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Unlocking the digital economy in Senegal: Executive summary

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This study aims to understand how digitalisation can support the creation of dignified and fulfilling work for young Senegalese men and women and identify specific opportunities.

Broad view of digitalised economy. To fully understand the employment dynamics associated with the digital economy, this study takes a broad view of the digitalised economy as defined by Bukht and Heeks[1]. According to this definition, the **digitalised economy** refers to not only purely digital products and services, but rather the application of digitalised activities and technology to economic activity. This definition also includes a consideration of the ways in which digital technology can enhance the efficiency and productivity of traditional economic activities, for example, the use of digital technology to enhance agricultural productivity through precision agriculture (PA) or the efficiency and reliability of logistics.

Sectoral transmission mechanisms. A key implication of this understanding of the digitalised economy is that the adoption of digital innovation enhances the efficiency, and therefore the productivity, of the enterprises that operate within sectors. This leads to enhanced competitiveness and productivity, and therefore growth in each sector. Sectors that grow ultimately create more jobs – both by generating employment at existing enterprises and by creating opportunities for new entrants. These linkages from digital innovation to employment constitutes the theory of change that underpins this study.

Deep-dive sector focus to identify key opportunities and risks arising from digital innovation. To understand how digital innovation manifests and the opportunities that it creates in Senegal, this study focused on four key sectors. The deep-dive sector focus aims to unpack the specific opportunities that are created by digital innovation in sectors that are key contributors to growth, employment and policy objectives. However, the deep dives also serve as case studies to enable the trends, opportunities and risks that apply across the economy more broadly.

Broad impact, but targeted interventions required. While digitalisation of the economy is broad and has widespread impact and implications for individuals and enterprises, this study finds that a small number of targeted, well-selected interventions with specific objectives are likely to generate the greatest potential positive impact. Such specific interventions can, firstly, unlock substantial productivity gains in targeted

1 Bukht, R. & Heeks, R., 2017. Defining, Conceptualising and Measuring the Digital Economy. s.l.:s.n.

sectors. Secondly, they can create positive network effects that encourage further development, and adoption and application of digital technologies. These technologies can address challenges, improve resilience and enhance productivity in areas of the economy and population not directly reached through targeted interventions. The deep dives into the four focus sectors aim to provide this focus by identifying the specific interventions likely to yield the greatest impact in the target sectors, but also for broader application across sectors.

The four deep-dive sectors selected for this study are **education**, **tourism**, **groundnuts** and **textiles**. These sectors were chosen because they are strategically and economically important. Education is also a critical enabling function in developing the requisite skills for the rest of the economy while the latter three provide insight into the three broad economic sectors of services, agriculture and manufacturing.

Education

Education sector not currently supplying the skills needed to develop the economy. High pupil-to-teacher ratios, poor teacher qualifications, a lack of access to content, and gender disparities are all major challenges that are leading to poor educational outcomes in Senegal. For instance, only 29% of children and 35% of young people are achieving a minimum proficiency level in reading and mathematics[2]. Furthermore, of the small portion of Senegalese youths that graduate from tertiary institutions, few have the skills most in demand in the economy. Even among those studying in-demand skills such as STEM (science, technology, engineering, mathematics), schooling remains very theoretical in nature. The result is a ***mismatch between the profile of the youth labour force and the needs of the job market***. The primary opportunity lies in deliberately identifying the key growth sectors and the likely skills required to further grow those sectors over the next 5-10 years and then implementing targeted vocational training initiatives that develop the necessary skills required by industry. Digital innovation offers two key opportunities or imperatives to do so:

- ***Using digital technologies in a blended learning environment to reach marginalised groups and to access necessary content.*** A successful online learning model is often accompanied by in-person teaching for practical learning. Adopting digital technologies in a blended learning environment enables learners to access the best educational content available globally while still benefitting from in-person support and interaction. It also presents opportunities to increase access to education for women and rural communities. It is, however, important to follow the Virtual University of Senegal (UVS) model to ensure that poorer students also have access to the devices and connectivity needed to engage in blended learning. More specifically, there is a clear opportunity to replicate the open digital spaces provided by UVS in a way that is not tied to a specific institution.
- ***Dealing with educators' limited proficiency and understanding of digital skills.*** Policymakers have begun prioritising capacity-building for teachers. Existing initiatives include teacher training by UNESCO and the World Bank and the Mastercard Foundation's work with lower secondary school teachers in the

2 United Nations, 2019. United Nations Sustainable Development Goals Indicators. [Online] Available at: https://unstats.un.org/sdgs/indicators/database/

APTE programme. Many of these initiatives, however, do not focus on digital skills training as their core value addition. There is therefore a need to coordinate with existing initiatives to incorporate digital skills into the educator training packages.

Looking beyond just digitalisation. One of the key pitfalls of relying heavily on digital transformation to solve long-standing challenges is that it diverts attention away from challenges that do not require digital solutions. For instance, the soft skills related to creating CVs and business plans play a significant role in ensuring that youths can access income-generating opportunities. Without also focusing on soft skills, Senegalese youths will lack the professionalism required to be high-quality recruits or business-savvy entrepreneurs. Furthermore, the digitalisation of education can increase the digital divide if it is not implemented in a coordinated manner.

Agriculture: Groundnuts

Digitalisation offers agriculture sector a range of compelling opportunities for productivity and employment gains. The peanut or groundnut value chain in Senegal is an area where digitalisation can enhance efficiency and generate youth employment. Groundnut production is one of the leading employers and producers in the agriculture sector and gains in the peanut value chain can have a far-reaching impact on livelihoods and the economy more broadly. Key challenges in the value chain include bottlenecks, poor logistics and coordination, asymmetric information flows and limited access to inputs. The greatest opportunities to arise from digital innovation lie in two key areas:

- ***Enhancing the productivity of farming practices***. PA is the adoption of data and advanced technology to optimise farming processes. Advanced sensors and equipment can enable farmers to monitor crops precisely, reducing misapplication of inputs and increasing crop efficiency through increased yields with less wastage. Furthermore, PA can increase the economic and practical viability of farming on smaller plots of land. In Senegal, youth don't have access to large tracts of farmland. Making smaller plots viable to farm through precision techniques may therefore increase youth employment. Beyond improving agricultural productivity, agritech innovation also has the potential to attract new people to the industry, from new farmers to computer scientists, software developers, AI engineers and other experts.
- ***Improving the efficiency with which produce reaches buyers.*** Some of the greatest challenges in the peanut value chain include coordination and logistics. Enhancing the speed and reliability of logistics can reduce the need for storage and can substantially reduce spoilage. Digital innovation may offer a solution. A digital platform that connects farmers and other producers to logistics providers enhances coordination and reduces bottlenecks in the value chain. It can aggregate both formal and informal transport companies to meet the needs of value chain participants and facilitate access to specialist transport infrastructure such as cold chains. Therefore, a platform of this nature can be used to efficiently coordinate the movement of agricultural goods between parts of the value chain. For example, Yobanté Express is a digital marketplace that provides logistics to the retail, e-commerce, and agricultural sectors. While they successfully connect clients with a network of independent agents and local carriers, the further scaling

of these types of solutions will require transport providers to have greater access to capital and risk management solutions.

Textiles

A tale of two sub-sectors: Textile manufacturing remains on the decline, while designer apparel shows promise. Despite producing cotton and benefitting from multiple beneficial trade agreements, Senegal's textile industry remains globally uncompetitive: exports have steadily declined over the past decade, while the importation of fabric has increased. Digitalisation and automation could possibly improve the efficiency of the industry, but this would probably be accompanied by the loss of jobs – often of low-skilled, vulnerable workers – to automation.

On the other hand, the country has a rich tradition of design and embroidery and high-end apparel designs, using traditional techniques and styles. Traditional Senegalese-styled clothing has a strong market locally and digital tools could also help designers to take advantage of international opportunities. Two specific opportunities arise:

- ***Digital tools can benefit designers.*** Digital design tools are popular internationally and can contribute to the efficiency and competitiveness of the Senegalese apparel sector. Internationally, most designers use clothing design software or graphic design software to create their fashion sketches and manufacturers prefer (and often require) the use of such digital tools. This technology can create several efficiencies, for example, by facilitating custom measurements and minimising fabric waste. Furthermore, digital sketches allow manufacturers to re-create designs better, which ensures better quality and creates opportunities to pitch designs to global buyers.
- ***Digital platforms offer a significant opportunity for designers to reach new and larger consumer groups.*** Senegalese designers already use digital channels for marketing, sales and communication with customers, but their use and understanding of digital tools remain narrow and limited primarily to social media. Using social media to conduct business does provide designers with an opportunity to showcase their designs to an online audience, such as through Instagram or Facebook. It also enables digital communication with customers through WhatsApp. However, social media platforms generally cannot facilitate logistics or aggregate payments. In addition, whereas designers can reach large markets with platforms such as Instagram, advertising on platforms can be expensive. But platform participation does allow businesses to expand and manage a higher frequency of orders and a larger clientele; it also signals that an enterprise is "official", in this way building trust. Moreover, allowing consumers to buy online increases the effective size of local and international markets as sales are no longer limited by location.

Tourism

A promising but vulnerable sector. The tourism and hospitality industry is a significant generator of employment in Senegal. It is an industry with much potential for increasing market access and efficiencies through digitalisation. However, the sector is also vulnerable to shocks – as the COVID-19 pandemic has shown – and it has struggled to break into the international market at scale. The sector largely fails to reach or cater for global tourists, apart from the French, owing to both language barriers and challenges in creating and managing an effective online presence and facilitating affordable cross-border payments. Furthermore, poor customer service skills are a major challenge in the industry.

Expanding the user-friendly online presence of tourist offerings an important first step for growth. Globally, a social media and an online presence are increasingly central to any leisure and business tourism offering. To highlight Senegal's unique nature and culture and set itself apart from competitors, its online and social media visibility needs to be expanded. Therefore, there is a big opportunity for social media marketing and for increasing the use of websites for all types of tourism. Moreover, by offering tourist information in languages other than French, Senegalese tourist offerings will appeal to a broader range of tourists. This opportunity entails not only translating existing information into multiple languages, but also developing the language skills of tourism graduates so that they can interact and communicate with tourists in their native languages.

Expanding the market through digital platforms. There is an opportunity to increase the number of visitors to Senegal by improving the linkages of Senegalese tourism market players to international booking platforms such as Airbnb and Booking.com, whose presence in Senegal is still nascent. This would increase the online findability of Senegalese offerings.

Improving customer service to match international standards. An opportunity also exists to increase Senegal's attractiveness through improving customer service. Improving language skills, but especially training in internationally accredited hospitality, is essential. Such training can be done locally if added to the curricula for tourism studies but also through online courses together with mentorships to assess students' abilities and their progress.

Resolving digital payment challenges. A substantial opportunity exists to reduce the barriers to accepting and making digital payments, particularly international payments. Travelling with cash is unsafe, and the ability to book and pay for trips securely in advance is an advantage. Local digital wallets are not accessible to international visitors, and therefore an opportunity presents itself to expand solutions for both online and in-person digital payments.

Youth Insights

Youth perceptions and experiences also critical to informing an understanding of the impact of digitalisation. Given the ultimate objective to grow dignified and fulfilling work for young women and men, it is crucial not only to understand market trends and opportunities for digitalisation as outlined above, but also to consider how individuals can be equipped to engage with digital tools and innovation. Accordingly, through a combination of quantitative and qualitative research with Senegalese youths, this study explored how these youths currently understand and perceive the digitalised economy, the extent to which they feel they are digitally enabled and the risks that they face. The major findings from the Youth Insights research include:

- ***Entrepreneurship now has higher appeal than employment.*** Fulfilling work for youths hinges on their ability to earn an income and support their families. Consequently, and largely out of necessity, entrepreneurship now has a higher appeal than employment. Overall, 88% of the youths surveyed reported that entrepreneurship appeals to them, while only 58% of the group said the same for employment.
- ***Youth have a growing appetite for work in the digital economy.*** Given the pervasive appeal of entrepreneurship, youths are increasingly looking for business opportunities in the digital economy. These opportunities are perceived as effective and fast ways to earn an income – especially in online retail and last-mile delivery.
- ***The digital economy is broadly available to young Senegalese men and women, but challenges are experienced in the cost and quality of connectivity, particularly in rural areas.*** No fewer than 95% of the youths surveyed reported having access to electricity and a mobile phone, whereas 39% of the respondents reported having access to a laptop or a personal computer. However, 74% of them reported that slow connectivity to desired websites was a challenge, while having insufficient data bundles was the second most prevalent challenge. Only 26% of the respondents reported having internet access at home, where connectivity is mostly attained through purchased mobile data.
- ***A narrow understanding of the digital economy limits usage.*** Young Senegalese men and women view the digital economy primarily as the online channels through which they can make money, particularly via social media. *"It is the money you earn through social networks."* Social media, followed by e-commerce platforms, are the primary facilitators of youth engagement with the digital economy. Specifically, the youths are using social media to network and share job opportunities, buy and sell goods, and engage in influencer marketing. However, awareness of the broader digital tools to enhance productivity and creativity is limited. A small constituent reported that they use the internet to gain knowledge or skills, while digital work tools are used less, and custom developer solutions are used by only a handful of the respondents.
- ***Digitalisation has imposed certain perceived and real security risks.*** The respondents identified a number of disadvantages arising from the increase in digitalisation, such as the risk of false information and advertising on social platforms. A fear of encountering fake jobs, investments or pyramid schemes has caused some youths to become less trusting of digital services.

- ***A feeling of disenfranchisement.*** The Youth Insights research suggests that the youths in Senegal do not feel that their voices are being heard in discussions and plans for the digital economy: "The problem here is that we don't integrate young people, we use them. Adults have to make room for young people to develop."

Cross-cutting opportunities

Across the sector deep dives and the Youth Insights research, four key cross-cutting opportunities arising from digitalisation emerge:

1. ***Adaptation of local business practices.*** The global trend towards digitalisation is an undeniable reality. This trend is present in Senegal, even if relatively nascent compared to many other countries. Senegalese youths tend to equate digitalisation with social media, both as a channel for societal engagement and to market and sell products. To a lesser extent, they also engage with the emerging e-commerce platforms. The same holds true for entrepreneurs across the focus sectors.
   This view misses the bulk of opportunities that can be derived from digital innovation. Improved understanding of the breadth of applicable digital innovation for individual businesses and the adoption of appropriate digital tools in different value chains therefore constitutes a major opportunity to improve efficiency and productivity across sectors. Those Senegal businesses engaging with global customers – such as in the tourism sector – have the most urgent need to adapt their operations and ensure that they are able to entice, engage and sell effectively to global consumers through online channels and platforms. This is not only an opportunity to reach new customer markets; it is also an imperative to stay in business. Regardless of whether Senegalese businesses do effectively adapt, the trend towards consumers' engaging with enterprises online will continue, meaning that a failure to adapt will result in an inability to compete for customers globally, leaving businesses behind.
2. ***Efficient logistics and coordination to support digitalised value chains.*** Digital innovation means that products can be marketed, sold and paid for remotely. However, physical products cannot be transmitted. Providers of physical goods still require an effective solution to get the goods into the hands of customers. Transport and logistics remain key to the functioning of supply chains; the digitalisation of commerce only makes this more important. The ability to coordinate, communicate and track goods and vehicles in real time means that digital innovation is creating major opportunities for enhanced efficiencies in the logistics sector. For agriculture sectors, improved logistics not only means that produce can reach the end buyers more quickly and efficiently; it also reduces the need for costly and scarce storage and minimises spoilage. The implication is that improved efficiency, reliability and speed in the logistics sector resulting from digitally enabled coordination have the ability to reduce losses substantially and therefore to enhance productivity across a vast number of economic sectors. Improved tracking and monitoring throughout the value chain can also play a major role in improving the transparency of individual value chains, an increasingly important requirement for trade.
3. ***Application of digital technology to improve production practices.*** Digital technologies can enhance the yield of agricultural products and the efficiency in manufacturing goods. PA can enable farmers to monitor crops precisely, reducing

the misapplication of inputs and increasing crop efficiency through increased yields with less wastage. Similarly, in the manufacture of apparel, digital design tools, for example, help apparel designers to create a number of efficiencies such as minimising fabric waste and more easily and consistently re-creating designs.

4. ***Carefully targeted education and skills training to build those skills most needed to support the digitalisation of priority sectors.*** Senegal currently faces a significant skills mismatch. While there is a high level of graduate unemployment and underemployment, key growth sectors struggle to find candidates who have the skills that they require. There is therefore a significant opportunity to build on existing programmes to develop the key skills required in priority sectors through targeted training courses aimed at young Senegalese men and women. Digital skills would be an important skill to incorporate in these training courses to equip youth job-seekers with the requisite skills to help local businesses and sectors adapt to the digitalised economy. But they should not be the only skills targeted: STEM skills and soft skills such as customer service skills and language skills are equally important. The greater adoption of digital learning tools through blended online/offline learning programmes offers significant opportunities for local learners to access global content and teachers while still benefiting from offline engagements through mentoring and tutoring relationships.

Imperatives for action

For these opportunities to materialise, interventions are required to

a) further develop an enabling regulatory and policy framework that takes account of trends and risks in the digitalised economy, and which balances regional processes with national policies to ensure that there are no gaps

b) directly support private sector players to develop, adapt their practices and processes, and adopt digital innovation.

The Digital Senegal 2025 strategy already provides important building blocks in this regard. This study identifies six key priorities to support the desired growth in dignified and fulfilling work for the youth.

Convene key stakeholders towards an industry-led, regulator approved framework for data governance. The governance of data collection, storage and use will fundamentally shape the extent to which the development and adoption of innovative digital technologies will manifest in Senegal. The creation of a governance framework that is led by industry rather than regulators is more likely to be adopted and the spirit complied with, than a top-down regulator-led framework. The pervasive nature of data and the challenges in effectively enforcing the strict regulation, mean that industry players need to see the benefits and incentives to comply, beyond just formal regulation. Examples from Singapore's approach to Open Finance and from South Africa's Financial Sector Charter, provide illustrations of how an industry led approach can be successful.

Targeted support for MSMEs in the tourism sector[2] to reach global consumers. Increasingly, global tourists rely on aggregating platforms to find tourism providers. Platforms like Booking.com and Airbnb aggregate the market for travellers seeking guesthouses or short-term rentals. To tap into this global network of travellers, Senegalese providers would need to ensure they are visible and attractive to platform users. This requires the ability to manage online bookings, process cross border payments, communicate in the language of the platform, as well as ensure that their value offering stands out to potential travellers. These platforms also typically rely on consumers' ratings of providers, hence consistent customer service and effective communication is critical to building and maintaining providers' reputations. Targeted support to MSMEs in the tourism sector to build greater understanding of the requirements to operate and compete in these global markets and the development of skills to be able to do so is therefore a major opportunity to grow the local tourism sector.

Support the local digital economy to develop context specific solutions. The development of digital solutions is an obvious prerequisite to the digitalisation of individual sectors and the economy more broadly. Therefore, whilst the growth of the local ICT/ start-up sector will not be a major direct contributor to employment, it is nevertheless a critical sector to support. The digital solutions and innovation developed within this sector will be a major engine for productivity gains, growth and ultimately employment generation across all other sectors. The unique regulatory, infrastructural and cultural context of Senegal (as with any country or society) means that context-specific solutions, or at least unique adaptions to existing solutions, will be required. Supporting local digital innovators relies heavily on creating a supporting enabling environment both in terms of enabling regulation but also proactive engagement, support and clear communication from supervisors and policymakers. Beyond creating a strong public enabling environment, innovators also need access to key prerequisites to be successful: the development of an ecosystem favourable to start-ups is critical and requires working with incubators, tech hubs and accelerators to support early-stage innovators to access capital, provide them with training and mentoring, and provide legal counselling and support to aid in navigating regulatory requirements.

Direct support to logistics ecosystem to encourage the scaling of improved technology-driven solutions. This study identifies logistics as a sector critical to the growth of the majority of sectors in the economy. The increasing digitalisation of the economy has only increased the critical importance of an efficient and reliable logistics sector. In many agricultural value chains, improved logistics can also substantially reduce losses from spoilage. Emerging logistics platforms in Senegal offer real opportunities to improve the efficiency and reliability of domestic logistics and are able to effectively aggregate and coordinate existing formal and informal transport networks. However, further growth of these platforms and the scaling of the logistics networks requires greater access to large sums of capital, enabling entrepreneurs to purchase new, efficient and specialised transportation vehicles. However, the provision of this capital will remain highly limited as long as the industry continues to be perceived as risky. Integrating aggregating platforms, capital and insurance providers together with providers of technologically enabled risk management solutions may therefore be key to the further scaling and the improved reliability of the logistics sector.

Encouraging global players to enhance the productivity of local priority sectors through digital innovation not available in Senegal. Not all, or even most, digital innovation needs to be developed locally. Digital solutions to many of the challenges facing enterprises operating across Senegal's productive sectors already exist elsewhere in the world. Some of these may need to be contextualised to fit the Senegal environment, but the core digital technology and innovation can be directly imported[3]. 'Importing' digital innovation can be approached in two, complementary ways:

- ***By incentivising global innovators to establish operations or distribute their innovation in Senegal***, for example by addressing well-established costs and risks for enterprises to enter[4], or through direct financial incentives to shift the risk-reward equation for potential entrants. Non-financial support such as regulatory guidance, consumer research or similar can also de-risk an investment by a potential innovator.
- ***By supporting Senegalese youth to learn from global innovation***, such as through scholarships and financial support to study at global learning institutions, or by supporting internships at global digital technology players.

Supporting targeted vocational training initiatives that develop the necessary skills for local value chain players to effectively adopt digital innovation enhance their productivity. The need to develop and access key skills is widespread and well-established in the Senegalese economy. There are undoubtedly many fundamental improvements to be made to the efficacy and quality of basic education, but as these require long-term, structural change, more immediate opportunities are to be had from targeted vocational training initiatives to generate the practical skills required by Senegalese enterprises. The TVET system has already begun trialling these kinds of solutions, and this can be further built on by identifying key growth sectors to focus on and specific skills required, and then to develop a blended learning approach to inculcate those skills, combining online learning in an optimal way with in-person tutoring. It would be important to develop certification for the training developed in this way, to add to the credibility and desirability of the training.

Estimated impact

If these opportunities and imperatives are realised, the upside potential for Senegal is substantial.

Market-oriented interventions can generate short-term gains. In the short term, the major impact would be primarily derived from the support provided to new innovation that supports the digitalisation and productivity of key established economic sectors. Interventions applied to identify and improve the training of key skills also begin to have a substantial impact on the supply of workers with good vocational skills and productive digital skills. This could boost the productivity gains from digitalisation within two to three years.

The public and private sectors must come together to entrench and expand impact. As digital solutions become increasingly embedded in many sectors, the network effects that naturally arise due to the ability to collect, use and exploit data

manifest themselves. This is where the imperatives to develop a fit-for-purpose approach to data governance is critical, along with supporting the broader enabling environment for digital innovation, to support sustained digital innovation in Senegal. If industry can work with the government over the short term to improve the enabling environment collaboratively and redesign the governance of data and innovation, the result would be a boost to digital innovation in the medium term, as the new rules will help to create a competitive market with a stronger enabling environment.
The combination of direct innovation support, a growing local digital ecosystem and a supportive enabling environment would act collaboratively, improving the attractiveness of the country to new innovators who see both a flourishing innovative market and an enabling public sector.

Potential to create more than a million youth jobs by 2030. The potential impact of this scenario playing out is substantial growth in the productivity, growth and exports of key sectors, particularly agriculture and tourism, which already have key local endowments (arable land and unique tourist attractions) that are enhanced by the adoption of digital technologies. This growth will translate into the creation of new jobs among existing market players and opportunities for new market entrants. Across the agriculture, textiles and tourism sectors, our scenario modelling exercise estimates that approximately 1.6 million jobs could be created from the effective adoption of digital technologies. The bulk of these would be among youths, who are also better equipped to adapt to market changes with the benefit of targeted skills training. It is forecast that over a million youth jobs would be created across these three sectors, assuming that the key imperatives are realised.