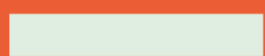


Policy Recommendations Paper

Insights and learnings from the ICT-58 projects



November 2023

This paper is the result of a close collaboration between four projects of the ICT-58 call funded under the Horizon2020 programme of the European Union. It showcases learnings that have been shared between the projects through joint meetings over the course of their runtime and builds the final step in this exemplary collaboration. This consolidation of learnings is a starting point for others to build on and intended to further facilitate and motivate the collaboration and development of DIHs in Africa and Europe in the future.

CONTRIBUTING PROJECTS



PUBLISHER

Digital Hub Management GmbH
Emil-Figge-Straße 80
44227 Dortmund
Germany

COPYRIGHT

© Digital Hub Management GmbH,
Dortmund 2023



AUTHORS AND CONTRIBUTORS

Abdur Rahim, WaziUp
Ana Aleixo, INOVA+
Ana Solange Leal, INOVA+
Charlotte Edzard, Digital Hub Management
Claudia Knobloch, Endevo e.V.
Daniel Ewusi, Africa Makerspace Network
Marit Spies, Digital Hub Management GmbH
Maumo Mubila, BongoHive
Promise Mwakale, BUNI
Servane Crave, Orange Innovation
Thorsten Hülsmann, Digital Hub Management



This paper has received funding from the European Horizon 2020 Programme for research, technological development and demonstration under grant agreement no. 101016583

Table of Content

1	Introduction.....	3
1.1	Background and Context.....	3
1.2	Objective of the Paper.....	7
1.3	Methodology.....	7
2	Learnings on the Innovation and Business Environment in Africa	9
2.1	Challenges in the Innovation and Business Environment in Africa.....	9
2.2	Opportunities in the Innovation and Business Environment in Africa	12
3	Learnings on European and African DIHs.....	16
3.1	The Role of African and European DIHs in their Ecosystems.....	16
3.2	Challenges of African DIHs.....	18
3.3	Collaboration of DIHs between Africa and Europe	18
3.4	Recommendations for Strengthening African DIHs and their Collaboration with European DIHs.....	20
4	Learnings on the Support of Innovators and Entrepreneurs.....	23
4.1	Support of Innovators and Entrepreneurs by African DIHs.....	23
4.2	Recommendations for the Effective Provision of Support by DIHs to Innovators and Entrepreneurs.....	24
5	Outlook: The Role of DIHs as a Facilitator for the AU-EU Innovation Agenda	25
6	APPENDIX.....	28

List of Figures

Figure 1: Policy Recommendations Report Approach.....	8
Figure 2: Selection of projects influenced by IoT and AI Technologies.....	13

List of Tables

Table 1: Chapter overview.....	8
Table 2: Challenges which affect innovation in Sub-Saharan Africa.....	9
Table 3: Positive impact of COVID-19 on relevant areas in the African digital innovation ecosystems..	15
Table 4: Challenges of African DIHs.....	18

Abbreviations

AI	Artificial Intelligence
AfCFTA	African Continental Free Trade Area
AU	African Union
CSA	Coordination Support Action
DIH	Digital Innovation Hub
D4D	Digital4Development
EDP	Entrepreneurial Discovery Process
EIP	European External Investment Plan
EIT	European Institute of Innovation and Technology
EU	European Union
GDPR	General Data Protection Regulation
IA	Innovation Action
ICT	Information and Communication Technology
IIB	International Internet Bandwidth
IoT	Internet of Things
PDES	Portfolio Dissemination & Exploitation Strategy
PPP	Public-private partnership
SME	Small to Medium Enterprises
STISA	African Unions Science, Technology, and Innovation Strategy for Africa
S3	Smart Specialisation Strategies
4IR	Fourth Industrial Revolution

1 Introduction

1.1 Background and Context

In 2019 the European Union (EU) launched the call *Information and Communication Technologies* (H2020-ICT-2018-20) under the Horizon 2020 Framework Programme. The call addressed the objective “to reinforce cooperation and strategic partnership with selected countries in Africa to support the strengthening of existing Digital Innovation Hubs (DIHs) in Africa and to facilitate the collaboration between European and African DIHs in order to strengthen a common EU-Africa innovation and start-up ecosystem.”¹ A total of six projects were funded under this call: AEDIB|NET (Innovation Action, IA), AfriConEU (IA), DIGILOGIC (IA), HUBiquitous (IA), IDEA D4D Hub (CSA), mAKE (IA). Each of the projects has their individual objectives contributing to the overall goal of the call.

The call is linked to the broader European Commission's Digital4Development (D4D) Strategy as an important framework for guiding the EU's efforts to promote digital transformation and development in partner countries. The strategy aims to leverage digital technologies to foster economic growth, improve governance, and enhance the overall well-being of people in these countries. The key topics and activities are²:

Digital Infrastructure Development: The D4D Strategy focuses on supporting the development of digital infrastructure in partner countries. This includes efforts to expand access to affordable and high-speed internet, promote the deployment of mobile networks, and improve the overall Information and Communication Technology (ICT) infrastructure.

Digital Skills and Education: Enhancing digital literacy and skills is a fundamental aspect of the strategy. Activities include supporting education and training programmes to ensure that individuals and businesses in partner countries can fully participate in the digital economy.

E-Government and Digital Services: The D4D Strategy encourages the adoption of digital solutions in government operations and public service delivery. This includes promoting e-government initiatives, such as digital identity systems, electronic payment systems, and e-health platforms.

Digital Entrepreneurship and Innovation: Encouraging digital entrepreneurship and innovation is seen as a means to drive economic growth. The strategy supports the development of ecosystems that enable start-ups and tech companies to thrive.

Cybersecurity and Data Protection: Ensuring a safe and secure digital environment is a priority. Activities include supporting partner countries in developing cybersecurity policies, improving data protection measures, and enhancing resilience against cyber threats.

¹ European Commission. (n.d.). International partnership building between European and African innovation hubs. Funding & Tender Opportunities. available at <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ict-58-2020>

² European Commission. (2020). *Team Europe: Digital4Development Hub launched to help shape a fair digital future across the globe*. European Commission – Press Corner. available at <https://ec.europa.eu/commission/presscorner/home/en>

Regulatory Frameworks: The D4D Strategy advocates for the development of conducive regulatory environments that foster digital innovation and investment. This includes measures to promote competition, protect consumer rights, and encourage private sector involvement.

Digital Inclusion and Gender Equality: The strategy emphasizes the importance of ensuring that digital benefits are accessible to all, including marginalized groups and women. It promotes initiatives to bridge the digital gender gap and promote social inclusion.

Digital Cooperation and Partnerships: Collaboration with international organizations, development partners, and the private sector is a key aspect of the strategy. It encourages joint efforts to leverage resources and expertise for digital development.

Research and Innovation: Supporting research and innovation in digital technologies is crucial for long-term sustainable development. The strategy may include funding for research projects and initiatives that address specific development challenges.

Monitoring and Evaluation: To assess the impact of the D4D Strategy, there are typically mechanisms in place for monitoring and evaluating the progress of digital development initiatives in partner countries.

With the EU-AU Innovation Agenda published on 19th July 2023³, the EU together with the African Union (AU) has once more demonstrated their commitment and intention “to transform and increase the innovative capacities and achievements of European and African researchers and innovators into tangible outputs, such as products, services, businesses and jobs”⁴. Within the agenda *Public Health, Green Transition, Innovation & Technology*, and *Capacities for Science* were identified as the four priority areas accompanied by specific objectives with short-, mid- and long-term actions. A long-term future strategic interest in the collaboration of the EU and the AU is, therefore, apparent which will in turn lead to future investments by the EU in projects and initiatives contributing to reaching these goals.

The European Commissions sees DIHs as an appropriate tool to engage and exchange on the before mentioned topics and challenges. The European Commission has various initiatives and policies related to international partnership building between European and African innovation hubs. These policies were primarily aimed at fostering collaboration, promoting innovation, and addressing common challenges in both regions.

Some of the key approaches of the European Commission’s to this issue are:

1. Horizon 2020 and Horizon Europe: The European Commission’s Horizon 2020 program and its successor, Horizon Europe, include provisions for international cooperation and partnership building with African countries. These programmes fund research and innovation projects that

³ European Commission. (2023). The AU-EU Innovation Agenda – final version. available at https://research-and-innovation.ec.europa.eu/system/files/2023-07/ec_rtd_au-eu-innovation-agenda-final-version.pdf

⁴ European Commission. (2023). New EU-Africa Innovation Agenda to enhance cooperation in science, technology and innovation | EURAXESS. available at <https://euraxess.ec.europa.eu/worldwide/south-korea/news/new-eu-africa-innovation-agenda-enhance-cooperation-science-technology>

aim to address global challenges and strengthen ties between European and African innovation hubs as for example the Innovation Action under the call ICT58.

2. **Africa–Europe Innovation Partnership:** The Africa–Europe Innovation Partnership was a collaborative initiative between the EU and the AU between 2019 and 2021. It aimed to promote innovation, technology transfer, and entrepreneurship in both regions. This partnership sought to create synergies between European and African innovation ecosystems and support initiatives related to research, innovation, and entrepreneurship.
3. **European External Investment Plan (EIP):** The EIP aims to promote sustainable investment in African countries and other regions. It seeks to mobilize private sector investment to support economic development and job creation. Part of the EIP's focus is on fostering innovation and creating opportunities for collaboration between European and African innovation hubs.
4. **EU–Africa High–Level Policy Dialogue on Science, Technology, and Innovation:** This dialogue facilitates discussions and cooperation between European and African policymakers, researchers, and innovation stakeholders. It aims to identify common priorities and areas of collaboration in science, technology, and innovation.
5. **European Institute of Innovation and Technology (EIT):** The EIT has initiatives like the EIT Innovation Communities, which aim to connect European innovation hubs with international partners, including those in Africa. These communities focus on various thematic areas, such as climate, digitalization, and health.
6. **African Unions Science, Technology, and Innovation Strategy for Africa (STISA):** The European Commission collaborated with the AU to support the implementation of STISA, which aims to promote research, innovation, and technology development in Africa.

Recommendations and learnings from existing projects and initiatives serve as a critical input into the policy-making process of the European Commission and are important for several reasons:

- **Informed Decision-Making:** The European Commission plays a central role in shaping policies and regulations that affect the EU and its member states. To make informed decisions, it relies on input from various sources, including experts, stakeholders, and advisory bodies. Policy recommendations provide valuable insights and expertise to help the Commission make well-informed choices.
- **Navigating complex issues:** Many of the challenges facing the EU are complex and multifaceted, such as economic stability, environmental sustainability, and social cohesion. Developing effective policies to address these issues requires input from a wide range of experts and stakeholders who can provide diverse perspectives and solutions.
- **Accountability and Transparency:** The EU operates on democratic principles, and decision-makers, including the European Commission, are accountable to EU citizens and institutions like the European Parliament. Policy recommendations help ensure transparency in the decision-making process by providing a clear rationale for proposed policies and demonstrating that decisions are based on sound analysis and evidence.

- **Compliance with EU Values and Goals:** The EU has established core values and goals, such as democracy, human rights, and sustainable development. Policy recommendations help ensure that proposed policies align with these values and contribute to the EU's overarching objectives.
- **Balancing Interests:** The EU consists of diverse member states with varying interests and priorities. Policy recommendations, formulated by teams that embody this diversity, help the European Commission strike a balance between these interests and facilitate consensus-building among member states, promoting cohesion within the EU.
- **Global Competitiveness:** In an increasingly interconnected world, the EU must remain competitive economically, technologically, and geopolitically. Policy recommendations can offer insights into how the EU can position itself effectively on the global stage and navigate international challenges.
- **Adaptation to Changing Circumstances:** The world is constantly evolving, and new challenges emerge regularly. Continuous policy recommendations provide a mechanism for the European Commission to adapt its policies and strategies to respond to changing circumstances and emerging threats or opportunities.
- **Efficiency and Effectiveness:** Effective policies are essential for achieving desired outcomes efficiently. Policy recommendations can help the Commission identify the most efficient and effective policy options, ensuring that resources are used wisely.
- **Stakeholder Engagement:** Engaging with stakeholders, including civil society organizations, industry representatives, and academics, fosters a sense of ownership and inclusivity in the policy-making process. Recommendations from these stakeholders can help build consensus and support policies.
- **Legal and Regulatory Framework:** Policy recommendations often consider the legal and regulatory framework within which policies must operate. Ensuring that policies are legally sound and compliant with EU law is crucial to their successful implementation.

In summary, project experiences and learnings and the resulting recommendations enhance the quality and legitimacy of decisions, contribute to the EU's goals and values, and help address complex challenges while fostering accountability and transparency in the EU's governance structure.

This is even more the case when policy recommendations come to existence through the synthesis of learnings from several projects or initiatives collaborating and sharing common objectives. The ICT58 projects have fostered the exchange and collaboration between each other by engaging in regular meetings where recent activities and learnings were shared, and potential collaboration opportunities were explored. The number of opportunities identified increased throughout the development of the projects and there was a clear upwards trend as the understanding for each other's project objectives and activities was deepened. Exemplary for collaborations between the projects were the participation and contribution to respective project events and meetings, the organization of joint events and webinars and the dissemination and exploitation of each other's project results. Furthermore, AEDIB|NET,

AfriConEU, DIGILOGIC and mAkE attended the EU-AU Innovation Festival in Cape Town in June 2023 and subsequently engaged in a joint workshop to discuss their experience and learnings in strengthening the collaboration between European and African DIHs. The results of this workshop are summarized in chapter 5 of this report.

Besides that, AfriConEU, HUBiquitous and DIGILOGIC jointly applied and took advantage of the Horizon Results Booster Programme. The programme allowed the projects to further deepen the understanding for each other's exploitable results and resulted in a shared portfolio dissemination plan.

1.2 Objective of the Paper

The results and learnings from the exchange between the ICT58 projects are relevant not only for the continuous improvement of the ICT58 projects during project implementation, but also provide valuable insights for individual project partners (e.g., DIHs) and inform the development of future projects. AfriConEU, DIGILOGIC, HUBiquitous and mAkE have, therefore, committed themselves to jointly develop this Policy Recommendations Paper to identify, structure, synthesize and document the generated learnings.

This paper is the result of a close collaboration between four projects of the ICT-58 call funded under the Horizon2020 programme of the European Union. It showcases learnings that have been shared between the projects through joint meetings over the course of their runtime and builds the final step in this exemplary collaboration. This consolidation of learnings is a starting point for others to build on intended to further facilitate and motivate the collaboration and development of DIHs in Africa and Europe in the future.

The report focuses on a description of the challenges and opportunities of the innovation and business environment in Africa (chapter 2), experiences and recommendations on the role of African and European DIHs and the collaboration between DIHs in EU and AU (chapter 3), learnings on the support of innovators and entrepreneurs (chapter 4), as well as learnings on the role of DIHs as facilitators in reaching strategic objectives such as those outlined in the EU-AU Innovation Agenda (chapter 5).

1.3 Methodology

The content of this report has been gathered by the projects throughout their runtime through various sources:

- Sourcing from existing published project reports, publications and deliverables
- Collection of input from the project consortium partners and stakeholders
- Policy Recommendations Workshop held in Cape Town in June 2023

The approach included the following steps:



Figure 1: Policy Recommendations Report Approach

The chapters have been written by individual projects. It is important to note that chapters 3.3, 3.4 as well as chapter 4 represent a summary of the findings gathered by all four projects in the appendix. The following overview indicates which project has taken the lead for the respective chapters:

Table 1: Chapter overview

Chapt. No.	Chapter Name	Lead Project
1	Introduction	
1.1	Background and Context	DIGILOGIC
1.2	Objective of the Paper	DIGILOGIC
1.3	Methodology	DIGILOGIC
2	Learnings on the Innovation and Business Environment in Africa	
2.1	Challenges in the Innovation and Business Environment in Africa	HUBiquitous
2.2	Opportunities in the Innovation and Business Environment in Africa	HUBiquitous, AfriConEU
3	Learnings on African and European DIHs	
3.1	The Role of African and European DIHs in their ecosystem	AfriConEU, mAkE
3.2	Challenges of African DIHs	AfriConEU
3.3	Collaboration of DIHs between Europe and Africa	AfriConEU
3.4	Recommendations for Strengthening African DIHs and their Collaboration with European DIHs	AfriConEU
4	Learnings on the Support of Innovators and Entrepreneurs	
4.1	Support of Innovators and Entrepreneurs by African DIHs	mAkE
4.2	General Recommendations	mAkE
5	Outlook: The role of DIHs as a facilitator for the EU-AU Innovation Agenda	DIGILOGIC
APPENDIX		All projects

2 Learnings on the Innovation and Business Environment in Africa

2.1 Challenges in the Innovation and Business Environment in Africa

The African continent comprises 54 countries with varying degrees of economic development, political stability, and infrastructure. Within this complex ecosystem, several recurring challenges have emerged as significant barriers to realizing the full potential of innovation and business development. By examining these challenges, we aim to shed light on areas where EU-funded projects can make a meaningful difference. Based on the research in the Handbook on African Innovation Ecosystems achieved in May 2023 by the HUBiquitous project, 10 challenges were identified which affect innovation in Sub-Saharan Africa.

Table 2: Challenges which affect innovation in Sub-Saharan Africa

Challenge	Sub-challenges	Description
Setting up businesses	Costs of starting a business and doing business in Africa	<ul style="list-style-type: none"> Costly, lengthy process, complexity, risk of corruption
	Costs of getting and maintaining electricity	<ul style="list-style-type: none"> Installation procedures, random and frequent electricity interruptions, costly
	Poor access to finance & high cost of securing capital	<ul style="list-style-type: none"> High interest rates because of the apparent risks of conducting business in Africa, Important deposit to guarantee the loan, access to only short-term loans services, Relatively high cost of capital for opening businesses and operating it in Africa compared to other continents
	High taxes	<ul style="list-style-type: none"> Almost all African financial systems apply a high tax system to capital movements going outside the country
	Finding skilled labor	<ul style="list-style-type: none"> Weaknesses in the higher educational systems that do not match up skills with the labor market Education budgets are not given priority and education can mainly focus on theoretical capability rather than practical ability, which does not transfer well to the world of work.
	Supply chain challenges	<ul style="list-style-type: none"> High cost and long waiting time for custom clearance
ICT policies and regulations	Frequency regulation	<ul style="list-style-type: none"> Frequency restriction for emerging technologies (e.g., some specific LoRa frequencies are forbidden preventing development of IoT solutions)
	Data regulation and standards	<ul style="list-style-type: none"> Despite General Data Protection Regulation (GDPR) imposed by Europe is a progress for data privacy in Africa, it is a “burden” to implement this process for African governments & companies
	Limited internet availability and cost	<ul style="list-style-type: none"> Lower internet penetration rate in comparison with other continents. From a general perspective, the bandwidth is limited and unevenly distributed. The International Internet Bandwidth (IIB) of Africa (1.4 billion population) increased by 10Tbps to 12Tbps throughout the decade till 2019. Nevertheless, it is still less than half of China’s (36Tbps for

		<p>1,4billion population) or Singapore (37Tbps for 5,5million population).</p> <ul style="list-style-type: none"> • Immediate challenge is the connection of far-distant areas of huge countries like the Democratic republic of Congo, Sudan, Chad, Ethiopia. • The cost of installing one km is from \$15,000 to \$30,000 while the last mile connection is in most cases a very difficult part to reach, particularly in rural areas
	ICT Infrastructure usage and availability	<ul style="list-style-type: none"> • The average mobile and fixed line download speed is still very low. There's a shift to fiber-optic systems in large cities, but rural areas are left alone
Political status/ strong governance	Purposeful governance	<ul style="list-style-type: none"> • Despite digital transformation strategies in almost all African countries, the absence of vigorous jurisdictive and monitoring structures has hindered their execution of the strategic plans and policy systems⁵
	Governance challenges	<ul style="list-style-type: none"> • There are numerous strategies related to social media tax regimes, internet shutdowns, and shortage of policies related to accessibility for finance and technology, that are also affecting access to market growth, innovation and technology entrepreneurship (Africa Cyber security Report, 2017).
	Emerging Policy Areas	<ul style="list-style-type: none"> • Emerging policy areas include the African Digital Single Market, laws on Digital Rights/Data Protection and Privacy, Cyber security, Fintech Regulation, Start-Ups & Innovation. More specifically on the latter, in order to have a responsive environment for innovation and business, a regulation directed towards start-ups has been formulated in 10 countries in Africa in 2021 and Start-up Acts have been approved in Tunisia and Senegal. However, there are challenges in implementing policies related to start-ups and innovation.
Funding		<ul style="list-style-type: none"> • Difficulty in application and qualification for key funding opportunities such as venture capitalists, angel investors etc. • Proper training for preparation and application for funding opportunities is limited and thus only a small percentage secure such funds.
Partnership and collaboration		<ul style="list-style-type: none"> • Uncoordinated infrastructure derails start-ups from meeting up to work out business dealings and agreements in a region where face-to-face meetings are crucial for building understanding.
Access to development and testing infrastructure for disruptive technologies		<ul style="list-style-type: none"> • High dependence on ready-made kits for applications, which makes it reliant on foreign technology suppliers and ineffective in digital technology innovation. The issue of access to development and testing infrastructure for disruptive technologies has so far received little attention.
Sector specific skills and competences		<ul style="list-style-type: none"> • Unmet demand for digital skills in Africa: need for tackling the rise in demand for digital jobs knowing that digital skills at various levels will be demanded by 35-42% of all jobs in Africa as of the year 2030.
Go To Market process		<p>Many challenges affect the Go to Market processes of innovative start-ups</p> <ul style="list-style-type: none"> • Limited access to financing: according to Aderibige (2015) about 84% of the Small to Medium Enterprises (SMEs) are underfunded: a

⁵ Barasa, H. (2022). *Digital Government in Sub-Saharan Africa: Evolving Fast, Lacking Frameworks*. Tony Blair Institute for Global Change. available at <https://www.institute.global/insights/tech-and-digitalisation/digital-government-sub-saharan-africa-evolving-fast-lacking-frameworks>

	<p>staggering 85% of small businesses are largely underfunded. However, a deeper analysis reveals that the overwhelming majority does not have viable business plans. Consequently, banks are unwilling to provide loans to small businesses⁶</p> <ul style="list-style-type: none"> • Digital infrastructure development and last mile connectivity • Inconsistent government regulations (unclear regulatory and trading laws, multitude of currencies, more and stricter import regulations, etc.) • Labor cost increase to adapt to globalization movement and follow, e.g., ethical rules for production • Still limited governmental support through trainings for instance • Complex cross-border payments: no single currency along with domestic laws and regulations for controlling cross-border payments by each government create a stressing environment
Infrastructure (utilities & transportation)	<ul style="list-style-type: none"> • African infrastructure is lagging behind. According to the OECD⁷, the African continent must progress much faster in developing its core infrastructure. In particular, cross-regional corridors and urban infrastructure projects play a catalytic role in Africa's transformation and regional integration. A major challenge is to develop compact and replicable projects that can be applied by project developers across Africa at different levels and in a dynamic mode as project opportunities open up. Access to services in regions beyond the innovators location becomes a challenge.
Access to information	<ul style="list-style-type: none"> • Lack of awareness of access to information laws • Poor documentation, record-keeping and archival processes • Inadequate funding mechanism and freedom of information in public institutions • Most public institutions are unable to comply with the obligations of Access to Information

Additional to the challenges described above, AfriConEU findings show that COVID-19 has had both positive and negative effects on the digital economies of the four countries researched (i.e., Nigeria, Ghana, Uganda and Tanzania). For example, non-digitised businesses and traditional sectors were negatively impacted by COVID-19 leading in some cases to job losses and business closures. Furthermore, the digital divides particularly for women and youth were widened immensely also due to higher rates of women dropping out of the labour force to accommodate the need for household labour.

⁶ Aderibigbe, N. (2015). The biggest challenge facing new businesses in Africa is financing. *Ventures Africa*. available at <https://venturesafrica.com/the-biggest-challenge-facing-new-businesses-in-africa-is-financing/>

⁷ OECD/ACET. (2020). Quality Infrastructure in 21st Century Africa: Prioritising, Accelerating and Scaling up in the Context of Pida (2021-30).

2.2 Opportunities in the Innovation and Business Environment in Africa

Africa, often referred to as the “next frontier” for innovation and entrepreneurship, is poised to experience substantial growth in the coming years. As the continent’s population continues to grow, urbanize, and embrace digital technologies, new frontiers are emerging, making it an attractive destination for investments, collaborations, and entrepreneurial ventures.

New emerging technologies

New emerging technologies are reorienting economies and styles of life all around the world, including varying the institutional scenery, social norms, and cultural traditions. As a result, emerging technologies in the Fourth Industrial Revolution (4IR) are considered as a game changer that can accelerate the economic transformation of developing countries⁸ especially in the African continent. It opens up opportunities to reiterate the leapfrog effects which have been extensively described in literature. Examples of note are the direct shift towards mobile networks without going through the copper wire land-lines deployment (i.e., “stage-skipping”: direct adoption to the latest technology) and the outstanding implementation of mobile money in Sub-Saharan Africa. This is an alternative path of technological development involving emerging technologies with new benefits and new opportunities (“path-creating”).

Emerging technologies include Artificial Intelligence (AI), Big Data, Cloud Technologies and the Internet of Things (IoT) all of which can be applied to a large variety of sectors. Africa has already taken advantage of digitalization which has enabled several major shifts such as the tremendous growth of mobile money and mobile banking, the development of African Smart Cities, e-commerce, and precision agriculture with drones. Supporting this claim are the results from the DIGILOGIC Trend Radar⁹. Technologies such as Automation, Blockchain, Drones, EdTechs, and Cybersecurity were identified as major trends shaping the logistics and innovation ecosystem in Sub-Saharan Africa in the upcoming years.

Some of these technologies such as IoT come with highly valued societal impact potentials. To illustrate this point, the map below shows start-ups projects, incubated in the Wazihub H2020 EU funded project¹⁰, which for the large majority of them had a social or societal clearly defined impact.

⁸ The Brookings Institution. (2022). Emerging technologies and the future of work in Africa. Brookings. available at <https://www.brookings.edu/events/emerging-technologies-and-the-future-of-work-in-africa/>

⁹ DIGILOGIC. (2023). Trend radar as a meta-study. DIGILOGIC. available at https://digilogic.africa/wp-content/uploads/2023/07/DIGILOGIC_D2.4-Trend-radar_R_PU_V193.pdf

¹⁰ Banini, P., Crave, S., Diop, B., Dupont, C., Eskandari, M., Mutesi, I., Pham, C., Rahim, A., & Sokeng, W. (2021). *Wazi-Hub: Empowering Open Source and Affordable IoT Technologies in Africa*. available at <https://doi.org/10.5281/zenodo.4835729>



Figure 2: Selection of projects influenced by IoT and AI Technologies

Human Resource Developments and Education

With more than 640 tech hubs active¹¹ on the African continent and with more than 200 million young people entering the labour force market in the next decade¹², (most of whom will fall somewhere on a spectrum between digitally sentient and digitally sophisticated), Africa has a huge potential to deploy disruptive innovation.

Workforce development in digital technologies and applications is of paramount importance for the sustainability of African digital technologies. Some new projects are already approaching this by implementing coding bootcamps and other processes of knowledge acquisition in data science, data analysis, website advancement, product design and management, digital marketing, and cyber security. To further facilitate this, trainings can be designed in such a way that they enable trainees to become employable in other businesses or to support e-commerce and markets for bigger sales, cost reduction,

¹¹ Statista. (2023). Africa: number of active tech hubs by country. Statista. available at <https://www.statista.com/statistics/1294785/number-of-active-tech-hubs-in-africa-by-country/>

¹² The Fletcher School of Law and Diplomacy, Tufts University. (n.d.). The African Leapfrog Index. Digital Planet. available at <https://digitalplanet.tufts.edu/african-leapfrog-index/>

strengthen competitiveness and increase margins. According to African Tech Start-ups Funding Report (2020)¹³, there is capital movement into places like Nairobi and Lagos where digital ecosystems have formed, and start-ups are attaining perceptibility. This is also a similar case with other markets such as Egypt, Tunisia, Ghana and South Africa, in various sectors.

Legal, regulatory and institutional frameworks

Digital markets are required to support African economic growth. This can be achieved if African countries and regions by introducing and implement legal, policies and regulatory structures which protect data privacy and transactions. It is important for the African governments to allow competitions for wide-ranging participation and to avoid dominations and distortions of markets. It is also required to create structures that inspire innovation and the enhancement of services, products and processes, to improve the general market and thus attending the requirements of small businesses and start-ups. The use of services of e-government, infrastructures is needed to deliver public services effectively, and they are to be employed also in the actual economy for effective agricultural practices, good utilities management and urban planning. It is also important to encourage and coordinate creativity and ingenuity on a cross-border aspect to work out the issues related to multinational facets of digital networks. The AU and Regional Economic Communities are required to play a crucial function in these areas to make sure there is a coordinated favorable environment to enable development with enough protections. Established services like mobile money are becoming a catalyst for driving innovation policy in the different parts of Africa.

Intra-Continental Trade

The African Continental Free Trade Area (AfCFTA) as one of the flagship projects of the Agenda 2063 provides a promising opportunity for a significant boost in the African economy. Its mandate is to create a single African continental market, thereby fostering intra-continental trade, value-added production, and investments across Africa. The innovation ecosystem and business environment are expected to benefit immensely from the facilitation of trade and digitalization through the implementation of digital platforms that foster collaboration, the elimination of trade barriers and the promotion of access to funding and investment. Hence, the AfCFTA is anticipated to lay the floor for the development of new business models and technologies and opens up markets for start-ups and SMEs across the continent. This is especially relevant for the 14 landlocked countries that highly depend on the smooth operation of import and export processes.¹⁴ Industries that are specifically expected to benefit from the implementation of AfCFTA are logistics, retail and fintech.¹⁵

¹³ Disrupt Africa. (n.d.). *African Tech Startups Funding Report 2020 & Full Startup List*. Gumroad. available at <https://disruptafrica.gumroad.com/l/njrzl>

¹⁴ DIGILOGIC. (2023). Trend radar as a meta-study. DIGILOGIC. available at https://digilogic.africa/wp-content/uploads/2023/07/DIGILOGIC_D2.4-Trend-radar_R_PU_V193.pdf

¹⁵ Plug and Play. (2021). *The AfCFTA Impact on the African Startup Ecosystem*. Plug and Play Tech Center. available at <https://www.plugandplaytechcenter.com/resources/afcfta-impact-african-startup-ecosystem/>

Impact of COVID-19

COVID-19 has had also positive effects on the digital economies of the four countries researched (i.e., Nigeria, Ghana, Uganda and Tanzania). The following table presents the main positive impacts regarding six relevant areas when analysing the African digital innovation ecosystems:

Table 3: Positive impact of COVID-19 on relevant areas in the African digital innovation ecosystems

ECOSYSTEM FACTOR	POSITIVE IMPACT OF COVID-19: FINDINGS
Markets	<ul style="list-style-type: none"> Accelerated adoption of digital tools by consumers, boosting demand for businesses across sectors.
Policy	<ul style="list-style-type: none"> Increased prioritisation of digital innovation and entrepreneurship by governments.
Finance	<ul style="list-style-type: none"> Highlighted and widened existing financing gaps. Prompted new solutions by traditional investors and governments targeting start-ups and SMEs.
Infrastructure & Support	<ul style="list-style-type: none"> Increased strain on digital infrastructure prompting prioritisation of infrastructural investments Increased opportunities for hubs and expanded their reach through online programmes Exacerbated sustainability challenges for hubs are contributing to an evolution in hub models
Culture	<ul style="list-style-type: none"> Lowered cultural barriers to technology use and driving adoption.
Human Capital	<ul style="list-style-type: none"> Tech jobs were extended to secondary cities Increased interest in digital jobs and online economic opportunities

To conclude, Africa holds a tremendous potential to develop groundbreaking innovations as the continent already has achieved from Fintech to clean energy services. This is what the latest McKinsey report¹⁶ points out: “Africa has the human capital and natural resources to accelerate productivity and reimagine its economic growth, which is, more than ever, vital for the welfare of the world.”

¹⁶ Kuyoro, M., Leke, A., White, O., Woetzel, J., Jayaram, K., & Hicks, K. (n.d.). *Reimagining Africa's economic growth*. McKinsey. available at <https://www.mckinsey.com/mgi/our-research/reimagining-economic-growth-in-africa-turning-diversity-into-opportunity#/>

3 Learnings on European and African DIHs

3.1 The Role of African and European DIHs in their Ecosystems

The digitalisation of the economy and industry has become a priority for the EU in the past few years, which has been reflected in its strategies and funding programmes. Since 2016, the EU started to actively invest in the creation and support of DIHs, which now represent a central factor in developing digital business opportunities both in Europe and in Africa. Besides directly supporting entrepreneurs, DIHs also play a central role in connecting the various actors and developing the innovation ecosystem. African DIHs play a key role in catalysing local innovation ecosystems through the following actions:

1. Creating a community and space where like-minded innovators and other ecosystem actors can connect;
2. Developing the talent pool and skills needed to drive innovation, which plays an important role in addressing digital divides for women and youth;
3. Providing spaces and infrastructure (internet and electricity) for entrepreneurs to innovate;
4. Connecting start-ups to investment;
5. Accelerating and incubating start-ups and supporting entrepreneurs to develop their business ideas into viable ventures;
6. Educating governments and bringing ecosystem actors together to develop enabling policies for innovation and technology.

Despite innovation development and economic growth being shared objectives, significant variations exist in how DIHs function and contribute to their respective innovation ecosystems. This analysis focuses on three critical aspects: Networks and Collaboration, Relevant Policy Areas and Policy Advocacy, and Policy Advocacy Processes. The analysis offers insights into the distinctions and commonalities in the conceptualization and operation of DIHs in the EU and Africa.

Networks and Collaboration

Similarities: Both regions emphasize partnerships as a vital strategy for their DIHs. Whether in Africa or Europe, DIHs actively engage in collaborations with local and international organizations to achieve their objectives. These partnerships often involve local private entities, government cooperation for non-policy-related activities, and collaboration with international entities. Additionally, both regions recognize the power of collective efforts in driving impact. African and European DIHs have shown that when they collaborate, they can achieve more significant outcomes. For instance, collective advocacy for favorable policies and the joint implementation of programmes are common strategies employed by DIHs in both regions.

Differences: Despite these similarities, there are notable differences between European and African DIHs when it comes to their focus and scope. European DIHs often concentrate on broader civic engagement, politics, democracy, and city-wide improvements. They engage in projects related to democracy access, urban innovation, and civic engagement, reflecting a more extensive focus. In contrast, African DIHs tend to have a narrower focus, primarily centered on improving innovation hubs and supporting entrepreneurs. They often provide a platform for grassroots innovators and seek to advocate

for innovation and creativity. This difference in focus results in distinct priorities for developing their network and seeking partnerships in areas of impact for DIHs in the two regions.

Relevant Policy Areas and Policy Advocacy

Similarities: A key similarity between DIHs in the EU and Africa regarding relevant policy areas and policy advocacy is the emphasis on government engagement and policy influence. In both regions, DIHs actively collaborate with government entities to shape policies that support innovation and entrepreneurship. This collaboration often involves advocating for favorable policies related to taxation, procurement, and investment. For instance, DIHs in both the EU and Africa highlight the importance of tax reductions and duty relaxations on imported goods for local manufacturers, as well as subsidies and procurement policies that support local businesses. This common focus on policy advocacy reflects the shared goal of fostering a conducive environment for innovation and economic growth.

Differences: One notable difference between DIHs in the EU and Africa lies in their primary policy focus areas. European DIHs, such as Innovationshauptplatz Linz and Volumes: Fab City Grand Paris, are predominantly focused on transforming cities into innovative hubs. They actively work on initiatives to make their cities more innovative and self-sustainable. In contrast, African DIHs, like the Association of Countrywide Innovation Hubs (ACIH) and Ghana Hubs Network (GHN), place a stronger emphasis on advocating for start-up legislation and creating a favorable environment for innovation. Their policy advocacy centers on improving working conditions, attracting more individuals to the innovation sector, and ensuring the recognition of innovation hubs in Africa. This difference in policy focus reflects the unique challenges and priorities faced by DIHs in each region.

Policy Advocacy Processes

Similarities: One major similarity in the policy advocacy processes of DIHs in the EU and Africa is their focus on a bottom-up approach. Both regions emphasize involving grassroots stakeholders and communities in the policy advocacy process. They recognize the importance of engaging with the people who directly benefit from these policies, ensuring that their needs and concerns are thoroughly understood and addressed. This grassroots involvement is a common strategy to build a strong case for policy change.

Another shared similarity is the active involvement of various stakeholders and government entities throughout the policy advocacy process. Whether in the EU or Africa, the policy advocacy efforts involve multiple reviews, open conversations, and engagements with relevant ministries, agencies, and government bodies. This comprehensive stakeholder involvement is crucial for gaining support and ensuring that proposed policies align with the needs and interests of all parties.

Differences: While both regions emphasize the importance of engaging stakeholders and documenting findings, African cases often aim for the direct reading or hearing of a bill by the legislative arm of government, such as Parliament. In contrast, some European cases focus on creating awareness about policy needs to the central government through various channels, including ministries and public service agencies. This divergence in the form of policy advocacy reflects the different strategies employed to achieve their goals.

3.2 Challenges of African DIHs

The following challenges of African DIHs have been identified by the projects.

Table 4: Challenges of African DIHs

Challenges of African DIHs
Current funding approaches limit the impact of African DIHs. Specifically, funding is focused on short-term programme delivery and does not recognise the longer-term, ecosystem-building work that DIHs are doing. Moreover, the funders' emphasis on outputs limits DIHs' potential to create systems change.
Many African DIHs lack sustainable business models and are heavily reliant on grants which leaves them financially vulnerable.
African DIHs face capacity and expertise gaps in key areas of business development, fundraising, investment facilitation and gender-responsive programme design. This is negatively affecting the level of support that they provide to start-ups and women as well as limiting their ability to tap into investment opportunities and drive investment into the ecosystem.
DIHs face challenges in building effective ecosystem partnerships with corporates, governments, investors and fellow DIHs which is limiting DIHs' ability to scale their impact, influence policy and more effectively contribute to developing the digital innovation ecosystem.
There is a crucial need for a sound trade-off between the implementation of high-tech technologies and less advanced technologies in African DIHs. This is well addressed by Kolade et al. in recent research ¹⁷ . According to them, "the focus of the hubs on high tech entrepreneurship is justified and necessary, as African entrepreneurs need to be equipped and ready to respond to fast-paced changes and opportunities in the highly competitive global economic landscape. However, for African entrepreneurs and tech hubs, the ambitious drive for high tech entrepreneurship needs to be complemented with a strategic attention on middle-of-the-range technological solutions that are better suited and more accessible to most of the African populations."

3.3 Collaboration of DIHs between Africa and Europe

DIHs stand at the forefront of this dynamic, serving as catalysts for technological advancement, economic growth, and entrepreneurship. In this chapter, we explore the profound insights and learnings derived from the collaboration of DIHs between Europe and Africa within the ICT58 projects. In tracing the journey of collaboration between DIHs in Europe and Africa, this chapter aims to provide a comprehensive overview of the lessons learned and the potential for collaboration between African and European DIHs.

¹⁷ Kolade, O., Atiase, V., Murithi, W., & Mwila, N. (2021). The business models of tech hubs in Africa: implications for viability and sustainability. *Technology Analysis & Strategic Management*, 33(10), 1213–1225. <https://doi.org/10.1080/09537325.2021.1947492>

Access to business and workforce opportunities for European DIHs: By supporting African DIHs in developing their capacities and networks to support digital innovators in Africa, European DIHs improve their knowledge and access to the business and workforce opportunities offered by the emerging African digital markets. Therefore, the collaboration between Africa and Europe on an equal footing is critical for accelerating digital transformation and contributing to the sustainable economic growth of both continents.

Access to donor funding and grants for African DIHs: Donor funding and grants will continue to play an important role in enabling African hubs to do their work. To build their resilience, African hubs need support to become more sustainable by developing alternative revenue streams, without losing focus on their mission of supporting entrepreneurship and enabling innovation.

DIH capacity and skill enhancement for African and European DIHs: Hubs need support to develop internal expertise on how to take new products to market such as product development, market research and user testing as well as in key aspects for growing and scaling businesses such as finance and strategy. Creating joint training and capacity-building programmes for DIHs can help bridge the skills gap and promote skills upgrading. These programmes should be co-created together with hub leaders to provide them with a sense of ownership, i.e., empower them to provide input into the design of programmes in order to ensure that they meet their needs.

Access to EU and AU markets: African digital actors provide benefit to European actors by supporting them to identify and pilot new opportunities within African markets as well as acting as access points into these markets through supporting European actors to navigate the local regulatory and business environment. Similarly, African hubs having European partners would provide the same benefits in helping African actors access European markets.

Sharing and exchange of knowledge: African digital actors can benefit from technological, business and investment expertise from Europe. While European actors stand to learn a lot from African actors about innovation and business models for low-resource environments as well as designing technological solutions to meet social needs.

Access to resources: DIHs need access to resources to gather, analyse, and utilize relevant data effectively. Collaboration among DIHs can facilitate data sharing and joint data collection efforts. By combining their resources and expertise, DIHs can overcome data limitations and make more informed decisions. The pooling of resources, infrastructure and capabilities, enables DIHs to enhance their collective impact, making the most of what is available. For example, DIHs in Africa require access to advanced technological resources and specialized knowledge to enhance their capabilities and offerings. Collaboration with partners from other regions can provide access to such resources and help address technological challenges faced by the African hubs.

Enhancement of service portfolio of African DIHs: Foster a well-balanced portfolio of services and solutions within the DIHs. Establish incubation and acceleration programmes that offer support to local entrepreneurs. These programmes can include mentoring, business counselling and access to investor networks.

Policy advocacy: EU-AU DIH cooperation has a significant impact on policy advocacy. It provides a unified voice for advocating favourable policies and addressing common challenges, informing policymakers and ensuring effective DIH support.

Regulatory reforms: Overcoming regulatory barriers often requires resources and expertise to navigate complex legal and bureaucratic processes. Collaboration among DIHs can provide a collective effort to address regulatory challenges and open access to new markets. By working together, DIHs can develop strategies and advocate for regulatory reforms that benefit the entire ecosystem.

Increased competitiveness: Collaboration enhances the global competitiveness of EU and AU DIHs, making them more appealing to international partnerships and investments. Overall, it empowers DIHs to thrive and contribute to technological progress worldwide.

3.4 Recommendations for Strengthening African DIHs and their Collaboration with European DIHs

As an approach to solving the specific challenges of African DIHs, the authors identified a set of recommendations listed below. The first set of recommendations addresses the strengthening of African DIHs. The second set of recommendations refers to the collaboration between African and European DIHs.

Recommendations for Strengthening African DIHs:

- **New funding approaches are needed** to support African DIHs more effectively. Funding for DIHs should support their sustainability and long-term impact. Specifically, more funding needs to be allocated towards covering DIHs core costs as well as developing their internal capacity and infrastructure. Additionally, funding for DIHs should focus on long-term outcomes and place less emphasis on maximising short-term outputs.
- There is a need to **provide African DIHs with funding and expertise to develop sustainable business models**. Those business models need to complement and build on rather than take away from the DIHs' core mission to support start-ups and innovation ecosystems.
- There is a need to **build African DIHs capacity** around business development, investment facilitation, fundraising and developing gender-responsive programmes as key areas where many DIHs have capacity gaps. One approach here is to enhance capacities and expertise through the exchange of knowledge between DIHs and the access to resources available at other DIHs. This is elaborated in chapter 4.3.
- **Support and facilitate partnerships between DIHs and diverse actors across the ecosystem**. For instance, by facilitating investment into the digital ecosystem by corporate actors; building evidence and data to support better policy making; supporting DIHs to develop investment strategies and strengthening hub networks. To address the challenge of limited stakeholder engagement, policymakers are advised to establish structured communication channels that include regular online meetings, email updates, and physical meetings among stakeholders. These channels can be complemented by various platforms for stakeholder engagement, such as events, workshops, innovation fairs, exhibitions, and specialized training sessions. Local gov-

ernment policy review meetings can also serve as important platforms for engaging stakeholders, including innovation hubs, entrepreneurs, and investors. These meetings can be held periodically to gather input and feedback from stakeholders. Furthermore, policymakers can create online forums or discussion boards where stakeholders can actively participate in policy advocacy processes, share insights, and collaborate effectively.

- **Support the development of innovative business models** at DIHs to reinforce their position on middle of the range technological solutions and make this range of activity sustainable. This could contribute to support the extension of these activities on Pan African markets and international markets and give to hubs more financial agility to address cutting edge technologies by developing new revenue streams give hubs.

Recommendations for the Collaboration of DIHs between Africa and Europe

- **Co-creative system approach** at the start of projects helps to gather knowledge and build a shared network easily: mapping relevant actors and exploring the system of digital logistics by inviting these actors to online consultations. This approach led to an early understanding of the sector, increased transparency in the sector and set the foundation for the network among European and African actors in the sector. The shared understanding of the sector supported the exchange and facilitated the collaboration for project activities.
- Policymakers are encouraged to **implement specific funding mechanisms to address the challenge of limited resources and support collaboration among Digital Innovation Hubs (DIHs)**. These mechanisms may include the establishment of contracts dedicated to funding collaborative projects between DIHs. Research grants can be made available to DIHs to encourage joint research initiatives and knowledge sharing. Policymakers can also consider providing training awards to DIHs to enhance their capabilities in resource management and collaboration. Moreover, cooperative agreements between DIHs and relevant government agencies are encouraged to pool resources and infrastructure. Public-private partnerships can be actively promoted to attract private sector funding and expertise, thereby increasing the available resources for DIHs.
- **Establish clear and regular channels of communication** between EU and AU DIHs identifying needs and strengths.
- **Effective communication with stakeholders** is crucial for policymakers to address the challenge of limited stakeholder engagement. Clear communication channels and protocols can be established to engage key stakeholders effectively. This includes involving innovation hubs, entrepreneurs, and investors in policy discussions and decisions through regular online meetings, email updates, and physical meetings among stakeholders. These channels can be complemented by various platforms for stakeholder engagement, such as events, workshops, innovation fairs, exhibitions, and specialized training sessions. Local government policy review meetings can also serve as important platforms for engaging stakeholders. Furthermore, policymakers can create online forums or discussion boards where stakeholders can actively participate in policy advocacy processes, share insights, and collaborate effectively. When stakeholders

are engaged through clear communication, policymakers can harness their insights and support to develop more impactful policies.

- To overcome the challenge of insufficient data, DIHs are to **create specific data-sharing agreements and protocols**. These agreements can include the exchange of information and research among DIHs, ensuring data privacy and security. DIHs can consider investing in data collection and analysis capabilities, potentially through partnerships with academic institutions or data analytics firms. Policymakers can also be urged to support the creation of data repositories dedicated to the DIH ecosystem. DIHs can actively advocate for government backing in this regard, emphasizing the importance of data-driven decision-making and the role of data in advancing innovation and entrepreneurship.
- **Jointly developing and implementing programmes and activities** serves as a proof of concept for future collaboration activities and at the same time fosters the development of sustainable course/programme/service offers that can be implemented further and/or adapted by the individual project partners with minimal effort.
- **Enhance understanding among consortium partners** through virtual and physical meetings and study visits in order to develop a fluid working culture. Specific peer-to-peer workshops among DIHs promote a reciprocal learning process with effective transfer and knowledge sharing to reduce disparities in knowledge, skills, and resources
- **Leverage on and synergize different project activities** in order to develop an integrated whole project through virtual and physical meetings and study visits.
- To address regulatory barriers, **policymakers and DIHs are to provide a dedicated regulatory working group or task force**. This group should include representatives from DIHs with expertise in regulatory matters and legal experts. The task force would work collaboratively to develop strategies for navigating complex legal and bureaucratic processes. Policymakers are encouraged to engage legal experts or consultants to provide guidance on specific regulatory challenges and potential reforms. DIHs would collectively advocate for regulatory reforms that promote innovation and entrepreneurship within the DIH ecosystem. These reforms may include streamlining regulatory processes, providing exemptions or incentives for innovation-related activities, and ensuring that the regulatory framework supports the growth and success of DIHs.

4 Learnings on the Support of Innovators and Entrepreneurs

4.1 Support of Innovators and Entrepreneurs by African DIHs

There are many critical insights and recommendations drawn from the various projects and experiences within the field of supporting innovators and entrepreneurs in Africa through DIHs. These learnings are elaborated upon, with recommendations provided to guide stakeholders in fostering an environment conducive to innovation and entrepreneurship. This chapter provides a consolidated summary of the insights gathered from the individual ICT58 projects.

Need for Specialized Business Development Support: Many innovation hubs lack in-depth business development expertise in critical areas like marketing, design thinking, market research, and user testing, hindering their ability to support start-ups effectively. Peer-learning and collaboration among hub leaders can help address this gap, facilitating the sharing of best practices and business development strategies. Additionally, establishing a ranking system for experts offering business development support can enhance credibility and guidance for start-ups.

Combining Training with Mentorship: Providing entrepreneurs with both training and mentorship is essential for their development. Training programmes offer insights into business trends and technologies, while mentorship provides practical guidance from industry professionals. Combining these two elements ensures entrepreneurs can apply acquired knowledge and skills effectively, fostering successful businesses.

Leveraging Collaboration for Growth: Collaborations between entrepreneurs and various stakeholders, including industry experts, investors, academic institutions, and governments, offer significant growth opportunities. Such partnerships can provide access to funding, research, knowledge exchange, and policy advocacy. Promoting collaboration across a wider spectrum can amplify these benefits and enhance the competitiveness of African entrepreneurs.

Supporting Innovation Intermediaries: Innovation intermediaries, such as incubators and innovation spaces, play a vital role in supporting entrepreneurs by offering technical expertise, infrastructure, and access to advanced technologies. The support of entrepreneurs at the scaling stage is often overlooked in favour of ideation and prototyping. Encouraging the establishment of local funding mechanisms and improving rural infrastructure, such as internet connectivity and power supply, can further bolster entrepreneurial activities.

Targeted Needs-Based Consulting: Start-ups benefit more from targeted, needs-based consulting than generic mentoring. European DIHs can emphasize their in-depth expertise in specific industries, technologies, and markets when providing support to start-ups. They should also ensure a low-entry barrier for start-ups to access support and clearly communicate the value of expertise. Along with that, the timing of support from European DIHs needs to be synchronized with the start-ups' evolving trajectories rather than set-out in a rigid schedule.

Networking and Pitching Events: Organizing networking and pitching events that involve stakeholders from both the EU and AU provides valuable opportunities for start-ups. These events help start-ups connect with potential investors, customers, and partners, increasing their visibility and bargaining power. Continuously engaging with industry through partnerships and extending support programmes beyond the initial phase can further enhance the impact of capacity-building initiatives.

Leveraging Open-Source Software and Training: Utilizing free open-source software and online open-access programming training can be a cost-effective way to enhance the skills and knowledge of entrepreneurs and DIHs. Creating accessible maps and examples for combining open-source resources to develop software applications can further support innovation.

4.2 Recommendations for the Effective Provision of Support by DIHs to Innovators and Entrepreneurs

Supporting innovators and entrepreneurs necessitates a multifaceted strategy driven by proactive policymaking.

Firstly, policymakers are encouraged to **establish and maintain open lines of communication with a wide array of stakeholders**, including innovation hubs, entrepreneurs, investors, and industry experts. This ongoing dialogue can be facilitated through regular workshops, consultations, and the creation of digital platforms, ensuring policymakers are well-informed about the evolving needs and challenges of these key players.

Secondly, **access to financial resources is fundamental for the growth and sustainability of innovation hubs and networks**. Policymakers must not only ensure dedicated funding but also explore innovative financing models. Collaborative partnerships between hubs and industries can further enhance resource sharing and market access.

Thirdly, **fostering an innovation-friendly policy environment** is critical. Policymakers can craft and implement policies that promote hub growth, including tax incentives, intellectual property protection, streamlined regulations, and infrastructure development. Encouraging collaboration between hubs, educational institutions, and enterprises can facilitate knowledge exchange and interdisciplinary projects. In essence, a comprehensive approach encompassing business development support, collaboration, training, mentorship, and favourable policy frameworks, underpinned by robust infrastructure, is essential to empower and nurture innovators and entrepreneurs. Policymakers play a pivotal role in shaping this ecosystem.

5 Outlook: The Role of DIHs as a Facilitator for the AU-EU Innovation Agenda

The AU-EU Innovation Agenda¹⁸, published on 19 July 2023, identifies four policy priorities for EU-AU cooperation in research and innovation:

- public health
- green transition
- innovation and technology
- capacities for science

Could these four priorities (or more specifically, three of them: public health, green transition, innovation and technology) be the foundation for the development of further cooperation between DIHs in Europe and Africa? This thematic cooperation model would necessarily require the progressive “specialisation” of African DIHs.

In Europe the DIHs “*Smart Specialisation*” process has been defined¹⁹ as “*Smart Specialisation Strategies*” (S3) is a place-based approach addressing a region’s unique development potential by means of targeted efforts devoted to support the emergence of new domains that may foster regional growth through structural change. It consists both of horizontal measures addressing the regional innovation ecosystem, regardless of economic domains, and vertically targeted efforts focused on a limited number of priority domains identified through a multi-stakeholders process of entrepreneurial discovery (EDP). While digital growth is a transversal priority and recurrent aim of most regional S3 across Europe, DIH is a policy instrument that can contribute to that goal by boosting the digitisation of the industry in every European country or region.”

These pose two further questions:

- Is this strategic approach suitable for the African innovation ecosystem?
- Would it be sustainable?

There are evidences that it could be appropriate:

Even if the majority of DIHs are servicing local communities in general, some have specialized expertise and target specific technologies or expert communities, these spaces include:

- [Health Tech Hub Africa](#), led by Novartis Foundation, based in Kigali, Rwanda
- [African Health Innovation Centre](#), based in Kumasi, Ghana
- [MboaLab](#), Yaoundé, Cameroon
- [Agric Digital Innovation Hub](#), based in Benin City, Nigeria

¹⁸ European Commission. (2023). *The AU-EU Innovation Agenda – final version*. available at https://research-and-innovation.ec.europa.eu/system/files/2023-07/ec_rtd_au-eu-innovation-agenda-final-version.pdf

¹⁹ Rissola, G. and Sörvik, J. (2018). Digital Innovation Hubs in Smart Specialisation Strategies. EUR 29374 EN, Publications Office of the European Union. ISBN 978-92-79-94828-2. doi:10.2760/475335, JRC113111.

Moreover, international development agencies, such as GIZ are promoting and supporting (through the MAKE-IT and Digital Transformation Centres initiatives) the set-up of specialised local DIHs, in the areas of Blue Economy (mostly Southern Africa), Smart Cities (mostly East Africa), Agriculture (mostly West Africa) and Smart Manufacturing (mostly West Africa).

The ICT-58 projects' partners discussed the specific topic in a dedicated workshop in Cape Town on 16 June 2023²⁰ and highlighted the need for Digital Innovation Hubs to adapt their services to the specific local/regional needs (not national but local ecosystems, industry, resource) and the specific local government development priorities and strategy.

The AU-EU Innovation Agenda also identifies specific actions for each of the four priorities for cooperation where the Digital Innovation Hubs could play a key role as facilitators, especially in the following key activities:

- Creating the framework for collaboration among local actors
- Creating the framework for AU-EU innovation collaboration
- Supporting digital / innovation / entrepreneurship capacity building programmes
- Supporting local innovation development and uptake
- Engagement of SMEs and start-ups in the innovation process
- Support the development of value chains

Here below some of the actions mentioned by the AU-EU Innovation Agenda which would require the development (or reinforcement of the current ICT-58 projects) network of Digital Innovation Hubs in Africa and between Europe and Africa.

- Fostering the **links and networks** between the business and government sectors, including PPPs, higher learning and research organisations, financial institutions and civil society organisations
- Fostering the **participation of financing partners**, e.g., business angels, into AU-EU partnerships to jointly improve access to the use of innovative financial engineering, including for early-stage businesses and start-ups
- Supporting the **transformation of health Research and Innovation outputs into relevant products and services**, including medical, digital, technological and social **innovations with application in healthcare**
- Developing and supporting the **market uptake of innovative renewable energy** solutions
- **Supporting research and innovation cooperation between AU and EU research organisations and companies** (in particular SMEs) from low tech to high tech (e.g., frugal innovation including organisational innovation) by making smart use of local intelligence and adapted business-driven models, mobilising multi-actor approaches (innovation platforms, living labs, etc.) in sectors like Agri-Food-Nutrition, Circular Economy, Sustainable Manufacturing, One Health, Raw

²⁰ EU-Africa Digital Innovation Hubs Collaboration Policy Recommendations Workshop Report. (2023). DIGILO-GIC. available at https://digilogic.africa/wp-content/uploads/2023/07/DIGILOGIC-Policy-Recommendations-Workshop_v0.6.pdf

Materials, using Digitalisation and AI as transversal enablers

- Supporting **technology/innovation hubs, networks, and operations of accelerators and incubators, including by assessing technology fields that could benefit from standardisation, to develop the human capital and skills pool for effective technology transfer and to stimulate entrepreneurship**, inter alia through thematic exchange programmes between start-ups, researchers and policymakers, including social innovation beyond technologies
- In this context the establishment of new partnerships in sectors and fields where collaboration is not yet common practice between African and European DIHs is relevant, but also the strengthening of existing networks and platforms engaging in organizing collaboration and exchange between DIHs in Europe, Africa and globally, such as the Global Innovation Gathering e.V. or the FabCities Network is crucial to establish sustainable and impactful work relations. Lastly, the establishment of open resources that can be accessed by partners in Africa and Europe, including shared data pools and open source digital commons resources is highly relevant.

6 APPENDIX

6.1 Collaboration of DIHs between Europe and Africa

6.1.1 Insights from AfriConEU

Added value of DIH cooperation between EU and AU

Taking into consideration the looked-for international partnership building between Europe and Africa, DIHs now represent a central factor in developing digital business opportunities between African and European entrepreneurs and start-ups. However, although Africa is undergoing a rapid digital transformation which translates into a strong potential for the digital economy to drive growth on the continent, this progress is still challenged by a variety of structural and systemic factors that restrict the creation of an enabling business environment and a strong digital innovation ecosystem capable to offer the required support services for boosting digital entrepreneurship. By supporting African DIHs developing their capacities and networks to support digital innovators in Africa, European DIHs will improve their knowledge and access to the business and workforce opportunities offered by the emerging African digital markets. Therefore, the collaboration between Africa and Europe on an equal footing is critical for accelerating digital transformation and contributing to the sustainable economic growth of both continents.

Learnings and Recommendations

#1 Learning: Donor funding and grants will continue to play an important role in enabling African hubs to do their work

Recommendations:

Funding for hubs should support their sustainability and long-term impact by focusing on long-term outcomes and placing less emphasis on maximising short-term outputs (i.e., programme based). Specifically, more funding needs to be allocated towards covering hubs core costs as well as developing their internal capacity and infrastructure.

To build their resilience, African hubs need support to become more sustainable by developing alternative revenue streams, without losing focus on their mission of supporting entrepreneurship and enabling innovation.

#2 Learning: DIHs need to improve their capacity in key areas of business development, investment facilitation and fundraising

Recommendations:

Hubs need support developing internal expertise on how to take new products to market such as product development, market research and user testing as well as in key aspects for growing and scaling businesses such as finance and strategy. Equally, capacity around facilitating investments, for example, being able to take equity and invest in funds, is crucial for developing the long-term sustainability of hubs. Yet, capacity building programmes should be co-created together with hub leaders to provide them with a sense of ownership, i.e., empower them to provide input into the design of programmes in order to ensure that they are relevant for their needs.

#3 Learning: Opportunities for EU-Africa value exchange exists around market access, knowledge exchange, and human resources and capital

Recommendations:

With regards to market access, Africa digital actors can offer value to European actors by helping them to identify and pilot new opportunities within African markets as well as acting as access points into these markets by supporting European actors to navigate the local regulatory and business environment. Similarly, African hubs having European partners would provide the same benefits in helping African actors access European markets. Also, on the one hand, African digital actors can benefit from technological, business and investment expertise from Europe. While European actors stand to learn a lot from African actors about innovation and business models for low resource environments as well as designing technological solutions to meet social needs.

6.1.2 Insights from Hubiquitous

Hubiquitous project has proven that the DIHs in Africa require access to advanced technological resources and specialized knowledge to enhance their capabilities and offerings. Collaboration with partners from other regions can provide access to such resources and help address technological challenges faced by the African hubs.

Additionally, DIHs seek collaboration to identify potential business opportunities, expand market reach, and facilitate international cooperation for mutual growth, knowledge and benefits sharing.

To establish strong and effective partnerships, regular communication and coordination mechanisms should be reinforced between European and African DIHs. Creating joint training and capacity-building programmes for DIHs can help bridge the skills gap and promote skills upgrading.

Added value of DIH cooperation between EU and AU

The cooperation between DIHs the EU and Africa brings significant added value to both regions.

By collaborating, DIHs can leverage each other's strengths, expertise, and technological advancements to foster innovation and address common challenges.

The EU DIHs can benefit from a deeper understanding of the African market and gain insights into the unique needs and preferences of the African populations. On the other hand, African DIHs can access advanced technologies, best practices, and knowledge sharing from their European counterparts, accelerating their technological development.

Learnings and Recommendations

#1 Learning: Joint initiatives can offer strong collaboration opportunities

Recommendations:

- Knowledge exchange and sharing of best practices in technology and innovation can lead to improved capabilities and expertise in both countries.
- Establish clear and regular channels of communication between EU and AU DIHs identifying needs and strengths
- Additionally, partnerships with other European organizations and international DIHs can open vias to funding opportunities and access to financial resources to African DIHs
- Aim for long-term partnerships and collaborations to maximize the benefits for both regions, setting also together, innovation and strategy agendas for the represented ecosystems and territories

#2 Learning: Focus on enhancing and reinforcing the range of services provided by African DIHs.

Recommendations:

- Foster a well-balanced portfolio of services and solutions within the DIHs
- Establish incubation and acceleration programmes that offer support to local entrepreneurs. These programmes can include mentoring, business counseling and access to investor networks

#3 Learning: Capacity building and skills transfer programmes between EU and AU DIHs enhance the capabilities of both parties

Recommendations:

- Creation of Training and Capacity Building Programmes. The creation and joint organization of training sessions, workshops and events, as may include Bootcamps, Hackathons and Accelerator Programmes on specific technology domains and innovation methodologies. This will enhance the technical capabilities of DIHs and contribute to their continued growth and development

6.1.3 Insights from DIGILOGIC

Added value of DIH cooperation between EU and AU

The collaboration of DIHs between Europe and Africa represents a synergy of talent, resources, and opportunities. The cooperation between DIHs can enhance the capacity of DIHs to foster the local innovation ecosystem and build a sustainable network of stakeholders. Through effective knowledge and experience sharing disparities in knowledge, skills and resources can be approached and minimized.

Learnings and Recommendations

#1 Learning: Combining virtual and physical consortium meetings and study visits can facilitate deeper understanding among project participants

- **Enhance understanding among consortium partners** through virtual and physical meetings and study visits in order to develop a fluid working culture
- **Leverage on and synergize different project activities** in order to develop an integrated whole project through virtual and physical meetings and study visits

#2 Learning: A structured peer-learning approach facilitates the exchange between the DIHs and enables the identification of common interests and shared opportunities.

- Jointly developing and implementing programmes and activities serves as a **proof of concept for future collaboration** activities and at the same time fosters the development of sustainable courses/programmes/services offers that can be implemented further and/or adapted by the individual project partners with minimal effort
- Specific peer-to-peer workshops among DIHs promote a **reciprocal learning process** with effective transfer and knowledge sharing to reduce disparities in knowledge, skills, and resources

#3 Learning: Co-creative system approach at the start of a projects helps to gather knowledge and build a shared network easily

DIGILOGIC started the project with mapping relevant actors and exploring the system of digital logistics by inviting these actors to online consultations using system practices and co-creative methodologies. This approach led to an early understanding of the sector, increased transparency in the sector and set the foundation for the network among European and African actors in the sector. The shared understanding of the sector supported the exchange and facilitated the collaboration for project activities.

#4 Learning: In weak ecosystem, DIHs play an essential role in building the ecosystem which is more feasible if they collaborate with other DIHs

The collaboration among DIHs from Europe and several African countries helped to create support structures for start-ups by tapping into each other experience and know-how. Each hub contributed either their technical expertise, e.g., through mentoring, or their country expertise, e.g., through organising local events and making connections to local actors. In some programmes, DIHs also collaborate with specialized hubs: For example, to cater to the needs of a special target group like female entrepreneurs where hubs collaborate to serve the target group's needs.

6.1.4 Insights from mAkE

Added value of DIH cooperation between EU and AU

EU-AU DIH cooperation brings numerous benefits. It fosters knowledge exchange and capacity building, enabling EU DIHs to mentor their African counterparts while African DIHs provide fresh perspectives. This enriches both regions' DIH capabilities. Moreover, it opens doors to new markets, facilitating international expansion for start-ups. This spurs economic growth and innovation. Collaboration also strengthens innovation ecosystems by pooling resources and expertise.

Additionally, EU-AU DIH cooperation has a significant impact on policy advocacy. It provides a unified voice for advocating favorable policies and addressing common challenges, informing policymakers and ensuring effective DIH support. Joint projects and research initiatives further technology transfer and innovation, particularly in critical areas. Lastly, this collaboration enhances the global competitiveness of EU and AU DIHs, making them more appealing to international partnerships and investments. Overall, it empowers DIHs to thrive and contribute to technological progress worldwide.

Learnings and Recommendations

#1 Learning: Effective communication with stakeholders is crucial for policymakers to address the challenge of limited stakeholder engagement. Clear communication channels and protocols can be established to engage key stakeholders effectively. This includes involving innovation hubs, entrepreneurs, and investors in policy discussions and decisions. When stakeholders are engaged through clear communication, policymakers can harness their insights and support to develop more impactful policies.

To address the challenge of limited stakeholder engagement, policymakers are advised to establish structured communication channels that include regular online meetings, email updates, and physical meetings among stakeholders. These channels can be complemented by various platforms for stakeholder engagement, such as events, workshops, innovation fairs, exhibitions, and specialized

training sessions. Local government policy review meetings can also serve as important platforms for engaging stakeholders, including innovation hubs, entrepreneurs, and investors. These meetings can be held periodically to gather input and feedback from stakeholders. Furthermore, policymakers can create online forums or discussion boards where stakeholders can actively participate in policy advocacy processes, share insights, and collaborate effectively.

#2 Learning: Policymakers can address the challenge of limited resources by facilitating access to necessary resources for DIHs. This includes financial support, infrastructure, and expertise. Collaboration among DIHs can help optimize resource allocation and sharing. By pooling resources and capabilities, DIHs can enhance their collective impact, making the most of what is available.

Policymakers are encouraged to implement specific funding mechanisms to address the challenge of limited resources and support collaboration among DIHs. These mechanisms may include the establishment of contracts dedicated to funding collaborative projects between DIHs. Research grants can be made available to DIHs to encourage joint research initiatives and knowledge sharing. Policymakers can also consider providing training awards to DIHs to enhance their capabilities in resource management and collaboration. Moreover, cooperative agreements between DIHs and relevant government agencies are encouraged to pool resources and infrastructure. PPPs can be actively promoted to attract private sector funding and expertise, thereby increasing the available resources for DIHs.

#3 Learning: The political environment can be unpredictable, impacting the priorities of policymakers. To address this challenge, DIHs can ensure their interests are aligned with those of policymakers. When DIHs and policymakers share common goals and objectives, it becomes easier to navigate shifts in political priorities. Moreover, improved policy advocacy can help DIHs make a stronger case for their initiatives even in changing political landscapes.

To navigate the challenge of an unpredictable political environment, DIHs are encouraged to actively engage with policymakers and develop strategies to align their interests. DIHs can organize regular meetings with policymakers to understand their current priorities and adapt their strategies accordingly. These meetings can involve open dialogues to foster mutual understanding and collaboration. Additionally, DIHs should consider creating flexible advocacy strategies that can respond to changing political landscapes. This may involve scenario planning to anticipate shifts in policy priorities. DIHs should consistently highlight the economic and societal benefits they bring to the region to secure ongoing support from policymakers. Demonstrating how DIHs contribute to job creation, economic growth, and innovation can be particularly effective.

#4 Learning: DIHs need access to resources to gather, analyse, and utilize relevant data effectively. Collaboration among DIHs can facilitate data sharing and joint data collection efforts. By combining

their resources and expertise, DIHs can overcome data limitations and make more informed decisions.

To overcome the challenge of insufficient data, DIHs are to create specific data-sharing agreements and protocols. These agreements can include the exchange of information and research among DIHs, ensuring data privacy and security. DIHs can consider investing in data collection and analysis capabilities, potentially through partnerships with academic institutions or data analytics firms. Policymakers can also be urged to support the creation of data repositories dedicated to the DIH ecosystem. DIHs can actively advocate for government backing in this regard, emphasizing the importance of data-driven decision-making and the role of data in advancing innovation and entrepreneurship.

#5 Learning: Overcoming regulatory barriers often requires resources and expertise to navigate complex legal and bureaucratic processes. Collaboration among DIHs can provide a collective effort to address regulatory challenges and open access to new markets. By working together, DIHs can develop strategies and advocate for regulatory reforms that benefit the entire ecosystem

To address regulatory barriers, policymakers and DIHs are to provide a dedicated regulatory working group or task force. This group should include representatives from DIHs with expertise in regulatory matters and legal experts. The task force would work collaboratively to develop strategies for navigating complex legal and bureaucratic processes. Policymakers are encouraged to engage legal experts or consultants to provide guidance on specific regulatory challenges and potential reforms. DIHs would collectively advocate for regulatory reforms that promote innovation and entrepreneurship within the DIH ecosystem. These reforms may include streamlining regulatory processes, providing exemptions or incentives for innovation-related activities, and ensuring that the regulatory framework supports the growth and success of DIHs.

6.2 Learnings on the Support of Innovators and Entrepreneurs

6.2.1 Insights from AfriConEU

Learnings and Recommendations

#1 Learning

A number of stakeholders AfriConEU spoke, felt that hubs are not effectively supporting start-ups because the hubs themselves lack in-depth business development expertise in key areas like marketing, design thinking, market research and user testing that are necessary for developing successful businesses from idea to scale. Peer-learning is mentioned as relevant and useful.

Recommendations:

Opportunities for hub leaders to learn from other hubs leaders across the region who are facing similar challenges should be sought and promoted. In addition to connecting African DIHs to hubs in Europe, emphasis should also put on connecting hubs regionally for instance to perform joint capacity building activities and benefit from each other's experience. To be noted that preference is given to face-to-face events and training, where participants can interact directly and on-site to discuss challenges and respond to exercises. Moreover, it has been suggested to build a ranking system for experts providing business development support services from Europe and Africa, as this would help build the credibility of such an offering for start-ups in the ecosystem.

#2 Learning

AfriConEU found that hubs face challenges in building effective partnerships with other key ecosystem actors including governments, corporates, investors and fellow hubs which is limiting hubs' ability to scale their impact, influence policy and more effectively contribute to developing the digital innovation ecosystem.

Recommendations:

Facilitating investment into the digital ecosystem by corporate actors; building evidence and data to support better policy making; supporting hubs to develop investment strategies and strengthening hub networks.

Building capacity in this aspect, for example, by training hubs to deliver a standardised enterprise support curriculum would be beneficial for enabling hubs to become well positioned to work with governments.

Moreover, enabling hub leaders' competences to implement and manage hubs on a data-driven approach, would be key. Support in this area could include sharing learnings of policies that have worked successfully to drive innovation in Europe, for example, technology investment tax incentives; facilitating joint information gathering on the economic contributions of the digital economy

and hubs; as well as providing expertise in drafting policy recommendations and supporting dissemination of learnings from the data gathered.

6.2.2 Insights from Hubiquitous

Learnings and Recommendations

#1 Learning

Providing capacity building to entrepreneurs in terms of training only is not enough to enhance the hands-on capacity of entrepreneurs.

A survey carried out by DTBi in 2023, on the African innovation Ecosystem revealed that training programmes provided to entrepreneurs are important in providing insights into business and industry trends, and emerging technologies that are paramount to their businesses, and in imparting best practices to them.²¹ On the other hand, mentorship provides guidance and practical experiences from professionals and industry players. When these two are combined they produce entrepreneurs who are competent and capable to face different business challenges leading to successful entrepreneurial businesses. Thus, if we want training to be impactful to our entrepreneurs, it should be provided as a package that includes training and mentorship for a specified period to ensure the trainees can apply the knowledge and skills acquired.

Recommendation:

The envisaged collaboration between Africa and Europe should take into consideration how the two sides can enhance the capacity of African entrepreneurs by providing hands-on training coupled with mentorship to enhance African entrepreneurs' confidence in the long-term collaboration between European youth and their peers in Africa.

#2 Learning

A wider collaboration and partnership among entrepreneurs and other stakeholders nationally, regionally, and internationally provides amazing opportunities for African entrepreneurs.

The survey referred to above has also shown that when entrepreneurs collaborate with industry experts and investors, they can access funding and enhance their competitive advantages. Likewise, when they collaborate with academic and Research and Development institutions, they can access cutting-edge research and knowledge exchange. On the other hand, when they collaborate with start-ups and SMEs, they maximize synergies and promote collaboration in the ecosystem. Finally,

²¹ D5.4 Handbook on African innovation ecosystem for setting up long-term collaboration.(2023).HUBiquitous.

when they collaborate with the government, they get the opportunity of aligning policies and regulations with the needs of entrepreneurs by pushing for a supportive conducive environment.

Recommendations:

The Hubiquitous initiative of creating collaboration between African and European IoT Innovators should be consolidated and disseminated for future collaborations of entrepreneurs in a wider spectrum.

#3 Learning

A supportive environment is considered to be a key element in providing sustainable support to entrepreneurs.

The existence of innovation intermediaries such innovation spaces, and incubators that provide technical support to entrepreneurs can speed up the scaling process for an entrepreneur. Such centres can provide access to advanced technologies, specialized infrastructure such as development and testing labs which are fully equipped, and technical expertise. Innovation intermediaries like I@LabAfrica/Strathmore University–Kenya, DTBi–at COSTECH in Tanzania, Innovation Growth Hub, CoLab Innovation Hub (Nigeria), EdenLab (Ghana), Accelerator (Egypt), ICODE GH (Ghana), and Node Eight (Ghana) have gone beyond the common services and have witnessed amazing improvement to their entrepreneurs. They have access to additional services such as funding, and opportunities. Assisting innovators in securing financing and technology support, especially at the growth stage where strong financial institutions show hesitation for risk avoidance.

Recommendations:

Support to entrepreneurs at the scaling stage is so important to African entrepreneurs. Experience from various projects supported by European Institutions has been focused on ideation, prototyping and minimum viable product stage forgetting the scaling stage which is a serious setback for most entrepreneurs due to the limited number of supporting institutions at this level. Therefore, Europe African collaboration needs to develop and implement modules that will consider supporting start-ups to scale-up their business models.

#4 Learning

The survey conducted by DTBi also revealed that Infrastructure is one of the serious challenges to African rural areas that limit the activities of entrepreneurs in those areas. Participants in the survey emphasized the need to enhance internet connectivity and power supply reliability in rural areas particularly the last mile connectivity.

Reliable internet and power supply speed up technology implementation and poor infrastructure limits technology deployment. All these hinder effective entrepreneurial activities in rural areas. Entrepreneurs operating in those areas cannot compete with their colleagues in the urban areas who have high-speed internet and reliable power. It is important to note that power companies and internet service providers are more interested in profits than services, so they don't care much about areas that are not profitable. Therefore, entrepreneurs who are in the rural areas have limited access to customers and suppliers of their goods and services while those who are in the urban areas are more advantageous because of access to abundant information from the internet. As a result, there is rural-urban migration where people from rural areas move to urban centers in search of employment and better living conditions among others.

Recommendations:

African Governments and partners like the EU should work together to develop fiscal incentives such as to subsidize power companies and Internet service providers to extend services to underserved communities to encourage entrepreneurship in those areas and thus control rural-urban migration

6.2.3 Insights from DIGILOGIC

Learnings and Recommendations

#1 Targeted needs-based consulting is perceived to be of higher value than predefined generic mentoring from the European DIHs

#2 The timing of support from European DIHs needs to be synchronized with the start-ups' evolving trajectories rather than set-out in a rigid schedule

#3 Networking events provide start-ups with valuable connections to potential investors, partners and customers and raises their bargaining power

In its one-year programme of support for start-ups, DIGILOGIC implements a targeted needs-based method for planning and reporting. This approach was developed, in accordance with the latest scientific research into survival in changing environments, in order to provide the start-ups with the most impactful support possible. When entering the DIGILOGIC programme, few of the start-ups had clearly defined their needs to leverage the opportunity to get company-specific needs-based mentoring support. However, the DIGILOGIC consortium invested a high amount of effort into the identification of their concrete needs to support them in the best way possible. This raised the question whether targeted needs-based consulting as opposed to predefined generic mentoring is a good and value-adding approach for the start-ups. DIGILOGIC found out that a high value of the support was perceived by the start-ups when:

- targeted consulting rather than generic mentoring was provided
- knowledge transfer through demonstration was carried out because this can inform the development of company-specific improvements: for example, through the co-creation of proof-of-concept demonstration
- the provision of technical expertise overcame the start-ups lack of time to explore all available options for addressing a technical shortcoming their operations
- support from DIHs was aligned with the start-ups evolving trajectories as influenced by unpredictable events such as widespread civil disorder in cities; personal health challenges such as malaria; need to focus all attention on large commercial orders; new customers in regions without reliable Internet connectivity
- they were connected to potential investors, business angels, strategic partners or potential customers (e.g., through four webinars with the start-ups)

Reflecting these insights amongst the European and African DIHs from the consortium, DIGILOGIC came to the conclusion that general mentoring with respect to the development of the start-up, its business model etc. is in many cases already covered by the local African hubs who knows their market, regulations, laws and the ecosystem much better than European hubs.

The most important added value by European hubs can be brought through in-depth expertise about certain industries, processes, technologies and markets. However, the support needs to be offered with a low-entry barrier in order for the start-ups to access the range of support offers possible. Many start-ups in Africa have not received similar support before and are not aware of what they can ask for.

Recommendations:

- Communicate the value of expertise and mentoring in terms that are specific to the start-up's needs. A simple science-based practical method for doing this has been developed and applied in DIGILOGIC
- Mentors need to invest a comparatively large amount of time in the understanding of the business model and the current challenges of the start-up. It is essential that the need for support is jointly identified
- Experts from the EU DIHs need to make transparent what kind of support offers are available and what the added value for the start-up is
- The organizing of networking and pitching events including stakeholders from EU and AU provides a real added value to the start-ups because of 2 reasons: 1. They get connected to

potential investors, customers or business partners; and 2. They gain visibility and the opportunity to raise awareness for their company. This in turn increases their bargaining power when searching for further funding, customers and partners

#3 Free open source software and free online open access programming training provide common resources that can be shared between DIHs and start-ups

Although much of free open-source software and free online open access programming training does not originate in either Africa or Europe, they provide common resources that can be shared between DIHs and start-ups. This sharing takes place within the broader context of people quickly asking and answering questions about programming via open forums, which facilitate the co-creation of mutual knowledge during the development of new software applications. Several of the start-ups have one person who has experience of open source and open access resources to develop software and their programming skills. Interestingly, they have a level of competence at least equal to people who have studied computer science at university. This indicates the potential of open source and open access resources to bridge digital divides.

Recommendations:

- Formulate easy-to-understand map to describe the landscape of open-source software and free online open access programming training
- Formulate illustrative examples of how they can be combined to provide new software applications

#4 African start-ups require funding and financing in order to improve efficiency of their operations and scale up their business

African start-ups are often in need of funding in order to improve efficiency of their processes and scale up their business. Generally, local investors from the respective region or country are preferred as they also have an intrinsic motivation for investing in their country and are rather willing to support the start-up with expertise besides the financial investment. Furthermore, international investors are often not interested unless local investors are already involved. However, in many African countries national investors are scarce so that the majority of start-ups do not have the opportunity to acquire even smaller sums of funding. This learning inspired DIGILOGIC partner BongoHive to develop a concept for establishing a fund to support local start-ups.

Recommendations:

- Activities supporting the establishment of local funding mechanisms by involving relevant stakeholders, sharing experience and supporting with the set-up of such mechanisms are needed

#5 Learning Case based learning and working in multi-functional teams provides hands on experience and practical industry based skills for recent graduates and young aspiring African entrepreneurs

Practical Learning: The capacity-building programme focused on providing practical, hands-on learning experiences rather than theoretical knowledge. This approach allowed participants to directly engage with real-life challenges faced by companies.

Collaborative Problem Solving: By forming cross-functional teams, participants were exposed to diverse perspectives and skill sets. Collaborative problem-solving enabled them to approach challenges from different angles, leading to more comprehensive solutions.

Applied Design Thinking: The programme emphasized design thinking and prototyping tools, enabling participants to understand how to ideate, iterate, and develop solutions iteratively. This hands-on experience in the innovation process was crucial for their learning.

Industry Integration: Partnering with local start-ups in Ghana and Zambia connected the participants with real companies and their challenges. This real-world integration bridged the gap between academic learning and practical application.

Experiential Immersion: Participants were immersed in real-life situations, simulating the professional environment. This helped them develop a deeper understanding of how technology-based solutions can address genuine company issues.

Recommendations:

Continued Industry Collaboration: Building partnerships with local start-ups or established companies is recommended for sustained success. Regular collaborations ensure that the programme's content remains relevant and aligned with industry needs.

Longer-Term Engagement: The one-month timeline for the programme proved to be quite short. Extending the programme beyond the initial capacity-building phase may have been more beneficial

to the participants. This could involve follow-up sessions, mentorship, or project implementation support. Long-term engagement can enhance the impact of the skills acquired. As a result, DIGILO-GIC opted to suggest to the companies to hire the winning participants as interns to further cement their learning.

6.2.4 Insight from mAkE

Learnings and Recommendations

#1 Learning

Effective stakeholder engagement is the bedrock upon which supportive innovation policies are built. Policymakers should initiate and maintain open channels of communication with innovation hubs, entrepreneurs, investors, and industry experts. By actively involving these stakeholders in the policy-making process, governments can gain firsthand insights into the challenges and opportunities within the innovation ecosystem. This engagement should not be a one-time occurrence but an ongoing dialogue, ensuring that policies remain adaptable and responsive to changing dynamics. Workshops, roundtable discussions, and advisory committees can serve as platforms for this engagement. Furthermore, policymakers should consider creating digital platforms or networks that facilitate continuous interaction, enabling the timely exchange of ideas and feedback. Stakeholders should be encouraged to voice their concerns, share their experiences, and propose solutions, fostering a sense of ownership and collective responsibility for the success of innovation hubs and hub networks.

Recommendations:

Policymakers should prioritize active engagement with stakeholders, including innovation hubs, entrepreneurs, investors, and industry experts. Regular dialogues and consultations should be held to understand the evolving needs and challenges of these key players. This collaborative approach ensures that policies and initiatives are tailored to address the real-world issues faced by innovation hubs and hub networks.

#2 Learning

Access to financial resources is fundamental to the sustainability and growth of innovation hubs and hub networks. Policymakers should not only allocate dedicated funding but also explore innovative financing models. This might include setting up innovation funds, providing low-interest loans, or in-

centivizing private sector investment. Beyond financial capital, hubs require access to physical infrastructure, modern technologies, and mentorship networks. Policymakers can play a pivotal role in brokering partnerships between innovation hubs and established industries to facilitate knowledge transfer, resource sharing, and access to markets. Additionally, governments should consider supporting programmes that encourage corporate social responsibility, encouraging large enterprises to invest in the development of innovation hubs. By ensuring that innovation hubs are well-resourced, governments empower them to nurture start-ups, incubate new technologies, and drive economic growth.

Recommendations:

Policymakers must facilitate access to funding and resources to sustain and expand innovation hubs and hub networks. This includes establishing mechanisms for grants, loans, and financial incentives. Ensuring that hubs have the necessary financial backing allows them to develop, scale, and provide support to the broader innovation ecosystem.

#3 Learning

Creating an environment that fosters innovation requires more than just financial support. Policymakers should actively design and implement policies that are conducive to the growth of innovation hubs and hub networks. These policies may encompass tax incentives for research and development, intellectual property protection, streamlined regulatory frameworks, and public procurement programmes that favour local innovators. Infrastructure is equally important; hubs need well-equipped physical spaces with state-of-the-art facilities, high-speed internet, and access to research institutions. Furthermore, innovation-friendly policies should encourage collaboration between hubs, educational institutions, and private enterprises to promote knowledge sharing and cross-disciplinary projects. Such an ecosystem not only attracts local talent but also encourages foreign investment, leading to a flourishing innovation landscape.

Recommendations:

Policymakers should focus on creating an ecosystem that nurtures innovation by implementing supportive policies and infrastructure. This includes tax incentives, streamlined regulatory frameworks, and robust physical infrastructure. These measures collectively create a conducive environment for innovation hubs and hub networks to thrive.