Accelerating Digital Transformation in Zambia
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Executive Summary

Zambia’s 7th National Development Plan (7NDP) sets ambitious targets for economic growth and poverty reduction. Technology can play an important role as Zambia advances this vision for economic transformation.

Recent evidence tells us that reaching the goal of universal and affordable internet coverage can raise growth per capita by 2 percentage points per year and reduce the poverty headcount by 1 percentage point per year. When internet coverage is complemented by human capital investments, growth per capita increases by approximately 5 percentage points and the poverty headcount falls by 2.5 percentage points per year. These contributions to growth are mainly due to growth in productivity across economic sectors; digital transformation is thus part and parcel of economic transformation.

The introduction of digital systems can also have a transformative effect on government. It is estimated that developing countries could collectively save 0.9 to 1.1 percent of GDP, equivalent to $220 billion to $330 billion annually (IMF 2017), by introducing digital systems in government that increase efficiency and reduce the potential for leakages to occur. Additionally, significant effectiveness gains can be realized by equipping government officials responsible for public service delivery with access to better data and tools.

Improved access to digital technologies and effective use of data and digital systems can thus be powerful tools in the quest to increase private sector productivity, enhance public sector efficiency and effectiveness, and improve the accountability of both the public and private sectors. Indeed, 7NDP includes several digital transformation strategies for these reasons.
This digital economy diagnostic assesses Zambia’s strengths and weaknesses with respect to five pillars that together form the foundation upon which the benefits of digital transformation can be realized. These pillars are Digital Infrastructure, Digital Skills, Digital Entrepreneurship, Digital Platforms, and Digital Financial Services. As discussed in the 2016 World Development Report (World Bank 2016), progress in these areas—combined with “analog complements,” that is, a favorable business environment, strong human capital, and good governance—can enable and accelerate development returns.

This digital economy diagnostic was carried out by a multidisciplinary World Bank Group team in close collaboration with a multiministerial working group, led by the Cabinet Office. More than 100 stakeholders from the public and private sectors were engaged in interviews, focus groups, and workshops to derive, triangulate, and validate the findings.

In summary, this analysis finds that Zambia has made significant strides on its path to digital transformation over the past few years. Progress is particularly evident in digital infrastructure, digital financial services, and digital platforms, while more significant gaps remain in digital skills and digital entrepreneurship.

With respect to digital infrastructure, all provincial centers are now linked to the fiber backbone, and the country has a state-of-the-art data center that can be leveraged for government and commercial use. International benchmarks for affordability of broadband have also been met, and the use of mobile phones has increased significantly, reaching 15.5 million mobile subscriptions in 2019, out of which 63.5 percent use broadband. The digital infrastructure foundation has thus been built to now focus on the use of the infrastructure, as well as on ensuring the reliability and security of the infrastructure that is in place. However, last mile connectivity remains a gap, preventing greater use of digital systems in more sparsely populated areas where access to services and markets is more limited, and where digital systems could help reduce transaction costs associated with serving smaller populations. The cost of connectivity also imposes a barrier to greater citizen and business take-up caused by low income levels, calling for measures to reduce connectivity costs.

Despite these remaining connectivity challenges, the take-up of digital financial services (DFS) has increased significantly since 2016. This illustrates that Zambia does not have to wait to deliver more services via mobile; a two-pronged strategy can be pursued that enables more mobile-based service delivery while steps are taken to promote greater last mile connectivity in secondary towns and rural areas.

With regard to DFS specifically, Zambia has had a strong commitment to financial inclusion over the course of the past several years. The country recognized early on that DFS can make financial inclusion less costly for financial services providers and consumers, and it was among the first set of countries to allow nonbank payment service providers. Access to financial accounts more than doubled from 21 percent in 2011 to 46 percent in 2017, and increased access to mobile money providers has been driving the bulk of this growth since 2016. The private sector clearly sees the provision of DFS as an opportunity; the DFS market now includes 10 banks, 3 mobile network operators, and 5 third-party providers, including financial technology companies. In June 2019, the national payment switch enabled the interoperability of all domestic transactions. This functionality was expected to be available for all point-of-sale and mobile money transactions by the mid-2020. This step would further increase convenience and reduce costs for citizens and businesses.

Substantial progress is also reported to have been made to digitize government salary and pension payments; some gains have been made in government-to-business and government-to-government payments; and early efforts have been made to digitize receipts from businesses and individuals. Early indications are that important results are being achieved: preliminary data from the digitization of government pay slips show that transaction costs decreased by 85 percent and several “ghost” workers were identified and removed. Similarly, when the pension authorities introduced a mobile-enabled module, contributions increased substantially.

These early results demonstrate the promise of greater use of digital payment systems in Zambia. However, several payment systems have just initiated their digitization journey, and most government payments for social cash transfers and subsidies are not yet digitized. Opportunities therefore exist to initiate or expand the digitization of such government payments for the purpose of efficiency gains and increasing the resilience of vulnerable and often unbanked populations (for example, smallholder farmers and social cash recipients). With the advancement of DFS, the need to develop adequate consumer protection measures is also pressing.

Payment systems is only one of several areas in which the Zambian government can—and is—taking steps to use digital tools to increase the efficiency of government services. With respect to digital platforms, the 7NDP sets specific targets for providing government services online, and Zambia is now among the top 10 in the least developed countries category of the E-Government Development Index published by the United Nations. The government has launched internal systems for internal government administration, and government-to-person and government-to-business services are increasingly digitized. However, interoperability between systems is often lacking, thus reducing their benefit to citizens, businesses, and government; usage and usability are not consistently monitored, and some systems suffer from a limited scale of implementation or from deterioration.
Furthermore, the ability to authenticate that people are who they say they are is fundamental to financial and public services delivery. The current identification system has several weaknesses in this regard, and the Zambian government has determined that a biometric national ID system would be the optimal approach for Zambia. Investments in a modernized ID system can result in significant fiscal returns, but it can also involve a significant fiscal outlay, thus requiring careful consideration.

To enable Zambia to make greater use of digital technologies as a transformation tool, individuals, businesses, and government must also have the requisite digital skills. This is an area in which Zambia has made less progress. The 7NDP Implementation Plan aims to have information and communications technologies (ICT) mainstreamed in schools, and the new competency-based national curriculum has made ICT a compulsory subject. In practice, however, most schools are not connected to the internet, they do not have adequate access to devices, and teachers have limited knowledge of how to use ICT in teaching and learning. Furthermore, the quality of general education is of serious concern; for example, fewer than one-third of learners pass their grade 12 examination.

Zambia will not realize the full benefits of digital transformation—nor will it meet its 7NDP goal of facilitating “innovative technologies skills development”—unless it also ensures that learners going through the school system are equipped with foundational numeracy and literacy skills. However, there is still room to better leverage digital tools for teacher training and access to up-to-date educational materials, as well as for education policy planning and monitoring and evaluation. With regard to government capacity in digital skills, important gaps remain to ensure the ability across ministries and government offices to systematically develop, maintain, and use digital systems.

The requisite digital and entrepreneurial skills are also needed to advance digital entrepreneurship: it is digital entrepreneurs who will derive innovative solutions to public and private sector challenges that can be resolved through the application of technology. Zambia has seen an increase in the registration of ICT-related firms between 2016 and 2019, and entrepreneurs are initiating innovative digital solutions in a wide array of sectors, including financial services, education, tourism, and agriculture. Although a handful of entrepreneurs are now delivering solutions at scale, most digital enterprises in Zambia are at the very initial stages of development.

Zambia’s Global Entrepreneurship Index scores in Startup Skills, Technology Absorption, and Risk Capital are very low, and entrepreneurial confidence is declining. Concerns about these four areas were also expressed repeatedly in the consultations for the diagnostic. Zambia is, however, fortunate to have a range of nascent private entrepreneurship initiatives that, coupled with increasing corporate interest, can lend themselves to public-private partnerships that make public funds stretch further. The public-private dialogue during the diagnostic process also indicated recognition of the challenge associated with regulating digital innovation and the importance of engaging in continued dialogue to ensure that regulators provide clarity and strike the difficult balance between enabling innovation and ensuring that citizens are protected.

Surprisingly, a relatively large proportion of start-ups focus on e-commerce. This is remarkable given the significant obstacles to e-commerce in Zambia; only a small proportion of the population has a home address, and goods ordered online can therefore not always be efficiently and reliably delivered to the buyer. Long distances and high logistics costs also affect the viability of both domestic and cross-border trade. Considerable improvements in addressing and logistics will therefore be needed before e-commerce significantly benefits Zambia. The government has recognized this obstacle and has recently embarked on the development of a new national logistics strategy.

All in all, Zambia has made important strides in initiating a digital transformation process, but there is still a long way to go. As was acknowledged by H.E. President Lungu in a speech to the National Assembly in September 2019, Zambia’s fiscal space is limited, and there is a need to “achieve economic stability, sustainable growth and development, within the spirit of ‘doing more with less.’”

The authors recommend that the government of Zambia develop a digital transformation strategy with a dual focus on meeting the 7NDP targets and improving the country’s fiscal space. This recommendation is closely aligned with the “doing more with less” mantra introduced by H.E. President Lungu, and it emphasizes the use of digital technology to improve (1) public sector efficiency and effectiveness, (2) private sector productivity, and (3) accountability across both the public and private sectors.

Against this background, this report suggests that the digital transformation strategy include four strategic themes (figure ES.1): (1) promoting greater use of digital technologies in the economy, (2) reducing government transaction costs and reducing the cost of doing business through digitally optimized government systems, (3) improving the adoption of innovative digital solutions by enabling entrepreneurship, and (4) leveraging data and digital systems to improve sector-specific outcomes in secondary towns and rural areas.

Promoting greater use of digital technologies in the economy. Enhanced broadband usage alone contributes significantly to growth and poverty reduction. Additionally, initiatives undertaken under this theme are foundational to greater adoption of digital technologies by citizens, businesses, and government. The probability of success
of initiatives launched under the other strategic themes will thus be limited without progress under this theme. Priority activities suggested under this theme include (1) streamlining compliance costs for connectivity providers; (2) strengthening government capacity in cybersecurity, data privacy, and consumer protection; (3) developing a road map and implementation plan for the rollout of digital ID that carefully considers the costs and benefits of the vast array of design options; and (4) partnering with the private sector to map and fill the digital skills needs for government to successfully design and implement priority digital transformation activities.

Reducing government transaction costs and the cost of doing business through digitally optimized government systems. Initiatives undertaken under this theme will have the most immediate and direct budgetary impact while also promoting private sector activity without much additional fiscal outlay. Priority activities suggested under this theme include (1) developing a government-wide implementation approach to advancing and scaling up digitization of major government payment flows (such as social cash, fertilizer subsidies, school fees, taxes, customs, and licenses), and (2) optimizing and scaling up the e-border management, e-licenses, and public e-procurement systems.

Improving adoption of innovative digital solutions by enabling entrepreneurship. Initiatives undertaken under this theme will ensure that the private sector has the capacity to develop innovative solutions to resolve public and private sector challenges. Priority activities suggested under this theme include (1) conducting a regulatory review assessing how tax, labor, and other pertinent regulations affect enterprises at the start-up stage, and developing a regulatory sandbox for digital innovation that provides digital entrepreneurs with a clearer mechanism for navigating regulatory requirements for innovative products and services; and (2) developing a start-up strategy that includes attention to technology entrepreneurship and that leverages the competency and resources of the Ministries of Higher Education and Commerce, Trade and Industry as well as the private sector and the continental entrepreneurship ecosystem.

Leveraging data and digital systems to improve sector-specific outcomes in secondary towns and rural areas. Initiatives undertaken under this theme would focus on the digital transformation of a sector (such as agriculture, education, or health) with the purpose of increasing the effectiveness of public service delivery or increasing productivity and reducing vulnerability. This theme will necessarily draw upon the other three themes, and should be planned spatially to ensure economies of scale and thus increased attractiveness for private sector participation.

While this report provides a suggested prioritization of digital transformation activities, it is recommended that the government create a Digital Transformation Steering Committee to lead the articulation of the digital transformation strategy and implementation matrix. Given that this agenda cannot be achieved by one ministry alone, the committee should have representation from multiple ministries. Relatedly, a dedicated public-private Digital Transformation Advisory Council may be advisable to ensure that the expertise of nongovernmental actors is leveraged in the articulation of the strategy and implementation matrix and to optimize the likelihood that the private sector buys into, and therefore contributes to, implementation.
PRIORITY DIGITAL TRANSFORMATION ACTIONS

1. Promote greater use of digital technologies in the economy.
   - **Streamline compliance costs** for connectivity providers, and develop a framework for **PPP investments** in last mile connectivity.
   - Strengthen the institutional capacity of government to **protect consumers, data, and critical digital infrastructure**
   - Develop a detailed implementation road map for the **modernization of the ID system**, and implement the same.
   - Map **data and skills needs** to support evidence-based policy planning; integrate data collection, accessibility, and analysis into digital government systems planning, and partner with the private sector to implement.

2. Reduce government transaction costs and the cost of doing business through digitally optimized systems.
   - Develop a government-wide implementation approach to **digitize major government payment flows** (social cash, fertilizer subsidies, school fees, tax, customs, and licenses).
   - Optimize and scale the **e-border management, e-licenses, and public e-procurement systems**.
   - Enable **data sharing** and compatibility between core government systems starting with enforcing interoperability standards and publishing the API road map.

3. Improve adoption of innovative solutions by enabling digital entrepreneurship.
   - Conduct a **regulatory review** related to start-ups and develop a regulatory sandbox for digital innovation.
   - Develop a **start-up strategy**, including explicit attention to technology entrepreneurship.
   - **Invest in PPPs** to seed and scale up programs that build start-up skills, provide startup financing, and link entrepreneurs to regional markets.

4. Leverage data and digital systems to improve sector-specific outcomes in secondary towns and rural areas.
   - Identify two to three priority **sectors for transformation**, agriculture, education, and health.
   - Based on current national strategies derive priority challenges to address, engage the digital entrepreneurship community to identify innovative digital transformation solutions that work, and partner with the private sector to replicate and scale them.
   - **Plan spatially** such that economies of scale are achieved, using an integrated approach that takes into account the connectivity, skills, and systems required.

Note: 7NDP = 7th National Development Plan; API = application programming interface; PPP = public-private partnership.

REFERENCES


As indicated in the previous chapters, Zambia has made significant progress on the path to putting in place the foundational building blocks for digital transformation to occur. Zambia is thus in a good position to leverage digital technologies to accelerate progress toward meeting the 7th National Development Plan (7NDP) targets. However, Zambia currently has limited budgetary room to invest in new development initiatives and must carefully prioritize which digital transformation initiatives it invests in.

The authors recommend that the government of Zambia develop a digital transformation strategy that contributes to meeting the 7NDP targets and improving the country’s fiscal space. This recommendation is closely aligned with the “doing more with less” mantra introduced by H.E. President Lungu and the Minister of Finance’s 2020 Budget Speech (see box 7.1), and it emphasizes the use of digital technology to improve public sector efficiency and effectiveness, private sector productivity, and accountability across both the public and private sectors.
**BOX 7.1: GOVERNMENT OF ZAMBIA COMMITMENT TO DIGITAL TRANSFORMATION**

Minister of Finance, the Honorable Dr. Bwalya Ng’andu spoke about the government’s commitment to digital transformation in his 2020 budget speech:

“To enhance transparency and accountability in public service delivery, Government will continue rolling out electronic platforms. This will not only reduce the cost of doing business for both the private and public sectors, but also enhance information sharing;

“to enhance domestic resource mobilization, Government in the medium term will implement the following measures: "i. Continue with the modernization and automation of revenue collection processes and provision of Government services. The Government will implement a service platform and payment gateway to create efficiencies in service delivery and enhance tracking of revenues."

To achieve these three strategic objectives, the authors suggest four initiatives:

1) **Promote greater use of digital technologies in the economy.** As discussed in chapter 1, enhanced broadband usage alone contributes significantly to growth and poverty reduction. Additionally, initiatives undertaken under this theme are foundational to greater adoption of digital technologies by citizens, businesses, and government. The probability of success of initiatives launched under the other strategic themes will thus be limited without progress under this theme.

2) **Reduce government transaction costs and the cost of doing business through digitally optimized government systems.** Initiatives undertaken under this theme will have the most immediate and direct budgetary impact while also promoting private sector activity without much additional fiscal outlay.

3) **Improve adoption of innovative digital solutions by enabling entrepreneurship.** Initiatives undertaken under this theme will ensure that the private sector has the capacity to develop innovative digital solutions to resolve public and private sector challenges.

4) **Leverage digital systems to improve sector-specific outcomes** (such as health, education, and agriculture) in secondary towns and rural areas. Initiatives undertaken for this theme would have a comprehensive approach to transforming a sector, leveraging progress made under each of the three previous strategic themes.

At the request of the government of Zambia, the authors have suggested a prioritization of the recommendations presented in this report, organized under each of these strategic themes. The diagnostic process resulted in a combined 27 recommendations (appendix F provides a full overview). Based on the authors’ review of these 30 recommendations and the three strategic objectives, as well as logical sequencing of activities, figure 7.1 presents the suggested 12 priority activities. These activities include development of strategies and implementation plans, regulatory activities, and investments. The highest cost items include (1) public-private partnership investments in last mile infrastructure (under Initiative 1), (2) implementation of digital ID (under Initiative 1), and (3) implementation of Initiative 4. These three items were included in the priority activities because of the corresponding high impact and catalytic effect effective implementation will have.

Although the authors have provided a suggested prioritization, it is recommended that the government create a Digital Transformation Steering Committee to lead the articulation of a digital transformation strategy and implementation matrix. Once the steering committee has derived the priority outcomes sought, it is recommended that it carry out a detailed costing of the activities. Subject to the amount of resources the government would like to invest at this point, and the time it will take to ensure that the government has adequate capacity to plan for and ensure effective implementation of activities, it is then advisable to separate the activities into a Phase 1 and Phase 2 implementation plan that stretches over a five to seven year period.

Given that this agenda cannot be achieved by one ministry alone, the steering committee should have broad-based representation. At a minimum, the committee should include the core ministries related to each of the digital economy pillars. Relatedly, a dedicated public-private Digital Transformation Advisory Council may be advisable to ensure that the expertise of nongovernmental actors is leveraged in the articulation of the strategy and implementation matrix and to optimize the likelihood that the private sector may contribute resources to a strategy into which they have bought in. Further suggestions for the roles and composition of the Digital Transformation Steering Committee is outlined in appendix G.
FIGURE 7.1: PRIORITY DIGITAL TRANSFORMATION ACTIVITIES

1. Promote greater use of digital technologies in the economy.
   - Streamline compliance costs for connectivity providers, and develop a framework for PPP investments in last mile connectivity.
   - Strengthen the institutional capacity of government to protect consumers, data, and critical digital infrastructure.
   - Develop a detailed implementation road map for the modernization of the ID system, and implement the same.
   - Map data and skills needs to support evidence-based policy planning; integrate data collection, accessibility, and analysis into digital government systems planning; and partner with the private sector to implement.

2. Reduce government transaction costs and the cost of doing business through digitally optimized systems.
   - Develop a government-wide implementation approach to digitize major government payment flows (social cash, fertilizer subsidies, school fees, tax, customs, and licenses).
   - Optimize and scale the e-border management, e-licenses, and public e-procurement systems.
   - Enable data sharing and compatibility between core government systems starting with enforcing interoperability standards and publishing the API road map.

3. Improve adoption of innovative solutions by enabling digital entrepreneurship.
   - Conduct a regulatory review related to start-ups and develop a regulatory sandbox for digital innovation.
   - Develop a start-up strategy, including explicit attention to technology entrepreneurship.
   - Invest in PPPs to seed and scale up programs that build start-up skills, provide startup financing, and link entrepreneurs to regional markets.

4. Leverage data and digital systems to improve sector-specific outcomes in secondary towns and rural areas.
   - Identify two to three priority sectors for transformation, agriculture, education, and health.
   - Based on current national strategies derive priority challenges to address, engage the digital entrepreneurship community to identify innovative digital transformation solutions that work, and partner with the private sector to replicate and scale them.
   - Plan spatially such that economies of scale are achieved, using an integrated approach that takes into account the connectivity, skills, and systems required.

Note: 7NDP = 7th National Development Plan; API = application programming interface; PPP = public-private partnership.
A top priority is to close any market efficiency gap. A critical point for the government is determining the optimal level of taxes and fees on the information and communications technology (ICT) sector from a societal point of view. For example, although excise taxes on mobile phone service or international calls may raise immediate revenue for the treasury, higher taxes translate into higher prices for consumers, thus limiting ICT use. High taxes also reduce margins, which leaves less earnings to invest in infrastructure. Additionally, discrepancies in the tax and fee structure can inadvertently create an uneven playing field, which ultimately hurts consumers.

To assess whether the cost of broadband can be reduced and coverage expanded by increased private sector investment, it is recommended that a comprehensive review of the taxes and fees levied on the ICT sector be conducted. This review should include modeling of whether the tax regime is striking the optimal balance between higher tax revenues in the short term and a longer-term increase in the use of broadband, increased productivity, and ultimately increased total tax intake. Further strategies are also needed to facilitate and safeguard fair competition, including changing the license regime to service neutrality.

As digital usage increases among citizens, business, and government, stronger consumer protection, including cybersecurity, is critical. Adequate cybersecurity is not cheap nor easy to implement. However, the cost of not performing adequate security will cost governments and society far more. Given the suggested emphasis on payment systems in the first phase of the digital transformation strategy (see Initiative 2), cybersecurity in the financial sector could also be a first-order priority. Security capabilities must thus be built into initial system design, accompanied by adequate resources to meet availability, confidentiality, and integrity requirements. Governments must take a leadership role through suitable cybersecurity policy formation and regulatory oversight on critical ICT assets and data. Users must be informed and educated as to the proper, safe, and secure use of ICTs, and have clear consumer recourse mechanisms for ensuring their data are kept private, secure, and protected from misuse. Risk-based asset management and a continuous security review will be key for the delivery of efficient and effective ICT services within society.

Several bills on cybersecurity, data protection and privacy, and electronic payments are being prepared. These bills must be finalized and investments made in implementation capacity, along with raising the awareness of consumers, businesses, and government officials. Conducting a security audit of critical ICT infrastructure and systems and the associated implementation road map is recommended, and the government may want to consider establishing a cybersecurity agency. The World Bank funded an assessment of Zambia’s cybersecurity maturity and a feasibility assessment of a cybersecurity agency in 2017. This work will need to be updated, but it can form a basis for conducting a cost-benefit analysis of the level of investment needed now to protect Zambian assets.

Given the unique nature of the risks involved, attention needs to be paid to consumer protection of digital financial services (DFS) users specifically. The memorandum of understanding between financial sector regulators and the Competition and Consumer Protection Commission is a good starting point for financial sector regulators to focus on consumer protection as it relates to DFS. Further actions needed include development of consumer protection rules, standards, and practices for digital payments (including transparency of fees charged and clear recourse mechanisms for delays in receiving funds from failed transactions); protection of DFS consumer data; and ensuring that the cost of default by financial consumers is proportionate to the cost to service providers.

The ability to authenticate that people are who they say they are is fundamental to DFS as well as to public service delivery. Modernization of Zambia’s ID system is therefore needed. As
indicated in chapter 5, the government has decided to develop a biometric national ID system. Deciding on the design features of a digital ID system has significant cost-benefit implications, as discussed in Koshy et al. (2018). The cost of implementation across the world appears to vary from $4 to $14 per citizen, depending on design choices, scope, country characteristics, and legacy systems. This cost would translate into a cost of between $70 million and $230 million in the Zambian context, which is a significant outlay at a time of very limited fiscal space. Investments in a modernized ID system can result in significant fiscal returns, stemming from reduced fraud in government-to-person transfers, reduced administrative costs, and increased tax collection (Clark 2018). Furthermore, it can significantly contribute to financial inclusion by enabling electronic know-your-customer, which reduces the cost to financial institutions of meeting know-your-customer requirements, and thus enables them to better serve low-income customers.

As Zambia embarks on a transition to biometric ID, it is thus crucial that objective guidance be obtained on the complex set of trade-off decisions needed to make cost-effective choices that strike the right balance for Zambia specifically. In addition to the investment in the system itself, legislative updates are needed for the biometric ID to be adopted. Along with modernization of the ID system, the government may want to assess whether this could be the right time to modernize the civil registration system. Many policies are dependent on accurate population data. Thus, an investment in an up-to-date civil registry can enhance the ability of the government to more accurately project the level of public service expenditures needed in any given geographic area.

The digital transformation activities recommended in this report will only be successful if, first, the government has adequate digital skills to plan, implement, and monitor systems. The authors therefore recommend that the government partner with the private sector to map the digital skills needs and deliver the digital skills upgrading required to ensure effective implementation.

Second, an investment must be made in the collection and analysis of data derived from the digital systems implemented, and in making anonymized and aggregate data available to government departments and the public to support evidence-based decision-making and the development of innovative solutions. To ensure that the data generated through implementation can indeed be used to inform policy decisions, the departments of planning in the relevant line ministries must be engaged in the requirements-development process, such that real-time data are made easily accessible to key stakeholders. This again illustrates the importance of ensuring that adequate consumer protection regulation is in place regarding data privacy. There are practical ways to make useful data points available to government and the private sector without disclosing sensitive data.

**Initiative 2: Reduce Government Transaction Costs and the Cost of Doing Business through Digitally Optimized Government Systems.**

It appears that a comprehensive government-wide payments policy, accompanied by targeted investments in advancing payment systems implementation related to social cash transfer, fertilizer subsidies, school fees, taxes, customs, and license payments, should be a high priority. Additionally, the government can reduce the cost of doing business and open market opportunities for the private sector, and simultaneously “do more with less” by enhancing government-to-business services, including optimizing the procurement, border management, and licensing systems.

A clear cost-benefit framework should be developed to identify which systems should be optimized and scaled up first. Once the priority systems have been identified for optimization and scale-up, the next steps would be to first review the user experience and efficiency of each system; second, to scale up and fully digitize each system; and third, to develop a monitoring and evaluation framework, and actively adapt the systems in line with user experience over time. This scale-up would need to be complemented by a deliberate effort to gain buy-in at all levels of the ministry involved, along with an awareness campaign targeting the beneficiaries of the system.

In the process of optimizing and scaling up, interoperability should be a key consideration to enhance aggregate efficiency gains. It is recommended that standards be developed for information exchange across government systems along with an application programming interface road map that enables both government and nongovernmental systems to interact and add value.
To build a critical mass of innovators and entrepreneurs who can create, adapt, and implement innovative digital solutions to resolve public and private sector challenges, the authors recommend first, improving regulatory dialogue and second, investing in increasing start-up finance, start-up skills, and shared infrastructure. Box 7.2 provides one of many examples of Zambian innovations possible with the right support.

The authors suggest that a mechanism (perhaps in the form of a regulatory sandbox) be created to support digital entrepreneurs in navigating the regulatory environment while also providing regulators with sufficient comfort that risks are managed. Innovative use of digital technologies gives rise to a wide range of new products, services, and business models that introduce new benefits and new risks to society. This poses a challenge for regulators who need to strike a delicate balance between enabling innovation while also protecting citizens and national interests. If regulators wait to introduce regulation, regulatory uncertainty may discourage investment, and if regulation is introduced too early, overregulation may stand in the way of innovation and societal benefits. A regulatory sandbox can thus improve public and private understanding of what the benefits and risks are, and what the most beneficial regulatory approach may be.

The recently introduced ICT Association Act appears to be an example of well-intended regulation leading to unintended negative consequences. As discussed in this report, the act may lead to a reduction of the digital talent pool available to support Zambia’s digital transformation efforts, and in the worst case, anticompetitive behaviors. The authors therefore suggest that this act be reviewed.

The authors further recommend that the government develop an early-stage entrepreneurship strategy that includes a subsection on technology entrepreneurship specifically. Figures 4.9 and 4.10 can be used as organizing frameworks for this strategy. Also, while chapter 4 on Digital Entrepreneurship includes significant data points upon which to develop the strategy, the authors recommend that a comprehensive review of the incentive regime for early-stage entrepreneurship (including but not limited to digital) be carried out as input to the strategy and possibly selected regulatory reforms. As discussed in this report, a wide range of regulations affect entrepreneurs’ incentives to start and to grow a business. However, thus far, a business life-cycle approach has not been taken in business regulatory reviews.

Finally, the government could consider seeding and scaling up private initiatives that build start-up skills and provide start-up funding and shared infrastructure for innovative entrepreneurs. This effort would require that the entrepreneurship strategy include a framework for collaboration with the private sector.

More detailed recommendations on each of these areas is provided in chapter 4 on Digital Entrepreneurship.

**Initiative 3: Improve Adoption of Digital Solutions by Enabling Entrepreneurship**

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**BOX 7.2: MUSANGA LOGISTICS—A ZAMBIAN DIGITAL SOLUTION TO LOGISTICS CHALLENGES**

Njavwa is the co-founder and chief executive officer of Musanga Logistics based in Lusaka, Zambia. He founded Musanga in 2016 with the support of the Tony Elumelu Foundation and BongoHive. Before starting Musanga, Njavwa worked in the logistics sector for six years. He noticed that there had been no change in the sector for many years. “We saw the mobile phone as a great opportunity to connect shippers looking for transportation to transport owners looking to earn income,” said Njavwa.

Musanga has developed two mobile applications. One application allows shippers to arrange delivery and track packages in real time through smartphones, and the other application was created for drivers (transporters) to access and manage delivery requests. Through the applications, transport logistic solutions and analytic reports are provided at low cost to enable business transactions.

Drivers and cargo owners are among Musanga’s target market. To date, Musanga has delivered more than 3 million kilograms of cargo involving 600 drivers (transporters) on its platform. Musanga has also recently entered into agreements with large companies in Zambia to deliver cargo to Walvis Bay in Namibia.

Njavwa said, “In the next five years, our goal is to become a key enabler of trade and logistics in Africa and to be part of a solution to increasing trade in Africa.”

*Source: Interview of founder by authors.*

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43 “Regulatory sandbox” is a term used to describe a framework set up by a regulator to allow small-scale, live testing of innovations by private firms in a controlled environment (operating under a special exemption, allowance, or other limited, time-bound exception) under the regulator’s supervision. This concept has been used extensively in the DFS field by regulators in the United Kingdom; Hong Kong SAR, China; Singapore; and elsewhere.
Zambia has the opportunity to leverage its backbone digital infrastructure to enhance outcomes in sectors such as agriculture, education, and health, which could be particularly transformative in secondary and rural towns. It is recommended that digital transformation in these sectors be approached from a spatial perspective, that is, by rolling out digital transformation initiatives that target agriculture, education, and health in one specific geographic area at a time. In this way, economies of scale can be achieved for last mile connectivity, geospatial mapping, awareness raising, and digital skills development to make adequate use of the online services offered. Some stakeholders suggested that the footprint of the postal service perhaps could be leveraged for this purpose, which is a potential avenue to explore. Box 7.3 outlines some of the many ways digital technologies can be leveraged to achieve development outcomes in the agriculture, education, and health sectors. Similarly to Initiative 1, strategic cost-benefit assessments must be carried out to determine which sector will yield the “biggest bang for the buck” in the medium and long terms.

Although significant strides have been made in increasing connectivity in Zambia, many local government offices, schools, health centers, and agricultural extension services have yet to be connected. Last mile connectivity and reliable power are lacking in some areas. In others, connectivity is available, but the public institutions do not have funds to pay the connectivity fees.

The following activities are recommended:

- Invest in last mile power and connectivity for critical institutions in agriculture, education, and health. Priority geographic areas would need to be selected so that a phased approach could be adopted and economies of scale achieved from the perspective of connectivity, geospatial mapping, digital skills development, and awareness raising. Prioritization will also help make it more attractive for the private sector to participate in last mile connectivity efforts (see Initiative 1: Phase 2 for further details).
- Digitize payment systems related to agricultural subsidies, education, and health payments, starting with those indicated under Initiative 1.
- Invest in seeding and scaling up innovative solutions to improve education, health, and agricultural extension outcomes. Based on the current national health, education, and agricultural strategies and problem statements, derive priority challenges to address, and engage with and provide incentives to entrepreneurs and the private sector to derive and test new solutions, explore the adaptation of solutions tested elsewhere on the continent, and develop a road map for implementation.
In **agriculture**, digital tools can:
- Provide farmers with more relevant and timely information on agronomic best practices, pests, diseases, weather, and market prices, thus increasing their productivity and reducing their vulnerability
- Enhance farmers’ knowledge of and access to a wider range of suppliers, distributors, and off-takers, thus increasing their profitability
- Enhance farmers’ access to transparent and affordable financial services

A 2019 review of the digitalization of African agriculture (CTA 2019) indicates that according to currently available data on digital solutions applied in the agriculture sector in Africa, digital advisory services yield a 10–70 percent smallholder income increase and digital market link services yield a 15–100 percent increase. The report includes valuable insights and recommendations for entrepreneurs, governments, and development partners.

In **education**, digital tools can:
- Provide teachers and students with more ready access to knowledge and educational materials
- Support the monitoring of learning outcomes
- Provide reliable data on the availability of teaching materials, school equipment, the number and qualification of teachers, and the attendance of students and teachers

For example, in Kenya, Eneza’s mobile-based e-learning platform provides learners with access to the curriculum, real-time engagement with teachers, reader boards, and learning competitions. For $0.10 per week, learners get unlimited access to the content on the platform. A flexible financing model allows users to pay for the service daily or weekly by using mobile money. To date, the platform has reached nearly 5 million learners, who scored 22 percent higher on national tests compared with their peers.

The World Bank conducted a review (Trucano 2016) designed to help policy makers make informed decisions about how best to use information and communications technologies to meet educational objectives.

In **health**, digital tools can:
- Improve patient connectivity and communications
- Improve the delivery and tracking of essential commodities and services
- Enhance health care capabilities

For example, in Rwanda drone technology is used to deliver blood supplies thanks to a partnership between the government of Rwanda and the California-based robotics company Zipline, Inc. In Uganda, about 27,000 government health workers use a mobile health system called mTRAC to report on medicine stocks across the country, while in Ghana, partners—including Novartis Foundation, the Ministries of Health and Communications, and the National Health Insurance Agency—are scaling up an initial pilot telemedicine system to connect frontline health workers with consultation centers in referral hospitals several hours away, where doctors and specialists with the right expertise are available.

Recently published guidelines on digital transformation in health care include that of BMZ (2018) and that of the World Health Organization (2019).
REFERENCES


