Kenya's Digital Economy

A People's Perspective

FULL REPORT

AUGUST 2021

Dalberg

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Credits

This report was written by Dalberg and funded by Omidyar Network.

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About Us

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Making of the Kenya's Digital Economy: A People's Perspective Report 2021

First and foremost, we appreciate the more than 2,400 residents in Kenya who participated in the surveys and human centred design (HCD) research for sharing their experience of digital adoption and usage during interviews.

This report would not have been possible without the valuable contributions of many experts and advisors.

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In preparation for this study, we consulted 10 experts. We thank them for sharing their experiences to inform a holistic understanding of Kenya's digital economy, offering views on what would make this report valuable to readers, reviewing initial versions of the questionnaire, and helping us think through key areas of study.

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Kenya as a digital adoption leader

- **98%** of Kenyans[1] own a SIM card; **65%** of Kenyans have access to the internet; **52%** own a smartphone.
- **84%** of Kenyans report that digital devices and services[2] are making their lives better; **1.2%** claim their life is worse.
- **30%** of Kenyans report a rise in their income as a result of using digital services.

Accelerating and deepening the use of digital services

- **94%** of Kenyans use mobile money; **44%** of them increased their usage during the Covid-19 pandemic.
- **45%** of respondents anticipate that Huduma Namba will make it easier to access and use digital services; **19%** are not yet convinced of its benefits.
- **49%** of Kenyans are aware of e-governance services or platforms; of this group, **55%** use those services; of these users, **81%** have used Huduma Centres for help with digital processes.
- **16%** of Kenyans who are employed have used digital services for upskilling and job search; **60%** of these users use Ajira centres.
- **13%**[3] of Kenyans have used e-commerce platforms to buy or sell products and services; a national addressing system is an important accelerator of e-commerce adoption—**40%** of these users faced challenges in receiving deliveries (due to lack of precise street addresses and logistics complications).
- **44%** of self-employed people / business owners use digital services to support their businesses; only **15–18%** of them use advanced digital services for business[4].
- **29%** of Kenyans report experiencing fraud; **35%** report facing cyber harassment whilst using a digital service.

1 Our study covers people in Kenya above 15 years of age.
2 Digital services include services accessed through the mobile phone, computer or internet.
3 This figure likely underestimates the real extent of e-commerce, as respondents largely reported the use of marketplace platforms like Jumia and Kilimall, while the full breadth of e-commerce also encompasses digital trade through informal platforms—for example, via social media—as well as payments, logistics, addressing systems, and asset recognition including mapping/tracking commodity ownership or exchange.
4 Including using digital devices to keep business records and track stock, using digital governance services to register businesses and pay taxes and levies, and using digital services to sell products and buy supplies through e-commerce platforms.

Inclusive digital transformation

- **22%** of Kenyans used digital services to access only basic digital services limited to sending and receiving money and buying airtime and data using mobile money; **3%** are non-users of digital services.
- **85%** of rural residents with lower than primary education, **45%** people with disabilities, **44%** of older people across all geographies, and **37%** of adult farmers / homemakers are basic digital services users or non-users.
- **35%** of women are advanced digital services[5] users, compared to **54%** of men.
- A number of key challenges limit basic digital services users to the use of mobile money: **69%** of basic digital services users have no access to the internet, **95%** have only basic phones, **54%** cannot pay for internet connection, **69%** need help to use digital services, and **71%** are allowed less time than other family members to use digital services

5 Advanced digital services include digital information / news, e-governance, e-commerce, digital health, digital education, digital services supporting livelihoods (business owners, farmers, employed), and content creation.

Executive summary

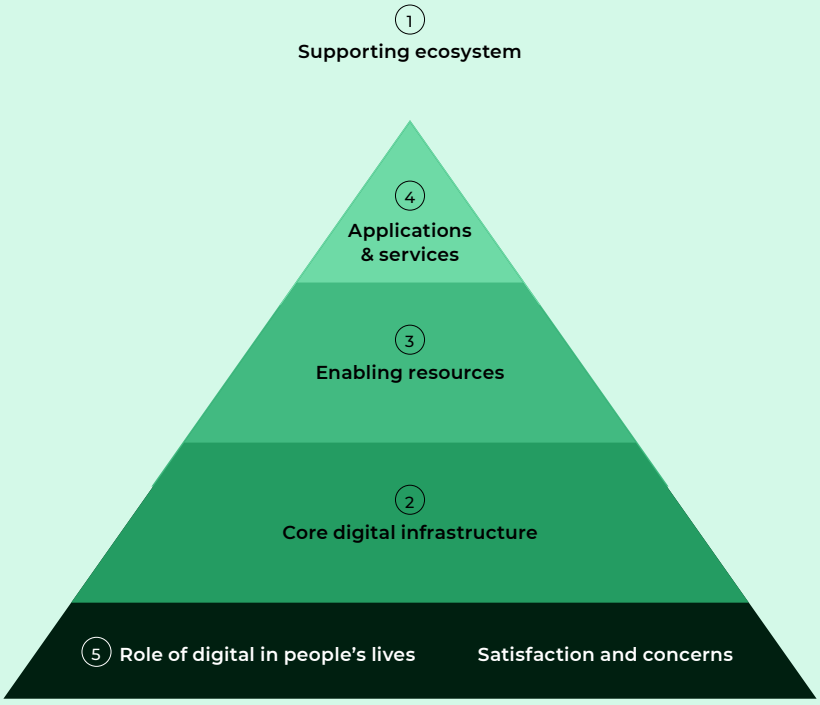
Why and how we conducted this study

Kenya has been a leader in digital transformation and has made great strides in laying the groundwork for its bold agenda across the four elements of the inter-linked digital economy: (i) forward-leaning investment and innovation in core digital infrastructure[6]; (ii) a booming technology start-up ecosystem for advanced digital applications and services[7], supported by the guide rails of mobile money and a favourable regulatory environment; (iii) progress in defining policies and frameworks for enabling resources, including digital ID, addressing systems, and asset registries; and (iv) public and private investments in supporting ecosystems to enhance capacity building for accessing and using digital services.

Our study develops a comprehensive evidence base of how different Kenyans[8] access and use digital services[9], as well as the specific support they need to increase the quality and depth of their participation in the digital economy. We conducted a nationally representative demand side survey of 2,456 households in Kenya in order to create a comprehensive account of how digital services support and impact people's lives; people's satisfaction and concerns of using digital services; the depth of digital exclusion and challenges people continue to face in accessing and using digital services; and, finally, the enabling resources, applications / services, and the supporting ecosystem required to deepen people's participation in the digital economy.

Exhibit 1 captures a framework of digital ecosystems that we have adapted to understand people's access to, usage and perceptions of the four interlinked components including supporting ecosystems, core digital infrastructure, enabling resources as well as applications and services.

Exhibit 1: Framework to map key features of Kenya's digital economy



1. Supporting ecosystem
- Support systems for access to digital services and capacity building
- Regulatory laws for data protection and safety

2. Core digital infrastructure
- Access to the internet and devices
- Affordability of devices and data
- Reliability of internet and mobile connections
- Power outages
- Digital awareness and literacy
- Cultural norms

3. Enabling resources
- Availability and efficiency of financial platforms, digital ID, asset registries, and addressing systems to use digital services

4. Applications and services
- Relevance and operational ease of use
- Cost

5. People's perceptions
- Perceptions of importance, benefits, and ill-effects of using digital devices and services
- Concerns of digital safety - including digital fraud, cyber harassment, and data privacy
- People's aspirations and current levels of satisfaction

As Kenya continues to transform its digital economy, narrowing the digital divide and deepening digital adoption will require solutions that account for the nuances and complexities of Kenyans' diverse experiences and needs. Our evidence base can be used to develop a better understanding of where Kenyans are along their digital usage journey, how they believe digital services can improve their lives, and what challenges they face. This understanding can help the government, the private sector, and civil society develop targeted solutions that are more effective in addressing the root causes of exclusion and further strengthen ongoing efforts to enhance penetration and usage rates in the country.

6 Core digital infrastructure includes towers, devices, and data.
7 Advanced digital services include digital information / news, e-governance, e-commerce, digital health, digital education, digital services supporting livelihoods (business owners, farmers, employed), and content creation.
8 Our study covers people in Kenya above 15 years of age.
9 Digital services people use on a mobile phone, computer, or with the internet.

The Covid-19 crisis provides a unique backdrop for this study—a profoundly disruptive event that prompted many Kenyans to accelerate their adoption of digital services (although not uniformly), while the government and private sector also used the period to accelerate important digitization policies and investments. Our study gathers evidence on which segments of Kenyan society were able or unable to accelerate their use of which digital services in order to support their lives and livelihoods during the early months of the Covid-19 pandemic[10]. In some cases, we find direct evidence that government and/or private sector interventions are beginning to accelerate usage[11]. We hope these survey results can both point to ways of accelerating digital adoption beyond the pandemic and highlight where gaps exist that may require larger or more targeted interventions.

While this study aims to provide a nuanced picture of how Kenyans are using digital services today, we do not attempt to present a holistic view of the digital economy, nor do we recommend specific interventions. On several points, such as digital penetration rates and the digital divide, this study confirms what is essentially common knowledge. Yet our data also update key digital usage and adoption metrics and provide new insights into the experiences, attitudes, and sentiments of Kenyan residents. Because the study is limited to a demand-side view of digital usage in Kenya, and does not attempt to capture supply-side and ecosystem dynamics, we avoid making presumptive recommendations. Nevertheless, our hope is that various stakeholders—from government to the private sector to academia and civil society—can draw on these findings and survey datasets to reach a clearer understanding of the different Kenyan consumer segments and their needs and challenges, and that this can form the basis for further research and customized solutions to enhance Kenyans' participation in the digital economy.

Key highlights of our report

Kenya as a leader in digital adoption

Our study validates Kenya's position as a continental leader in access to digital infrastructure and sheds new light on the degree to which Kenyans rely on and are satisfied with digital tools and services. Our survey data corroborate and update what is already well established: Kenya is a continental leader in internet penetration (65% of Kenyans over the age of 15 have access to internet[12]), mobile phone penetration (98% of Kenyans older than 15 own a SIM card[13]), and mobile money penetration (94% of Kenyans older than 15 use mobile money[14]). Our data also shed new light on people's experience of digital services. The vast majority (86%) of Kenyans report they are satisfied with their experience of using mobile phones, internet, and digital services, and 74% say the use of the internet is important for meeting their day-to-day needs. An overwhelming majority (84%) of Kenyans also report that digital devices and services are making their lives better, while just 1.2% claim that they are making their lives worse. Meanwhile, a significant minority (30%) of Kenyans report an increase in their income as a result of using digital devices and services.

Building on its strong foundation of digital infrastructure, Kenya has been making a significant effort to broaden participation in the digital economy; this study further confirms that Kenyans are receptive to expanding and deepening their digital usage and are benefiting from efforts to make digital services more accessible. During the Covid-19 pandemic, 44% of mobile money users increased their usage; the majority of those who did cited the fee waiver as a motivating factor[15]. Although the Huduma Namba digital ID scheme is still in early stages of operationalization, almost half (45%) of Kenyans[16] anticipate that it can make improvements in accessing and using digital services, while 19% of Kenyans are yet to be convinced of its value for this purpose.

10 We asked people about the change in usage of digital services during the lockdown period of Mar-Aug 2020.

11 For instance, in early 2021, the Ministry of Health began digital contact tracing, reporting, and test result verification through QR codes. The Ministry of Education also enhanced its curriculum delivery during the pandemic by enabling access to digital education through various digital and media platforms

12 External benchmarks for internet penetration from Digital 2021: Global - 59.5%; Peer within the continent Nigeria- 50% and South Africa 64%

13 GSMA's State of Mobile Internet Connectivity report 2019 places global SIM penetration at 103%

14 External benchmarks show that the rate of adults making/ receiving digital payments in Kenya is 79% compared to 62% for higher-middle-income countries and 29% for lower-middle-income countries (Source: World Bank Findex)

15 Eighty-eight percent of those who started using or increased their use of mobile money during the pandemic cited the fee waiver for transactions below KES 1000 as a factor in increasing their use of the service. Of these users only 2% say that they would discontinue the use of the service if waivers were rescinded.

16 Questions on Digital ID include a sample of people above 18 years of age.

Meanwhile, Huduma Centres are playing a critical role in supporting e-governance users—81% of e-governance users have used the Centres for help completing digital processes[17]. And while Ajira Youth Empowerment Centres (AYECs) are still a nascent part of the Ministry of ICT's Ajira Digital Program, AYECs are proving to be a critical resource for those using digital services for livelihood support: 60% of people who are employed and use digital services for upskilling and job search find support at Ajira Centres.

Kenya has also established itself as a go-to country for many start-ups looking to test and launch digitally enabled products and services. Kenya has one of the most advanced agri-tech ecosystems in Sub-Saharan Africa (SSA)—approximately 30% of the SSA's agri-tech start-ups operate and 18% maintain headquarters in the country[18]. Agri-tech (e.g., DigiFarm), e-commerce (e.g., Jumia, Sendy, Safeboda), financial products for savings and credit (e.g., M-Shwari, M-Kesho, Branch, Tala), ed-tech (e.g., Eneza), and many other services that have been tested and launched in Kenya are increasingly benefiting individuals and businesses. The country has also experienced an upsurge of services (such as M-KOPA and M-Gas) for a mobile-money-enabled internet of things (IoT).

Accelerating and deepening the use of digital services

Digital services have penetrated the daily lives of a majority of Kenyans. Kenya is among the largest markets for mobile money in SSA that have achieved quasi-universal usage rates[19]. This backbone, combined with a moderately high digital literacy rate (38%)[20], provides many innovators—local and foreign, commercially-driven and socially-driven—with a suitable environment to test new digital products and services[21].

Beyond mobile money, the use of digital services for business and livelihoods has considerable room for growth and deeper engagement. Our survey finds that just 13% of Kenyans have used e-commerce platforms[22] to buy or sell products and services. This figure underestimates the real extent of e-commerce, as respondents largely reported the use of marketplace platforms like Jumia and Kilimall, while the full breadth of e-commerce also encompasses digital trade through informal platforms—for example, via social media—as well as payments, logistics, addressing systems, and asset recognition including mapping/ tracking commodity ownership or exchange. Still, even if all forms of e-commerce were included, there is almost certainly room for many more Kenyans to utilise or deepen their utilisation of digital services for commerce and trade.

Businesses that do use digital services do not necessarily use advanced digital services. While 44% of self-employed people / business owners use digital services to support their businesses, 86% of this group use these services to communicate with customers and vendors, while 23–40% use intermediate digital services for business[23], and only 15–18% use advanced digital services for business—including digital devices to keep business records and track stock, digital governance services to register businesses and pay taxes and levies, and digital services to sell products and buy supplies through e-commerce platforms.

17 A majority of people who are aware of and use e-governance services visit Huduma Centres in order to use the police abstracts in place of IDs if they have lost their ID (59%), to pay in cash because they can receive immediate payment confirmation (56%), or to complete processes as directed by the e-citizen platform (53%).

18 Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA), Digitalization for Agriculture in Africa—preliminary findings, 2019.

19 Mckinsey, Mobile financial services in Africa: Winning the Battle for the Customer, 2017

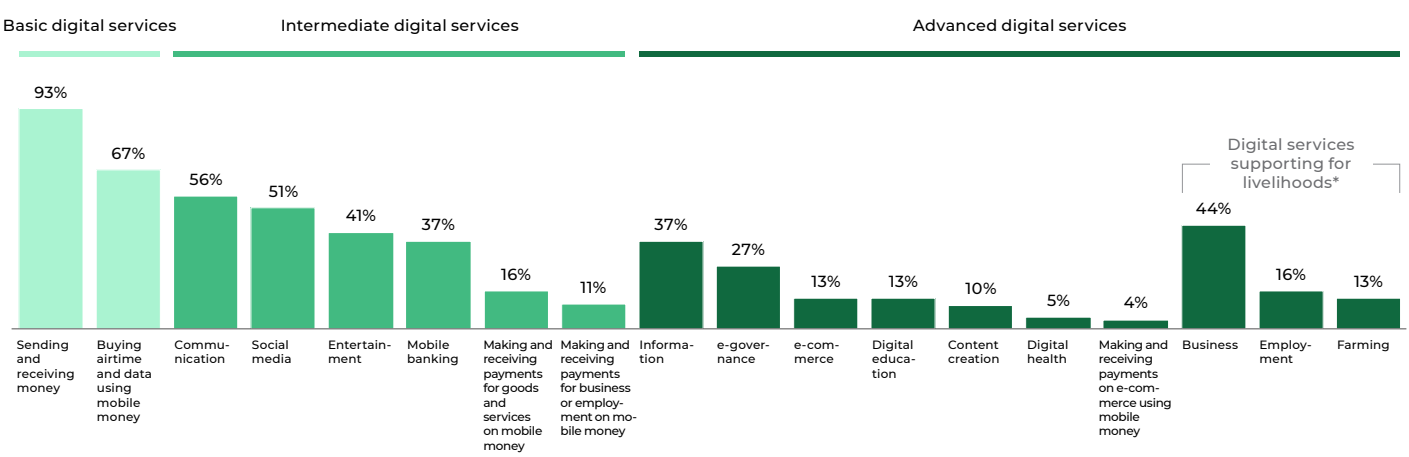
20 External benchmarks show that the digital literacy rate in Nigeria is 35%, Rwanda is 50% and South Africa is 53%. (Siemens, African Digitalisation Maturity Report, 2017)

21 Kenya attracted USD 564 million in start-up funding in 2019 — the second highest figure in Africa (Source- Partech, Africa Venture Capital Report , 2019); Some home grown innovations , such as DigiFarm, have reached more than 1 million Kenyans. (Source: Mercycorps, Digifarm- An digital platform for farmers, 2019)

22 In this study the term e-commerce refers to conventional e-commerce platforms (e.g., Jumia, Kilimall, etc.); trade through mobile money tills, digitally enabled commerce embedded in providers' business processes (e.g., Agri-wallet), and commerce through social media may have been captured but are not comprehensively measured.

23 Intermediate services for business include using digital services to find new information on products and services, market products on social media, and learn how to improve products, as well as using mobile money to access credit and pay salaries and expenses.

Current levels of Digital Service Usage



*N represents only the proportion of respondents that cited digital usage for specific occupations; digital livelihoods (business), N=236; digital livelihoods (farmers), N=59; digital livelihoods (employment), N=97.

As Kenya progresses on its digital transformation journey, a critical next step will be to continue investments in enabling resources to deepen Kenyans' engagement with e-commerce and the use of advanced digital services. Enabling resources such as mobile money, digital identity systems, national addressing systems (NAS), and asset registries play a substantial role in accelerating digital innovation and deepening the adoption of advanced digital services. Our study offers a people's perspective on how enabling resources and supporting systems could be further strengthened to enhance Kenyans' usage of digital services for their economic benefit. This is far from an exhaustive list, but Kenyans see the following enabling factors as having an impact on their use of advanced digital services.

- **National addressing system**
  For the 40% of e-commerce users who face challenges in receiving deliveries (due to lack of precise street addresses and logistics complications) and who cite this as a major limitation to their digital usage for business purposes, the national addressing system presents a critical opportunity within ongoing government efforts to unlock more e-commerce and digital trade opportunities.

- **Fraud and digital safety**
  Efforts to address digital safety concerns are becoming an increasingly important factor in supporting Kenyans' embrace of digital services. Many Kenyans are concerned about digital fraud and online safety[24]. Thirty percent of respondents have experienced digital fraud and 90% express concerns about fraud in their use of digital services—including 71% of self-employed people / business owners whose concerns limit their usage of digital services for their businesses. Moreover, 65% of people worry about their personal safety and that of their family due to the use of digital devices and services. However, only about half of Kenyans seek redressal after experiencing fraud and even fewer change their online behaviour[25]. Regulatory changes aimed at providing greater protection for individuals and businesses in their digital usage are already underway in Kenya, through adoption and implementation of the Data Protection Act, and globally through other critical legislations such as the GDPR; to fully address digital safety concerns, however, redressal mechanisms need to be strengthened and users' awareness of these mechanisms needs to increase.

- **Hands-on support**
  Our study reinforces previous findings that access to hands-on support seems critical in helping Kenyans deepen their use of some digital services. With the Huduma Centres, Kenya has made strides in setting up supporting ecosystems for e-governance. However, many users say that the lack of access to a Huduma Centre limits their use of e-governance services—a majority (58%) of people who are aware of and use e-governance services experience challenges due to lack of Huduma Centres in the neighbourhood (especially 68% of people in less populated urban areas), working hours lost due to visiting Huduma Centres (58%), and having to wait in long queues to receive service (51%). In the private sector, field agents act as a strong supporting system for farmers—52%[26] of users of farming-related digital services say that field agents (e.g., DigiFarm agents) provide them with guidance and support in using ag-tech platforms; however, many farmers lack access to agents.

24 There are limited data sources from other countries on concerns around digital safety and prevalence fraud to substantiate whether Kenya's experience is unique, higher or lower compared to similar or slightly more advanced economies.

25 Thirty-eight percent of Kenyans change their usage behaviour after experiencing a digital safety issue, including online fraud, a data breach, or cyber harassment.

26 This figure is taken from a base of 13% of the overall population who identified themselves as farmers and use digital services for livelihoods support.

An inclusive digital transformation

Our study corroborates that (as is the case in many other countries) segments of the Kenyan population that are geographically, financially, and socially vulnerable[27] are more likely than the average Kenyan to participate minimally in the digital economy. Twenty-two percent of Kenyans are basic digital services users and use only basic mobile money services[28]; 3% are non-users of digital services. Unsurprisingly, the most vulnerable populations are predominantly basic digital services users or non-users. Eighty-five percent of rural residents with lower than primary education, 45% people with disabilities, 44% of older people across all geographies, and 37% of adult farmers / homemakers are basic digital services users or non-users[29]. Our study also corroborates the commonly understood gender divide in Kenya[30]: 35% of women are advanced digital services users, compared to 54% of men.

The challenges faced by excluded groups are neither simple nor homogeneous, and one-size-fit-all solutions will not adequately address them. However, our study does shed light on some advanced digital services that are reaching some portions of "typically left-behind" segments and helping to improve lives, particularly for women.

Adult female farmers[31] are one hard-to-reach group for which current efforts may represent a path toward greater and deeper engagement with digital services. This segment tends to be excluded from various economic opportunities[32]; like many vulnerable groups, adult female farmers face challenges in affording devices[33] and accessing the internet[34]. Fifty-two percent of adult female farmers have no access to the internet. Over half (54%) say they need help in using digital services, compared to 37% of all Kenyans. Yet, some digital agricultural programs are having an impact with female farmers and demonstrating new models of how to serve and reach women. For example, DigiFarm—a Safaricom-led, multi-provider platform offering farmers digitally-enabled extension services, input purchases, and market linkages—is reaching many female farmers. According to a recent study[35], female farmers on the platform experienced increases in their income, yields and farm productivity, which we expect to further increase through a compounding effect[36]. Although much remains to be done to fully address exclusion among female farmers, the programs such as DigiFarm are pushing in the right direction. Despite the challenges they face, some female farmers also experience greater agency thanks to being able to use digital services[37].

27 World Bank, Kenya Economic Update, 2019.

28 Basic digital services include the use of mobile money services for sending and receiving money or for buying airtime and internet data.

29 These groups represent the following proportions within Kenya's overall population over the age of 15: rural residents with lower than primary education: 7%; adult farmers / homemakers: 15%; older people across all geographies; 7%; people with disabilities: 3%.

30 An estimated 32% of women and 49% of men aged 18 years and older used mobile internet in Kenya in 2019 (GSMA - The Mobile Gender Gap Report, 2020)

31 Numbers in these segment also capture data for adult female home-makers.

32 According to the Mastercard Foundation Young Africa Works, The Human Account report 2019, young female farmers earn 30% less than their male counterparts.

33 One in five adult female farmers / homemakers can't pay for a devices. This is in comparison to 23% among the overall Kenyan population.

34 One in five adult female farmers / homemakers can't pay for a device, 52% have no access to internet and 39% can't pay for internet connections or services. This is in comparison to 23%, 34%, and 30%, respectively, among the overall Kenyan population.

35 Busara and Dalberg on behalf of Mercy Corps Agrifin, Digifarm: Gender Impact Study, 2021

36 We anticipate that income increases will result in additional gains and value in productivity and socio-economic empowerment for women leading to additional income.

37 70% of adult female farmers / homemakers experience increased ability to make decisions and 66% reported having more independence due to usage of digital devices and services. This is in line with national averages of 75% and 69% respectively.

Female self-employed people / business owners are also a segment primed for greater adoption of advanced digital services. Although female entrepreneurs may not be among the most excluded segments, there is a substantial gap in digital usage between this group and their male counterparts. Only 36% of female self-employed people / business owners use digital services to support their livelihoods (compared to 54% men), and over half (56%) say they need help in using advanced digital services but are unable to find it (compared to 44% among men). Despite the challenges this segment faces, female entrepreneurs aspire as much as their male counterparts to fully utilise digital tools for business and to learn more about how e-commerce and digital marketing can assist them to expand their businesses[38]. Given the right supporting services, interventions such as the USADF supported WomenWork Digital Future Program have the potential to deepen advanced digital usage for women.

As innovative services continue to decrease levels of exclusion, more research and focused efforts are required to bridge the gap for other segments, such as people living with disabilities, that are not yet being reached by innovations supporting use of advanced digital services.

The next few years offer an opportunity to build on the progress of prior years and the momentum of current efforts. To do so will also require focusing on deepening Kenyans' use of advanced digital services as well as addressing persistent challenges for people who have been historically excluded. We hope that the information in this report can help inform both the design of new digital services and the national conversation about where and how to target interventions aimed at narrowing the digital divide and bringing all Kenyans along on the country's journey toward digital transformation.

38 A recent study by the IFC and Dalberg on the impact of the Covid -19 Pandemic on women-led MSMEs found that women led MSMEs in Kenya were just as likely to be interested in digital tools and digital training as their male counterparts.

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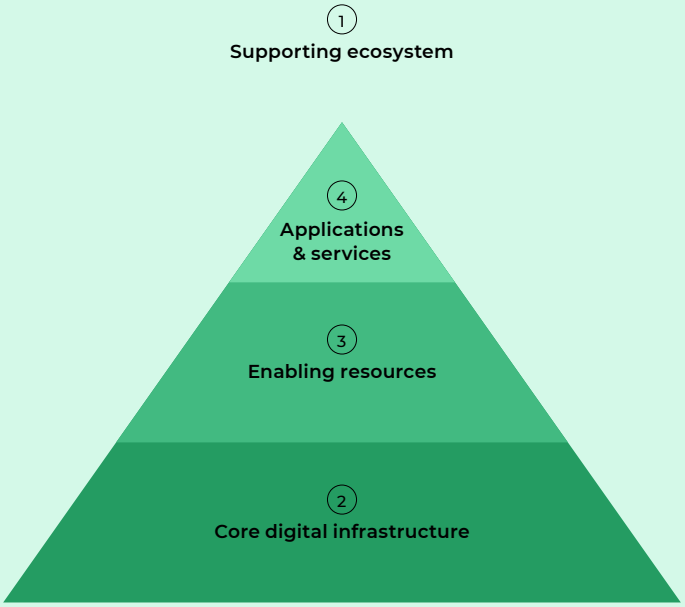
Introduction

What we studied

Our study develops a comprehensive evidence base of how different Kenyans access and use digital services, as well as the specific support they need to increase the quality and depth of their participation in the digital economy. We lay out some of the important context of Kenya's digital transformation journey as it pertains to the four interlinked elements of the digital economy (see Exhibit 1), and highlight the ways in which understanding people's views of digitization can help accelerate Kenya's digital economic goals.

Exhibit 1: Framework to map key digital ecosystems within Kenya's digital economy



1. Supporting ecosystem
Regulatory environment (policies), institutional frameworks (innovative hubs, data governance), investments, etc., across levels of the pyramid that address bottlenecks and catalyse growth.

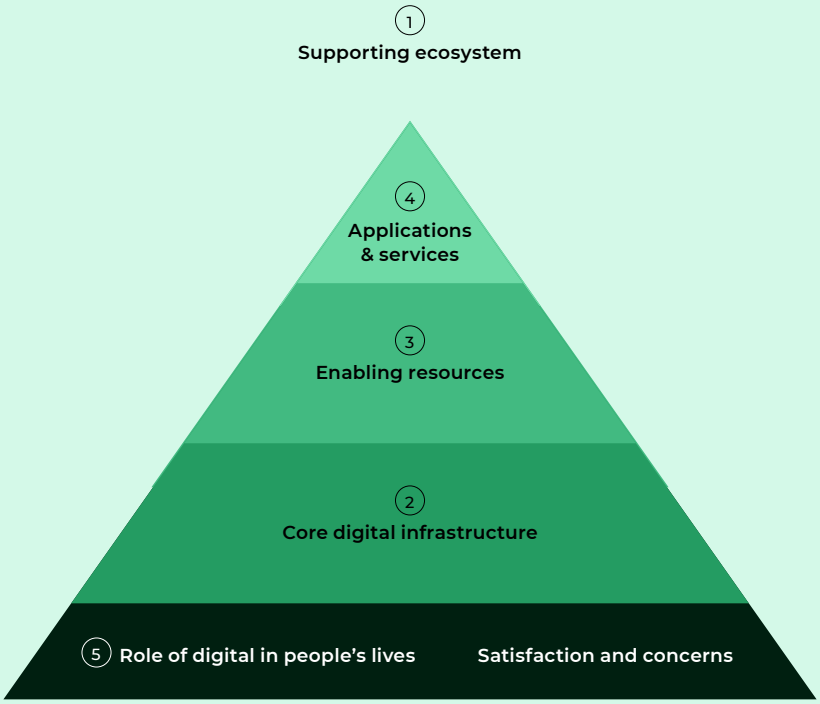
2. Core digital infrastructure
Foundational infrastructure required to ensure quality access to internet through which users can access digital services. This includes mobile towers, fibre optic cables, mobile handset penetration, etc., essential for seamless digital functioning.

3. Enabling resources
Intermediary layer comprising resources such as financial transaction platforms, asset registries, citizen inclusion systems, etc., which allow utilisation of digital infrastructure and enable the launch of innovative digital infrastructure, services, and applications.

4. Applications and services
Services used by end-users and derived from core infrastructure through enabling resources (e.g., e-commerce, ed-tech, etc.)

We focused our research on understanding people's perspectives on their participation in the digital economy along the dimensions laid out in Exhibit 2—how digital services support and impact people's lives; people's satisfaction and concerns of using digital services; the depth of the digital divide and challenges people continue to face in accessing and using digital services; and, finally, the enabling resources, applications / services, and the supporting ecosystem required to deepen people's participation in the digital economy.

Exhibit 2: Framework for studying people's access to and usage and perceptions of digital ecosystems



1. Supporting ecosystem
- Support systems for access to digital services and capacity building
- Regulatory laws for data protection and safety

2. Core digital infrastructure
- Access to the internet and devices
- Affordability of devices and data
- Reliability of internet and mobile connections
- Power outages
- Digital awareness and literacy
- Cultural norms

3. Enabling resources
- Availability and efficiency of financial platforms, digital ID, asset registries, and addressing systems to use digital services

4. Applications and services
- Relevance and operational ease of use
- Cost

5. People's perceptions
- Perceptions of importance, benefits, and ill-effects of using digital devices and services
- Concerns of digital safety - including digital fraud, cyber harassment, and data privacy
- People's aspirations and current levels of satisfaction

How we conducted the study

This study is based on findings from a nationally representative survey[39] that gathered the experiences and perspectives of 2,456 residents in Kenya. We conducted one-hour in-depth interviews with respondents across all 47 counties in Kenya. Following data analysis, we conducted in-depth interviews using human-centred design (HCD) research with 27 people. All data collection took place from November to December 2020. The survey and HCD research were conducted in English, Kiswahili, and Somali.

The survey output is a public dataset that allows anyone to conduct their own analyses—to add nuance to the findings reported here or to arrive at their own conclusions.

In preparation for the study, we received inputs from more than 10 experts in various fields including government, the private sector, media, academia, the development sector, and civil society (a full list is included in the annexure). Throughout our study, we received guidance on research and survey design as well as analysis from seven technical and subject matter experts on our Advisory Panel.

Limitations of the study

Given the limitations of survey methodologies, we focused only on questions that residents were able to answer credibly through a survey format. We are also limited by the following:

- Residents' personal perceptions and experiences are by nature subjective.
- While we have tried to understand specific challenges that limit people's usage of various digital services, we cannot attribute causality to these drivers.
- This study likely underestimates the real extent of e-commerce, as respondents largely reported the use of marketplace platforms like Jumia and Kilimall while the full breadth of e-commerce also encompasses digital trade through informal platforms—for example, via social media—as well as payments, logistics, addressing systems, and asset recognition including mapping/tracking commodity ownership or exchange. Still, even if all forms of e-commerce were included, there is almost certainly room for many more Kenyans to utilise or deepen their utilisation of digital services for commerce and trade.
- Through a rigorous review process and extensive enumerator training, we have tried to minimise biases arising from the framing, sequence, translation, communication, and interpretation of questions; some biases will inevitably remain.

39 Our sampling frame is based on the Kenya National Bureau of Statistics (KNBS) 2019 census data.

Given that we conducted this research in the midst of the Covid-19 pandemic, residents' responses may reflect conditions (some of which limit users and some of which may push them to adopt more digital services) that differ from the pre-pandemic norm. We have tried to ask respondents to note how their usage of digital services changed during the pandemic, but some recency biases almost certainly remain.

Because this study considers only the views of Kenyan residents, we do not attempt to develop a systemic view of the ecosystem that includes a comprehensive exploration of supply-side factors. As a result, we have chosen to not make formal recommendations.

Segmenting users of digital services

In an effort to build a deeper and nuanced understanding of the digital divide, we have used a PAM cluster algorithm to find four distinct groups of Kenyans and organised them based on what digital services they currently use. We have found one group of **non-users** who don't use any of the digital service use cases studied, and three groups of digital services users that include different clusters of use cases. Users of **basic** digital services use only basic mobile money services including sending and receiving payments or mobile phone airtime top-ups. Users of **intermediate** digital services use one or more of services including social media, digital communication tools, digital entertainment, and digital financial services using mobile money. Users of **advanced** digital services use one or more services that support knowledge building, social services, and livelihoods—e.g., information / news, e-commerce, e-governance, digital education, digital health, business support, upskilling / job search, or agricultural support.

While we have defined the segments as users of basic, intermediate, or advanced services, we do not mean to suggest that this is the only way to cluster usage patterns across the broader digital economy, or that there is a continuum of use across these services. Our segmentation is rather a reflection of the observation that the use of more advanced digital services may require greater resources and/or know-how—and therefore that people from more vulnerable socio-economic demographics may face more and deeper structural challenges to the use of these services. Understanding differences and similarities in how these segments perceive and engage with a range of digital services can help us distil the specific challenges users face and identify what it will take to bridge the digital divide.

CHAPTER 1

Digital economy in context

Kenya's digital transformation journey – laying the groundwork

Digital economy is a foundational pillar in Kenya's vision of building an empowered society. Digital economy is an integral part of Kenya's Vision 2030 and a centrepiece of Kenya's plan to increase the annual GDP growth rate from 5.4% to 10% by 2030[40]. The Digital Economy Blueprint (2019), National ICT Master Plan (2016), and National Broadband Strategy (2013–2017; 2018–2023) are critical plans put forward by the government and key stakeholders to establish policy and regulatory frameworks for the digital economy. These plans all share the objective of increasing ICT contribution to GDP from current levels of 2% to 10%, making it a key driver of the Big 4 agenda—food security, manufacturing, affordable housing, and affordable health care for all. In doing so, Kenya aims to act on its vision of a digitally empowered citizenry wherein every citizen, enterprise, and organization has digital access and the capability to participate and thrive in the digital economy[41].

We find that individual Kenyans mirror the government in recognizing the importance of the internet and digital services to improving their lives. Regardless of their current use of digital services, most participants in our study (74%) indicate that the internet is important for meeting their day-to-day needs, and overwhelmingly (84%) report that digital devices and services are making their lives better.

Kenya has made great strides in laying the groundwork for its bold agenda across the four elements of the inter-linked digital economy: (i) forward-leaning investment and innovation in **core digital infrastructure**[42]; (ii) a booming technology start-up ecosystem for advanced **digital applications and services**[43], supported by the guide rails of mobile money and a favourable regulatory environment; (iii) progress in defining policies and frameworks for other **enabling resources**, including digital ID, addressing systems, and asset registries; and (iv) public and private investments in **supporting ecosystems** to enhance capacity building for accessing and using digital services.

Core digital infrastructure

Forward-leaning investments and innovations in last-mile connectivity and digital financial inclusion have positioned Kenya as a continental leader in internet penetration, while mobile phone penetration and digital payments adoption are approaching and even exceed global levels[44].

Our survey results validate publicly available information on these penetration levels; we found that, as of November 2020, 98% of Kenyans over the age of 15 own a mobile phone SIM, 65% have access to the internet, 92% use USSD/SMS, and 52% own a smartphone; mobile money has now achieved almost universal adoption (94%)[45].

The government has laid the foundations for further private investment and innovations in last-mile connectivity. The government has made catalytic investments in backbone infrastructures including TEAMS cables, the National Optic Fibre Backbone Infrastructure (NOFBI) network, National Broadband Strategy, and County Connectivity projects. Private companies have made a push towards increasing last-mile connectivity through leveraging this infrastructure and expanding reach with green technologies. Off-grid solar power companies provide access to low-cost off-grid solar energy to base-of-the-pyramid (BoP) households in rural and remote areas[46,47].

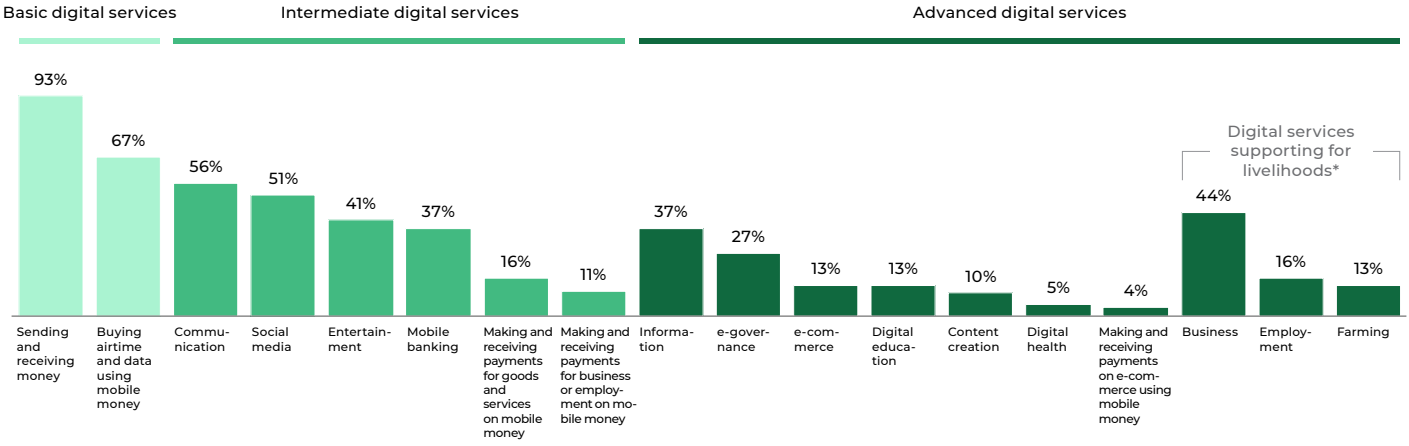
40 Kenya Digital Economy Strategy 2020.
41 Kenya Digital Economy Blueprint 2019.
42 Core infrastructure includes towers, devices, and data.
43 Advanced digital services include digital information / news, e-governance, e-commerce, digital health, digital education, digital services supporting livelihoods (business owners, farmers, employed), and content creation.
44 Internet penetration: Kenya 46%, global rate 59%, Nigeria 42%, South Africa 62%, and Brazil 71%. In Kenya, 79% of adults make / receive digital payments; the rate is 62% for higher-middle-income countries and 29% for lower-middle-income countries. Digital 2020, World Bank Kenya Economic Update, and World Bank Findex.
45 Kenya benchmarks: mobile phone SIM penetration (101%), smartphone ownership (41%), internet penetration (46%). This data comes from comparative studies including GSMA, Mobile Connectivity Index, 2019; Pew Research, 'Smartphone ownership is growing rapidly around the world but not always equally'; and World Bank, Kenya Economic Update, 2019 (note: population figures in these studies the overall population people aged three years old and older).
46 M-KOPA provides solar electricity access to over 3 million people through a pay-as-you-go plan on Safaricom's mobile payment platform. Our Impact, 2019.
47 BRCK, a portable internet connectivity device, keeps people connected in rural and urban areas where electricity provision and internet connectivity are problematic. Connecting Africa to the Internet, (Accessed March 2021).

Applications and services

Technology innovation in digital applications and services is another lever supporting Kenya's digital economy growth. Kenya has one of the most advanced agri-tech ecosystems in Sub-Saharan Africa (SSA)—approximately 30% of SSA's agri-tech start-ups operate and 18% maintain headquarters in the country[48]. Agri-tech (e.g., DigiFarm), e-commerce (e.g., Jumia, Sendy, Safeboda), financial products for savings and credit (e.g., M-Shwari, M-Kesho, Branch, Tala), ed-tech (e.g., Eneza), and many other services are increasingly benefiting individuals and businesses. The country has also experienced an upsurge of services and production distribution channels (such as M-KOPA and M-Gas) enabled by mobile money and the internet of things (IoT)[49].

Kenya is currently in the early stages of adoption of advanced digital services (see Figure 1). Just 27% of Kenyans use e-governance services or platforms, 13% use e-commerce[50] platforms to buy / sell goods and services, 44% of self-employed people / business owners use digital services to support their livelihoods, and 13% of farmland owners use digital services to support their livelihoods.

Figure 1: Usage of digital services
% of respondents. N=2,456



*N represents only the proportion of respondents that cited digital usage for specific occupations; digital livelihoods (business), N=236; digital livelihoods (farmers), N=59; digital livelihoods (employment), N=97.

Kenya continues to lead its peers amongst lower-middle-income countries in e-commerce penetration levels while, as expected, it trails those of many higher-middle-income countries[51]. However, this study likely underestimates the real extent of e-commerce, as respondents largely reported the use of marketplace platforms like Jumia and Kilimall. As such penetration levels would most certainly be higher. E-commerce is growing rapidly and appears to be on track to reach levels on par with those of many higher-middle-income countries over the next decade[52]. The planned implementation of a national addressing system should speed up the growth of e-commerce and digital trade by mitigating challenges relating to order delivery and verification.

48 Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA), Digitalization for Agriculture in Africa—preliminary findings, 2019.

49 According to a 2017 GSMA report, mobile technologies and services have disrupted emerging economies by unlocking new markets and providing innovative, affordable services to vulnerable populations. Kenya has leveraged its high mobile money penetration to accelerate IoT use cases, especially in utility-oriented services.

50 E-commerce usage in this study likely underestimates the real extent of e-commerce, as respondents largely reported the use of marketplace platforms like Jumia and Kilimall, while the full breadth of e-commerce also encompasses digital trade through informal platforms—for example, via social media—as well as payments, logistics, addressing systems, and asset recognition including mapping/tracking commodity ownership or exchange.

51 UNCTAD estimates for the percentage of online shoppers as a proportion of the population: Kenya 9%, Ghana 4%, India 3%, South Africa 8%, Mexico 10%, Indonesia 10%, Argentina 15%, Brazil 24%, and Turkey 25%.

52 At its current e-commerce growth rate (~22% between 2014–2017), Kenya has the potential to reach the levels of higher-middle-income countries in the next few years. As a comparison, Argentina's growth rate is -2%, Brazil's is 8%, and Turkey's is 14%.

Enabling resources and supporting ecosystem

A supportive regulatory ecosystem has improved ease of doing business in Kenya and is pivotal to achieving its ambitious goals. The Government of Kenya has been instrumental in supporting ease of doing business and ranks amongst the top 120 on the e-governance development index (EGDI)[53]; it has digitised key services (e.g., e-visa, e-tax, business registration, etc.) through the e-citizen online portal and set up Huduma Centres in all counties to improve government-to-citizen (G2C) service delivery.

Yet as Kenya continues along its growth trajectory, and many reforms and initiatives are underway, the government has identified key enabling resources and elements of the supporting ecosystem that need greater attention.

Digital ID: Kenya has a mature system of IDs—our study shows 97% of the adult population have a National ID that allows them to access and use digital and physical services. The government has initiated registration for (and begun mass distribution of) Huduma Namba, a digital ID which is expected to facilitate the harmonization and standardization of the registration of persons, support accurate planning, foster efficient resource allocation, and enhance service delivery in the country[54].
National addressing system: The lack of a nationwide standardised physical address system affects the growth of e-commerce and hinders the delivery of public services such as police, fire fighting, and ambulances[55]. The Ministry of ICT, Innovation, and Youth Affairs (MoICT) previously announced plans to adopt a National Addressing System and is working on enacting legislation and regulatory frameworks that will guide countrywide implementation[56].
Capacity building of youth: In 2016, The Government of Kenya through the Ministry of ICT established the Ajira Digital Program to bridge the gap between skills demand and lack of jobs. The program aims to introduce young people to digital and digitally enabled work and provide the tools, training, and mentorship needed for young people to work and earn an income with dignity[57].
Laws on digital safety: The government has passed various laws to support digital safety—including the Data Protection Act (2019) and the Computer Misuse and Cybercrimes Act (2018)—and has appointed the country's first data commissioner to drive implementation.

There is still much that the government and private sector can do—even in the short term—to accelerate the expansion of the digital economy, both in terms of the services people use and the segments of the population who are able and eager to use them. Understanding how and why people use (or do not use) the digital services that are theoretically available to them provides insight into challenges that could limit the pace of growth of the digital economy and points toward the ways in which the government and private sector might address these barriers.

53 Kenya is ranked 116th out of 193 countries on the EGDI index with a score of 0.5326, which is considered a high ranking (scores of 0.5–0.75 are deemed high).
54 https://www.hudumanamba.go.ke/ (Accessed March 2021).
55 NAS Policy Draft 1.1, 2018
56 https://www.the-star.co.ke/business/2020-01-13-sh2-billion-street-name-project-to-commence-this-year/ (accessed March 2021).
57 In its first phase, the Ajira program established 343 Ajira Youth Empowerment Centres (AYECs) and over 40 Ajira Digital Clubs; trained and sensitised over 70,000 youth on sourcing work from digital platforms; and, by March 2020, had 677,961 people working on digital and digitally enabled jobs. In Phase 2, the program partnered with the Mastercard Foundation, KEPSA, and eMobilis to scale its activities countrywide, training over 9,000 youth virtually on work-readiness digital skills, providing jobs for 791 youth working on transcription and digitization of judicial records, connecting over 5,000 youth directly to jobs through partnerships with the private sector, and helping many more find work from through work readiness trainings (a household survey in Q1 2021 will measure the overall impact of the Ajira program). The program is also offering support to over 15 local start-up innovations that focus on job linkage.

FOCUS AREA

Covid-19 – crisis and opportunity

The Covid-19 pandemic has presented a unique opportunity for people to accelerate their adoption of digital services. By gathering a people-centred perspective on what key digital services Kenyans were able or unable to use during the early months of the Covid-19 pandemic, we hope to shed light on the systemic challenges that continue to limit adoption and must be addressed as part of creating a resilient digital economy.

The government has used the Covid-19 pandemic to accelerate important digitization policies and investments. Many of these are long-term initiatives that were not implemented until the middle of the lockdown or later, and so have not yet had a substantial effect. In early 2021, the Ministry of Health began digital contact tracing, reporting, and test result verification through QR codes[58]. The judiciary launched an e-filing system to allow for filing of cases online. Over 700 youth from the Ajira Digital Program were recruited to assist in the judiciary transformation project between July and December 2020. Around the same period, the National Transport and Safety Authority offered cashless public transport[59]. The National Police Service digitised its services, including reporting crimes[60], and the Ministry of Education enhanced its curriculum delivery during the pandemic by enabling access to digital education through various digital and media platforms[61]. In addition, government directives encouraging the use of digital payments prompted telecommunications companies to waive transaction costs[62].

The Covid-19 pandemic had the potential to catalyse people to accelerate their adoption of digital services. At least during the initial days of the pandemic (March–August 2020), the effects were mixed—the use of some services increased substantially while that of others saw only a limited uptick in use. As expected, our study shows that, with lockdown restrictions in place, about half of Kenyans increased their usage of digital communication tools, social media, and mobile money (facilitated by the waiver of transaction charges[63]). However, this trend did not extend to the use of e-commerce platforms[64] and other social services over the early portion of the lockdown period during the pandemic[65]. While many countries experienced an increase in transaction volume over major platforms like Amazon, our study shows that volume over similar platforms in Kenya essentially remained flat—16% of people increased their usage while 21% decreased their usage. Given the restricted interpretation[66] of e-commerce in this study, changes in usage and growth of e-commerce services during the pandemic may not have been fully captured. Despite an uptick of e-commerce value across larger formal e-commerce platforms such as GoBeba and Glovo[67], the overall economic decline[68] resulting from the Covid-19 pandemic could account for the decrease in usage volume captured in our survey. E-commerce usage volume did, however, increase among people whose income increased during this period (44% vs. 15% of those whose income decreased) and it substantially decreased for those in rural areas (27% vs. 14% of those in urban areas).

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58 https://africacdc.org/news-item/kenya-adopts-trusted-travel-digital-tool-for-Covid-19-test-result-verification/ (accessed March 2021).

59 NTSA began the tendering process for the cashless transport system in June 2020.

60 https://www.capitalfm.co.ke/news/2020/08/kenyas-national-police-service-goes-digital/ (accessed March 2021).

61 GoK expanded digital education during the Covid-19 lockdown period in Kenya.

62 https://www.reuters.com/article/kenya-safaricom-idUKL8N2B956H (accessed March 2021).

63 Forty-four per cent of people increased their usage of digital communication tools and mobile money; 39% increased their usage of social media.

64 We have defined the use of e-commerce as buying and selling products on a mobile phone, computer, or the internet—e.g., using Jumia, Glovo, Copia, Skygarden, Facebook marketplace, etc.

65 The lockdown period analysed for Covid-19 impact covered in this study was March–August 2020.

66 E-commerce usage in this study likely underestimates the real extent of e-commerce, as respondents largely reported the use of marketplace platforms like Jumia and Kilimall, while the full breadth of e-commerce also encompasses digital trade through informal platforms—for example, via social media—as well as payments, logistics, addressing systems, and asset recognition including mapping/tracking commodity ownership or exchange.

67 GoBeba and Glovo experienced a threefold increase in orders and 30% increase in grocery orders respectively during the Covid-19 lockdown period. A Mastercard study found that 79% of Kenyan consumers shopped more online during the lockdown period.

68 Kenya's GDP contracted by 0.4% in the first half of 2020 and was expected to contract by 1–1.5% by the end of 2020 as a result of the Covid-19 pandemic. The country's unemployment rate also doubled by the second quarter of 2020, three months after the first case in Kenya was announced.

Meanwhile, uptake of digital education and digital health was limited. Despite the considerable efforts of educators and other stakeholders[69], digital education adoption reflected (and likely exacerbated) resource inequalities: only 15% of households with school-going children participated in some form of digital learning during this period[70] (33% of private school students and just 8% of public-school students), while 64% of all students did not continue learning[71]. Even the reach of traditional media channels including TV, radio, and the distribution of printed materials remained limited[72], highlighting the very nascent stage of remote education. Digital health use, meanwhile, grew from a very low base (of 5%) and remains relatively low.

Figure 2: Change in digital services usage during the Covid-19 lockdown period*
% of respondents

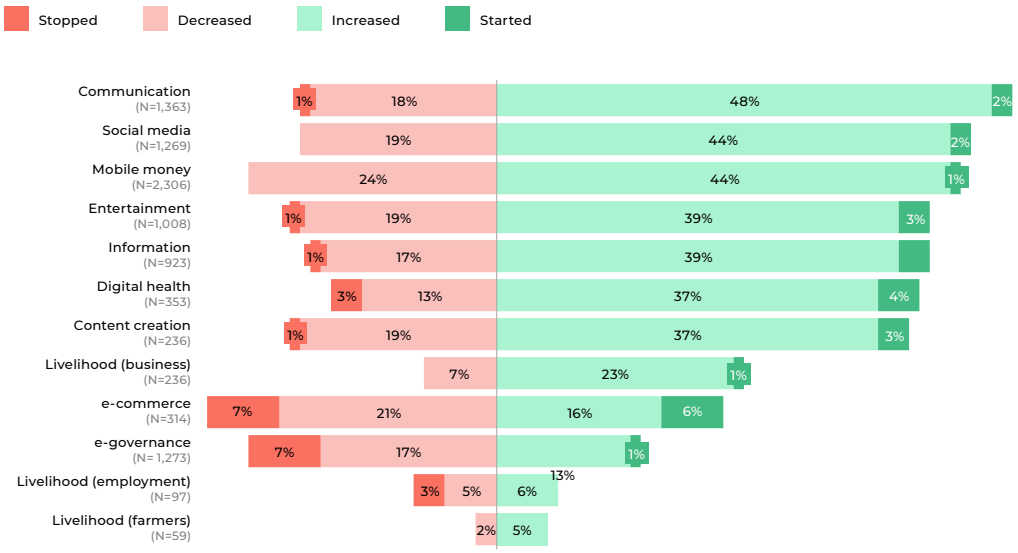


*Chart does not include data on usage that remained the same.

> "I use Google on my smartphone to research crops and pesticides. I can also market my fresh produce via Facebook and WhatsApp. Sometimes I take a picture of my produce then send them via groups. It has helped me market during Covid."
> – Thomas, 32, rural, farmer

> "If [my course] is online I expect it to cost more money than studying in person because accessing the internet and digital tools are expensive."
> – Stephen, 20, peri-urban, student

69 GoK expanded digital education during Covid-19; Safaricom and Eneza Education partnered to provide free digital education access during the Covid-19 lockdown period.

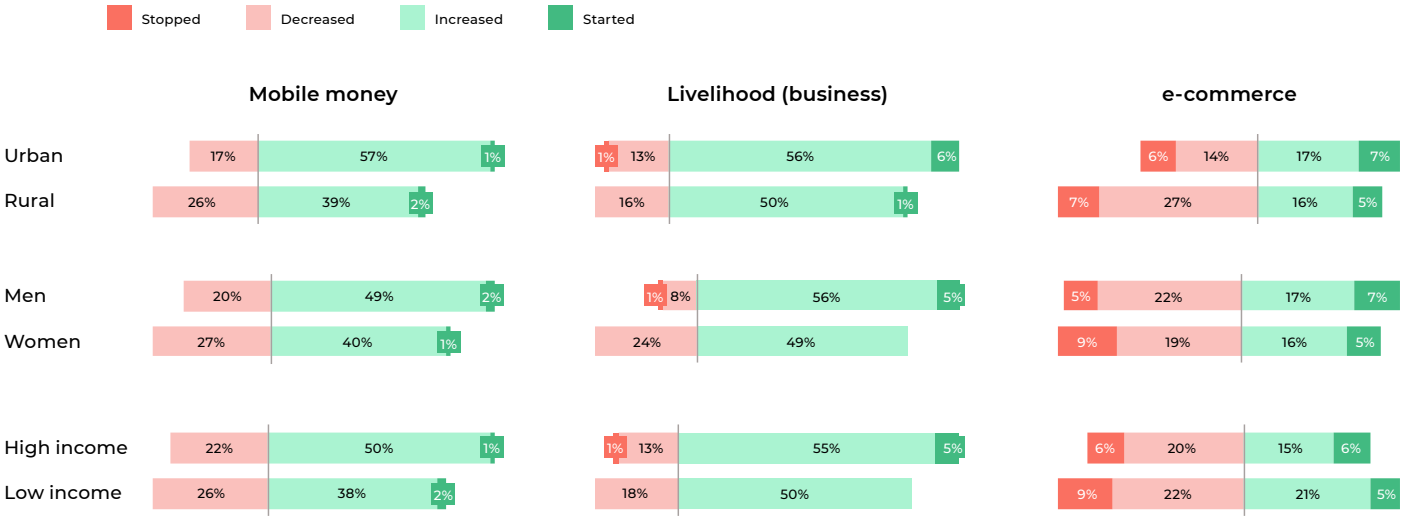
70 Six per cent of households with children used online ed-tech platforms, 4% used WhatsApp, and 5% used online classes organised by their school during the Covid-19 lockdown period.

71 Data on remote learning from other countries during the Covid-19 pandemic is sparse. However, we have learnt that comparator lower-middle-income countries such as India had much higher adoption rates of e-learning during this period. A Dalberg UNICEF report recently found that ~60% of children 5–13 years old in India had access to remote education during the Covid-19 pandemic.

72 Fifteen per cent of households with children accessed digital education through TV, 9% used radio, and 9% used printed material from schools during the Covid-19 lockdown period.

Moreover, the increase in adoption was limited to those who were already advanced digital services users. Broadly speaking, the pandemic saw population segments with already high usage rates (among them the urban, the highly educated, and the wealthy) use advanced digital services more, while those with low usage rates (including many vulnerable populations in rural areas, with lower income levels) further reduced their usage of these services. While a higher proportion of people with low incomes increased their usage of e-commerce, they were starting from a lower base (11% of people with low income vs. 29% of people with high income[73] used e-commerce).

Figure 3: Change in digital services usage during the Covid-19 lockdown for various user segments*
% of respondents



*Charts do not include figures on no change

73 In this report, low income earners are defined as those earning less than KES 25,000 while high income earners are defined as those earning above KES 50,000

FOCUS AREA

Key challenges for the digital economy – a people-centred perspective

Our study takes a people-centred perspective on the key challenges that keep significant portions of Kenya's population from participating fully in the digital economy.

Based on the responses of Kenya's residents, three challenges stand out as stumbling blocks for the next stage of growth in Kenya's digital economy. We explore these issues in the chapters that follow.

- **Enabling resources and supporting systems**
  In order to deepen adoption of advanced digital services, a number of nuts-and-bolts issues across the broader ecosystem need to be better understood and addressed. These include mixed perceptions of the role digital ID can play in accessing and using digital services, the limits that a lack of a national address system places on the growth of e-commerce, the lack of sufficient coverage for programs and facilities that support e-governance and for digital services that support livelihoods, and the potential impact of fee waivers on increasing mobile money transactions.

- **Digital safety**
  Experiences of and concerns about digital fraud and cyber harassment are common in Kenya, and increase with more advanced use of digital services. Understanding how people perceive the safety of digital services can highlight areas where the government and private sector can collaborate on building a stronger supporting ecosystem, including a comprehensive regulatory framework, as well as directing resources towards enhancing cyber resilience.

- **Exclusion**
  Supply-side challenges such as accessibility and affordability of core digital infrastructure and demand-side challenges such as digital literacy, language, relevance, and cultural norms have deep roots and clear impacts on people where the digital divide is most extreme; yet these challenges also present opportunities for strategic investments to accelerate adoption amongst those eager to participate.

CHAPTER 2

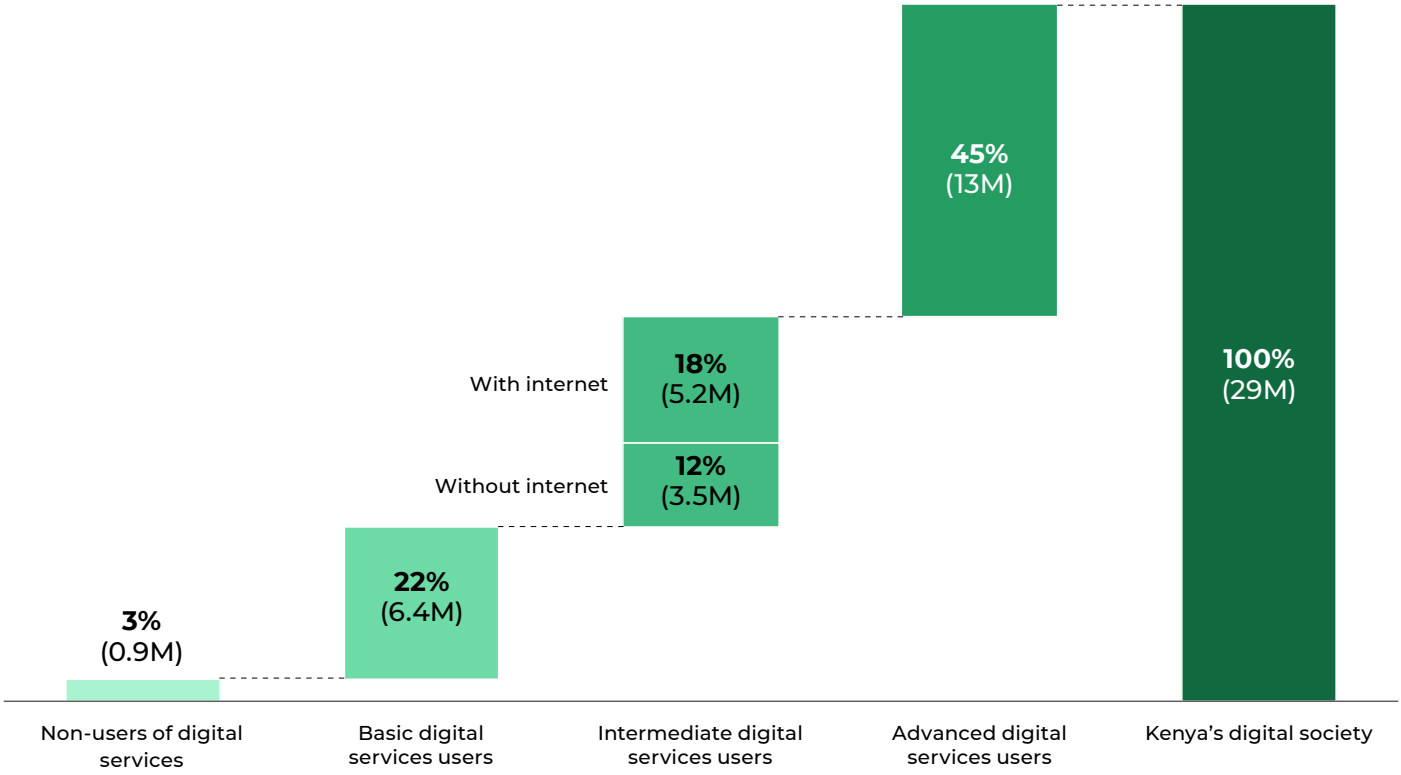
Understanding different segments of digital users

Segmenting users of digital services

We segmented Kenyans into four groups based on what digital services they use in order to understand the diversity and extent of digital usage across the country[74]. As shown in Figure 4, about half of the population (45%) use one or more advanced digital services. Thirty per cent use one or more intermediate digital services and one-fourth either use only basic digital services or are non-users.

Among users of intermediate digital services, we distinguish two groups: people who access digital services through USSD/SMS only (42% of the group) and people who access them through the internet. Intermediate users who access digital services through USSD/SMS continue using more basic digital services and are less likely to use the intermediate digital services compared to those who use the internet[75].

Figure 4: Key segments within Kenya's digital society
Segments that predominantly exhibit different digital-usage behaviour. N=2,456



The KNBS 2019 census estimates the size of the population for 15 years and older as 29,013,291.

These four levels of use intersect with socio-economic status, gender, geography, and education in ways that highlight which Kenyans are participating in the digital economy. As is the case in many countries, segments of the Kenyan population that are geographically, financially, and socially vulnerable[76] are more likely than the average Kenyan to be excluded from the digital economy. Figure 5 breaks down Kenya's digital divide by socio-economic and gender segments[77].

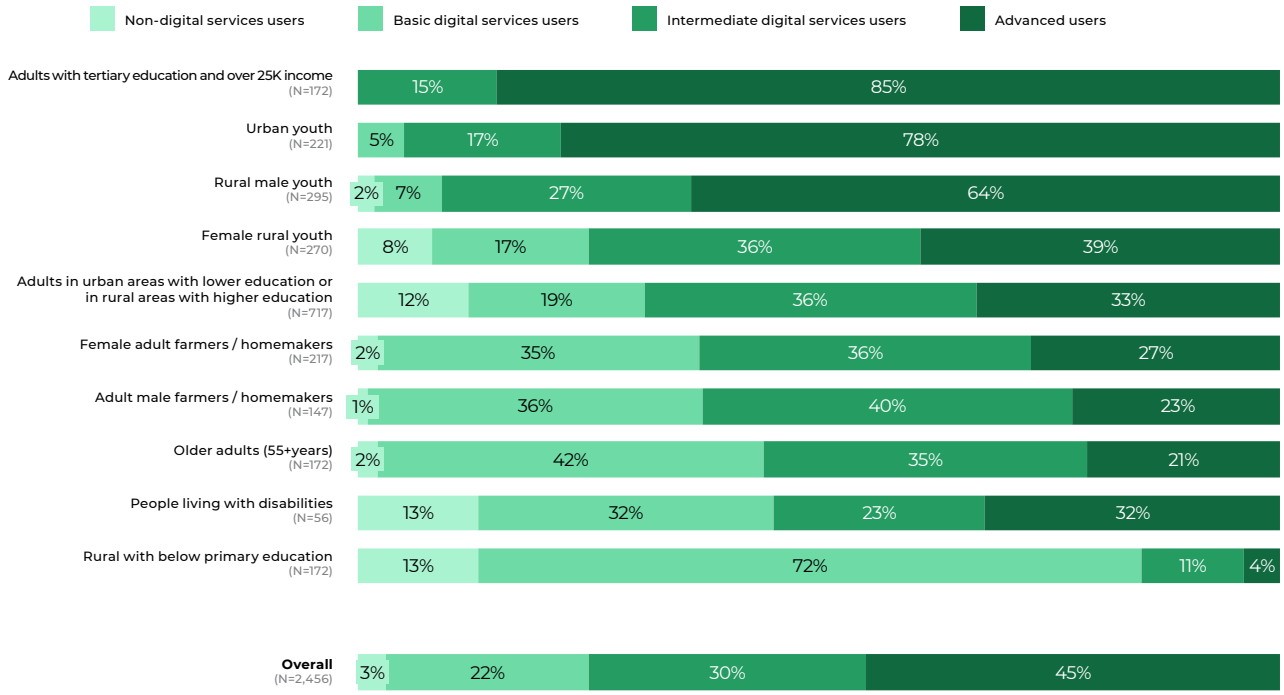
74 We classify individuals on the basis of their usage of different digital services. In order to classify these services, we used a PAM cluster algorithm to explore the number of potential clusters and use cases within each. The results indicate that three clusters provide the best fit for users. Users of basic digital services use only basic digital services. Users of intermediate digital services use one or more intermediate digital services and may use one or more basic digital services but do not use any advanced digital services. Users of advanced digital service use one or more advanced digital services, and may use one or more basic or intermediate services. Non-users do not use any of the use cases tested in the survey.

75 Just 36% of intermediate digital services users who use only USSD/SMS also use digital communication tools, compared to 72% of intermediate digital services users who use the internet. Similarly, just 8% of intermediate digital services users who use only USSD/SMS also use social media, compared to 69% of those who use the internet.

76 World Bank, Kenya Economic Update, 2019.

77 These segments represent the following proportions of Kenya's digital society (29 M): rural adults with below primary education (9%), older adults (7%), people living with disabilities (3%), female adult farmers/ homemakers (9%), male adult farmers/ homemakers (6%), female rural youth (11%), male rural youth (12%), adults in rural areas with lower education or urban areas with higher education (29%), urban youth (9%), adults with tertiary education and over 25K income (7%).

Figure 5: Kenya's digital divide across socio-economic representation and demographic segments
% of respondents



Unsurprisingly, the most vulnerable populations—rural residents with lower than primary education, farmers/ homemakers, older people across all geographies, and people with disabilities—are the most likely to be non-users (48%) and basic digital service users (66%). At the other extreme are urban youth, male rural youth, and high-income urban adults with tertiary education, who together make up 45% of advanced digital services users. Between these poles is a group that includes another vulnerable population: female rural youth, who are significantly more likely than are their male counterparts to be non-users and less likely to use advanced services.

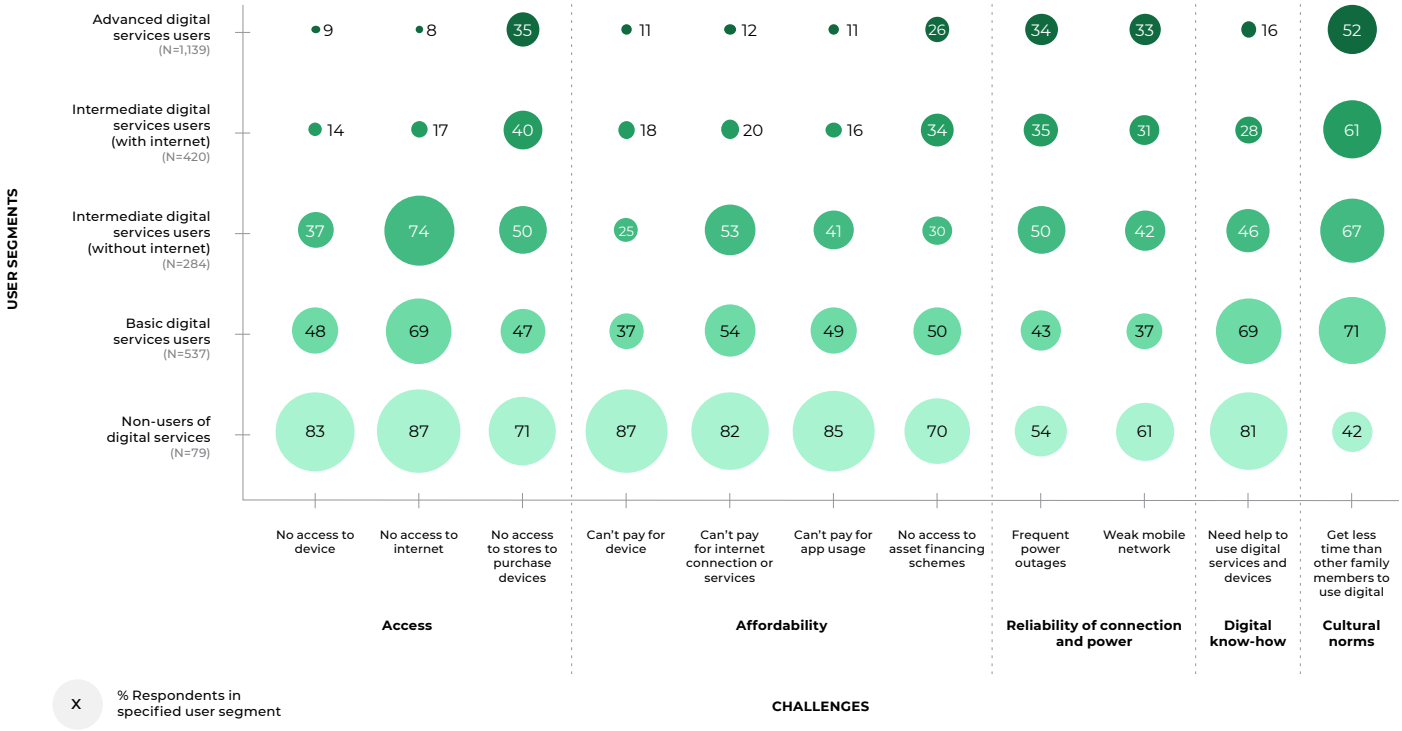
Primary structural barriers and how they compound one another

The digital economy's supply-side challenges—such as accessibility and affordability of core digital infrastructure—and demand-side challenges—such as digital literacy, language, relevance, and cultural norms—have been well documented in other publicly available sources, such as GSMA's mobile internet connectivity report[78]. We have deliberately taken a comprehensive view of the various challenges in order to understand which factors have more or less impact on the use of digital services for different segments of digital users, and which barriers compound each other's effects.

In general, non-users and basic digital services users are more likely than advanced digital services users to face challenges in accessing and affording digital infrastructure, to lack adequate digital knowledge, and to contend with restrictive cultural norms. Figure 6 shows the top challenges faced by the digital usage segments.

78 GSMA Mobile Connectivity Report, 2019.

Figure 6: Access challenges faced by digital services users



Access to the internet and devices

Limitations in accessing smartphones are a major constraint for non-users and basic digital service users (especially for those who are more vulnerable). As expected, a majority of basic digital services users use basic phones (95%) compared to a small proportion of advanced digital service users[79]. This is a major challenge for people who are more vulnerable—almost all (96%) people in rural areas with below primary education and a majority of female adult farmers / homemakers (74%), older adults (71%), and people with disabilities (76%) are basic phone users.

> "If I had a smartphone, I would have to learn how to use it. As soon as I have learned, I'd visit Google and YouTube, and use WhatsApp and Facebook so I could be more connected."
> – Phyllis, 45, peri-urban, micro consumer goods vendor

However, some people are working around access limitations by using cyber cafes—some basic phone users (15%) are surprisingly advanced digital services users. A large percentage (32%) of these users are active users of cyber cafes. This characteristic is notably uncommon among other types of users (7%). One possibility is that basic phone users are using cyber cafes in order to work around access limitations.

79 Just 8% of advanced digital service users lack access to the internet and 15% use basic phones.

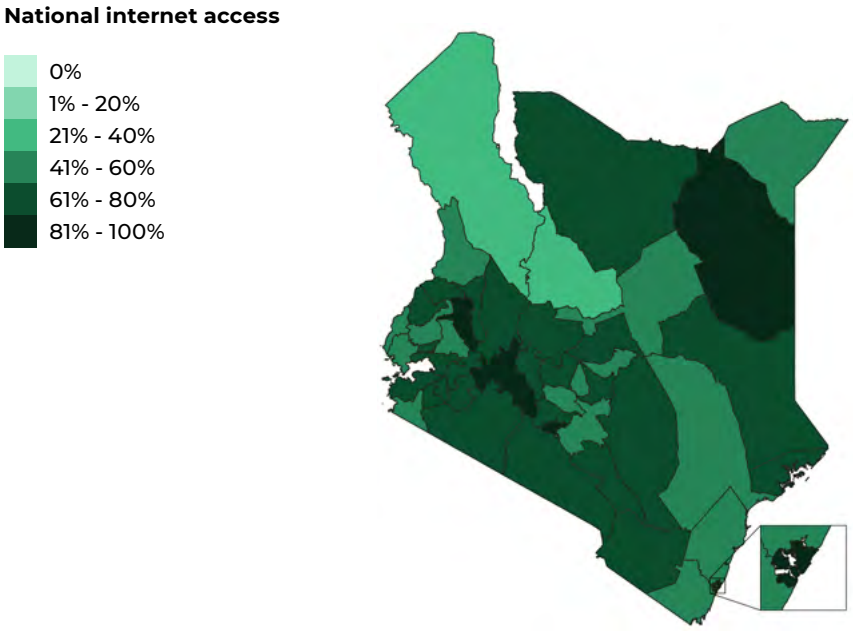
FOCUS AREA

The geographical digital divide in Kenya

While the rural-urban divide is well understood, our study shows that the 8% of Kenya's population that lives in less populated urban areas[80,81] have lower usage of digital services than people in urban centres and face similar access and connectivity challenges to people in rural areas. A smaller proportion of people (41%) in these less populated urban areas (which include smaller metropolitan areas) than of those in the urban centre (64%) are advanced digital services users. Our study shows that last-mile internet penetration is lagging in these areas, as only 6% of people have 4G access compared to 36% of people in urban centres. People in less populated urban areas are more likely to face limitations in their use of digital services due to challenges with access to the internet (40% vs. 20% of people in urban centres) and weak internet connections (39% vs. 15% of people in urban centres).

Figure 7 highlights the geographical digital divide. Unsurprisingly, more remote and less densely populated areas, including Turkana and Samburu counties, are lagging in internet usage with below 40% usage rates. Urban areas account for most of the country's 4G penetration—in particular, Nairobi, Mombasa, and Nakuru, which have 81–100% penetration, along with pockets of penetration in other developed areas such as Laikipia. These patterns are replicated in other countries in the region[82]. Although levels of smartphone ownership remain moderate (21–60%) in most parts of the country, rates are below 20% in the North Western and North Eastern regions, and West Pokot appears to have ownership rates approaching zero.

Figure 7: Geographic representation of key access / usage metrics in Kenya[83]



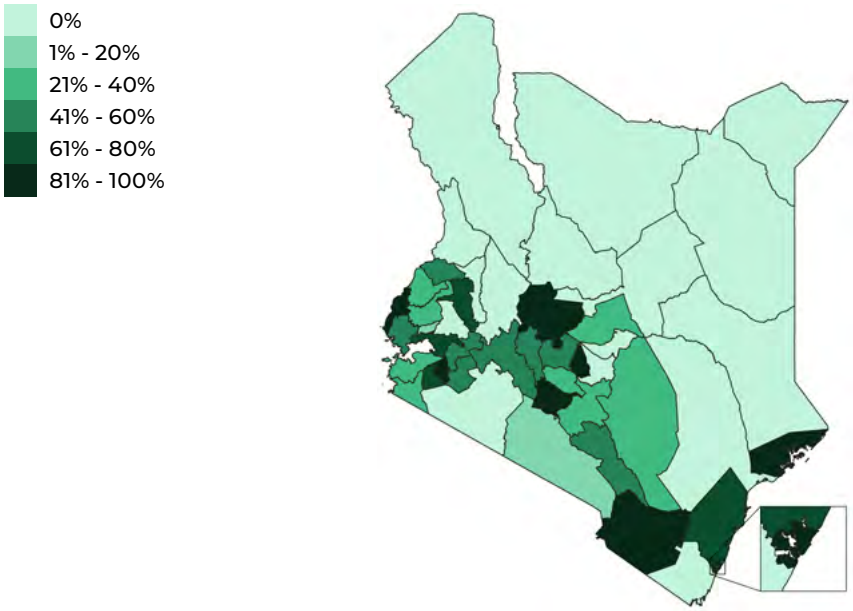
80 Urban centres are classified as areas with a population density of 1,500 inhabitants per km2, built-up surface on permanent land of greater than 50%, and at least 50,000 inhabitants. These areas include Nairobi, Mombasa, Machakos, Kisumu, and Nyeri counties. Less populated urban areas are classified as areas with a population density of 1,500 inhabitants per km2, built-up surface on permanent land of greater than 50%, and 5,000–49,999 inhabitants. These areas include Kiambu, Nakuru, Kericho, Meru, Uasin Gishu, Bungoma, Kakamega, Homa Bay, Kisii, Lamu, and Marsabit counties. Rural areas are classified as areas with a density of 300 inhabitants per km2 and at least 500 and less than 5,000 inhabitants.

81 Eighteen per cent of the population lives in urban centres, 8% in less populated urban areas, and 74% in rural areas.

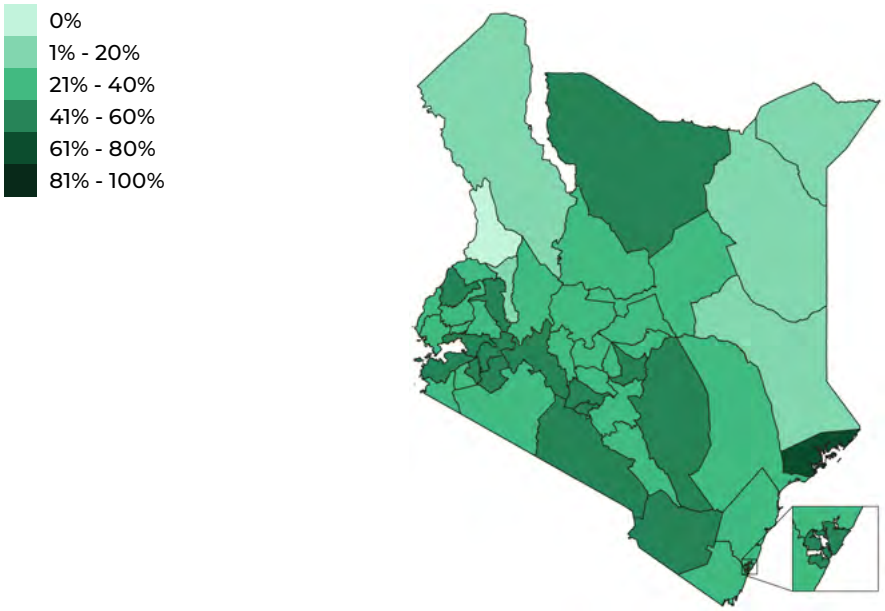
82 GSMA's, Mobile Economy, 2020 report estimates the 4G penetration rate for Sub-Saharan Africa to be 9%.

83 These maps were created using location analytics (LOCAN) wherein geospatial data were mapped against the percentage of respondents in each of the categories in relation to 4G access, internet access, internet usage, and smartphone ownership (applying all relevant filters). We then joined county data to the county administrative boundary map in QGIS and mapped using a scale of 20% intervals.

National 4G access



National smartphone ownership



Affordability of devices and internet data

The unaffordability of devices and internet data poses an entry barrier and limits the use of digital services. Eighty-seven per cent of non-users and 37% of basic digital services users face challenges in paying for devices, compared to 11% of advanced digital services users. Although Kenya ranks among the 10 best performing countries in Africa in terms of affordability[84], there is still a substantial gap between what basic and advanced digital services users are able to spend; basic digital services users spend less than one-tenth as much as advanced users (KES 56 per month vs. KES 575 for advanced users) on mobile top-ups and internet data.
Half (47%) of basic digital services users frequently run out of mobile talk-time and internet data compared to 24% of advanced digital services users. Unsurprisingly, most adult users with tertiary education and high income do not face affordability challenges[85], though 1 in 5 urban youth do.

Furthermore, the cost of devices compounds challenges for those who are having difficulty accessing the internet, further limiting their usage of digital services. Forty-two per cent of people who face only access issues are non-users and basic digital services users, compared to a majority (67%) of those who face both access and affordability issues.

Our study finds that device financing schemes and airtime advance schemes are enabling some people to mitigate their affordability challenges. Non-users (70%) and basic digital services users (50%) are more likely not to have access to financing schemes (e.g., M-KOPA and Lipa Mdogo Mdogo) for buying devices compared to a quarter (26%) of advanced digital services users. We also see some differences in usage of airtime schemes—basic digital services users are somewhat less likely (66%) than are advanced digital service users (76%) to use airtime advance schemes such as Okoa Jahazi and Kopa Credo when they run out of airtime.

However, the government and the private sector need to be watchful of potential debt traps. Several reports suggest a sobering trend of rising mobile money debt with the accompanying risk of driving vulnerable segments into debt distress[86]. Yet these same population segments risk further financial exclusion if they decrease their use of mobile money (and other digital services linked to mobile money) in order to avoid taking on debt or defaulting on loans.

Reliability of mobile connectivity and electricity

Unreliable mobile connectivity and lack of a stable power supply are also clear challenges for the usage of digital services, especially for people in rural areas with low income levels. Since 69% of people use mobile networks to access the internet, lack of reliable mobile connectivity can have a profound effect on what services they are able to use. As expected, rural areas face more frequent disruptions of mobile connections and power outages (42–44% prevalence) than do urban areas (18–23% prevalence). Almost twice the proportion of rural dwellers (26%) as urban residents (14%) cannot afford to pay for electricity.

People tend not to have a workaround solution for these challenges—a majority (67%) of users who face challenges with mobile connections just wait for the mobile network to improve. Solar power has been championed as a potential solution for rural power outages, but our study shows that a similar proportion of people in rural areas with (48%) or without (41%) access to solar power faced challenges in charging their mobile phones and computers due to power outages. Further research can determine if people are using solar power systems of adequate capacity and/or if they face affordability challenges in using solar power systems[87].

84 The Alliance for Affordable Internet (A4AI) ranks Kenya 28th globally and among the top ten performing countries in Africa (top ten includes two in Northern Africa—Tunisia and Morocco) in its Affordability Drivers Index.
85 Only 9% of adult users with tertiary education frequently run out of mobile airtime and data.
86 FSD Kenya, Digital Credit Report, 2019.
87 Twenty-nine per cent of people in rural areas with access to solar power faced challenges with paying for electricity, compared to 24% of people in rural areas without access to solar power.

Digital know-how

Lack of know-how concerning digital applications and services—as well as language barriers—continue to dampen Kenyans' appetites for digital services. Thirty-seven per cent of all respondents—and a much higher proportion of basic digital service users (73%)[88]—say they need help to use digital services. A far greater proportion of basic digital services users (41%) than of respondents overall (16%) face language barriers. The gender and age disparities in the responses to the lack of digital know-how are stark—women (43%) are more likely to need help than men (31%) and older adults (69%) are much more likely to need help than the population at large. As expected, more people who are vulnerable face these challenges, including 73% of people in rural areas with below primary education and 69% of people living with disabilities.

While exposure to using digital services and learning from friends and family remain the primary ways Kenyans acquire digital skills, limited access to the internet and, for some, to formal learning channels and hands-on support systems compounds the challenge. One-third (32%) of people in Kenya learn digital skills through exposure to the digital activities of the people around them. About half (53%) seek help from friends or family, or teach themselves by trying services (46%).

A majority (59%) of people who face know-how challenges also have internet access challenges; of those who have access to the internet, many (60%) cite lack of access to or affordability of formal learning and support systems—e.g., schools, adult learning centres, Ajira Youth Empowerment Centres (AYECs), cyber cafes, etc.—as a barrier to getting the help they need.

People with disabilities considerably lag most Kenyans in access to and usage of digital services, and many don't find the available support systems suitable for their needs. About half feel that community centres are not equipped with the right devices (43%) or trained staff to serve and assist them (43%), especially older adults and people in rural areas. There are intersectional challenges at play here, as well—among people with disabilities, women are more likely than men to feel that digital services and applications are not suitable for them (16% vs. 3% for men).

Cultural norms

Women and people in rural areas with lower education levels disproportionately face cultural barriers, including greater time limitations and mobility restrictions. More female students need to seek permission to use digital devices. As seen in many societies[89], our study shows females (64%) have less time to use digital services compared to males (55%)[90]. Some segments of people who are vulnerable, including adult female farmers / homemakers (72%) and people in rural areas with lower levels of education (70%), face even greater time limitations. Female youth face additional cultural restrictions: 40% of female rural youth must seek permission to travel to places to use digital devices and services compared to 30% among their male counterparts. Female students (34%) are more likely than male students (15%) to need permission to use digital devices (or use them only when the devices are free)[91].

> **"Women work 24 hours and they don't take breaks. But with digital, women are left behind, despite if they wish to—they don't have the time."**
> – Susan, 49, rural, hotelier and farmer

Women who face challenges also use fewer advanced services: 39% of women who have time limitations are advanced users, compared to 56% of women who do not face these challenges. Among female students, 42% of those who need to seek permission to use the internet are advanced users, compared to 62% who say they do not face this challenge.

88 Only 16% of advanced digital service users say they need help to use digital services.
89 GSMA Gender Gap Report 2019.
90 People who experience time limitations are defined as respondents who disagree with this statement: "I have more time in the day than other members of my household to use the mobile phone, computer, or internet."
91 Twenty-six per cent of female students are only allowed to use devices when they are free compared to 11% male students.

CHAPTER 3

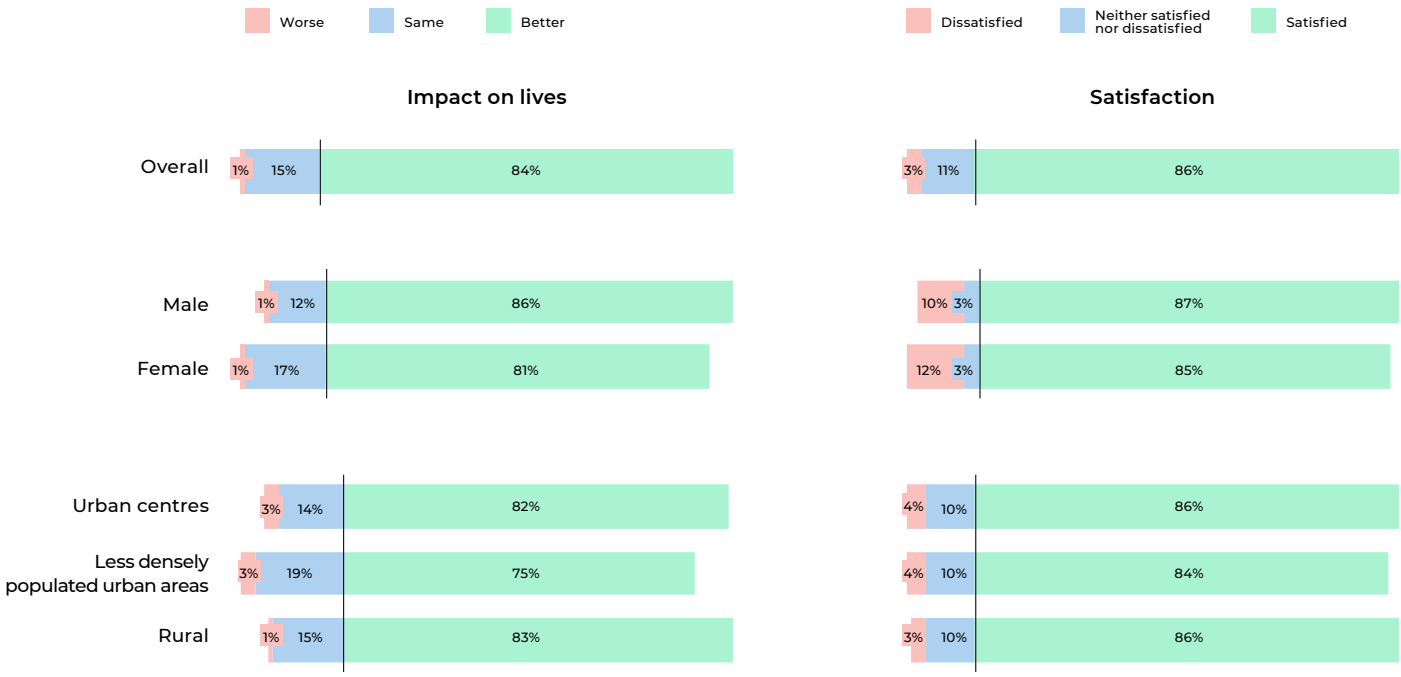
Perceptions, satisfaction, and trust

Digital devices and services – satisfaction and concern

Most Kenyans (86%) are satisfied with their experience of using digital devices and services. A majority of people say mobile phones (98%) and the internet (74%) are important for meeting their day-to-day needs, including about half of non-users (41%) and half of basic digital services users (47%). Most (84%) people report that using digital devices and services makes their lives better, while just a few (1.2%) claim their life is worse.

Figure 8 shows that, surprisingly, there are no significant differences between men and women or between rural and urban residents in terms of perceptions of the impact of digital services on people's lives, or the satisfaction derived from using them. However, people in less populated urban areas are less likely than the average Kenyan to feel that their life is better due to digital devices and services, or to be satisfied with their current usage of these technologies.

Figure 8: People's perceptions of the impact and satisfaction of using digital devices and services
% of respondents considering their experiences of using a mobile phone, computer, or the internet. N=2,456



*Charts do not include figures on don't know and refused to answer.

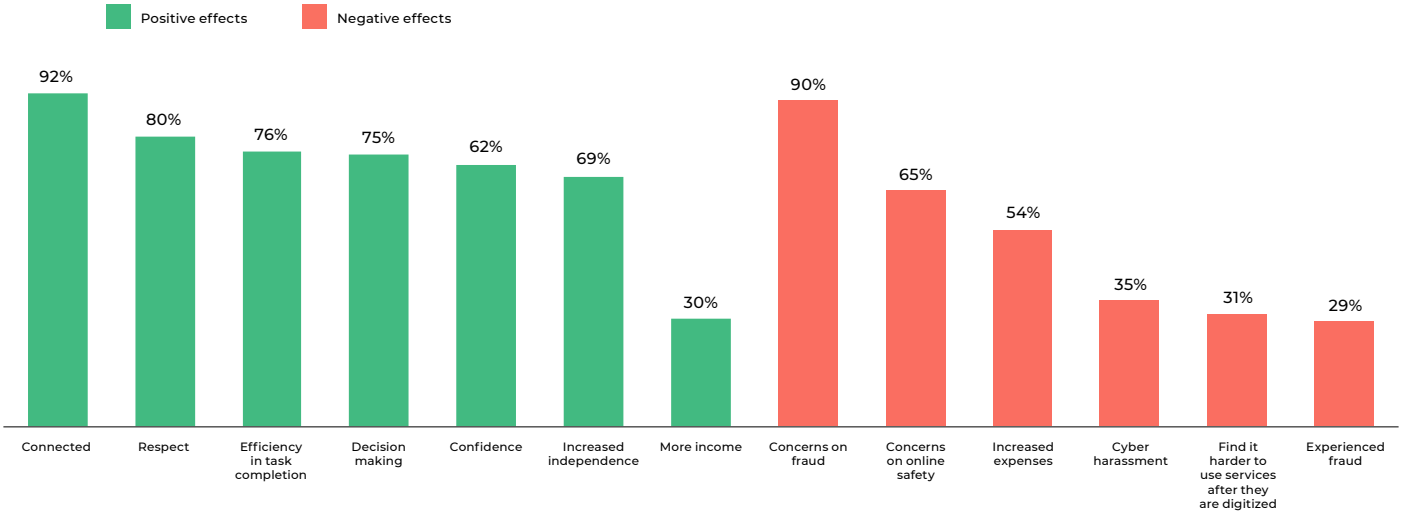
Most Kenyans see a better quality of life and greater individual agency—and some see improved economic conditions—as a result of using digital devices and services (see Figure 9). Unsurprisingly, the strongest impact that people experience is a greater sense of connection (92%). Seventy-six per cent of people also do not feel that they are more inefficient in their everyday tasks because of their digital usage. Many users also believe that digital services support their individual agency—most people do not feel that they are less respected by others due to their digital usage (80%), they feel they make better decisions (75%), and they feel more confident (72%) and independent (69%). A sizable minority (30%) have seen their income increase.

However, people perceive drawbacks to using digital devices and services—especially when it comes to digital safety (see Figure 9). Nine out of ten respondents express concern about fraud in their use of digital services, and nearly one-third (29%) of respondents report experiencing digital fraud[92]. Additionally, two-thirds (65%) of people worry about their personal safety and that of their family due to the use of digital services; roughly one-third (35%) of people have faced cyber harassment.

92 There are limited data sources from other countries on concerns around digital safety and the prevalence of fraud. As such, we cannot substantiate whether Kenya's experience is unique, higher, or lower compared to similar or slightly more advanced economies.

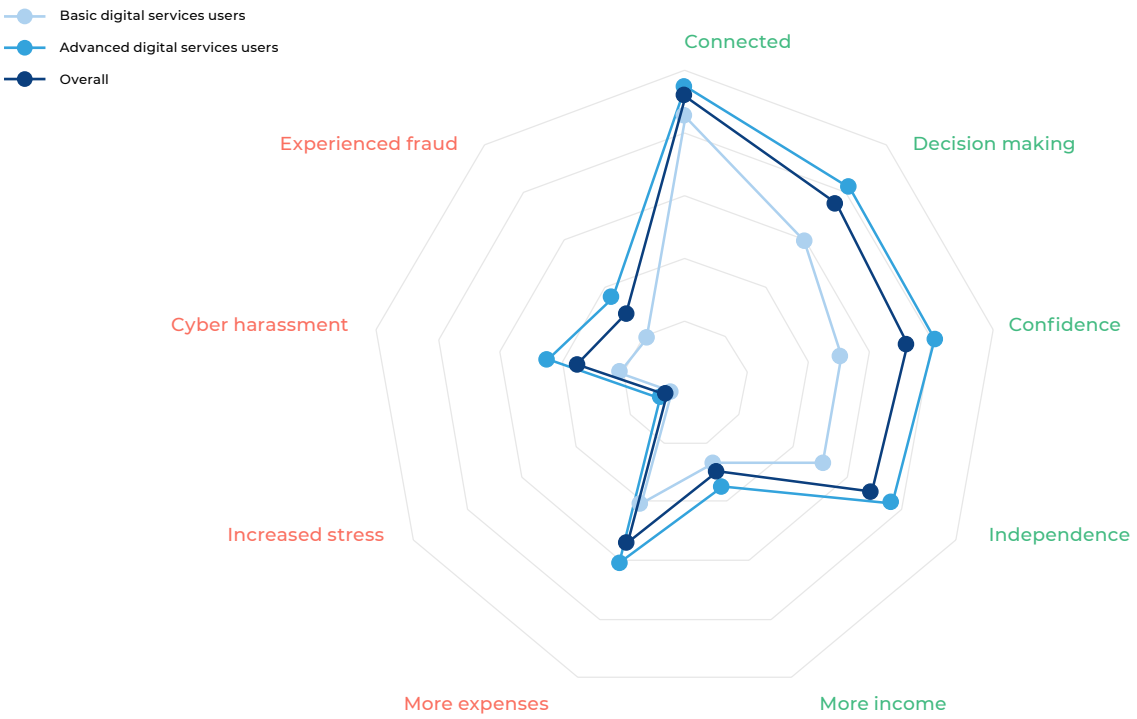
Kenyans also cite concerns about data privacy and lack of adequate parental controls over children's content. A quarter (25%) of all users of digital health services are concerned about sharing personal health information online, and half (48%) of all users whose children receive digital education are concerned about their children viewing inappropriate adult content while using digital channels.

Figure 9: People's perceptions of the impact of using digital devices and services
% of respondents who experience perceived positive or negative effects of using a mobile phone, computer, or the internet. N=2,456



With greater use comes more experience of both the positive and negative aspects of digital services. Figures 10 shows that a higher proportion of advanced digital services users report improvements in decision making, confidence, and independence than do non-users and basic digital services users. On the other hand, advanced digital services users are more likely to have faced digital fraud and cyber harassment than are basic digital services users.

Figure 10: Perceptions of the impact of using digital devices and services among key digital services user segments
% of respondents who experience perceived positive or negative effects of using the mobile phone, computer or the internet. N=2,456



The perception of the economic benefits and challenges of using digital devices and services cleaves along the existing digital divide. Advanced digital services users are more likely to see an increase in income by using mobile phones, computers, or the internet (35% vs. 24% of basic digital services users)—especially adults with higher income and tertiary education (47%)[93]. On the other hand, a greater proportion of people in rural (58%) than urban areas (48%), and a majority of older adults (64%), find it more expensive to complete tasks using the mobile phone, computers, or the internet.

Surprisingly, respondents' perceptions of the effects (positive or negative) of digital devices and services on their quality of life and individual agency do not vary significantly by gender. However, fewer women see economic benefits and more often face cost challenges than do men. Women are less likely (26%) than men (33%) to see an increase in income. At the same time, women are less likely (30%) than men (37%) to spend lower amounts of money to complete tasks using the mobile phone, computers, or the internet.

How digital safety concerns affect behaviour

Experiencing fraud in digital transactions is not uncommon in Kenya[94]. Yet few people are changing their behaviour; only half are seeking redress. Nearly one-third of respondents report experiencing digital fraud, especially mobile money fraud (80% of victims), but also fraud in payment links (14%) and ID theft (11%). Nonetheless, just 3–6% of respondents who experienced fraud stopped or reduced their internet usage; only 13% adopted and/or increased safe digital practices; and just over half (56%) sought any form of redress (although it is worth noting that redressal seeking is uncommon in a number of other countries, too[95]).

> "If you set up a new account online, maybe someone can take your details and something can happen. Even though there is a risk, I have to socialise, so I risk. It's not a big risk. I've heard about profiles being copied on TV but not in person. Most people in my community do not feel like it is a big risk."
> – Anne, 30, rural, food vendor

Basic digital services users (especially the more vulnerable among them) are the least likely to change their behaviours or seek redressal after experiencing fraud. Basic digital services users are far less likely to change privacy settings (6% vs. 16%) or use digital services from a trusted service provider (2% vs. 14%) or seek redress (28% vs. 61%) than are advanced users. Women (68% vs. 58% of men) and people in rural areas (66% vs. 55% of people in urban areas) are more likely not to change their online behaviour, differences in their redressal seeking behaviour are not as stark[96].

Concerns about personal and family safety are prevalent and also typically go unaddressed. Roughly one-third of people have faced cyber harassment. A majority (74%) of people who experienced online harassment did not take any action.

> "I am a bit cautious about what I share on social media. This thing of hacking is real. I have a cousin who was hacked. I know people who have been cyber bullied and I have seen how it has affected them psychologically, so I would rather stay away from such incidents"
> – Patricia, 32, urban, accountant

93 Even when the use of digital devices and services led to economic benefits, these benefits were not enough to mitigate shocks from the Covid-19 crisis. During the first six months of the Covid-19 pandemic lockdown, people with low incomes (27%) and those with high incomes (33%) alike experienced deep income shocks that were not lessened by the use of advanced digital services. Income shock is defined as a decrease in income of more than 25%. Among people with low incomes, 65% of people who used advanced digital services and 67% of people who used only basic digital services faced an income drop.

94 There are limited data sources from other countries on concerns around digital safety and the prevalence of fraud. As such, we cannot substantiate whether Kenya's experience is unique, higher, or lower compared to similar or slightly more advanced economies.

95 In a 2015 study, CGAP found that in Bangladesh, Ghana, Kenya, Pakistan, Rwanda, Tanzania, and Uganda redressal-seeking behaviour was low among those who had experienced fraud.

96 People who did not seek redressal after experiencing fraud: 47% of women vs. 44% of men, 46% of people in rural areas vs. 40% of people in urban areas.

Kenyans are aware of digital safety laws and safe digital practices, but many don't find redressal mechanisms to be responsive or lack confidence in using them. Legal support is not an option for most. A significant majority (71–85%) of respondents—including many basic digital services users (49–67%)—are aware of safe digital practices[97]. Moreover, a majority of respondents (58–60%) are aware of digital safety laws, including the fundamental right to privacy, the data protection act, and the law against cybercrime[98].

Yet just one-third (36%) of those who experienced fraud used grievance redressal mechanisms offered by service providers[99]. Many who didn't seek redress report difficulty in finding contact numbers or connecting with helplines (33%), as well as feeling discouraged by their own or others' past experiences (28%). Few (2–4%) have sought any legal support (including police complaints) or used dedicated consumer forums[100].

> **"I would trust spending money online more if it was with a brand I knew, like Safaricom. They have mechanisms of following up and assisting clients if they get conned. I know that if that were to happen to me using Safaricom, I could get my money back."**
> – Miriam, 21, rural, student

Perceptions of digital safety have the potential to limit the adoption of advanced digital services. For example, in Australia, public concerns about digital fraud and cyber-crime were, in the past, found to substantially diminish adoption of e-commerce[101]. Similarly, in Bangladesh, digital wallet holders decreased their usage to minimise their risk of experiencing fraud[102]. Already a majority of key advanced digital services users in Kenya—especially those using e-commerce (97%) or digital services to support their livelihoods (e.g., 71% of self-employed people / business owners)—indicate that they limit their usage of digital services due to concerns about fraud. Even within their limited usage, basic digital services users are facing losses from fraud—an average of KES 1470 per user over the last three years. Advanced digital services users have lost twice as much on average (KES 2996)[103]. As people increase their use of digital services and graduate to advanced services, more people with little capacity to absorb unexpected losses will be at risk of suffering the potentially devastating effects of fraud.

The government has taken critical steps to create an environment of trust that instils confidence in users of digital platforms and services, and can further collaborate with private sector actors to promote safe and responsible digital usage. Kenya has taken the lead in defining laws and policies[104] that establish data protection rights, principles of managing digital safety, and criminalization of cyber-crimes—and has recently set up the office of the Data Protection Commissioner to implement these laws and policies. The private sector also has an important role to play in building the 'trust quotient' of digital services—something the mobile money sector has had success in achieving[105]. Readers of this report can leverage the people's perspective on safety and security to develop a roadmap for implementing the Data Protection Act and strengthening collaboration between the government and private sector.

97 Safe digital practices include using passwords, changing privacy settings, and denying permission to applications and services to store data on the internet.

98 Computer Misuse and Cybercrimes Act, 2018.

99 In-service redressal mechanisms include communicating with sales / service representatives through the service itself, filing a complaint through the service itself, and receiving a refund through the service itself.

100 Dedicated consumer forums include Kikao Kikuu, Communications Authority of Kenya, Competition Authority of Kenya, Kenya Consumer Rights Empowerment Forum, and Consumer Information Network.

101 Roberts, Indermaur, and Spiranovic. "Fear of Cyber-Identity Theft and Related Fraudulent Activity", Psychiatry, Psychology and Law, 2012.

102 Digital wallet holders decreased digital balances to avoid losing money to fraud.

103 ncome differences between the basic and advanced digital services users are substantial. Only 10% of basic users have personal monthly income of more than 50,000 KES compared to 75% among advanced users.

104 Digital safety policies / laws include the Data Protection Act (2019) and Computer Misuse and Cybercrimes Act (2018).

105 Sixty-two per cent of mobile money users are concerned about digital fraud in general. Despite these concerns, 80% of mobile money users indicate that they trust mobile money platforms.

FOCUS AREA

Gender, barriers, and perceptions

Our study both corroborates the commonly understood gender divide[106] and highlights a particularly wide gender gap between young women and men—a worrying trend that requires urgent attention. Thirty-five per cent of women in our study are advanced digital services users compared to 54% of men—but the divide is even sharper for adult female farmers / homemakers and female rural youth, including female rural students[107].

As expected, we found that women typically face stiffer challenges in gaining access to the internet as well as being able to afford and use digital services (see Figure 11). Fifty-eight per cent of women used mobile internet in Kenya as compared to 71% of men. Women (37%) are more likely to frequently run out of mobile phone airtime and internet data than are men (31%), and 43% of women say they need help in using digital services compared to 31% of men.

Figure 11: Barriers to digital usage among gender segments
% of respondents

Our study highlights two female segments—one that needs more attention on all fronts, and one that is quite resourceful and needs more modest and targeted support to propel its members to a deeper engagement with the digital economy.

Adult female farmers / homemakers make up 9% of the population and remain predominantly limited in terms of what digital services they use (or want to use). They face challenges in accessing and affording phones and the internet (like most people who are vulnerable), but a larger proportion of them need help with or don't know how to use digital services. As do a majority of Kenyans (64%), 67% of female farmers / homemakers acquire digital skills primarily through exposure to digital services and by observing friends and family. However, over half (54%) say they need help in using digital services and many of those (68%) lack access to formal learning and support systems, compared to 59% of all Kenyans.

106 An estimated 32% of women and 49% of men aged 18 years and older used mobile internet in Kenya in 2019 (GSMA - The Mobile Gender Gap Report, 2020).

107 Basic digital services users make up 37% of adult female farmers / homemakers, 17% of female rural youth, and 10% of female rural students.

Yet, some digital agricultural programs are having an impact with female farmers and demonstrating new models for how to serve and reach women. For example, DigiFarm—a Safaricom-led, multi-provider platform providing farmers with digitally enabled extension services, input purchase, market linkages—is reaching many female farmers. According to a recent study[108], female farmers on the platform experienced increases in their income, yields, and farm productivity, which we expect to further increase through a compounding effect[109]. Despite the challenges they face, some female farmers also experience greater agency thanks to being able to use digital services[110]. Although much remains to be done to fully address exclusion among female farmers, programs such as DigiFarm are pushing in the right direction.

Despite these challenges, women in this segment are almost just as likely (80%) to believe that digital devices and services are making their lives better as is the average Kenyan (84%).

> **"Nobody wants to be left behind with these kabambes [feature phones] or small phones. Everyone wants to know more and to be part of the digital world."**
> – Grace, 52, peri-urban, selling hardware goods

Female rural youth make up 11% of the population and face acute affordability challenges and strong cultural barriers. Female rural youth (44%) have only limited access to financing schemes (e.g., M-KOPA) for purchasing devices and more frequently run out of airtime and data (44%) than does the overall population (34% and 34%, respectively). In addition, this segment also faces greater cultural barriers, including more mobility restrictions (see Chapter 2)[111].

Despite this litany of challenges, female rural youth are determined to be active participants in the digital economy. They are almost just as likely (81%) as the overall population (84%) to perceive that digital devices and services are making their lives better. In fact, they are more likely than the average Kenyan to see an increase in agency as a result of using digital devices and services—people are more likely to respect them (90% vs. 80% overall), they are more likely to feel confident in sharing opinions (78% vs. 72% overall), and they are more likely to participate in their communities (87% vs. 81% overall). Nonetheless, female rural youth are less likely (18%) to see an increase in income compared to all women (26%) and all Kenyans (30%).

108 Busara and Dalberg on behalf of Mercy Corps Agrifin, Digifarm: Gender Impact Study, 2021

109 We anticipate that income increases will result in additional gains in productivity and socio-economic empowerment for women, leading to additional income.

110 70% of adult female farmers / homemakers experience increased ability to make decisions and 66% reported having more independence due to the use of digital devices and services. This is in line with national averages of 75% and 69%, respectively.

111 Mobility restrictions are defined as needing to seek permission to travel to places to use digital devices and services.

CHAPTER 4

Accelerating and deepening the use of digital services

As Kenya progresses on its digital transformation journey, a critical next step will be to continue investments in enabling resources to deepen Kenyans' engagement with e-commerce and the use of advanced digital services for livelihoods. Enabling resources such as mobile money, digital identity systems, national addressing systems (NAS), and asset registries play a substantial role in accelerating digital innovation and deepening the adoption of advanced digital services. Our study provides a brief snapshot of use of various advanced digital services, and offers a people's perspective on how enabling resources and supporting systems could be further strengthened to enhance Kenyans' usage of digital services for their economic benefit.

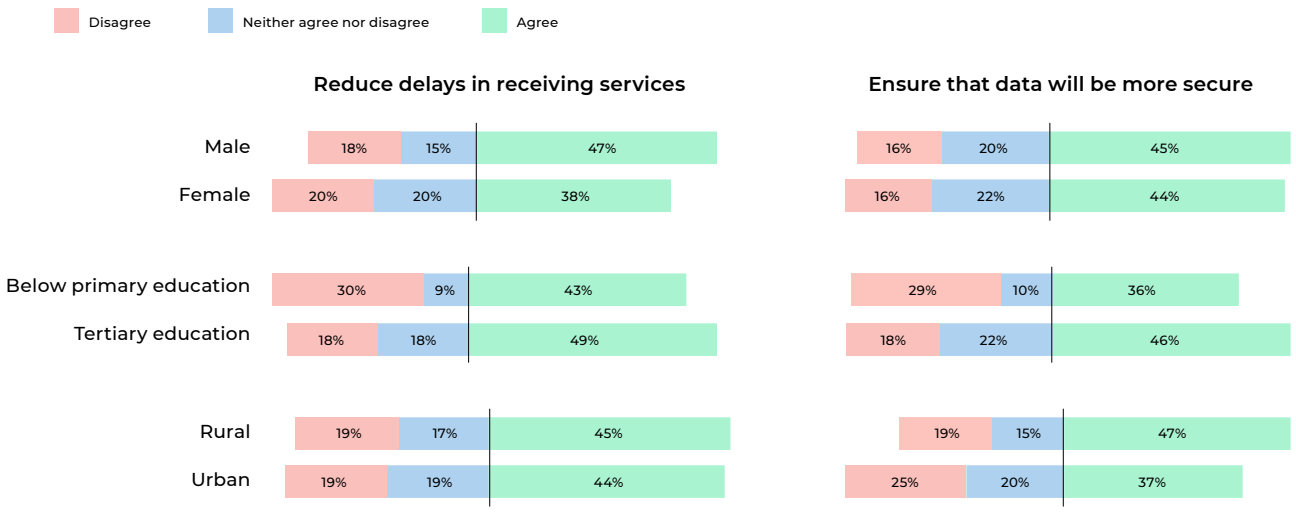
Digital ID

Kenya has a mature (non-digital) ID system in place for accessing digital services. Ninety-nine per cent of adults (18 years and above) currently have National ID and most (97%) are able to use it to access various digital services[112]. Ninety-five per cent of Kenyans also have other IDs (e.g., passport, birth certificate, KRA pin certificate, SIM cards), but only a minority (8%) use them to access digital services, and 9% don't use any ID to access digital services. For those who access digital services without using any ID, many use workarounds, such as a police abstract (50%), working with mobile money agents who know them (40%), and using other people's IDs (13%).

While half of respondents anticipate improvements with Huduma Namba, a minority are yet to be convinced of its value for accessing and using digital services. A majority (84%) of Kenyans have registered for Huduma Namba, and about half (45%) of respondents believe that the Huduma Namba program will enable them to access more digital services, and/or that it will support improvements over the existing system by making data more secure (45%) or addressing interoperability issues (43%)[113]. However, 16–19% disagree with this assessment.

People with higher education levels expect to see operational benefits of Huduma Namba, but they are also less convinced about expected increases in data security (see Figure 12). In addition, a greater proportion of men than of women believe that Huduma Namba can reduce delays in accessing digital services.

Figure 12: Perceptions on benefits of Huduma Namba across segments
% of respondents. N=2,456



*Charts do not include figures on don't know and refused to answer.

112 Our study focused on understanding the role of ID and digital ID in facilitating specific activities which are important for the digital economy, including SIM registration; using mobile money; opening a bank account; digitally applying for and receiving a loan; accessing digital government services; finding employment on digital platforms; and selling goods, providing services, and verifying the recipients' identities on e-commerce platforms. We did not consider the broader role of IDs in enabling access to and use of other services.

113 Forty-two per cent of people were denied access to services, 8% faced delays due to errors on their ID, and 5% had errors on their IDs while using multiple IDs to access and use digital services; 43% of people agreed that Huduma Namba can reduce delays in getting services and/or information errors that emerge with the use of multiple IDs.

We recognise that people's perceptions of the expected benefits of Huduma Namba may evolve once the platform launches and people start using it to access and use digital services. Further, our study reviewed people's perceptions about using IDs for a finite set of digital services, and this may not represent their views on the value of digital ID to access and use a wider array of services.

Mobile money

Adoption of basic mobile money services is near universal; in contrast, fewer than one in five Kenyans are using advanced mobile money services[114]. Mobile money usage rates are similar across income groups—95% of people with lower income (less than KES 25,000 per month) and 93% of people in rural areas—highlighting the contribution of mobile money to laying the groundwork for the digital economy. A majority of people use basic mobile money services, including sending and receiving money (99%) and buying airtime and mobile data (71%). However, just 5–17% of people use advanced mobile money services, including a higher proportion of people in urban areas (9–19%) or those with higher income (25–29% of people earning more than KES 50,000 per month).

Kenyans view mobile money agents as a strong supporting ecosystem enabling deeper use of mobile money. Seventy-three per cent of mobile money users consider mobile money agents to be an important reason for using mobile money, while some (11%) consider the absence of agents to be a challenge.

Concerns about fraud remain, but people trust their mobile money platforms. Sixty-two per cent of mobile money users are concerned about digital fraud in general. Despite this, 80% of mobile money users indicate that they trust mobile money platforms.

While user-experience challenges are rampant in other countries[115], mobile money users in Kenya are largely satisfied with application usability. Transaction costs remain a challenge for half of users and limit usage. Most people (86%) who use mobile money find digital money applications easy to navigate. Yet, 53% of mobile money users cite high transaction costs as a challenge that limits their mobile money usage; this is more likely to be a concern among people with lower income levels (55% of people earning less than KES 25,000 per month) than for people with higher incomes (38% of those earning greater than KES 50,000 per month).

Waiving transaction fees during the Covid-19 pandemic increased the usage of mobile money; however, a majority of respondents would continue to use this service even if the charges were reintroduced. Over half of mobile money users cite high transaction costs as a limiting factor, and most (88%) mobile money users who started or increased their usage of mobile money during the Covid-19 pandemic cite the fee waiver for transactions below KES 1000 as a factor in increasing their use of the service. Yet only a few (2%) of these users who started or increased their mobile money usage because of the transaction fee waiver say that they would discontinue the use of the service if waivers were rescinded.

As the use of digital financial services continues to deepen, the government and the private sector need to be watchful of potential debt traps. Particularly for many underserved demographic groups, the recent growth in digital financial services has resulted in improved financial outcomes, including increased ease of access to digital credit[116]. However, these gains have had unintended consequences for some users of these services. Several reports suggest a sobering trend of rising mobile money debt with the accompanying risk of driving vulnerable segments into debt distress. Nearly 1 in 2 digital borrowers reported having had to borrow more, sell assets, reduce expenditure on food, or take a child out of school to repay a loan between 2018 and 2019[117]. Yet these same population segments risk further financial exclusion if they decrease their use of mobile money (and other digital services linked to mobile money) in order to avoid taking on debt or defaulting on loans.

> *"People borrow from multiple apps, then they default the loan and throw away their SIM cards. Then they're listed on CRB (credit reference bureau). People are giving out loans like it's free money, so people are taking them and not paying them back. They don't care about being listed on CRB. If I live in a slum, why would I care about my credit scoring?"*
>
> – Peter, 32, peri-urban, selling properties and household goods online

114 The proportion is greater, however, among people in urban areas or with higher income levels. Advanced mobile money services include making and receiving payments for goods and services, making and receiving payments for business or employment, and making and receiving payments on e-commerce platforms.

115 In Zimbabwe, operational challenges such as lack of local dialects on mobile money applications, inhibitive costs, intermittent service interruptions, and relatively low levels of ICT literacy (due to lack of proper usage training by the service provider) affect mobile money users.

116 Our study finds that 37% of Kenyans use digital services to access mobile banking, including accessing credit.

117 FSD Kenya, Digital Credit Report, 2019.

E-governance

Awareness and usage of e-governance platforms is low, especially amongst more vulnerable population segments. Half (51%) of Kenyans don't know about any e-governance services or platforms. Of those who are aware, about half (55%) use some e-governance platforms. People in rural areas (56%) and those with below primary education (84%) are less likely to be aware; females also have lower levels of awareness (43% vs. 59% for males).

Users experience challenges with e-governance applications; these services' continued reliance on manual steps further limits usage. Twenty-six per cent of people who are aware of and use e-governance services experience frequent e-citizen website downtimes, and 22% find the fact that services on the e-citizen platform require human approval on the back end to be inconvenient and slow.

With the Huduma Centres, Kenya has made strides in setting up supporting ecosystems for e-governance, particularly for those who face challenges completing processes digitally. Huduma Centres are used by most people (81%) who are aware of and use e-governance services. A majority (59%) of people who are aware of and use e-governance services visit Huduma Centres because they can use the police abstracts in place of IDs if they have lost their ID, to pay in cash because they can receive immediate payment confirmation (56%), or to complete processes as directed by the e-citizen platform (53%).

> "I went to a Huduma when I lost my ID. The experience was very timely, convenient, and professional compared to other government departments I have visited."
> – Christopher, 42, rural, farmer

However, many people lack access to the centres in their neighbourhoods or find the centres too far away. Many users of e-governance applications and services say that the lack of access to a Huduma Centre limits their use of e-governance services—a majority (58%) of people who are aware of and use e-governance services experience challenges due to lack of Huduma Centres in the neighbourhood (especially 68% of people in less populated urban areas), working hours lost due to visiting Huduma Centres (58%), and having to wait in long queues to receive service (51%).

E-commerce

E-commerce adoption is at an early stage in Kenya. While 56% of Kenyans are aware of e-commerce services, only 13% of Kenyans are e-commerce users. The latter figure likely underestimates the real extent of e-commerce, as respondents largely reported the use of marketplace platforms like Jumia and Kilimall, while the full breadth of e-commerce also encompasses digital trade through informal platforms—for example, via social media—as well as payments, logistics, addressing systems, and asset recognition including mapping/tracking commodity ownership or exchange. Smartphone users are three times more likely to use e-commerce than are basic phone users (21% and 7%, respectively) and people with tertiary education are even more likely to do so than those with less education (30% and 2–9%, respectively), while men (15%) are slightly more likely than women (11%) to use these services. Twenty-three per cent of people in urban areas use e-commerce compared to only 9% of people in rural areas. E-commerce appears to be at least twice as popular in the Nairobi and Central regions (24% of people use it) as it is across the rest of the country (1–12%).

Challenges in product quality, complaint management, and delivery costs limit usage, while concerns about fraud and failed delivery run deep. Over half (53%) of e-commerce users cite concerns with product quality, while some point to inadequate complaint management processes (37%) and high delivery fees (28%). Meanwhile, 97% of e-commerce users are concerned about fraud and 30% are concerned about the failure of products to be delivered after payment. We anticipate that the challenges captured here using a definition of e-commerce that focuses on marketplace platforms like Jumia would nevertheless apply to the broader definition of digital trade, as well.

> "One major reason people don't use online platforms for e-commerce is trust. There are a lot of crooks. They don't offer a platform where my data is safe. If I make a payment, I can never be sure that my payment can't disappear. Other platforms like in the US, they have certain rules so that I know I can get payments back. It's just a jungle on our platforms, and you have to survive.
> – Peter, 32, Waithaka, selling properties and household goods online

> "I would wait until receiving a product before paying. Otherwise, there are con men that can take advantage. But with someone you've dealt with, you can trust. Also, you can trust something if others do."
> – Thomas, 32, rural, farmer

Users express that the lack of street addresses remains a significant barrier, indicating a huge potential for on-going government efforts on national addressing systems to unlock more e-commerce opportunities. Forty per cent of e-commerce users frequently[118] face challenges in receiving order deliveries. Many of these users cite problems with lack of precise street addresses (42%) or find it cumbersome to coordinate with delivery agents (26%). A majority of e-commerce users rely on time-consuming workarounds, such as guiding deliveries over the phone (67%), while 22% opt to pick up the goods they order online from the store or collection points. Kenya has made progress in developing an approach for a national addressing system; accelerating implementation could clear a significant barrier to greater e-commerce adoption.

Digital services to support livelihoods: self-employed people / business owners

About half of self-employed people / business owners (and a slightly higher percentage of men in this category) support their livelihoods by using digital services to more easily connect, communicate, and manage business operations. While 44% of self-employed people / business owners use digital services to support their businesses, 86% of this group use these services to communicate with customers and vendors, while 23–40% use intermediate digital services for business[119], and only 15–18% use advanced digital services for business—including using digital devices to keep business records and track stock, using digital governance services to register businesses and pay taxes and levies, and using digital services to sell products and buy supplies through e-commerce platforms.

There is a substantial gap in digital usage between female entrepreneurs and their male counterparts. Only 36% of female self-employed people / business owners use digital services to support their livelihoods (compared to 54% men), and over half (56%) say they need help in using advanced digital services but are unable to find it (compared to 44% among men). Despite the challenges this segment faces, female entrepreneurs aspire as much as their male counterparts to fully utilise digital tools for business and to learn more about how e-commerce and digital marketing can assist them in expanding their businesses[120].

Lack of access to innovation hubs and concerns about fraud limit usage. Almost half (49%) feel they need help using advanced digital services but do not get it. The majority (65%) of people who are self-employed / business owners cite a lack of support from innovation hubs, and also indicate that they are concerned about fraud (71%).

Digital services to support livelihoods: land-owning farmers

Awareness of digital services to support farming is low among farmer landowners; use of these services is far lower still. Almost half (45%) of land-owning farmers are not aware of digital services. Just 13% of land-owning farmers use digital services to support their livelihoods; among this group, 80% use digital services for communication with customers, vendors, and suppliers and 57% make and receive payments and acquire credit. Some land-owning farmers use advanced services for buying inputs / selling goods (10%) or knowledge sharing / peer learning (15%).

Field agents act as a strong supporting system, but many farmers are not receiving the support they need. Over half (52%) of farmers who use digital farming services say they are able to use digital platforms because they receive guidance and support from field agents (e.g., DigiFarm agents). In contrast, 45% of farmers who use digital farming services say that they limit their usage of digital services because they do not receive the support from field agents to use digital services.

Concerns about fraud limit the usage of digital services. Sixty-three per cent of farmers who are users of digital services supporting farming are concerned about fraud and cite it as a reason for limiting usage.

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118 Five per cent of e-commerce users always face challenges in receiving order deliveries and 35% face these challenges sometimes.

119 Intermediate services for business include using digital services to find new information on products and services, market products on social media, and learn how to improve products, as well as using mobile money to access credit and pay salaries and expenses.

120 A recent study by the IFC and Dalberg on the impact of the impact of the Covid -19 Pandemic on women-led MSMEs found that women-led MSMEs in Kenya were just as likely to be interested in digital tools and digital training

Digital service to support livelihoods: employed

Digital services for upskilling and employment are at early stages of adoption. Sixteen per cent of people who are employed use digital services for upskilling and job search. More employed men (20%) than women (10%) and urban residents (20%) than rural residents (14%) use these services.

AYECs are pivotal for those using these services. Sixty per cent of people who are employed and use digital services for upskilling and job search get support from Ajira Centres.

Digital health

Awareness and adoption of digital health services are very low. Only 15% of respondents are aware of digital health. Only 35% of those who are aware are using digital health services. The most widely used digital health services are consultation with health workers (50%) and payment for services or medicine using mobile money (35%).

Challenges with platform costs and lack of trust limit usage. Thirty per cent of users of digital health services feel costs are too high and 30% don't trust doctors they don't know and can't see. Meanwhile, a quarter of digital health services users are concerned about sharing personal health information online.

More work needs to be done to understand what drives demand for advanced digital services

Even as Kenya works to address the structural barriers and challenges discussed above, it also needs to understand what fuels demand for advanced digital services. Looking ahead, most people in Kenya want to continue to prioritise[121] mobile money, digital communication tools, and social media. Most self-employed people / business owners and land-owning farmers prioritise these same digital services for future use; only a small minority of people (17–20%) suggest that they want to prioritise e-commerce, finding information online, and using digital services to support their livelihoods. Even the advanced digital services users do not seem to prioritise the use of advanced digital services.

Where people have a need and see relevance in a service, they are using digital services at higher rates. Many non-users (41%) and basic digital services users (30%) do not find digital applications and products relevant to them, while a much smaller percentage (5%) of advanced digital services share this view. However, the more people see the relevance of a service, the more they use it; many more (40–60%) people with a government stipend or pension use various e-government services[122] than do Kenyans overall (25%).

Ultimately, it is not clear how much weight to give people's relatively low prioritization of advanced digital services. Our survey asked respondents to choose their top three digital services now and for the future; it's unclear from our results whether the relatively lower popularity of digital services like using e-commerce platforms or using digital services to support livelihoods is due to people not yet recognizing the full value of these services, an awareness of the many barriers that must still be overcome, or the simple fact that mobile money, digital communication tools, and social media are top-of-mind services that cultivate higher levels of engagement. More work needs to be done to better understand from a people-centred perspective what can drive demand for advanced digital services.

121 We asked respondents to indicate the top three services they want to use in the future.

122 E-government services include e-citizen, iTax, and NHIF.

CHAPTER 5

Conclusions and further research

Our study has brought a people's perspective on the key challenges that keep significant portions of Kenya's population from participating fully in the digital economy. In exploring many issues of access, relevance, and appetite, we have attempted to present a nuanced understanding of the three challenges that stand out as stumbling blocks for the next stage of growth in Kenya's digital economy—exclusion, digital safety, and the enabling resources and supporting ecosystems required to deepen the adoption of digital services.

We hope that various stakeholders—from government to the private sector to academia and civil society—can build on these findings to conduct further research and design solutions for improving access to, affordability of, and reliability of core digital infrastructure, as well as for expanding the reach of supporting ecosystems for specific population segments. Policymakers can use these findings to support further research on how best to increase the public's awareness of the utility and availability of enabling resources, including digital ID and a national addressing system. We hope that the government will take an inclusive view—incorporating the voice of all impacted residents—in the design and implementation of new legislation, including the Data Protection Act.

Opportunities abound to conduct further research and design solutions that address both core digital infrastructure challenges and the need to expand the reach of supporting ecosystems. The private sector can continue to innovate on the availability and pricing of financing schemes and airtime credit top-up schemes while also understanding the risk of potential debt traps, especially for the more vulnerable segments including adult female farmers / homemakers, female rural youth, and people living with disabilities. Government and the private sector can identify drivers of using solar power systems in rural areas and solutions to mitigate frequent power outages—e.g., by determining the extent to which people are using solar power systems of adequate capacity and facing affordability challenges in paying for solar power systems. Government can conduct research on specific geographic areas where people face more challenges in accessing and using supporting systems, including Huduma Centres and Ajira Centres, and assess the opportunities to expand the scope of these centres to provide support for a wider array of digital services.

A human-centred design (HCD) approach to these further studies can help ensure that supply-side interventions remain grounded in people's needs, concerns, and perspectives.

Government can support research into the best ways to build awareness of the utility and availability of key enabling resources. We recognise that people's perceptions of the expected benefits of Huduma Namba may evolve as the platform launches and people become more familiar with its uses. Even so, lessons from other countries' experiences in implementing digital ID and how people's perceptions of it evolved over time could be useful in guiding the government's efforts to build more awareness of and confidence in the new resource.

Another area ripe for study is the full slate of opportunities and concerns that will likely flow from the implementation of the national addressing system (NAS). This might expand the full suite of use cases of NAS, including supporting access to emergency services, the benefits of using smart maps, and the increased efficiency and reliability of postal and delivery services that would, in turn, spur e-commerce and potentially reduce costs for businesses. Further research could also explore people's concerns about digital safety related to their fixed addresses being known—for example, unease regarding the ability of the government, the private sector, or private actors to trace people through data accessible online.

Relevant government bodies can also conduct further research to address people's additional concerns about digital safety. Beyond taking the positive step of establishing a task force to identify gaps and inconsistencies in the Data Protection Act and develop regulations to guide its implementation, the government can actively seek out lessons from other countries and apply them to implementation. It can also foster a robust collaboration with the private sector to ensure that regulatory requirements are practical for all organisations and provide technical support to enhance compliance.

Ultimately, we feel the greatest value of this study is to amplify the voices of Kenyan residents across all geographies and walks of life, from every socio-economic stratum of the population and representing the full spectrum of current levels of engagement with a growing roster of digital services and devices. We hope that it will serve as a new starting point for debate, discussion, and further exploration as Kenya advances toward a more inclusive and resilient digital economy—one that builds on the promise of new digital technologies and services to create greater opportunity for all residents of Kenya.

Annexures

Methodology

Based on the 2019 census data, the total population of Kenya was 47,562,772; those aged 15+ years numbered 29,013,291, representing 61% of the total population. The census data were classified by prevailing administrative units in Kenya, from the largest to the smallest, i.e., by county → sub-county → ward → location → sub-location, and disaggregated by age, gender, and location (rural/urban), as well as level of education.

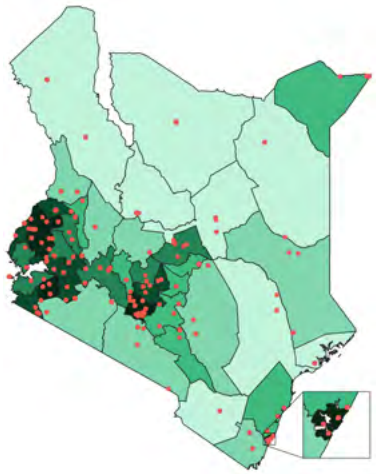
Figure 13 captures the distribution of survey points in line with Kenya's population density.

Figure 13: Geographic representation of survey points

Population density (persons per square kilometer)

- 5-35
- 35-101
- 101-228
- 228-424
- 424-590
- 590-6881

Interview location
(approx. 20 interviews per cluster)



We considered three main population attributes in the distribution of the survey target respondents across the various enumeration areas: location, age, and gender. We observed the existing population ratios for each of the attributes as follows:

- **Location:** We used the existing national rural / urban population split of 69% and 31%, respectively.
- **Age:** We developed three main age bands for the eligible population in the survey: 15-34 years, 35–54 years, and 55+ years, which constitute 59%, 28%, and 13% of the eligible population, respectively.
- **Gender:** The national gender ratio of male to female is 49.51% to 50.49%; among the eligible population it is 48.98% and 51.02%. As such, we observed a 50/50 gender split in the survey sampling.

Comparative country analysis

Kenya has made great progress across the four elements of the inter-linked digital economy (see Exhibit 3) and is leading its peers and exceeding many global benchmarks.

Exhibit 3: Positioning Kenya's digital transformation

High Medium Low

Key digitalisation metrics		Low-income and lower-middle-income countries				Higher-middle-income countries		
		Kenya	Rwanda	Ghana	India	South Africa	Brazil	Indonesia
Infrastructure	Mobile SIM penetration	112%	77%	127%	79%	178%	96%	125%
	Internet penetration	43%	26%	48%	50%	62%	71%	64%
Applications and services	E-government development index	0.53	0.47	0.59	0.59	0.69	0.76	0.66
	E-commerce index	49.0	30.9	42.8	57	54.4	56.9	50.1
	E-commerce usage[1]	9%	1%	4%	3%	8%	24%	10%
Enabling resources	Adults making/ receiving digital payments (2017)	79%	39%	49%	29%	60%	75%	35%
	Postal reliability score	47	17	59.7	65	83	68	65.6
Supporting ecosystem	Ease of doing business rank	56	38	118	63	84	124	73
	Global cyber-security index	0.75	0.69	0.44	0.72	0.65	0.58	0.78

[1] % of people who used the internet to buy something online

Sources: Communications Authority Kenya, Annual Report 2018 – 2019; Statista; GSMA State of Mobile Internet Connectivity 2019; Datareportal : Digital 2020; UN, Global E-governance Index, 2020; UNCTAD, B2C E-commerce Index; World Bank, Global Findex Database 2018; World Bank, Postal reliability Index; World Bank, Ease of Doing Business 2020; ITU Global Cybersecurity Index Overview 2020.

Abbreviations and acronyms

ABBREVIATION	EXPANSION
AYEC	Ajira Youth Empowerment Centre
EGDI	E-Government Development Index
G2C	Government to citizen
GDP	Gross domestic product
GoK	Government of Kenya
HCD	Human-centred design
ICT	Information and communications technology
ID	Identification (card)
IoT	Internet of things
KES	Kenya shillings
KRA	Kenya Revenue Authority
MoICT	Ministry of ICT, Innovation, and Youth Affairs
NAS	National addressing system
NOFBI	National Optic Fibre Backbone Infrastructure
PAM	Partitioning around medoids
QR	Quick response (code)
SIM	Subscriber identification module (card)
SMS	Short message service
SSA	Sub-Saharan Africa
TEAMS	The East African Marine System
USSD	Unstructured supplementary service data

Glossary of terms

TERM	DEFINITION
Advanced digital services	We define advanced digital services as digital information / news, e-governance, e-commerce, digital health, digital education, digital services supporting livelihoods (business owners, farmers, employed), and content creation.
Basic digital services	We define basic digital services as using mobile money services to send and/or receive money or buy airtime or mobile data.
Basic mobile money	Using mobile money services to send and receive money or buy airtime and data.
Cyber harassment	Consistent unsolicited messaging, pestering, abuse, or bullying.
Digital safety	Protection from fraud, harassment, misconduct and cyber-crime while using a mobile phone, computer, or the internet
Digital services	Services accessed through a mobile phone, computer, or the internet.
Intermediate digital services	We define intermediate digital services as digital communication, social media, entertainment, mobile banking, and making and receiving payments for goods and services using mobile money, as well as making and receiving payments for business or employment using mobile money.
Resident	Any person living in Kenya. Our study cannot establish legal residence status.

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