Bridging the Digital Divide with upskilling strategies which unlock an expert IoT workforce: A way forward for AUDA -NEPAD

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Abstract

The internet of Things as a disruptive technology of the day and trend brings in a huge sense of connectivity and interaction not only between objects or devices, but also the workforce within institutions to amplify efficiency and productivity. This paper provides insights and perspectives of how institutions can bridge the digital divide with upskilling strategies which unlock an expert IoT workforce. Particularly, it focuses on AUDA – NEPAD scope of work areas such as Economic Integration, Human Capital and Institutional Development, Digitalization, Science, and Technology, Smart Industrialization and Environment Sustainability by elucidating how IoT can positively influence these aspects and vice versa for the benefit of the workforce and institutions in Africa. Moreover, it offers recommendations to AUDA – NEPAD on how it can play a leading role in IoT embracement in Africa to address the issues previously mentioned and foster industrialization in the continent. It highlights that regardless of the IoT's benefits, the impact is highly felt only by the urban-based workforce, neglecting the rural-based workforce, who are the majority population in Africa. It concludes that there is a need for the public and private sector to invest in the Internet of Things (IoT) in both rural and urban African areas for the purpose of not only minimizing unemployment, attracting investment in IoT to retain staff, but also to keep the workforce up to date by bridging the digital divide.

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Introduction

The concept of the Internet of Things is referred by the Institute of Electrical and Electronics Engineers Communications Magazine as 'a framework in which all things have a representation and a presence on the Internet.[1] More specifically, the Internet of Things aims at offering new applications and services bridging the physical and virtual worlds, in which Machine-to-Machine (M2M) communications represents the baseline communication that enables the interactions between Things and applications in the cloud.[2] However, since the term was first coined in 1999 by the British Technology pioneer Kevin Ashton, different definitions have emerged. For instance, on a report published in 2012 by the International Telecommunication Union (ITU) (namely ITU–T Recommendation Y.2060, Overview of the Internet of things) the concept is defined as 'a global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies'.[3] Conversely, Rose, Eldridge, and Chapin (October 2015) elucidate the terms 'Internet of Things' and 'IOT' as broadly to the extension of network connectivity and computing capability to objects, devices, sensors and items not ordinarily considered to be computers.[4]

Therefore, with the rise of globalization and the 4th Industrial Revolution -that can be described as the advent of 'cyber-physical systems' involving entirely new capabilities for people and machines[5]-, the world is not only turning into a village nowadays, but into a smart village where different things or objects are interconnected to create efficiency and effectiveness in different social, economic and political settings such as workplaces, homes, retail shops, infrastructures, healthcare providers, manufacturing industries, transportation system, electoral system, supply chain,

utility companies, insurance, and oil and gas as to name just a few. As a result, all these settings are now highly influenced by the Internet of Things (IoT), robotics, virtual reality (VR) and artificial intelligence (AI). This means that IoT is not only a disruptive technology but also a trend of the day that may have a major positive impact in all works of life in Africa if well used. As per Tech Target, when it comes to the Internet of Things (IoT), the numbers depicting its market impact are staggering: it is a $737 billion market, reaching $1.3 trillion by 2020. By 2025, the total global economic value of IoT technology could be as much as $6.2trillion.[6] These statistics manifest the need to invest in the workforce and institutions with the IoT technology for upskilling strategies that will unlock their full potential to ensure that no one is left behind and enhance productivity.

Consequently, after getting diverse perspectives of how different authors view the Internet of Things and its promising positive impact in the social, political and economic spectrum in Africa and the world at large, this paper offers an in-depth insights on the topic, 'bridging the digital divide with upskilling strategies which unlock an expert Internet of Things (IoT) workforce: A way forward for AUDA -NEPAD,' by responding to research questions such as: how can we ensure workforce is up to date on all things IoT so it does not get left behind? How do we minimize unemployment through IoT knowledge byupskilling strategies which are proven to work? And lastly, how can encourage a tech-first culture and mindset across institutions in Africa to security investment into IoT vision and, hence, retain staff?

As a background to address the research questions, this paper highlights the nexus of the Internet of Things with a focus on AUDA-NEPAD scope of work areas such as economic integration, human capital, and Institutional Development, digitalization, science, and technology, Smart Industrialization, and last but not least, Environment Sustainability. Most importantly, it offers recommendations of what should be done by AUDA - NEPAD to accelerate development in Africa with respect to adaptation Internet of Things.

1 Bouk ,A.H. , IEEE Communication Magazine, May 04, 2017, https://ieeexplore.ieee.org/document/7916573/authors#authors

2 Ibid

3 "Overview of the Internet of Things." ITU, June 15, 2012. http://www.itu.int/ITU-T/recommendations/rec.aspx?rec=Y.2060

4 Rose, K., Eldridge, S., Chapin, L., October 2015, "The Internet of Things: An overview understanding the issues and challenges of a more connected world," Internet Society (ISOC)

5 What is Fourth Industrial Revolution, World Economic Forum, January 2016, https://www.weforum.org/agenda/2016/01/what-is-the-fourth-industrial-revolution/

6 Tech Target, white paper, April 2017, 'How to plan for IoT success: strategy and recommendations.'

Research method

The research method used to conduct this study is based on data that is exploited through a literature review of information available on Open Source or publicly available data. Open source data are defined as a raw print, broadcast, oral debriefing, or other forms of information from a primary source.[7] The study has relied on open source simply because it is data that is publicly available on either online and/or on offline libraries. The diversity of emerging topics is addressed through a holistic conceptualization and synthesis of the existent literature.[8]

Literature review

1. Internet of Things Nexus to Economic Integration

The sense of connectivity among things, objects or as an interaction between machine to machine (M2M), machine to human (M2H), human to machine (H2M) or human to human (H2H) through the extension of network connectivity and computing capability means, that has arisen as a result of the Internet of Things (IoT), can play a vital role in the economic integration process in Africa and vice versa as far as creation of employment opportunities, workforce retainment and IoT investment within our entities is concerned.

According to Online Cambridge Dictionary, economic integration is a process in which the economies of different countries are more connected because government rules, taxes, limits, etc., are removed from trade between those countries. Therefore, the presence of IoT might have created a platform for a digital single market in Africa, in which most barriers have become a myth for people to interact and conduct trade activities regardless of the existing physical borders between their respective countries.

As defined by the European Commission, a digital single market is one in which the free movement of goods, persons, services, and capital is ensured and where individuals and businesses can seamlessly access and exercise online activities under conditions of fair competition while receiving a high level of consumer and personal data protection, irrespectively of their nationality or place of residence.[9] Moreover, the African Union is also emulating a portion of the digital single market to simplify trade by incorporating digital (IoT) approaches among the supporting instruments facilitating the African Continental Free Trade Agreement (AfCFTA) that intends to promote economic integration in Africa. It is noted by the African Union (2019) that the AfCFTA supporting instruments are: rules of origin, schedules of tariff concessions on trade in goods, online non-tariff barriers monitoring and elimination mechanism, digital payments and settlement platform, and African Trade Observatory Portal.[10]

Thus, IoT may have an astonishing contribution to economic integration in Africa due to declining trade costs influenced by it. As per the World Trade Report (2018), international trade costs declined by 15 percent between 1996 and 2014. New technologies will help to reduce even more the costs of trade. On that note, the report further highlights that projections predict that trade could grow yearly by 1.8 - 2 percentage points more until 2030 as a result of the falling trade costs, amounting to a cumulated growth of 31 to 34 percentage points over 15 years. Moreover, and still according to the report, in such case, developing countries' share in global trade could grow from 46 percent in 2015 to 57 percent by 2030.

Nevertheless, with the existence of a single digital market that comes as a result of adaptation of IoT, AI and 4th Industrial Revolution, institutions and workforce will not be the only ones benefiting from this technology; different individuals, companies and industries will also be able to capacitate their workforce through technological transfer and compete in the market.
Moreover, the absence of trade barriers or limits eliminated by the African Continental Free Trade

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7 Williams, H.J, Blum, I., 2018, Defining Second Generation Open Source Intelligence (OSINT) for Defense Enterprise,Rand Corporation, Santa Monica, Calif

8 Torraco, R.j, Writing integrative literature reviews: Using the Past and Present to Explore the Future, Hum. Resource. Dev. Rev., 15 (2016), pp. 404-428

9 European Union, 2015 as quoted by Jorge Alejandro Patiño and Edwin Fernando Rojas on "Regional Digital Market: Strategic Aspects," Economic Commission for Latin America and the Caribbean.

10 African Union, 29th April 2019, AfCFTA Agreement secures minimum threshold of 22 ratifications as Sierra Leone and the Saharawi Republic deposit instruments.

Agreement (AfCFTA), will allow not only the flow of capital or investment to institutions but also grant them access to trade their goods, services and conduct business activities with other countries in the region. In a nutshell, the more there is connectivity and economic activities interaction between institutions or individuals from country (A) to institutions or individuals in country (B) –which is an outcome of an integrated economy facilitated by a single digital market-, the more it will be possible to up-skill strategies that will unlock an expert IoT workforce, promote a tech-first culture and secure investment into IoT vision and retain staff in the different institutions across Africa.

2. Internet of Things Nexus to Human Capital and Institution Development

Human resource development is a crucial requirement not only to build up technical knowledge and capabilities but also to create new values to help individuals and nations cope with fast-changing social, environmental and development realities.[11] The Internet of Things (IoT) is a technology concept that is currently transforming and redefining virtually all markets and industries in fundamental ways.[12] That being the case, if organizations in Africa opt to invest in IoT not only that it will reduce the unnecessary workload ofthe workforce and boost productivity, it will also facilitate the growth of organizations internally and expand their level of consumers reach in the competitive market and service provisions externally.

Organizations can use IoT to drive considerable cost savings by improving asset utilizationand enhance process efficiency and boostproductivity.[13] More importantly, IoT-driven innovations are expected to increase return on R&D investments, reduce time to market, and open up additional sources of revenue from new business models and opportunities. [14] The World Trade Organization report of 2018 explains that digital technologies may decrease the relevance of distance, be it geographical, linguistic or regulatory, and that

they also facilitate searches for products, introduce mechanisms to verify quality and reputation, and simplify cross-border transactions.[15] According to the Organization for Economic Cooperation and Development (OECD) (2016) report, using IoT approaches allows firms to fundamentally integrate sensing, analytics, and automated control into business models.[16] Some firms have called it the 'Industrial Internet' and have estimated gains of USD 10-15 trillion to global GDP over the next 20 years.[17] The report emphasizes that moving towards equipping machines with a range of sensors in order to be able to do predictive maintenance, firms are improving processes and have become smarter and more efficient.[18] According to a study by a network operator, the average cost saving for the industry, in general, is 18%, and nearly 10% of M2M adopters have reduced their costs by over 25%.[19] Furthermore, the report highlights that new jobs in IoT-related services will be created, e.g. in data analytics, while existing tasks may be enhanced through the availability of new tools. In an area such as warehousing, the IoT may improve the quality of jobs, though fewer employees may be required in increasingly 'robotized facilities',[20] which may lead to loss of jobs. However, the report argues that there are also cost savings associated with autonomous machines, which may allow the re-employment of people in other parts of the economy.[21]

On that account, due to revenue intensification and new opportunities, IoT will minimize unemployment, nurture tech-first culture among the staff members as they will be required to use technology in their day-to-day work and foster institutional developments in Africa.

The following, 'Internet of Things: A Transformational Force Table'" illustrate how institutions in the different sector can reap the benefits of applying Internet of Things to its workforce on a day to day operations.

11   United Nations. Report of the World Commission on Environment and Development (or Brundtland Commission), 1987.

12   Lucero, S., March 2016," IoT platforms: enabling the Internet of Things," IHS Technology

13   Cognizant Report, May 2014, Reaping the benefits of the Internet of Things

14   Ibid

15   World Trade Organization, (2018), The economics of how digital technologies impact trade

16   OECD, 24th May 2016, The Internet of Things: Seizing the Benefits and Adressing the Challenges, Background report for Ministerial Panel 2.2

17   Ibid

18   Ibid

19   Vodafone M2M Barometer 2015, p. 3

20   OECD, 24th May 2016, The Internet of Things: Seizing the Benefits and Adressing the Challenges, Background report for Ministerial Panel 2.2

21   Ibid

Table1: Internet of Things: A Transformational Force

Industry	Key Change	Potential Benefits
Automotive and Transportation	Real-time driving behavior, traffic and vehicle diagnostics.	Improved customer experience, reduced pollution, increased safety, and additional revenue streams.
Healthcare	Remote monitoring of staff and patients' ability to locate and identify the status of equipment.	Improved employee productivity, resource usage, and outcomes that result in efficiency gains and cost savings.
Manufacturing	Quick response to fluctuations in demand; maximized operational efficiency, safety, and reliability, using smart sensors and digital control systems.	Enhanced agility and flexibility, reduced energy consumption and carbon footprint.
Retail	Stock-out prevention through connected and intelligent supply chains.	Ability to predict consumer behavior and trends, using data from video surveillance cameras, social media, Internet and mobile device usage.
Supply Chain	Real-time tracking of parts and raw materials, which helps organizations preempt problems, address demand fluctuations and efficiently manage all stages of manufacturing.	Reduced working capital requirements, improved efficiencies and avoidance of disruptions in manufacturing.
	Smart lighting, water, power, fire, cooling, alarms, and structural health systems.	Environmental benefits and significant cost savings with better utilization of resources and preventive maintenance of critical systems.
Oil and Gas	Smart components.	Reduced operating costs and fuel consumption.
Insurance	Innovative services such as pay-as-you-go insurance.	Significant cost savings for both insurers and consumers.
Utilities	Smart grids and meters.	More responsive and reliable services; significant cost savings for both utilities and consumers resulting from demand-based and dynamic pricing features.

Source: Ericsson, M2M Magazine 2013, Zebra Consulting/Forrester Research, IBM, McKinsey & Co., Data Informed, ZDNet

IoT can help organizations make use of their business infrastructure and assets in innovative ways to offer new services and deliver additional revenue. Moreover, deriving meaningful information from the huge volumes of data that IoT produces can improve decision-making and enable proactive and predictive insights.[22] As a consequence, these huge volumes of data will unshackle a system of knowledge management that is healthy for the prosperity of the institutions and the workforce at large.

3. Internet of Things Nexus to Digitalization, Science, and Technology

The digital revolution is driven by technologies such as application programming interfaces (APIs) and the Internet of Things (IoT). It is changing communication, mobility, and commerce, closing traditional establishments and paving the way for new digital entrants.[23] Due to the rise of the digital revolution that is partly a result of the IoT, both

22   Cognizant Report, May 2014, Reaping the benefits of the Internet of Things

23   CA Technologies, A Guide to Digital Banking in the IoT Economy

public and private organizations are moving away from traditional approaches by choosing IoT technologies to digitalize their modus operandi. And to some, this is an opportunity to create new scientific IoT platforms or infrastructures and supply them to other institutions as vendors. According to Misuraca (2009), IoT brings with it a wealth of new business opportunities. There is an enormous scope for developing applications and selling new services.[24] Indeed, employment opportunities will be created and there will be the need for organizations to up-skill their workforce so as to be able to operate with the new installed models where smart devices and sensors are the driving force behind IoT.

Figure1: IoT Drivers: Exponential Growth of Smart Devices and Sensors
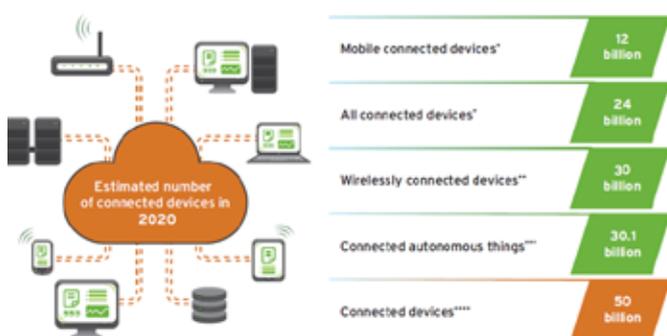
Source: * GSMA, ** ABI Research, *** IDC and **** Cisco

Companies that sit at the heart of the telecom, networking, industrial infrastructure, enterprise system and cloud computing sectors are converging on the strategy of offering IoT platforms to facilitate the broader economy's transformation to pervasive connectivity. Examples of leading ICT firms that have introduced IoT platforms include Amazon Web Services, AT&T, Cisco, Deutsche Telekom, Ericsson, Fujitsu, General Electric, Huawei, IBM, Salesforce.com and Vodafone, among others. Huawei's Ocean Connect IoT Platform is an example of a leading IoT platform strategy. [25] Respectively, this adaptation of Internet of Things does not only foster digitalization, science and technology within institutions, but will crucially minimize the likelihood of unemployment, bridge the digital divide and, lastly, ignite the passion to

embrace technology in organizations or institutions in a day to day operations.

4. Internet of Things Nexus to Smart Industrialization

Internet connectivity is becoming the driving force behind modern manufacturing.[26] As industries are now moving towards modern technology adaptation by applying IoT to boost efficiency and productivity through innovative ICT technologies, they have become smart industries in which the manufacturing process is well equipped with smart devices and intelligent machinery monitored through an interconnected network system.. According to Chao (2015), fully connected intelligent industries are redefining the landscape of traditional manufacturing, connecting manpower, application systems and intelligent machinery at unprecedented rates. Ultimately, they will create an era of agile and networked manufacturing.[27]

As illustrated in figure one (1), in the manufacturing industry, IoT will enable a quick response to fluctuations in demand; maximized operational efficiency, safety, and reliability, using smart sensors and digital control systems that will lead to enhanced agility and flexibility, while reducing energy consumption and carbon footprint. As a result of cost savings, improved asset utilization led by IoT, industry revenues will increase astonishingly and foster economic growth.

Three of the most important means by which the pervasive connectivity of the IoT will affect the economy, as well as society, are in the areas of automation, integration, and servitization. These three features are interrelated in the sense that automation and integration are often employed in tandem to enable servitization.[28] These three factors are explained in more detail below[29]:

- **Automation:** Connecting machines, sensors, and actuators to computing systems enables a large degree of process automation. For example, fleet management systems enable automatic logging

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24 Misuraca, G. (2009) 'Futuring e-Government: Governance and Policy Implications for Designing an ICT-enabled Knowledge Society', Proceedings of the 3rd International Conference on Theory and Practice of Electronic Governance, ACM, New York, NY, USA, pp. 83–90.

25 Lucero, S., March 2016, IoT platforms: enabling the Internet of Things, IHS Technology.

26 Zhao, W., February 2015 (Issue 13), Smart Factory Solution for the Modern Age, Huawei Enterprise

27 Ibid

28 Lucero, S., March 2016, IoT platforms: enabling the Internet of Things, IHS Technology

29 Ibid

of driving parameters such as hours in motion, removing the need for drivers to manually submit this information. Automation facilitates dramatically larger scales of data utilization as well. For example, jet aircraft engines typically produce several terabytes of data per flight on operating parameters. Proactively monitoring this data feed enables faster resolution times in instances of performance faults and minimizes unnecessary maintenance services.[30]

- **Integration:** There are more benefits than simply connecting a machine and automating its performance. Integrating the data from a machine with data from other sources, such as the aforementioned ERP systems, open government databases, and social media feeds, greatly enhances the value derived from connecting the machine. For example, Salesforce.com enables the integration of machine performance and condition data, collected automatically from the machine, to be combined with traditional customer relationship management (CRM) data and social media feeds to improve the organization's customer service by working proactively.[31]

- **"Servitization":** Together, automation and integration help organizations move from primarily product-centered business models to service-oriented business models, also known as 'servitization'. Many traditionally product-centered companies are realizing the revenue opportunities offered by developing an ongoing, service-oriented relationship with customers, for example organizing a customer relationship on the basis of a service contract whereby the customer is paying for a negotiated business outcome rather than a piece of equipment. In fact, automakers are increasingly talking about "mobility as a service" as a result of connected, and increasingly autonomous, vehicles as opposed to the traditional vehicle sales model.[32]

Therefore, as per the explanation provided by Lucero (2016), Internet of Things play a vital part in advancing smart industrialization. Consequently, if Africa adapts this technology, industries will not be the only ones benefitting from the efficiency and productivity offered;

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30 Ibid
31 Ibid
32 Ibid

staff could also be able to learn new skills. Therefore, unemployment will decrease, the culture on tech will escalate within organizations and, as a result of revenues of growth, conditions of staff will also prosper positively.

5. Internet of Things Nexus to Environment Sustainability

A clean, safe and sustainable environment could be possible if all our social and economic settings are characterized by the smartness of everything as far as the IoT is concerned.

This technology will also offer massively to environmental sustainability, that will lead to a healthy workforce with sufficient resources, skills, and knowledge to adapt in the new interconnected system.
The technical innovation that is being driven by IoT can be utilized in a number of situations to advance environmental sustainability efforts, including advancing agricultural efficiency, reducing food waste, and managing transportation impacts, especially through implementing IoT in smart cities.[33] For instance, according to Hewlett Packard Enterprise (2017), many urban areas are embracing the idea of smart cities, where IoT is embedded in public infrastructure to automate efficiency and track data for applications from traffic light sensors, to waste management, to paving the way for driverless cars.[34]

Many of the systems in smart cities rely on analytics, meaning decisions on data are automated in real-time as it is collected.[35] These systems can respond to information dynamically as environments change, and in smart cities, this can improve public infrastructure, traffic management, and provide a wealth of other solutions.[36] Therefore, with the potential brought by the Internet of Things, our industries and organizations will be able to 'reduce waste in manufacturing, to help grocers manage surplus food, to change the way data centers are used.'[37] Ultimately, if IoT is integrated within institutions in the African continent all these positive impacts will facilitate

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33 Hewlett Packard Enterprise, Globe-scan,(January 2017), ' Capitalizing on the sustainable benefits of the IoT: Observations from the Living Progress Exchange', Business White Paper
34 Ibid
35 Ibid
36 Ibid
37 Ibid

data-based decision making that may influence the creation of employment opportunities, promote a tech-first mindset, keep the workforce up to date with respect to IoT and, almost importantly, bridge the digital divide.

Recommendations

Therefore, with respect to the benefits and challenges brought by the Internet of Things, AUDA - NEPAD as an implementing arm of the African Union has a fundamental role to ensuring that Africa is not left behind with the revolution brought by IoT in the world. That being the case, AUDA – NEPAD has to lead the way for African countries to integrate IoT in different social, political and economic sectors as far as its focus areas and the aspirations of Agenda 2063 are concerned. Therefore, following are the recommendations:

• AUDA – NEPAD should fully adopt IoT Technology to enhance efficiency, smooth implementation, monitoring and evaluation of development projects in member states. For instance, having an open database where member states will voluntary submit reports as feedback on different agreed strategic continental projects, example PIDA, CAADP, ASTII, AMRH and SAPBHSS project, etc. This will facilitate a knowledge management system that will be useful for sharing best practices for implementation of future national, regional and continental projects by understanding their successes, setbacks and how to address them.

• AUDA – NEPAD should initiate a project or program that will advocate for the member states to shift from the traditional modus operandi to modern modus operandi by integrating Internet of Things in their development projects such as infrastructures, healthcare, transportation, waste management, industries, agriculture and mining activities as to name just a few , to facilitate productivity, efficiency, cost savings and revenue growth that will foster economic advancement and create more employment opportunities for the unemployed majority youth in Africa.

• AUDA – NEPAD should encourage member states to balance investment in telecommunication development infrastructures between urban and rural areas so as to ensure connectivity and equal access to the Internet of Things that may help rural based majority farmers involved in agriculture to

boost their productivity through smart agriculture practices and mitigate the risks of unforeseen circumstances, such as change of weather, flood, drought, cyclones, etc.

• Apart from encouraging the member states to adopt IoT in their institutions or development programs, AUDA-NEPAD should also come up with a strategic plan that will help the member states to mitigate the risks and challenges coming as a result of embracing the Internet of Things, so as to ensure the workforce within institutions in member states is well informed and equipped with necessary skills needed to resolve them.

• AUDA – NEPAD should rally the member states to formulatean Internet of Things policy framework and simplify legal frameworks. By doing so, it would provide a strategic direction of what the country intends to achieve with the IoT in terms of bridging the digital divide, and how it is going to achieve it as well as addressing the fear of the workforce losing their jobs as a result of the digital revolution.

• AUDA – NEPAD should identify potential Sustainable Development Goals and Agenda 2063 Aspirations targets addressable by the Internet of Things (IoT) projects and incorporate them into the commercial designs to promote digital transformation, in order tosupport social economic development in the continent.

• AUDA – NEPAD should conduct enhanced R & D as well as concrete implementations regarding digital security (information and cybersecurity) in order to enforce safety and security in the beneficial usage of IoT Services in the member states.

Conclusion

In conclusion, despite the promising benefits of IoT, its positive effects caneffects can only touch those with access to the internet connectivity and, therefore, neglects rural less connected communities who are the majority in Africa. For that reason, as we are moving towards the 4th Industrial Revolution, IoT technology should also impact the rural-based institutions and workforce that is highly depending on agriculture for subsistence.

Lastly, Ifif we are to not leave anyone behind, there is a need for the public and private sector to invest in the Internet of Things (IoT) without distinction in both rural

and urban areas in Africa for the purpose of not only minimizing unemployment, attracting investment in IoT for staff retainment, but also to keep the workforce up to date by bridging the digital divide. And for this to be successful, AUDA - NEPAD as the only African Union agency responsible for development as well as ensuringas ensuring Agenda 2063 and the SDGs are fully realized has a big part to contribute in influencing positive results of IoT in both rural and urban settings in Africa.

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Figures

- Table 1: Source: Ericsson, M2M Magazine 2013, Zebra Consulting/Forrester Research, IBM, McKinsey & Co., Data Informed, ZDNet
- Figure 1: Source: * GSMA, ** ABI Research, *** IDC and **** Cisco

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About Policy Center for the New South

The Policy Center for the New South (PCNS) is a Moroccan think tank aiming to contribute to the improvement of economic and social public policies that challenge Morocco and the rest of the Africa as integral parts of the global South.

The PCNS pleads for an open, accountable and enterprising "new South" that defines its own narratives and mental maps around the Mediterranean and South Atlantic basins, as part of a forward-looking relationship with the rest of the world. Through its analytical endeavours, the think tank aims to support the development of public policies in Africa and to give the floor to experts from the South. This stance is focused on dialogue and partnership, and aims to cultivate African expertise and excellence needed for the accurate analysis of African and global challenges and the suggestion of appropriate solutions.

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