

4 Addressing infrastructure and skills gaps for private sector digitalisation

Government efforts to improve digital infrastructure and the digitalisation of public service delivery were received positively by survey respondents. The government has made significant progress in these areas in recent years, and digitalisation remains a cornerstone of its ambitions to develop economic competitiveness, raise productivity and foster innovation. Yet, despite an improved supply of digital services and infrastructure, the diffusion of digital tools and processes at the firm level remains limited. This chapter highlights achievements that the government has made in facilitating the digital transition, notably in its success with e-government and digital public service delivery, before highlighting a number of challenges relating to infrastructure and skills for the digital transformation.

4.1. Overview and survey insights

The digital transformation can have a profound impact on private sector development (OECD, 2021^[1]). Digitalisation can offer new opportunities for firm organisation and production, as well as how crucial government services are administered, while the ever-increasing value of data as an economic input is pushing the frontiers of innovation in both the public and private sectors. At the same time, as the contribution of digital technologies and services continues to increase its share of value added in both manufacturing and services, who has the skills and capacities to take advantage of digitalisation, as well as where those skills and capacities are located, has significant implications for competitiveness, inclusion, and inequality.

Many survey respondents underscored their enthusiasm for digital opportunities in Kazakhstan but also expressed their frustration at how underdeveloped framework conditions prevented them from making the most of these opportunities. This is an important and positive observation – the surveyed firms remain dedicated to the Kazakh market, but believe that they can achieve more if the government is more responsive to their infrastructure and connectivity needs. Some 80% of respondents considered digitalisation to present opportunities for their business activities in Kazakhstan (40% significant opportunities, 40% some opportunities).

While only 7% of respondents reported that their firms had become fully digitalised, an overwhelming majority of firms had nevertheless adopted digital processes within their firms. Over half (54%) of respondents reported that upwards of 75% of internal processes now had some kind of digital component, while another 39% reported that 50-75% of internal processes now had a digital component. These figures suggest a fair level of digital penetration in the European business community in Kazakhstan, though it would be necessary to compare with the domestic business community with a larger sample size to determine whether such levels were representative throughout the country.

A significant number of respondents demonstrated an advanced level of digital maturity. For example, some 89% of respondents reported that they used advanced tools such as customer relationship manager software (CRM) or some form of data analytics, which suggests a relatively high level of digital maturity of European firms operating in Kazakhstan. The rate of firms using cloud-based data solutions (67%) and digital communications (70%) further underscores the digitalisation of the surveyed firms.

The key barrier to further adoption and use of digital technologies by the surveyed firms appears to be infrastructure-related. A majority (61%) of respondents underscored the importance of improving internet speed and quality for digitalisation, 52% emphasised the need to improve the terms provided by Internet providers to customers, and almost half (48%) highlighted the need to improve data security. Other issues related to the need to develop online payment systems (32%), improve the digital skills and qualifications of the labour force (23%), and improve the quality of the regulatory framework for online commerce (29%).

Enabling the private sector – and society more broadly – to make the most of the opportunities of the digital transformation requires a range of different policy interventions. For one, firms can only digitise their activities – for example, through the adoption of IT solutions, be they simple or advanced, to improve productivity – if the basic digital and connectivity infrastructure is in place. This means having access to high-quality fixed and cellular internet, and access to ICT equipment and software, as well as the availability of more complex forms of digital infrastructure, such as cloud computing. It also means having access to the skills and knowledge necessary to apply digital technologies and to derive new insights and innovations from them. And, importantly, it means having access to the capital necessary to invest in the above, and a regulatory environment which fosters digitalisation rather than constraints it.

On the supply side, infrastructure challenges can be linked to competition issues in key network sectors of the economy necessary to develop a modern, digital and connected economy. On the demand side, long-standing access to finance challenges may make it difficult for firms to invest in digital

technologies and intangible capital necessary to make the most of them. The government of Kazakhstan has stated its ambition to drive the digital transformation of the country's economy, with its strategic objectives codified in the National Development Strategy project, as well as digital-specific strategies such as the 2018-2022 Digital Kazakhstan programme (OECD, 2023^[2]).

This chapter builds upon research that the OECD conducted in 2023 on the digital framework conditions for Kazakhstan's private sector (OECD, 2023^[3]). Insights from the survey complement a number of findings that emerged in this work, such as the demand from the private sector for improvements to connectivity infrastructure, and the need for greater regulatory clarity if firms are to make the most of the opportunities presented by the digital transformation. The policy implications of these challenges relate to the more transversal issues of competition in the telecommunications sector, access to finance for digital and other intangible investments, and regulatory quality and simplification.

This chapter gives an overview of the latest developments in private sector digitalisation in Kazakhstan, noting the particular improvements in the areas of digital public service delivery. It then expands upon two areas identified in the survey as challenging for firm-level digitalisation. First, the framework conditions for private sector digitalisation. Second, the skills-related challenges for firm-level adoption of digital tools, building on recent OECD work in this area (OECD, 2023^[4]).

4.2. Digitising the state: a key success of Kazakhstan's digital agenda

The digitalisation of Kazakhstan's economy has been a policy priority and a major part of the country's diversification agenda since 2013, when the government launched its first major digital strategy "Informational Kazakhstan 2020" (Government of Kazakhstan, 2017^[5]). This first digital strategy focused on the development of ICT infrastructure and online public administration systems to facilitate business activity (egov.kz, 2021^[6]) and has been successful in developing country-wide connectivity. In 2018, the government followed this initial strategy with the five-year "Digital Kazakhstan" initiative, aimed at increasing the private sector's use of digital tools to support economic growth through targeted programmes in the agricultural, energy, transport, and e-commerce sectors, and which ran until 2022 (OECD, 2023^[2]) (Digital Kazakhstan, 2022^[7]). The initiative also developed additional sub-programmes, targeting digital innovation (launch of the Astana Hub International Technology Park in 2018) and cybersecurity ("Cybershield Kazakhstan"). In early 2022, the government launched "Digital Era Lifestyle" (*DigitEL*), its third five-year digitalisation programme, with a focus on quality and safe internet, using ICT businesses as a growth lever, and further digitalising the services sector (Republic of Kazakhstan, 2022^[8]). DigitEL targets include an ICT share of GDP of 5%, compared to 4% in 2020, and the strategy anticipates greater involvement of the private sector, as over 70% of the programme is to be funded through private investments.

One area where the government has had great success with its digitalisation agenda has been e-government and digital public service delivery. Quality digital government services are important for improving the efficiency of interaction with state bodies in any country, but this is particularly true in a country like Kazakhstan, where low population density and a high degree of administrative centralisation can significantly raise the costs and time involved in accessing public services. Until it elapsed in 2022, the country's e-government agenda was guided by the Digital Kazakhstan strategy, which set a goal of providing 100% of government services online. As suggested through survey responses on the quality of service provision such as licensing and permits for businesses, these reforms appear to be bearing fruit.

In 2022, Kazakhstan had risen to 28th in the UN E-Government Development index, ahead of a number of OECD countries (United Nations, 2022^[9]). The country's strong performance reflects a number of important, and at times challenging, reforms. Kazakhstan recognised the need to centralise public service delivery on a unified platform, but also took the opportunity in doing so to create adjacent platforms and services, such as an interoperable API and permitting linkages between government data and private

partners (for example, in the banking sector), to improve previously analogue services and ensure that the digitisation process was harnessed as a moment to modernise service delivery comprehensively.

Kazakhstan has increasingly been applying data analysis to improve the policy process, particularly for policies that aim to improve the quality and coverage of digital infrastructure networks. For instance, under the NDS, citizen-reporting platforms have been created as a monitoring tool for minimum internet speed requirements imposed on operators in remote rural and small urban areas (Government of Kazakhstan, 2017_[5]). The online platform gathers complaints about internet quality and is linked to the Interdepartmental Commission on Radio Frequencies and local state telecom authorities. It verifies connection quality and fines telecom operators immediately should quality fall below the minimum threshold.¹ OECD interviews suggest that the system has enabled the improvement of internet connection quality, especially in Kazakhstan's areas. The MIID has also developed monthly public-private dialogue (PPD) with the Council of Operators since 2020, where the owners of main telecommunication infrastructure and towers and large business associations discuss infrastructure bottlenecks and challenges. However, neither regional governments nor small last-mile operators are part of such meetings, which limits their effectiveness in gathering the relevant actors – national and local operators, regional authorities, and the private sector – to address often highly localised issues.

In addition, one of the main objectives of DigitEL is the development of data-driven government by 2025. The “attentive and effective state” initiative aims at creating a unified data collection process to ground policy decisions, including the development of user feedback for public services, and more importantly the automatic collection and treatment of data relevant for policy-making. However, in its current state, the initiative only targets industrial data to be monitored by the public revenue committee (Government of Kazakhstan, 2021_[10]). If effective, the initiative could be expanded in the coming years to new sectors, where it could thereby serve as an important tool for gathering data about the digital needs and use of businesses.

4.3. Infrastructure and investment gaps remain a challenge to private sector digitalisation

The rate and depth of digitalisation in Kazakhstan, as in any country, is shaped by a number of important infrastructure-related framework conditions and the diffusion of digital technologies. It is precisely the lack of development of these framework conditions that survey respondents identified as being the major barrier to digitalisation in the country.

Kazakhstan continues to have a highly regulated telecommunications sector, with significant competition-related issues that may affect investment and the quality of connectivity infrastructure, slowing the rate of digitalisation. The government has made efforts to liberalise the sector, notably following accession to the WTO in 2015, when it lifted a monopoly on the provision of 4G services in the telecoms sector (OECD, 2023_[3]). Before this point, only Altel, a subsidiary of *Kazakhtelecom*, had the right to provide 4G services. Since early 2017, all three mobile telephone providers have been allowed to get licenses on existing and new 4G frequencies (Samruk Kazyna, 2016_[11]). In March 2021, *Kazakhstan Transtelecom*, a fixed broadband network operator and former subsidiary of the state-owned rail firm, was privatised. This followed a gradual process initiated in 2014, when the company was first included in a list of strategic assets for privatisation, before 49% of its shares were sold in 2015, followed by a second sale (26% of shares) in 2018 (Government of Kazakhstan, 2014_[12]; Kazinform, 2015_[13]).

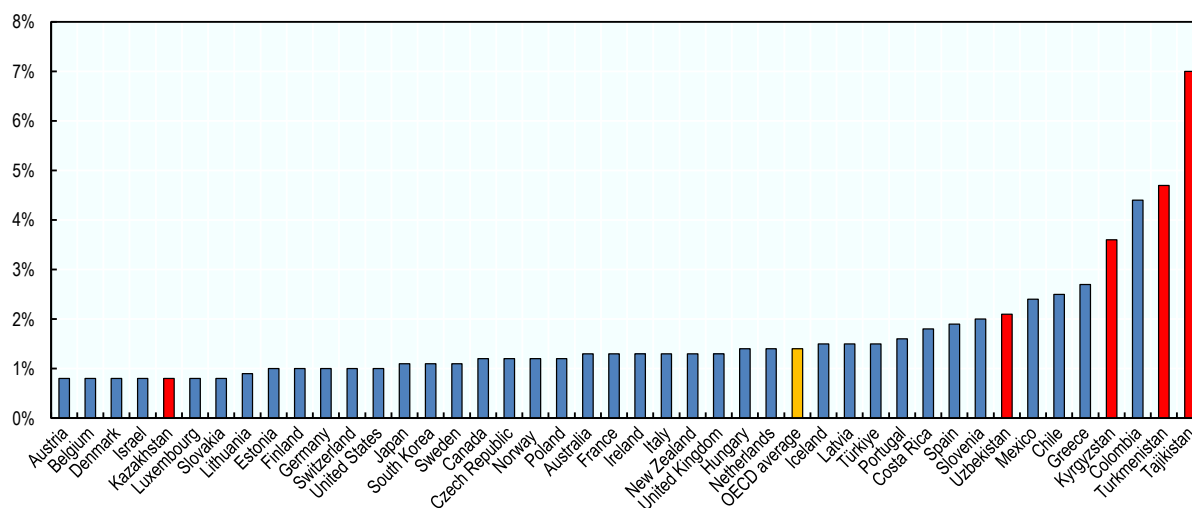
In 2023, recognising the important role of small operators in bridging the “last-mile” connectivity gap, the OECD recommended that the government initiate steps to demonopolise that segment of internet provision (OECD, 2023_[3]). While this should enable small operators to enter the mobile market, it remains unclear whether it aims at fostering end-to-end infrastructure competition, or if it is to allow for

infrastructure sharing. In the first case, different operators, both new and incumbents, would compete with their own networks, while in the latter, small operators would use the infrastructure of incumbents but provide services to market segments that remain outside the current network, i.e. mainly in rural and small urban areas.

In the framework of this reform, the government announced that *Kazakhtelecom* would sell one of its two mobile operators in 2022, which would result in essentially three independent operators in the mobile market by the end of that year (Government of Kazakhstan, 2022^[14]). In addition, the government set up a special Commission on demonopolisation in early 2022, with the main goal of reviewing and proposing amendments to the current legislation applicable to the telecom sector. The Commission is composed of the Ministries of Infrastructure Development and Justice, relevant public institutions, such as the Competition Authority, and representatives of the private sector. However, results have not yet been communicated and it is unclear if the partial privatisation of *Kazakhtelecom*'s mobile operators will result from the Commission's activities.

Nevertheless, since the early 2000s, the government has had significant success in developing and modernising the country's connectivity infrastructure, leading to affordable and quality access to internet in most of Kazakhstan's urban centres. In terms of access, nearly universal mobile coverage has been in place since 2015 at least, with the population covered by 2G or higher networks reaching 98% in 2019, while access to broadband internet remains more modest (ITU, 2022^[15]). Internet access has also become widely affordable across the country, with fixed and mobile subscription costs falling in recent years; they are now well below the UNESCO's affordability target of 2% of Gross National Income (GNI) per capita. Fixed subscription costs stood at 0.85% of GNI per capita in 2020 (Figure 4.1) compared to a 2.3% average for the Commonwealth of Independent States (CIS), while mobile subscriptions costs are among the lowest in the world at 0.33% of GNI per capita, compared to 1.0% in CIS countries and 2.6% globally (ITU, 2022^[15]; ITU, 2021^[16]; Cable, 2022^[17]).

Figure 4.1. Cost of fixed broadband access as percentage of GNI (2021)

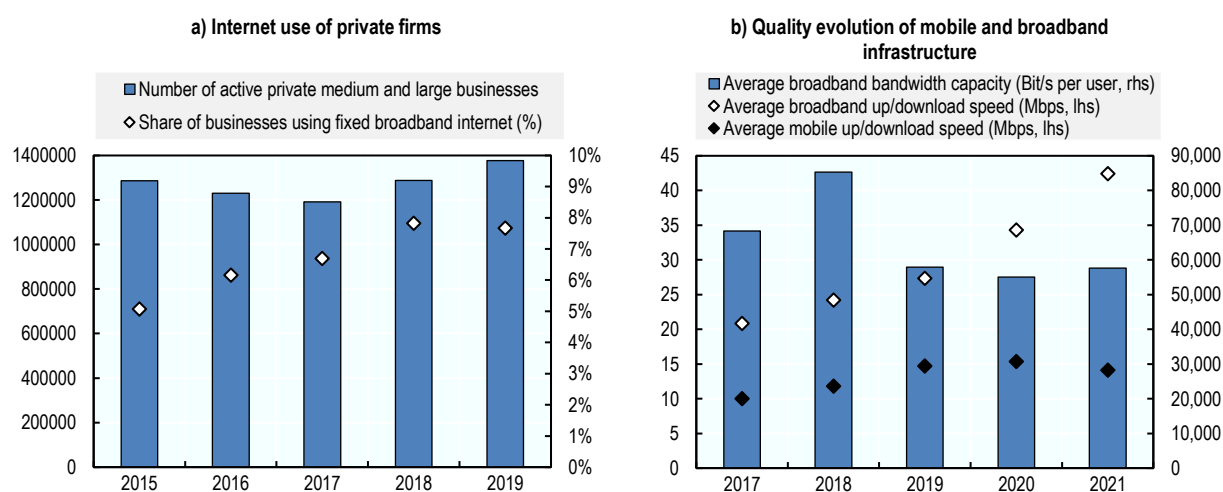


Source: (ITU, 2023^[18])

Improvements have also been made in network quality. About three quarters of the population covered by 4G internet in 2021, while the download and upload speeds of broadband lines have doubled on average since 2017 (EIU, 2022^[19]). Digital connectivity at large has also progressed in Kazakhstan, with a significant reduction in the rural-urban connectivity gap², with 89% of the rural and 91% of the urban population having access to broadband networks in 2019 (ITU, 2022^[20]).

While fixed internet is a key driver for SME digitalisation, broadband uptake in Kazakhstan remains low compared to OECD countries. Broadband subscriptions per 100 households rose only slightly, from 13.1 in 2015 to 13.8 in 2021, compared to 33 on average in high-income countries (ITU, 2022^[20]; OECD, n.d.^[21]). Though there are no data available on small businesses specifically, only 7.8% of medium and large enterprises reported having access to fixed broadband internet in 2020 (Figure 4.2), while 48% of small business indicated having a website in the latest World Bank Enterprise survey, compared to almost 90% for large businesses (World Bank, 2021^[22]). Access to fixed broadband internet varies widely among regions, ranging from 4.3% in Aktobe Region to 15.2% in neighbouring Atyrau. In 2019, the number was even lower (5.9%), with the recent increase being presumably at least partially due to the effects of COVID-19. As a result, only 11% of medium and large enterprises reported using digital technologies in 2020, and while no data are available for SMEs, OECD interviews suggest that the numbers could be even lower for the latter (National Statistics Office, 2022^[23]).

Figure 4.2. Internet use of firms, and quality of available networks



Note: In 2021, fixed broadband average speed stood at 55 for upper-middle income countries, and 113 for high-income countries, while the mobile broadband average speed stood at 25 and 51 respectively.

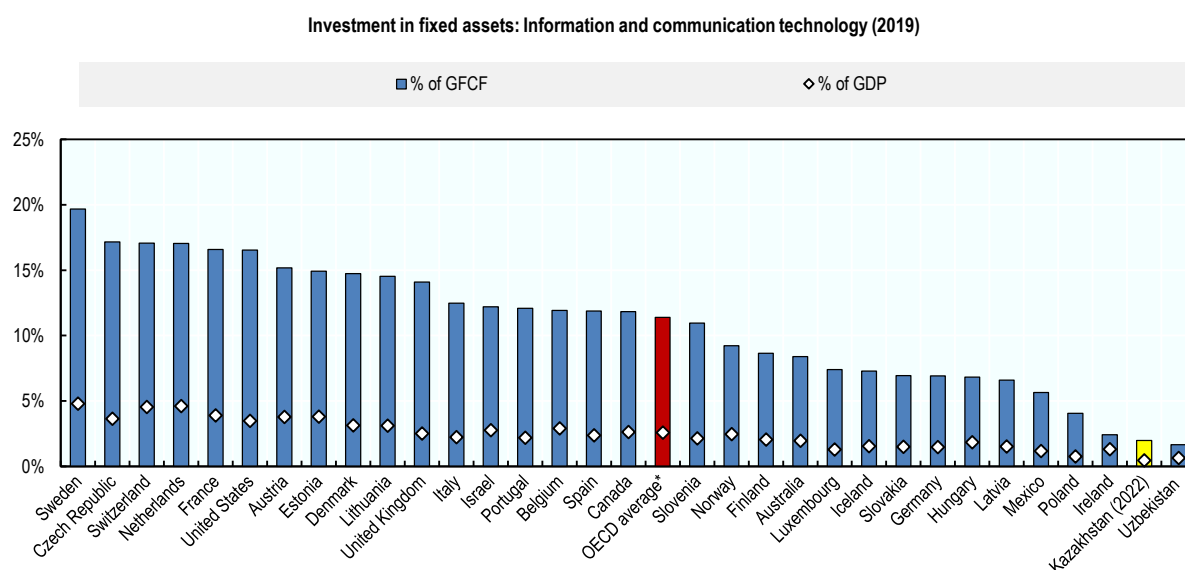
Source: (DAMU, 2020^[24]) (Bureau of National Statistics, 2022^[25]) (EIU, 2022^[19]; ITU, 2022^[20])

In Kazakhstan, as in many OECD countries, there is a persistent coverage gap between urban and small urban and rural areas. Narrowing this gap is critical to strengthening the overall economic development of these regions and the competitiveness of their small firms and entrepreneurs. Since the “last-mile” connectivity initiative has not yet been successful in connecting these regions, their municipal or regional governments, in co-operation with local interest groups and citizen-led initiatives could facilitate, build, operate or finance high-speed networks, compensating for the absence of operators. Across the OECD area, such municipal networks have been successful in extending connectivity in regions where deployment by national communication companies was lacking or deemed unprofitable; they have contributed to increased competition, and therefore lower prices, in areas where coverage was partially provided by national operators (Mölleryd, 2015^[26]) (However, institutional framework conditions, in particular open competition in the telecom market, have proved an important enabler of such bottom-up initiatives in OECD countries such as Mexico, Sweden, the UK, and the US (OECD, 2021^[27]).

4.3.1. Supporting firm-level digital uptake: the challenge of raising investment and modernising the regulatory framework

One clear trend in Kazakhstan that has significant implications for the digital transition is underinvestment in ICTs. Investment in ICTs in Kazakhstan amounted to only 1.98% of total GFCF, putting the country slightly ahead of Uzbekistan but significantly below the OECD average of 11.4%, and further still behind the leading OECD members Sweden (20%) and the Czech Republic (17%) (Figure 4.3). Relative to the size of the economy, the level is similarly low (equivalent to 0.46% GDP), comparable only to Poland among OECD members (0.78% GDP), and significantly behind the OECD average of 2.58% of GDP.

Figure 4.3. Investment in ICTs: Kazakhstan in international context



Note: *The OECD average does not include Chile, Colombia, Costa Rica, Greece, Japan, Korea, New Zealand.

Source: (OECD, 2023^[28])

Raising the level of investment in ICTs and connectivity infrastructure is crucial for Kazakhstan to succeed in the digital transition. It is imperative that government strive to increase both the relative share and total volume of investment in these assets if its firms and workers are to be able to take advantage of the digital transformation, ensuring that the productivity and output of the country's private sector does not further diverge from the OECD average.

In recent years, Kazakhstan has worked to adapt the legal and policy framework for firms to new digital challenges. On the data front in particular, Kazakhstan has been regularly amending its legal framework to gradually move toward the privacy and security standards set by the European Union's General Data Protection Regulation (GDPR) (Government of Kazakhstan, 2013^[29]; Government of Kazakhstan, 2017^[30]). As part of these efforts, the government created the Information Security Committee under the MDDIAI, mandated with the implementation and monitoring of compliance with the Law on Data Protection (Government of Kazakhstan, 2022^[31]). Though the objective was to create a Data Protection Agency following the GDPR model, the Committee's mandate so far focuses mostly on technological solutions to data issues, rather than on legislative and implementation aspects for data protection issues (CAISS, 2020^[32]). The new legislative framework also imposes obligations on companies to appoint a data protection officer to ensure internal compliance with the Law, notify the Committee about data breaches,

and carry out data protection impact assessments before engaging in any activity requiring the collection and handling of data (Dentons, 2021^[33]).

One of the main areas for improvement highlighted by survey respondents was the need for better digital security (45% of respondents), which has been a policy priority for the government in recent years. As part of the country's broader digitalisation programme, the government has, for example, been developing digital security policies to reduce vulnerabilities to cyber threats (Government of Kazakhstan, 2017^[34]). In 2016, the government launched the Cybersecurity Concept until 2022 ("Cyber Shield of Kazakhstan"), which aimed to develop a cybersecurity sector in the country, something that had previously been largely underdeveloped (Government of Kazakhstan, 2017^[35]). The strategy included a number of important initial steps: (i) the creation of a national register of trusted digital software and IT products to reduce reliance on foreign solutions; (ii) enhanced international co-operation with internationally recognised private digital security providers and international organisations active in the domain to build local capacity; and (iii) the development of a digital culture for the general population and the training of cybersecurity specialists. Some of the targets of the initiative were further included in the objectives of the Digital Kazakhstan programme. In 2022, the government announced the launch of the Cybershield 2.0 programme, incorporating new challenges and aspects of the digital transformation in Kazakhstan, especially on the liberalisation and inclusion of the private sector, law enforcement, security, and defence sectors (OECD, 2023^[3]).

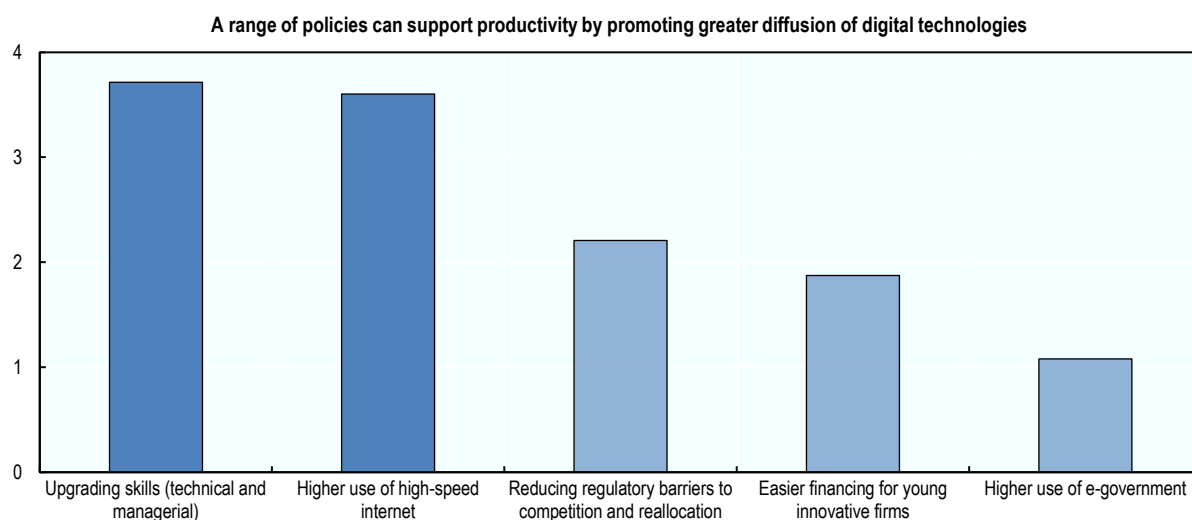
The strategy has been successful so far in beginning to establish a cyber-security landscape in the country. On the institutional front, the National Security Council, the Council for Cybersecurity, the Information Security Committee under the MDDIAI and an industry information security centre covering the country's financial sector were created (ITU, 2021^[36]). However, recent analysis by the OECD suggests that the current institutional architecture can lead to co-ordination issues, while businesses remain insufficiently aware of the initiatives implemented (OECD, 2023^[3]). Kazakhstan has been actively seeking to expand international co-operation, in particular with the International Telecommunication Union (ITU), and through its involvement in the fourth industrial revolution working group of the World Economic Forum (WEF).

4.4. Equipping the private sector with skills for the digital transition remains a key policy challenge for the government

Ensuring that firms have the skills and knowledge needed to make the most of digitalisation is crucial for both competitiveness and inclusion. The ability of private sector firms to make the most of the opportunities presented by the digitalisation transition, and to ensure that they are not left behind by competitors both domestically and internationally, depends on the capacities of firms to use a range of digital technologies, as well as complementary capacities in other areas necessary to identify commercial or organisational use cases for those same technologies too (such as management skills that reflect how digitalisation can affect firm organisation).

For example, the ability of a manufacturing SME to innovate with respect to their internal organisation or production depends on their ability to derive new data and insights from data using digital tools. It is for this reason that, in a study on the impact of various policy interventions and framework conditions on the diffusion of digital technologies in the EU, the OECD found that the intervention with the greatest single impact was upgrading technical and managerial skills of firms (Figure 4.4) At the same time, firms must have the internal capacities and knowledge to recognise the *value* of using digital tools for their business, and to have the skills necessary to recognise opportunities where digitalisation would be of use to them.

Figure 4.4. Impact of selected policy interventions on improving productivity



Note: Effect on multifactor productivity of the average EU firm of closing half of the gap with best-performing EU countries in a range of structural and policy areas, after 3 years

Source: (OECD, 2019^[37])

The type of skills that the workforce needs to make the most of the digital transition are manifold.

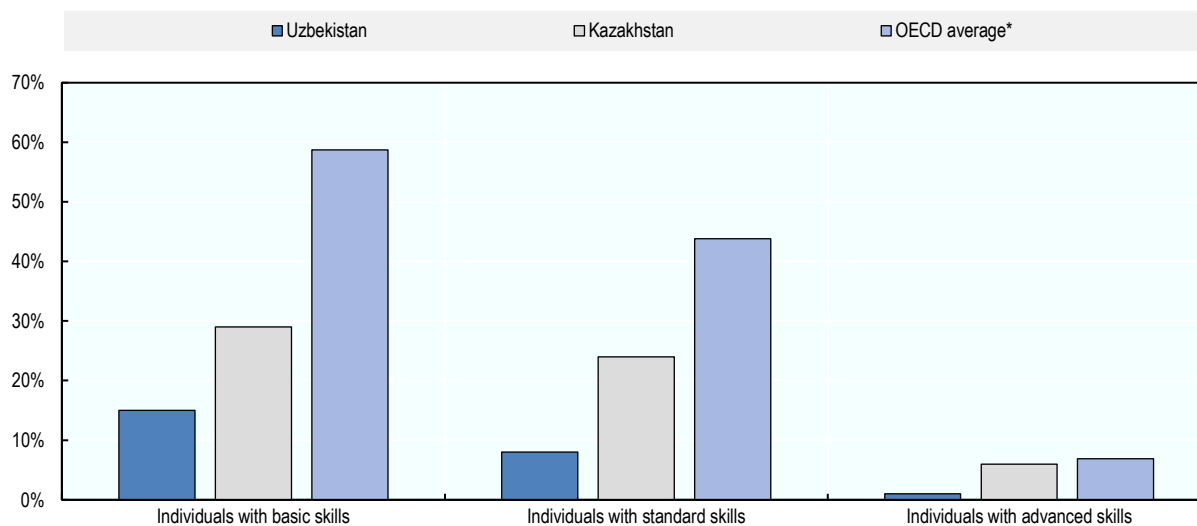
In certain cases, new types of jobs and the changing nature of existing ones require job holders to have a mix of technical and high-level cognitive skills, for example, database management skills and related data analytical skills. In some professions, for example, there may develop a need for proficiency in coding languages such as Python and Java, or knowledge of and experience with machine learning, data science and visualisation. These are advanced skills, ones which are not widely held even in OECD countries (1% of workforce), but they are nevertheless important for Kazakhstan and other transition economies if they are not to be left behind by new forms of value creation, drivers of productivity, and innovation (OECD, 2022^[38]). At the same time, more “basic” skills, such as a familiarity with widely used software or experience with social media platforms are increasingly important to a wide range of industries, beyond the traditional confines of the ICT sector. Whilst there are, of course, sector- and industry-specific digital skills needs, the whole-of-economy significance of digitalisation requires an inclusive approach to digital skills development.

While it is clear that digitalisation offers significant opportunities for innovation and productivity growth for Kazakhstan’s SMEs, the uneven diffusion of infrastructure and skills risks aggregating productivity gaps between firms due to difficulties in financing digital technologies and the related intangible capital necessary to use them effectively. Access to finance challenges are long-standing barriers to firm growth in Kazakhstan, in part due to the pervasive presence of the state in the banking sector and issues relating to preferential SOE lending. The banking sector’s stringent collateral requirements are particularly difficult for SMEs in the digital context, where much investment is in intangible capital (skills, software and other forms of intellectual property). Ensuring a broad access to the skills and capacities necessary to make the most of digitalisation is therefore also important for inclusion, be it at the industrial level (i.e., between firms and industries with more or less investment capacity), regional level (i.e., between SMEs in Almaty and major industrial hubs and more rural areas of the country), or socio-economic level (i.e., gendered differences in terms of access to digital skills).

The level of digital skills in Kazakhstan has still to catch up with the OECD average, though it is notably higher than in Uzbekistan and other regional peers (Figure 4.5); less than 30% of the population have basic ICT skills, which is half the OECD average. This is true across the basic, standard, and advanced skills categories, suggesting that the labour force in Kazakhstan remains underequipped to

use even the more basic of digital technologies and to recognise potential applications for them in their own businesses, or indeed in the context of a start-up or innovation. Raising the general level of digital skills should be a priority for the government in their pursuit of private sector competitiveness, and efforts should be made to begin digital skills training early in the education system, ensuring that new labour market entrants are equipped with the skills they need to succeed, as well as mitigating the development of skills-related bottlenecks in the labour market as digital technologies continue to change how firms work and produce.

Figure 4.5. Overview of digital skills: Kazakhstan, Uzbekistan and OECD average

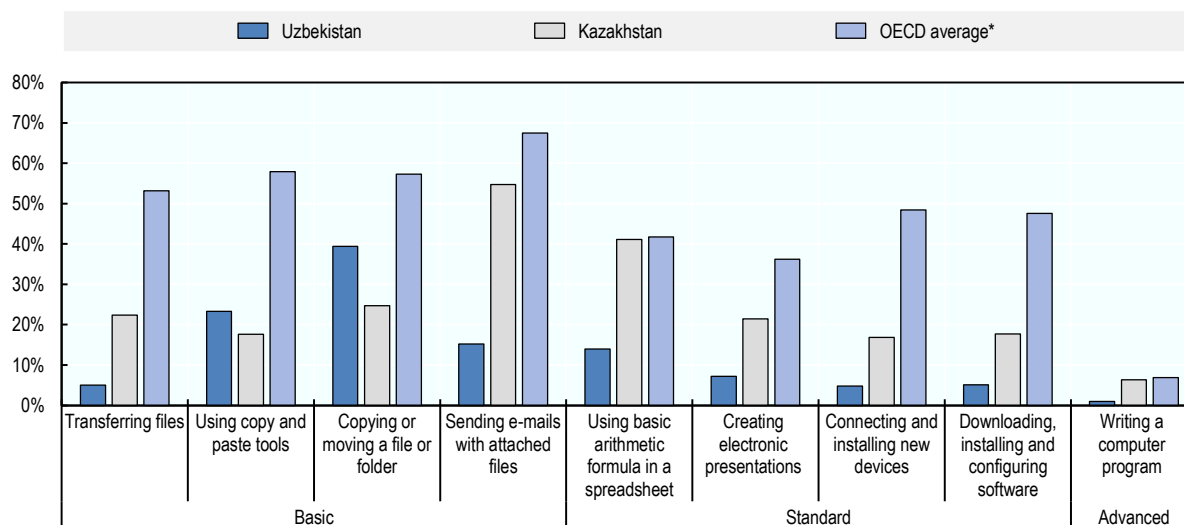


Note: As a percentage of the population. *Data was not available for Australia, Canada, Costa Rica, Israel, New Zealand, United States. Data for Uzbekistan is from 2018-2020, data for Kazakhstan is from 2019-2020. Observations for OECD countries go from 2013 to 2020. Data for Uzbekistan used as a comparator for Kazakhstan due to data availability.

Source: (ITU, 2023^[18])

The difference in digital skills levels in Kazakhstan and peer countries is less stark in the areas that are likely to be productivity enhancing, i.e., where the person uses their digital knowledge to create new knowledge and insights from data, or to innovate and improve communications (WEF, 2020^[39]) (OECD, 2021^[40]). For example, around a quarter of Kazakhstan's population have standard digital skills, meaning that they have experience in tasks such as using an arithmetic formula in a spreadsheet, creating an electronic presentation, connecting new electronic devices, or downloading and configuring software (Figure 4.6). In advanced skills, which include tasks such as programming, Kazakhstan is close to the OECD average. Greater data availability on digital skills and digital diffusion in the business community, for example in terms of firm size and industry, would allow for more targeted policy interventions should they be necessary.

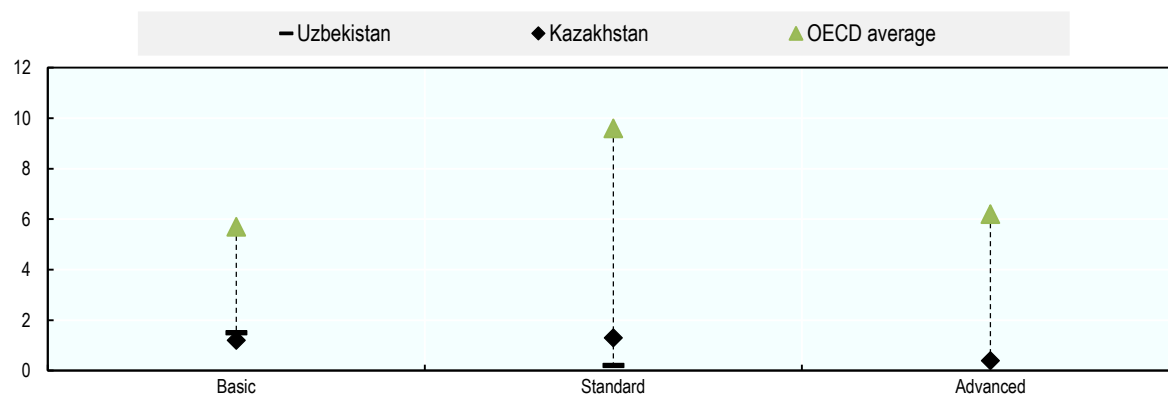
Figure 4.6. Breakdown of digital skills: Kazakhstan, Uzbekistan and the OECD average (2019)



Note: As a percentage of the population. *Data was not available for Australia, Canada, Costa Rica, Israel, New Zealand, United States. Data for Uzbekistan is from 2018-2020, data for Kazakhstan is from 2019-2020. Observations for OECD countries go from 2013 to 2020. Source: (ITU, 2023_[18])

One characteristic of the digital skills landscape in Kazakhstan, as in Uzbekistan, is that the digital skills gap is relatively ungendered. The gap between men and women in basic, standard and advanced skills is significantly higher in the OECD than it is in Kazakhstan and Uzbekistan (Figure 4.7). Given the generally low level of digital skills in the country, the relatively narrow gender gap may be more representative of the broader availability of these skills rather than a positive trend in their development. Nevertheless, the government has an opportunity to ensure that the policy interventions to develop digital skills build on rather than diverge from the relatively ungendered dispersal of digital skills that the country currently has.

Figure 4.7. Gender differences in the digital skills gap: Kazakhstan, Uzbekistan and the OECD average (2019, in percentage points)



Note: As a percentage of the population. OECD estimations based on ITU data. Data was not available for Australia, Canada, Costa Rica, Israel, New Zealand, United States. Data for Uzbekistan is from 2018-2020, data for Kazakhstan is from 2019-2020. Observations for OECD countries go from 2013 to 2020. Source: (ITU, 2023_[18])

It is important to note that a country's historically important industries can create path dependencies in skills availability and development that can either enable or inhibit the private sector's digital – and green – transition (OECD, 2022^[41]). If, for example, in a certain economy there has been a historically high importance of a given sector or industry where gender gaps are present, then it may follow that the starting point from which to inclusively develop digital skills may be uneven (e.g., if an industry in which digitalisation has clear potential to increase productivity and innovation, such as manufacturing, has had a historically significant gender gap in terms of employment or productivity, then there may be structural barriers to overcome to ensure that the development of digital skills is truly inclusive). One of the key policy challenges for Kazakhstan is therefore in ensuring that pre-existing gender gaps in terms of employment generally or access to high-productivity employment specifically (for example, in manufacturing) do not act as de facto barriers to the inclusion of women in digital skills development.

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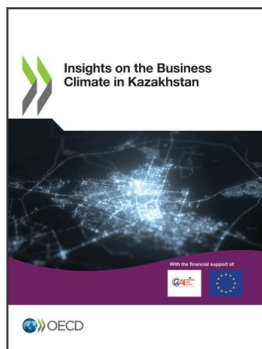
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Notes

¹ At the time of writing, a new draft law is under consideration to increase the liabilities of the operators in case of low or deteriorating network quality.

² The term “connectivity gap” refers to gaps in access and uptake of high-quality broadband services at affordable prices in areas with low population densities and for disadvantaged groups compared to the population as a whole (OECD, 2021^[27]).



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