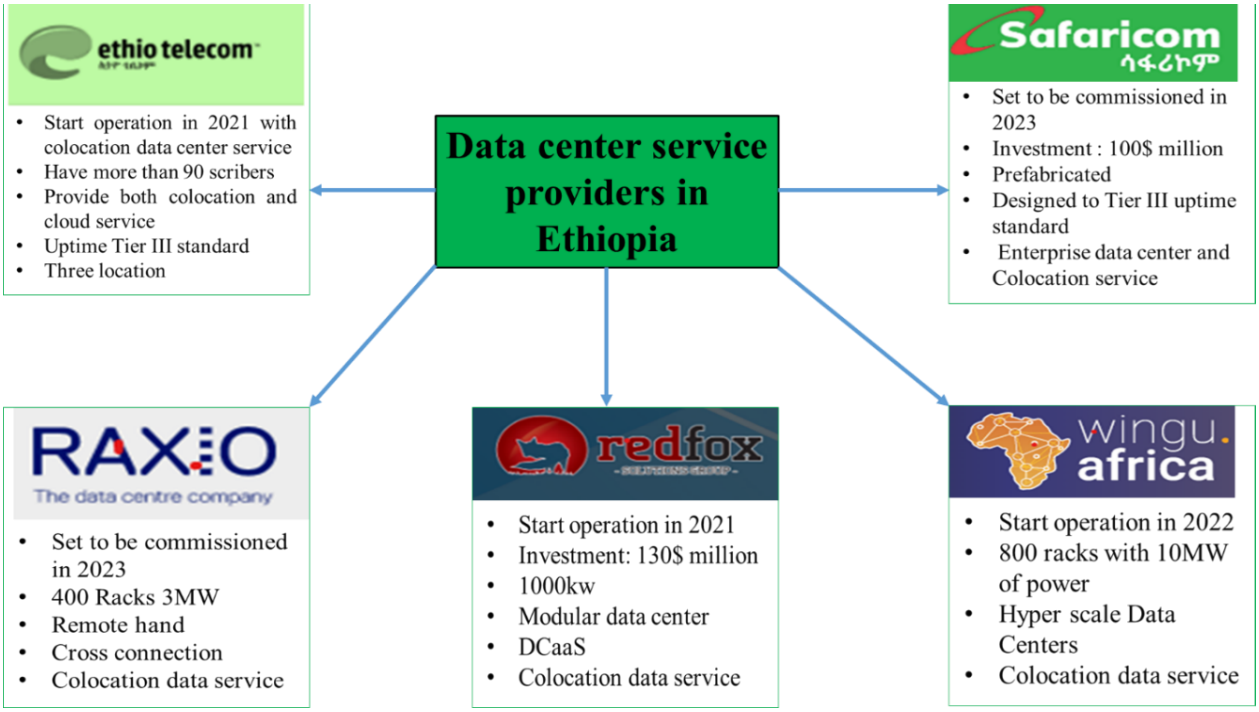

Figure1: Data Center service providers in Ethiopia and Their Services

Similar to profit-making organizations Ethiopian government also making significant progress in expanding its data center infrastructure to support its economic growth and digital transformation. The Ethiopian government has launched the construction of a data center in the country, which provides hosting services to government agencies and private companies. Uptime Tier III standard data center currently located in artificial intelligence institute(AII), minister of Innovation and Technology (MINT) (https://www.mint.gov.et), and Minister of Education (MOE) (https://ethernet.edu.et/) start providing service for the customer in need as seen in Fig.2. The data center located in the Ministry of Education provides cloud service and high-performance computing (HPC) service to universities, TVET, and other accountable institutions to MOE. Similarly, the data center is located in AII and MINT mainly provide data center service for government institution and cloud service for limited private organizations (Fig. 2). One of the challenges for data center service in Ethiopia is limited skilled human resource gaps, especially in governmental-based organizations, and the availability of reliable and affordable energy. However, the country is investing in improving its energy infrastructure, including the development of renewable energy sources like hydropower, wind, and solar. Another challenge for data center infrastructure in Ethiopia is connectivity. The country has been investing in expanding its fiber-optic network to improve connectivity and support the growth of data center infrastructure.

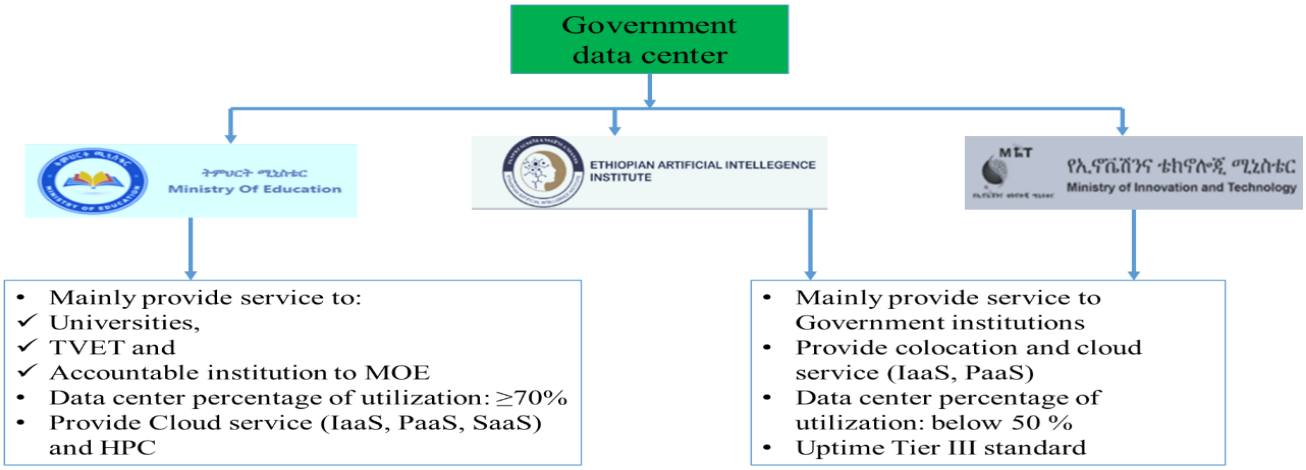

Figure 2: Uptime Tier III Government Data Centers in Ethiopia and Their Services

3.4. Enterprise-based data center and its attribute in Ethiopia

It is a type of data center that is built, owned, and operated by companies and optimized for their end-users, most of them are on the corporate campus. This kind of data center is owned by most governmental organizations and universities. As survey data indicated in Fig.3, 16.7% of governmental organizations and 55.5% of universities do not have data center policies and strategies implemented within their organization. Half of the governmental organizations surveyed responded that their data center policy and strategy is underdevelopment while 33.3% of governmental organizations have policy and strategy in place. Approximately, half of the university surveyed has also implemented data center policies and strategies within their organizations. However, the national ICT strategic plan for higher education and TVET (2021-2030) developed by the Minister of Science and Higher Education who is currently the Minister of Education was used by most universities (Minister of Science and Higher Education, 2020). Datacenter percentage utilization for most organizations as seen in Fig.3 is below 85%. As shown in Fig. 3, the majority of enterprise data centers are used air cooling systems as the main source for data center cooling while some institutions use water cooling systems and others use both air and water cooling systems. In other cases, 83.3% of government organizations and 44.4% of government universities use network-related or tape backup systems for their data backup (Fig.3). Around 16.7% of either governmental organizations or universities use edge data center backup systems.

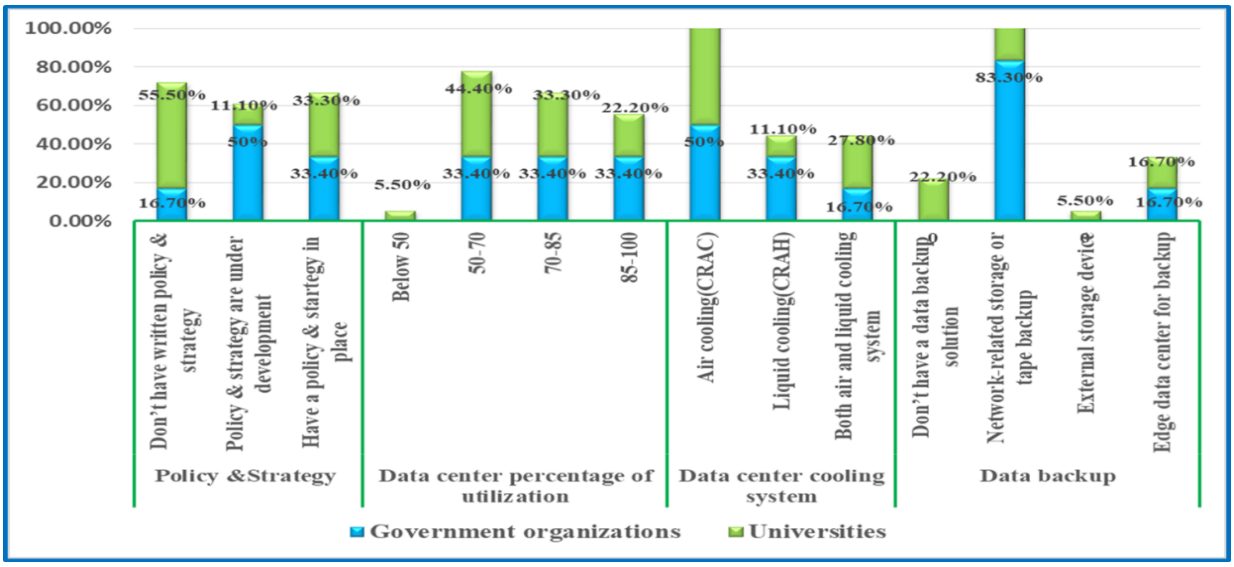

Figure 3: Enterprise-based data center and its attribute in Ethiopia

3.5. Robotics infrastructure

Ethiopia, like many other countries, is currently investing in robotics technology to improve various industries such as agriculture, manufacturing, and healthcare. Ethiopia's robotics industry is still in its early stages, the country is making significant investments to develop its robotic infrastructure. The government has launched several initiatives to support the development of the country's robotics industry. For example in 2021 Ethiopian government establish a research center in 11 universities to promote research and development in which one of the pillars is robotics. The government also create a partnership with developmental organizations to establish a robotics hub in Ethiopia to facilitate research, development, and commercialization of robotics technologies.

The Robotics laboratory focusing on designing, building, and testing robot designs equipped with required machines and test bed distribution in Ethiopia is limited. Most of the robotic laboratories located in Ethiopian universities are used for educational purposes and are equipped with analysis, simulation, and design tools having software such as CAD/CAM, Solid work, Catia and ANSY, and demonstration robots. Robotic research infrastructure for robotics research, robotics prototyping, manufacturing, and optical inspection equipped with equipment motion capture system, and a workbench with tools for support and maintenance of robots not highly distributed in Ethiopian universities. Among surveyed universities, 44.4% of the universities have AI and robotics centers of excellence as seen in Table I. The robotics research infrastructure is not sufficient to conduct even simple robotics research and development, and the country needs start of art robotic infrastructure that will help researchers to conduct research, tests, and develop robots. Moreover, all universities have ICT centers and more than half have STEM centers of excellence. ICT centers located at different universities were established with similar structures and goals as directed by the minister of education. In other directions, some private institutions also have robotics centers of excellence and are working towards training, researching, and robotics developments. For Example, iCog Labs is a company engaged in providing research and development services to its customer on artificial intelligence, machine learning, robotics, and application software. This company is developing various robotics technologies and has worked on projects such as developing robots for educational purposes and creating an AI-powered virtual assistant for customers based in Ethiopia (https://icog-labs.com/).

Table I: University Contribution towards AI Adoption in Ethiopia

Area of Excellence	Categories	Percentage
Center of Excellence	AI and Robotics	44.4%
	Information and communication technologies (ICT) and Science, Technology, Engineering, and Mathematics (STEM)	100%
Offer AI-related coarse	Yes	77.7%
	No	22.2%
Offer AI-related Ph.D. program	Yes	50%
	NO	50%
Have founded AI-related project	Yes	61.1%
	No	38.9%
Research priority area	Robotics	44.4%
	Natural Language Processing (NLP)	22.2%
	AI and Machine Learning (ML)	50%

3.6. Human force to run AI infrastructure

Artificial intelligence is a broad discipline, and it has a diversity of associated specialists for conducting research and development and running AI infrastructure. According to the global AI talent report, AI talents includes data engineers, data scientist, machine learning engineer, and artificial intelligence engineer(Haynes and Gbedemah, 2021). We also follow a similar approach to identify AI human force capable to run AI infrastructure. Universities and training centers are working in filling an industry need

and develop professionals working in emerging technology areas. More than 75% of universities in Ethiopia recently started providing courses in artificial intelligence and related field as shown in Table I. Additionally, 50% of universities surveyed also offer a Ph.D. course in the field related to AI and robotics. Moreover, around 60 % of universities surveyed have funding for AI-related projects. This indicates governmental organizations as well as private companies interested in AI technologies. The research priorities of most of the universities are artificial intelligence and machine learning, followed by robotics research and development.

3.7. Challenges for artificial intelligence adoption in Ethiopia

a. Access to data

AI applications require a large set of data to train machine models for better performance. AI researchers and developers' demand for access to data has exponentially grown in the world. This has largely been led by the assumption that AI model training needs access to data facilitates to spur innovation, improved service delivery, and better economic opportunities for citizens. Ethiopian companies' digital data capturing and sharing experience is limited and major data players are reluctant to share their company data. As a result, important industry-specific data necessary for building AI solutions and utilize for customized platforms have been limited.

b. Regulatory framework

Ethiopia lacks AI policies and strategies that promote AI development, and create enabling ecosystem for AI investment, utilization, and capacity and skill development. The absence of a national AI regulatory framework created a risk of data privacy, and fear of investments in AI infrastructure, research and development, and training. This slows the development and growth of AI in the country. Hence, the government needs to act rapidly to create enabling ecosystem for AI development and utilization by developing AI policy and sharing with its stakeholders, regulatory laws and means to mitigate AI risks.

c. Infrastructure

AI infrastructure development by the government, as well as private institutions, is at an early stage in Ethiopia and appropriate computing infrastructure is rarely available throughout the country. AI application Training and interface require high computing and connectivity for the appropriate deployment of AI-based services. Only a few cloud service providers provide cloud service and most of them are under development. The lack of availability of AI infrastructure is posing problems for start-ups to use AI. Low availability of proper infrastructure and its cost push startups to look for an alternative source outside that country based on open-source services.

d. AI talent

It is known that only a meager percentage of AI professionals in Ethiopia could work on AI technology. The insufficient availability of talent in the field of AI has created impediments to AI adoption. There is a dearth of Ph.D. scholars in this domain.

e. AI Research and Development

The lack of government and private institutions' investment in AI research and development limits the opportunities to design AI solutions that meet the most pressing Ethiopian needs. The government must provide funding for research and development in providing AI solutions in priority government sectors.

f. Cooperation

The involvement of the international organization in funding AI research in Ethiopia is limited compared to neighboring countries such as Kenya. Regional and international cooperation is also needed for data-sharing, cofounding AI solutions, and mobility of AI talents useful for local AI developers in advancing in AI research for developmental priorities.

3.8. AI Implications in Ethiopia and Action Forward

Ethiopia working to deploy AI solutions on a small scale, unlike other African countries that attracted global technology giants such as Google's AI research lab in Accra, Ghana, and IBM's AI-oriented research labs

in Kenya and South Africa (Global Information Society Watch, 2019). However, global companies such as Excellent Digital Solution have centers in Ethiopia and offer Artificial Intelligence and Machine Learning solutions to customers around the globe (https://excellerentsolutions.com/). Similarly, iCog Labs Software Consultancy Company based in Addis Ababa provided research and development services to its customers on artificial intelligence, machine learning, robotics, and application software in collaboration with international AI research groups (https://icog-labs.com/). Ethio Robo Robotics (https://ethioroborobotics.com) company partnering with VEX Robotics (https://www.vexrobotics.com), a US-based company working to transform access to robotics training by providing mentor-based training to children to promote the early adoption of AI technologies. Guzo Technologies, Lersha, EthioCloud, and other companies are also working on AI related-software and product development to provide AI solutions to customers in Ethiopia to mention a few. Those are attempts by private sector investments in AI-based solutions for early AI technology adoptions in Ethiopia. In terms of government readiness, the state of AI in Ethiopia is accompanied by various challenges and opportunities (Adams, 2022). The government has given attention to technology and perceived it as one of the technologies that have the potential for economic and social development. Accordingly, the government has invested in establishing ICT Park that attracts investors working in IT and IT-related services, creates Ethiopian artificial intelligence institutes that lead AI tech communities, built a government data center, and directed universities to train more AI task forces. However, the government lacks behind in publishing AI policies and strategies, implementing legal frameworks concerning data privacy and protection, assessing the ethical risks of AI solutions on societies, and other related issues. The adoption of AI technology within the country is also challenged by factors such as lack of access to data, absence of regulatory framework, lack of computing and data infrastructure, limited AI talent, insignificant R& D investment, and cooperation among others. AI applications require a large set of data to train machine models for better performance. AI researchers and developers' demand for access to data has exponentially grown in the world. This has largely been led by the assumption that AI model training needs access to data facilitates to spur innovation, improved service delivery, and better economic opportunities for citizens. Ethiopian companies' digital data capturing and sharing experience is limited and major data players are reluctant to share their company data. As a result, important industry-specific data necessary for building AI solutions and utilize for customized platforms have been limited. Ethiopia also lacks AI regulatory framework that promotes AI development and deployments. The absence of a national AI regulatory framework created a risk of data privacy, and fear of investments in AI infrastructure, research and development, and training. AI infrastructure development by the government, as well as private institutions, is at an early stage in Ethiopia and appropriate computing infrastructure is rarely available throughout the country. AI application Training and interface require high computing and connectivity for the appropriate deployment of AI-based services. Only a few cloud service providers provide cloud service and most of them are under development. The lack of availability of AI infrastructure is posing problems for start-ups to use AI. Low availability of proper infrastructure and its cost push startups to look for an alternative source outside that country based on open-source services. The insufficient availability of talent in the field of AI accompanied by the lack of government and private institutions' investment in AI research and development has created impediments to AI adoption. The government must provide funding for research and development in providing AI solutions in priority government sectors. Finally, regional and international cooperation is also needed for data-sharing, cofounding AI solutions, and mobility of AI talents useful for local AI developers in advancing AI development and deployments.

4. Conclusion

An organizational survey was conducted to assess the state of the AI ecosystem in Ethiopia by mapping Ethiopian AI infrastructure and government readiness to create sustainable ecosystems to intake and adopt AI in Ethiopia. The survey data was collected from 28 governmental organizations including ministries, research institutions, offices, and universities, and 4 private data infrastructure service providers in Ethiopia. The collected data were analyzed by categorizing collected data into data center infrastructure and services, robotics infrastructure, and human force to run AI infrastructure. Additional government attempts in

developing Ethiopian AI policy and strategy and challenges Ethiopia faced for AI adoptions were analyzed based on data from surveyed organizations. The Ethiopian government is making significant progress in expanding its data center infrastructure to support its economic growth and digital transformation. The data center industry in Ethiopia has many driving opportunities such as government efforts on the digital economy, growth of data colocation service, and increasing drivers for the data center market that include increasing mobile penetrations and usage of the internet, growth of social media usage, the beginning of e-commerce, emerging of IT and IT-enabled service, a rise of app eco-system and emerging technologies. There is high interest from the private sector in Ethiopia in building data centers and providing services such as colocation and cloud service. Currently, there are around 8 companies in Ethiopia that provide data center services, and most of them provide data colocation services as the main preferable data center services. Ethio Telecom is a company that has a large number of subscribers compared to other data center service providers. Most of the organizations surveyed have an enterprise data center. Ethiopia lacks state of art robotic infrastructure capable of research and development, prototyping, and manufacturing of robots. Similarly, Ethiopia has a shortage of AI talents. However, most of the universities in Ethiopia started providing training in AI and started Ph.D. programs in AI-related fields that support AI adoption shortly.

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