



Digital
Readiness
Analysis

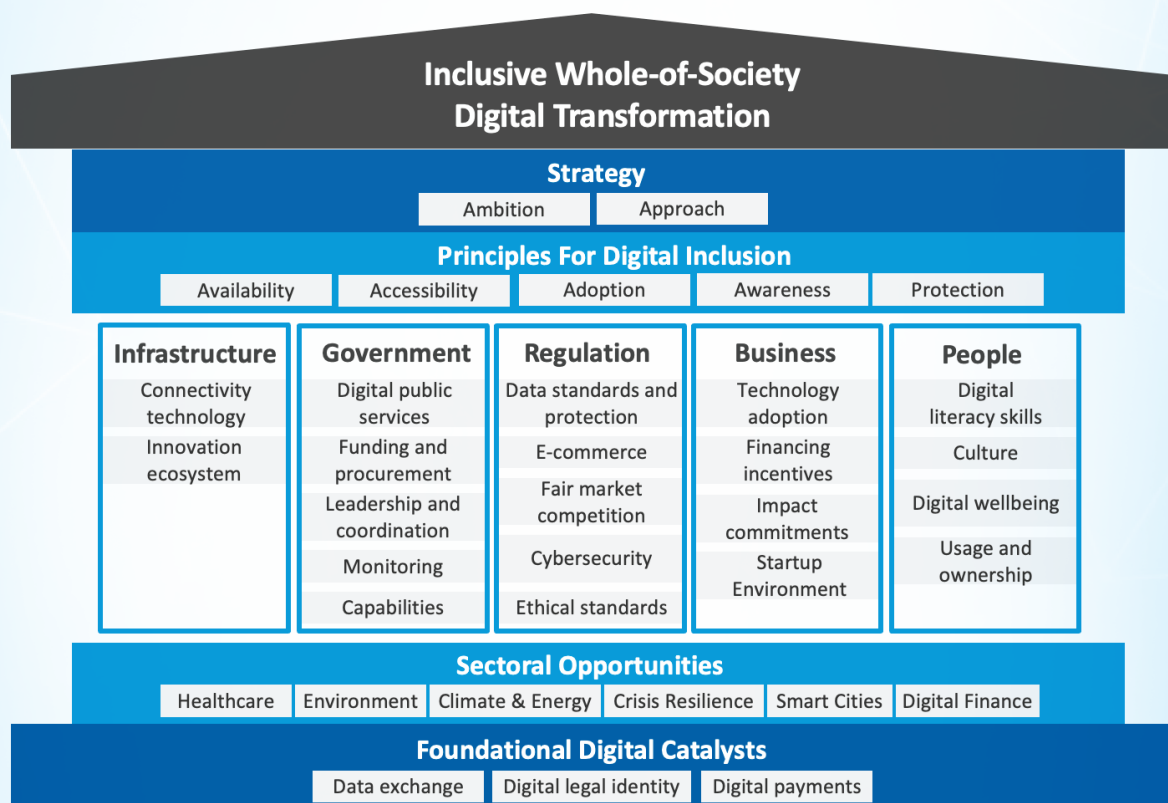
MOLDOVA MD

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1. Introduction to the DRA

UNDP Framework for inclusive whole-of-society digital transformation.

- Serves as an **overarching reference model** to identify, structure and prioritise national digital transformation efforts and agendas
- In each area there are a **broad range of components** that can be addressed for a successful national digital transformation
- A **basis to discuss possible UNDP support** – and a **top-level framing** that could encompass other frameworks
- People and digital inclusion **need to be put at the centre** of this identification and prioritisation.



What is the Digital Readiness Assessment?

- A **survey-based tool** to provide rapid, high-level insights into a country's digital strengths and opportunities
- Intended to serve as an **“entry point”** for increased engagement between governments, UNDP Country Offices, and a broad range of UNDP experts
- **Used in conjunction with other tools** and existing research.
- Improving coordination and clarity to drive a **whole-of-government and whole-of-society approach** to digital transformation
- Leveraging digital to achieve the **Sustainable** Development Goals.

1. Introduction to the DRA

- *Easy to complete*
- *Includes quantitative elements*
- *Real-time*
- *SDG-focused*
- *Technology as foundation*
- *Iterative, tailored, actionable*
- *Built for inclusivity*

Combing results from a survey, external data, and earlier reports provides a holistic view

RAPID COUNTRY SURVEY

g. Where does digital rank as a national priority given all other needs?

- A Low
- B Medium
- C High
- D Unknown

a. Has the COVID-19 pandemic impacted your organization's adoption of digital?

Not including video conferencing.

- A Slowed
- B No
- C Accelerated
- D Unknown

- Online survey that can be **quickly filled out anywhere** by civil society & government

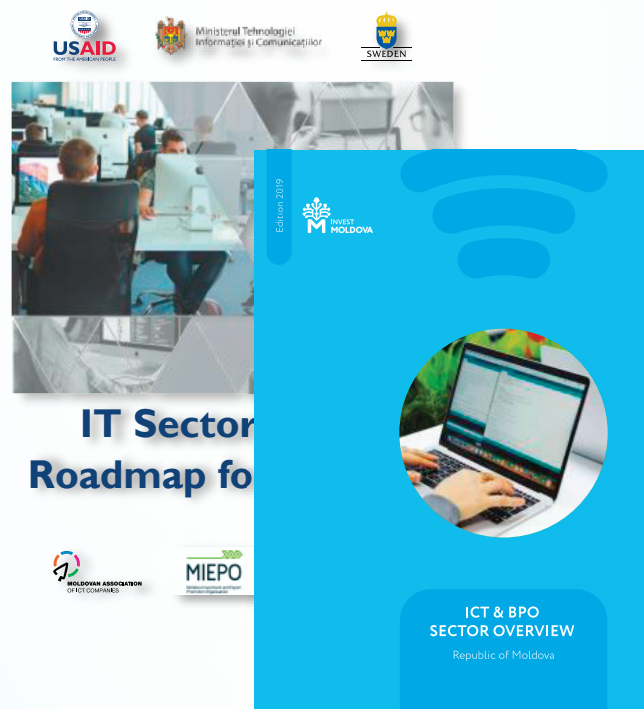
1. Introduction to the DRA

INCLUSIVE DIGITAL DATA REPOSITORY



- Integration with relevant external data sources to **build a complete picture**

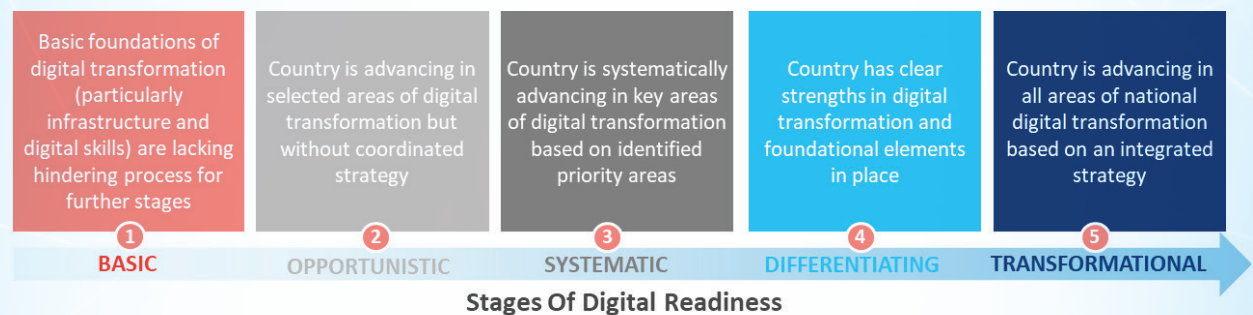
RESEARCH REVIEW



- In-depth desk research on recent materials **to track progress**

DRA Scores for the Stages of Digital Readiness

- The DRA analyses the perceptions and data provided by a non representative sample of stakeholders participating in the survey. The overall scores are the aggregation of opinions of expert stakeholders.
- The assessment provides a Digital Readiness Index for the country and for each of the key pillars of Digital Transformation and combines it with qualitative insights.
- Each pillar can be in a different digital readiness stage. This data gives a general vision on the perceptions of actors on the different pillars of digital transformation.



1. Introduction to the DRA

2. Moldova DRA - Results

2.1. Survey Data

2.2. Executive Summary and Graphs

2.3. Presentation of Insights per Pillar

2.4. Foundational Digital Catalysts

2. Moldova DRA - RESULTS

2.1 SURVEY DATA:

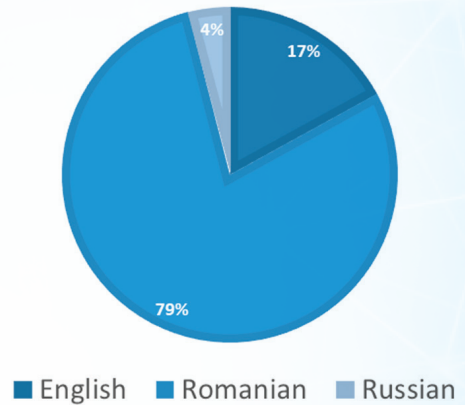
Calendar: Responses for the survey were collected between 1st April – 20th May 2021.

Overall respondents: 93

Distribution: aprox. 300 invitations sent

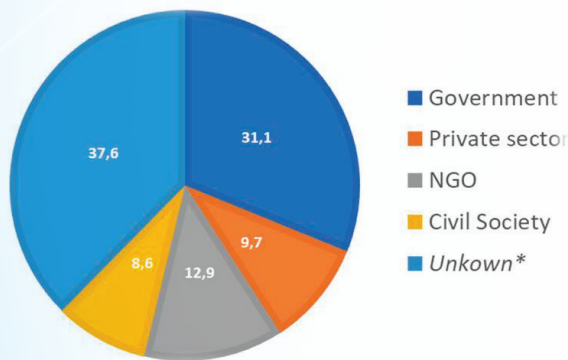
- Targeted e-mails sent from UNDP Moldova
- Dissemination through State Chancellery to Governmental institutions
- Distribution among members of business associations
- Publication on social media (LinkedIn)

Language response:

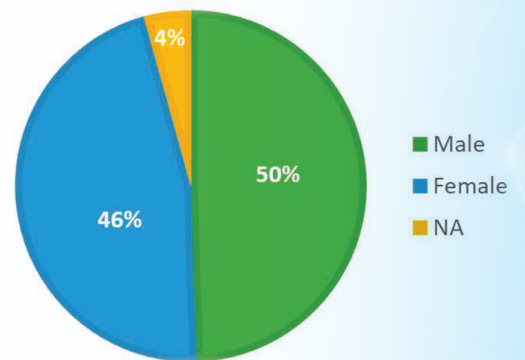


Respondent's profile Sector:

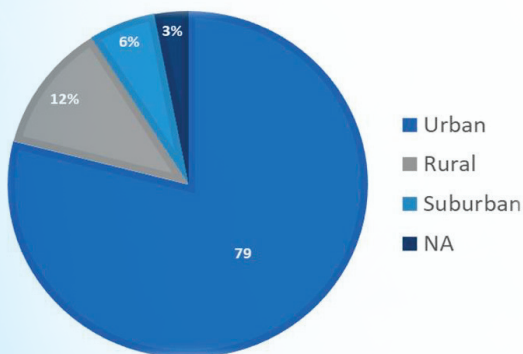
Sector:



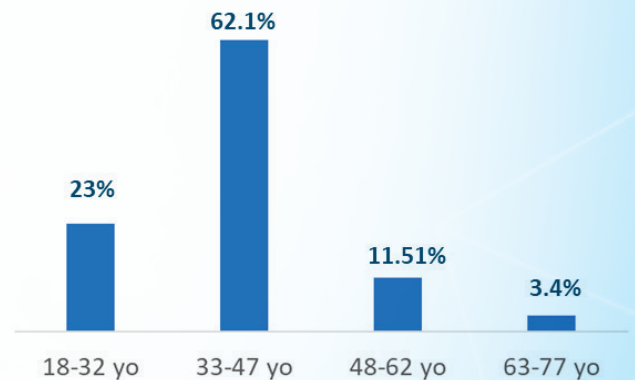
Gender:



Location:



Age:



2. Moldova DRA - RESULTS

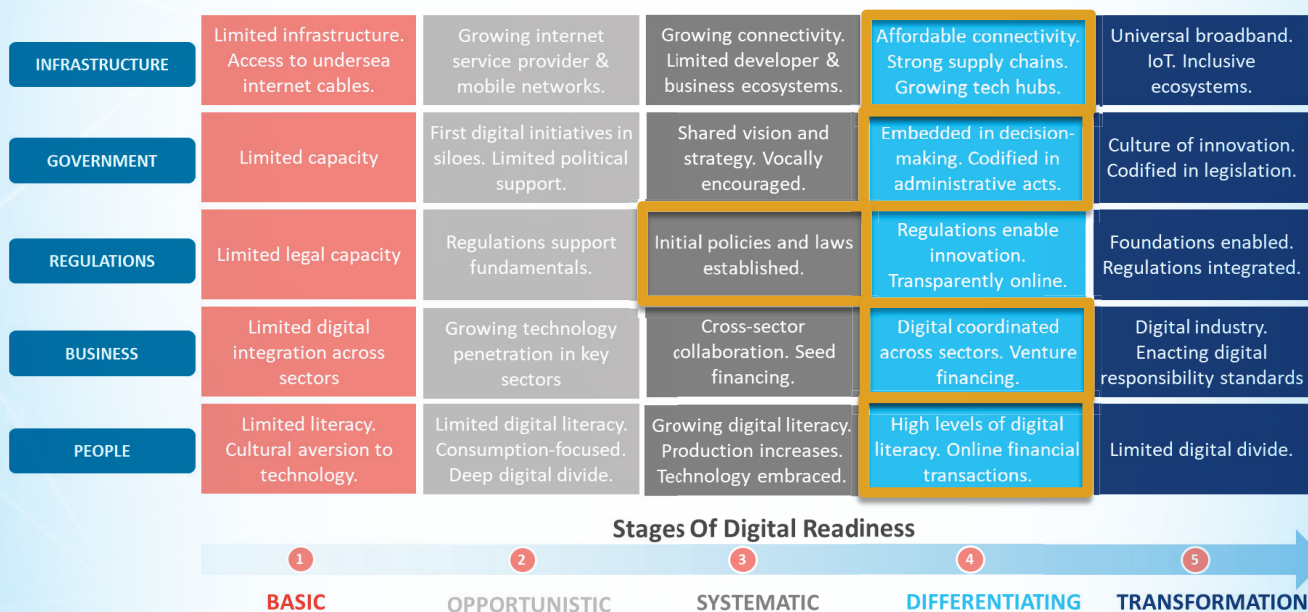
2.2 Executive Summary and Graphs

Moldova Score : 4,1 - Differentiating



PILLARS AND SUB-PILLARS	SCORE	Response rate*	PILLARS AND SUB-PILLARS	SCORE	Response rate*
INFRASTRUCTURE	4,1		BUSINESS	4,0	
Connectivity technology	4,5	71,7%	Technology adoption	3,8	65,4%
Innovation Ecosystem	3,0	75,0%	Financing Incentives	3,1	62,0%
GOVERNMENT	4,4		Impact Commitments	4,1	67,4%
Digital public services	4,4	53,0%	Startup Environment	5,2	18,5%
Funding and procurement	3,8	51,6%	PEOPLE	4,3	
Leadership and coordination	3,9	90,6%	Digital Literacy Skills	3,3	60,1%
Monitoring	4,3	49,3%	Culture	4,1	50,0%
Capabilities	4,1	69,9%	Digital Wellbeing	5,2	92,4%
REGULATIONS	3,9		Usage and Ownership	4,7	93,1%
Data Standards and Protection	4,0	73,9%	FOUNDATIONS	5,0	
E-Commerce	3,9	54,3%	Digital Payments	3,6	89,1%
Fair Market Competition	4,3	67,6%	Digital Legal Identity	5,5	87,0%
Cybersecurity	3,8	66,8%	Data Exchange	4,5	96,7%
Ethical standards	3,4	66,8%			

Moldova Score : 4,1 - Differentiating



* The response rate is calculated considering the number of respondents that provided a concrete answer to the question over the total of participants to the survey. Those responding "unknown" or skipping the question are considered as no responses.

KEY INSIGHTS

■ Social inclusion needs to be further integrated.

Most of Moldovan society has access to internet and devices, but the quality of this access and affordability of internet and the devices is variable between socioeconomic groups, rural-urban populations, and gender. There is a generalized perception among survey respondents that there is a **limited focus at the strategic and program level** on how digital transformation is affecting and benefiting vulnerable groups in society such as ethnic minorities, women or socio-economically disadvantaged groups. **Results from the Inclusive Data repository also indicate that digital literacy is one of the components least well ranked by external data sources.** However, there is still limited data informing current situation and impacts of digitalization and how it is benefiting or affecting different societal groups. **Digital inclusion needs to be further researched and integrated in digital strategies to ensure that digital transformation doesn't exacerbate current inequalities, and make it become instead a driver of opportunities for the whole country.**

■ More private sector modernization is necessary to increase IT-related opportunities

Moldovan SMEs are not dedicating enough resources to Research and Innovation activities - and their collaboration with knowledge providers and innovation stakeholders is mostly opportunistic. Most digital transformation efforts are led by the Government, or by big companies in very localized sectors such as banking and manufacturing, while the rest of the economy doesn't invest in improving their current services using digital tools. **The Business Pillar, and particularly the financing incentives component are the lowest scored by external data sources, and also receives the second lowest score for the aggregate respondents' data.** Current public support services and incentives such as those provided through the IT Park and innovation hubs need to be boosted and expanded to more companies. **Enhancing access to credit and finance for companies** are needed in order to promote the uptake of digital solutions and enhance innovation.

■ E-SERVICES: Much has been done, but much more is needed.

The Moldovan Government provides several digital services available to citizens, has established guidelines and procedures to monitor these services, and improved its public information publishing practices. **Government Pillar has the highest score but is also one of the pillars where there are more discrepancies between stakeholders ranking - while it is very well scored by the Government actors and external data, end-users (civil society and private sector) have a less positive perception.** The current momentum could be leveraged to target the improvement of the digital delivery of current services, integrate more complex services, and effectively invest in the digitalization of essential services that are more used by citizens. **Highly demanded services by survey respondents included business registration, and services related to judiciary procedures.**

■ Updating and enhancing current regulations

Regarding the legal framework, Moldova has approved most of the fundamental regulations needed to sustain its digital transformation (digital identity, privacy, basic cybersecurity, open data, etc). However, further work needs to be done looking forward. Many of the regulations, such as data protection and cybersecurity, need an urgent update to adjust to new developments and align with new international trends, such as European Union's GDPR. **The Regulation Pillar is the lowest scored among all survey respondents, while the civil society group are particularly critical with the data protection and standards.**

Moldova is also lacking specific regulations on new digital technologies, such as Artificial Intelligence or blockchain. These technologies will be shaping the digital landscape of the future and regulators needs to foresee and organize their use in advance. The provision of a legal framework around them can also create opportunities for local companies developing related services. European Union has also developed some policy guidelines and frameworks on some of them than can be adapted to the country.

■ Enhancing the backbone of digital transformation

Moldova has very different scores among the foundations of digital transformation. **While Digital Identity is one of the highest scored components by all groups of stakeholders, Digital Payments are among the least well evaluated** by external data sources and at the aggregate level, except for the Government respondents. Digital payments are fundamental for the development of digital services and e-commerce. Hence, there is a need to enhance the regulatory framework for Digital payments, which could leverage recent EU directives, facilitate opportunities for fintech innovations, and increase trust among citizens and business on the security of these services. **Infrastructure is one of the best ranked pillars, but also the one with more diverging perspectives among actors.** While Government and external data give it a high score, end-users such as the private sector and civil society organisations score it significantly lower, which can be due to limited last-mile connectivity or quality of the services for some users. Further research on access and affordability could shed some more light and inform a comprehensive strategy.

■ Improving and increasing the IT talent pool for a sustainable digital transformation

The availability of IT professionals is one of the shared concerns across society, as it threatens the sustainability of IT programs, the capacity to service current and future IT service demands, and the resources to build a competitive digital economy. Moldova universities are graduating qualified IT professionals and the IT Park has eased the visa procedures to attract foreign talent for IT companies. However, there is still a limited pool of talent available to cover the increasing market demand, and they are not highly specialized. The country needs to invest more in facilitating opportunities to enlarge this professional base through lifelong learning opportunities, increasing research activities on technical areas, promoting STEM careers among students, and investing in the attraction of foreign IT professionals for all industries.

■ Building long term and visible leadership on digital transformation

The Moldovan Government has developed a set of strategies addressing specific digital transformation challenges, and focused on the Digital Moldova 2020 strategy objectives until recently. Moldova 2030 draft strategy will be setting the foundations of a National strategy aligned with the 2030 Agenda, but there is a need for an aligned specific digital transformation strategy to guide internal efforts and policies, and to provide a digital governance framework. **Respondents to the survey align in the perception that further coordination is needed and that the overall government future digital strategy and vision are not clear enough in the present. An integrated digital strategy would provide coherence to the government efforts on its digital transformation agenda, establish priorities and ensure coordination across Ministry and agencies.** This could ensure more efficient long-term planning in projects, help to cover some monitoring gaps and increase the trust and engagement of social actors. **The development of this strategy needs to be based on intensive stakeholder engagement, to make sure that needs and concerns from all actors are considered in it.** This participatory approach will also increase the buy-in of the strategy, while increasing the visibility of Governmental efforts on this domain.

KEY INSIGHTS PER PILLAR

Pillar I – Infrastructure

- Infrastructure is one of the highest scored pillars but with highest diversity of opinions among the different stakeholders. While Government and external data score very high, private sector actors and civil society score it more than one point below.
- The deployment of broadband line and last-mile connectivity, especially in peri-urban and rural areas is one of the key limitations identified in this pillar, as it reduces the already limited internal market for IT services. This could explain the different perception between stakeholders on the provision of key infrastructure.
- Moldova displays wide internet access and ownership of IT devices such as computers and mobile phones among its population. However, challenges can be identified in the degree of quality and affordability of this access for certain groups (poor, women, rural areas) that might limit the capacity of vulnerable groups to access some services and hamper the development of the digital economy.
- Despite growing efforts in the country to increase stakeholder cooperation for innovation and digital transformation, Moldovan companies interactions with other innovation actors are still opportunistic. There is also lack of IT professionals in the country to sustain current digital transformation efforts' sustainability.

Pillar II – Government Services

- This pillar is the one with the highest scores among respondents, but also where there are more divergent opinions between stakeholders. While Government officials and international data give high scores to this pillar, private sector and civil society organisations are less supportive, indicating a need to focus on digitalizing more essential services and those providing more added value to citizens. The coverage of digital services for procedures related to business registration and for the judiciary is still limited though, and most essential services have not yet been digitalized.
- The country has made several strategic efforts to give more visibility and structure digital transformation. However, stakeholders perceive a moderated prioritisation of this topic and a lack of a comprehensive and structural strategic approach that gives coherence at the institutional, financial and technical levels, and ensures program sustainability.
- The lack of capacity to implement and sustain digital projects is a general concern, including the limited availability of skilled IT professionals. The Government has made some efforts to provide funding, technical support and hiring professionals, but these are perceived as insufficient to successfully integrate some digital projects.

Pillar III – Regulations

- Regulations Pillar is the one with the lowest scores at the aggregated level, and across all stakeholder groups. There's a particularly low trust on data privacy regulations, specially among civil society organisations.
- The country has suitable legal frameworks in many of the fundamental areas supporting digital transformation, including the data privacy, digital identity and authentication, and open data principles and standards. However, there is a limited development of regulation on new digital technologies, which leaves a legal void that can be problematic once they are further developed and commercialized.
- E-commerce is not very popular among local businesses and consumers yet. Some existing barriers to its uptake are the lack of trust on local providers and regulations on the demand side, and administrative and regulatory barriers encountered by local businesses on the supply side. Further development of payment services would also contribute to the uptake of the sector.
- Moldovan Government has improved its approach to cybersecurity and made efforts to align with European legislation and best practices in its Cyber Security Program 2016-2020. However, further improvements can be made in several domains, from strategy development to improved threats analysis and prevention.

Pillar IV – Business

- Business Pillar is the least well classified in the scores issued in the external data repository. Financial incentives is one of the key components that are less positively scored by all stakeholders, while start-up environment is the better considered, despite a high abstention rate.
- Entrepreneurs can easily create a business in Moldova, and the country ranks very positively in the domain of ease for creating a business. This contrasts with the lack of credit and financing for the private sector and new ventures, which is limited in the country, and is discouraging the emergence of new start-ups and business models.
- Moldovan SMEs are not investing at the same level as similar economies in Research and Development activities for their products, and they have a limited digital technology adoption rates. The current support mechanisms provided by the Government on this direction are vastly considered weak or ineffective. This is hampering companies' innovation capacity and their competitiveness potential in international markets, while limiting the internal market for IT-related services.
- The IT Parks Law has been a success of the recent policy developments in the country. It has lightened the tax and administrative burdens for a wide number of IT and technology-based companies.

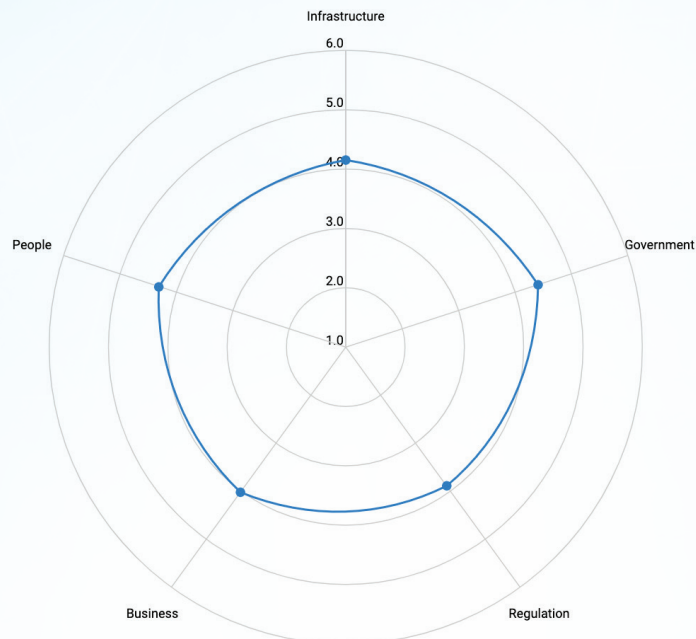
Pillar V – People

- People pillar is scored positively and very similarly among all stakeholders, including external data. Among its components though, it is remarkable the also unanimous low score for Digital Skills and Culture in the country, indicating little attention to social inclusion and limited entrepreneurial and digital-friendly mindsets.
- The general attitude towards digital transformation is positive, although there is not a particular social push for it the access to e-services have been increasing in the last years. In what regards attitudes towards entrepreneurial risk, Moldovan society doesn't seem to reward or incentivise entrepreneurial mindsets, although there is not a particular aversion to risk.
- There is a lack of awareness from the public on the importance of digital inclusion, and the generalised opinion is that public transformation initiatives and programs do not target particularly the inclusivity of most vulnerable groups. External data also indicates inequalities in the access to internet and devices.
- Moldova has a good basic education system, but there are few programs to attract more talent to STEM careers. The lack of specialised IT skills among the population is a concern among all respondents.

2. Moldova DRA - RESULTS

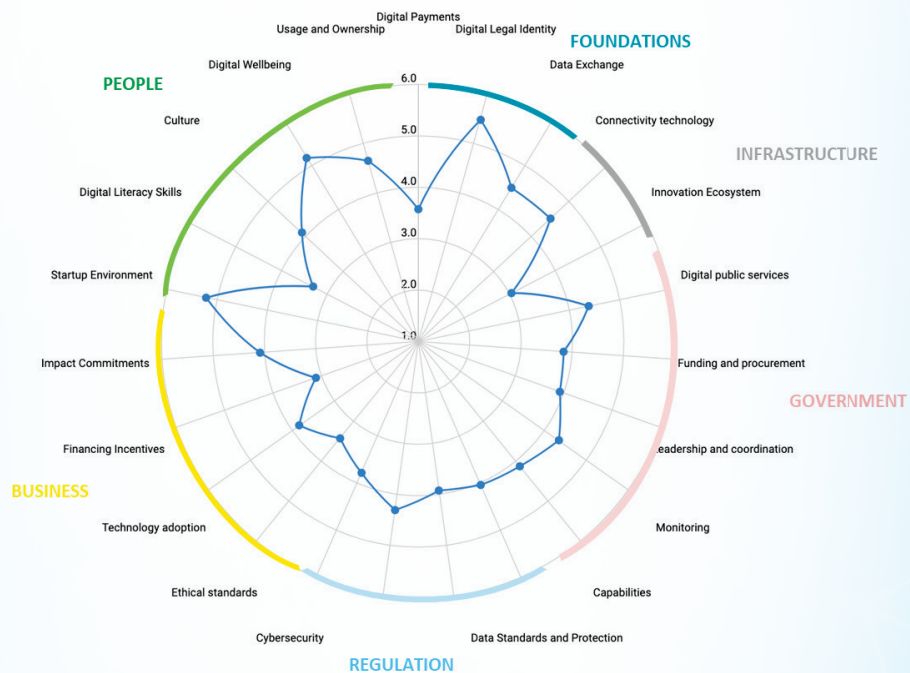
Aggregated scores

Scores per pillar



The stage of development of digital in the country is very balanced between the different pillars, all approaching or surpassing the threshold of Four. **Government services**, including digital strategy and leadership is the pillar receiving more positive evaluation from the respondents, recognising the efforts done in developing e-services of the last years.

Scores per components



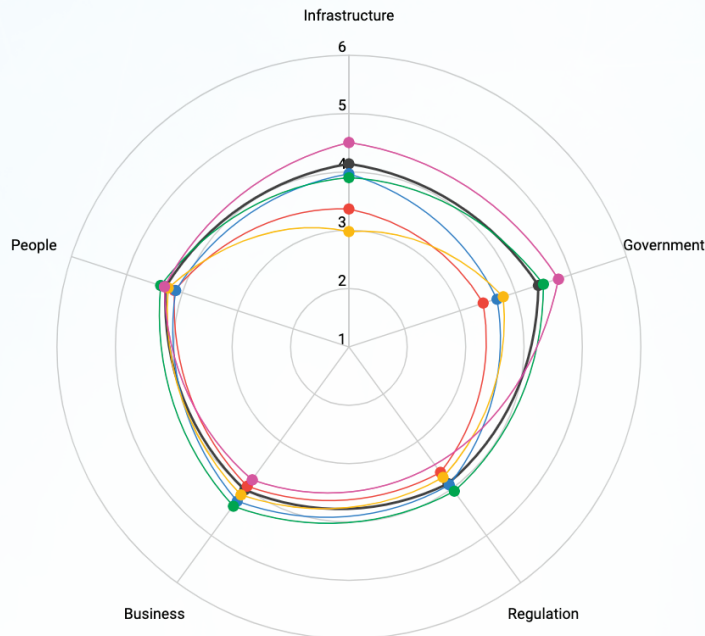
The best ranked components indicate a recognition of Governmental efforts deployed in the last years, particularly deploying **digital services** and establishing sound foundations for a functional **digital identity** structure. The ease of doing business in the country (Startup environment*) is also well ranked.

2. Moldova DRA - RESULTS

Aggregated scores by respondent type

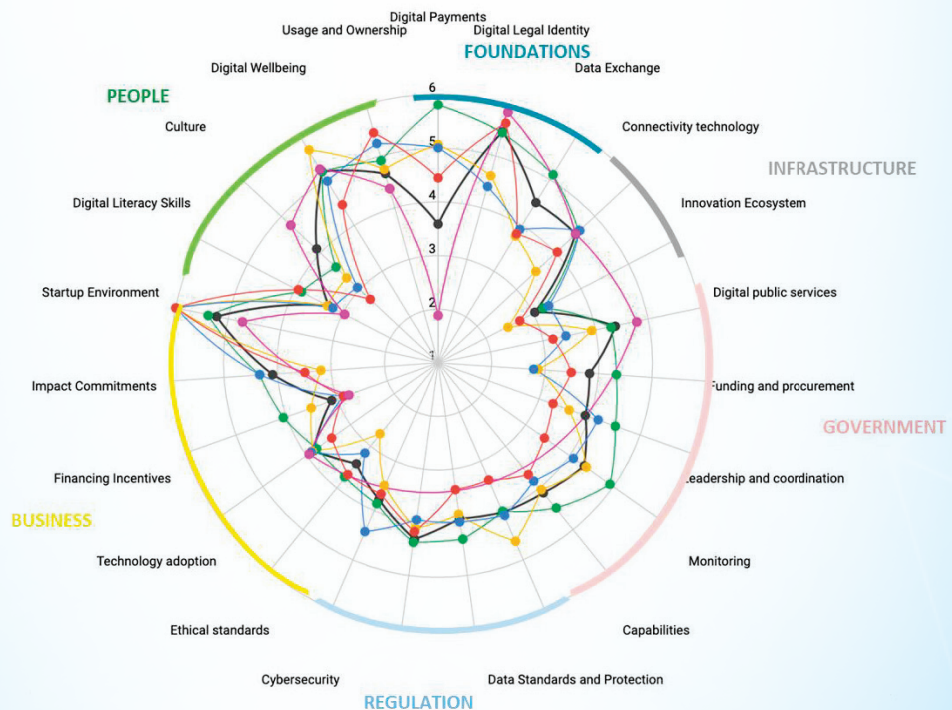
Scores per Pillar

- Overall Average
- Civil Society Response Average
- INGO Response Average
- Private Sector Response Average
- Government Response Average
- Data Average Infrastructure



The pillars where there are more discrepancies between stakeholders are Infrastructure and Government. While data from external sources and Government officials provide a very good scoring for both pillars, Private sector and Civil Society score it one point lower or more. This can be due to how these actors experience the services provided in these two pillars, as they experience the limitations of the current services and are more critical.

Scores per Components

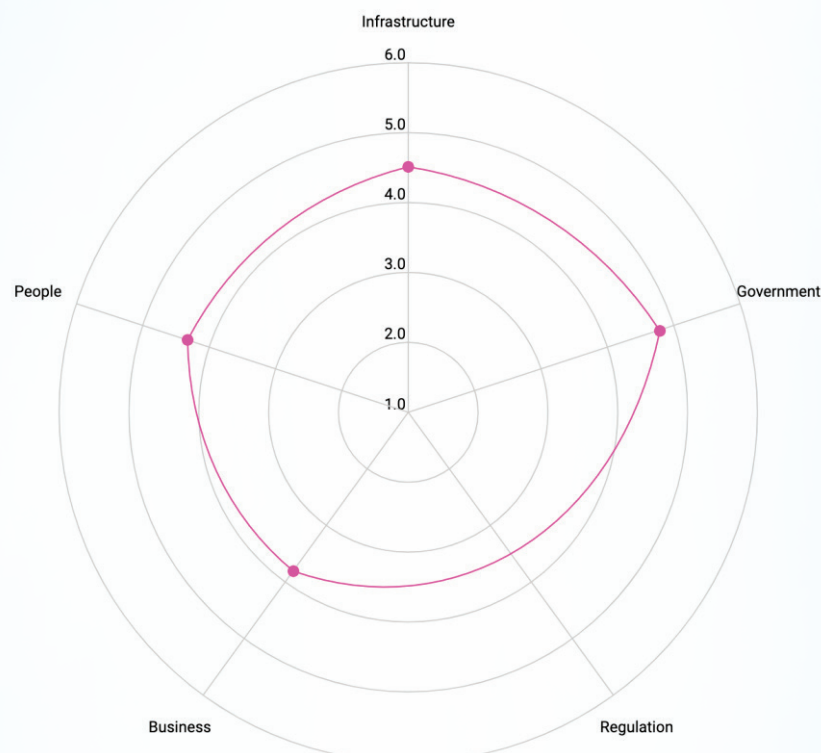


2. Moldova DRA - RESULTS

In general, the Government provides a higher score for each of the pillars, compared to other national stakeholders. In general there is a shared trend among the different stakeholders on the different components' scoring. The most important discrepancy is on the **Digital payments** component. While Government respondents give it a very high score, data from indexes and benchmarking do not rate it as positively. The **Start-up environment** receives a particularly high score by all actors, and international data aligns with a positive scoring, although a bit more moderated. Another important discrepancy is on the **Monitoring component**. While the Government scores it very positively (5), civil society organisations provide half the score (2,5), indicating that probably these actors don't feel the current system answering all their needs.

Inclusive Data Repository

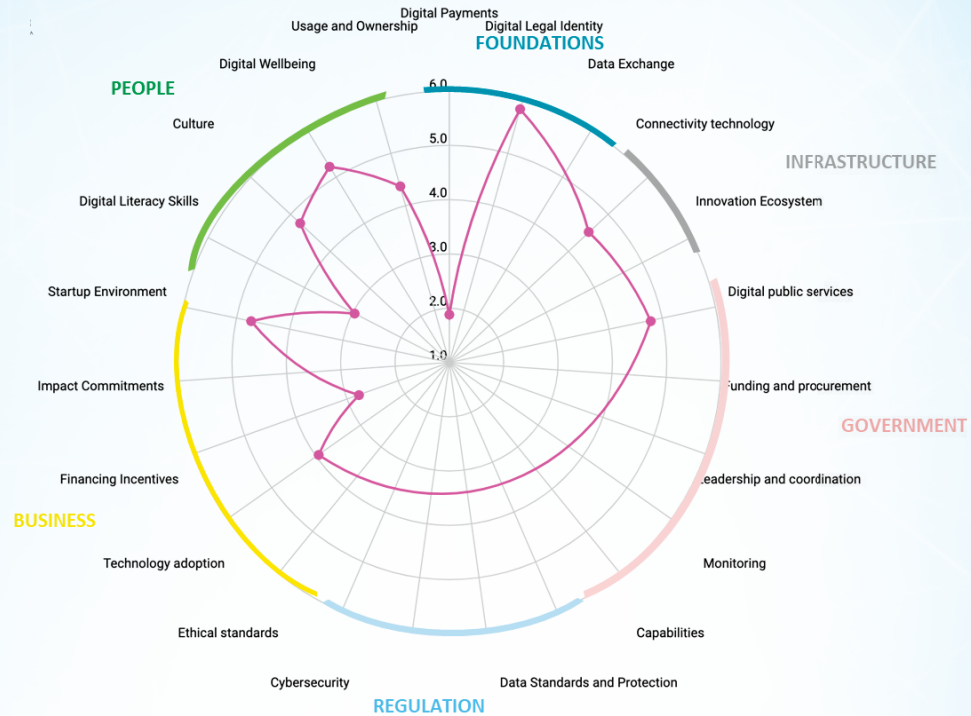
Scores per Pillar



International indexes provide particularly positive data for the Pillars Government and Infrastructure. These are areas in which Moldova has positioned itself thanks to the efforts made in the deployment of new e-services and improved digital transformation in the public institutions, and to its fast broadband connectivity. **The Business pillar is the one least well scored by external data,** indicating the need to improve support to companies to engage in digital transformation, including financing.

2. Moldova DRA - RESULTS

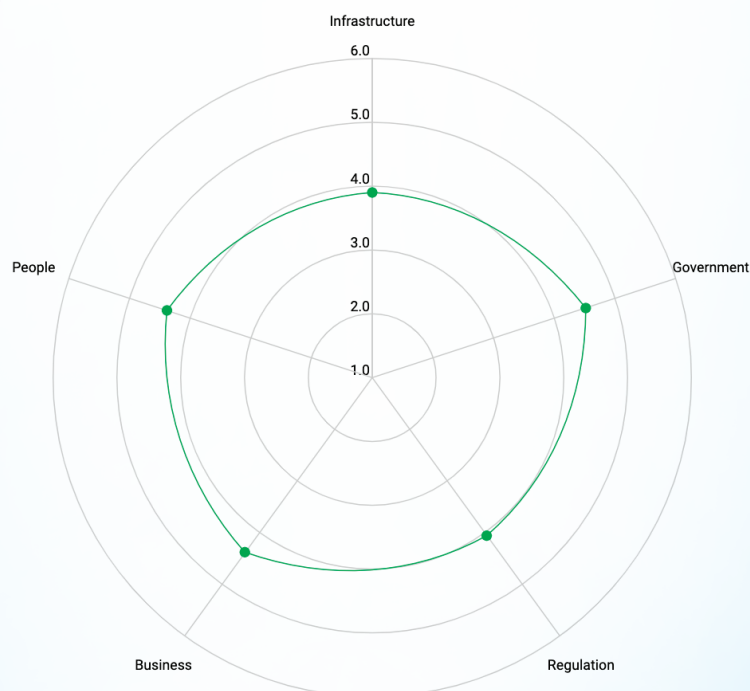
Scores per Components



Regarding the components, **international data scores very positively the Legal Identity Component**, recognising all the efforts and success of the current system. However, **the least positive scoring is on Digital Payments, another of the key foundations for digital transformation and to enhance private sector digitalisation. Digital Skills and Financing incentives are also among the components least ranked by the external data**, in alignment with the need to further invest in digital inclusion, IT talent, and support to start-ups and private sector digitalisation.

Government Sector

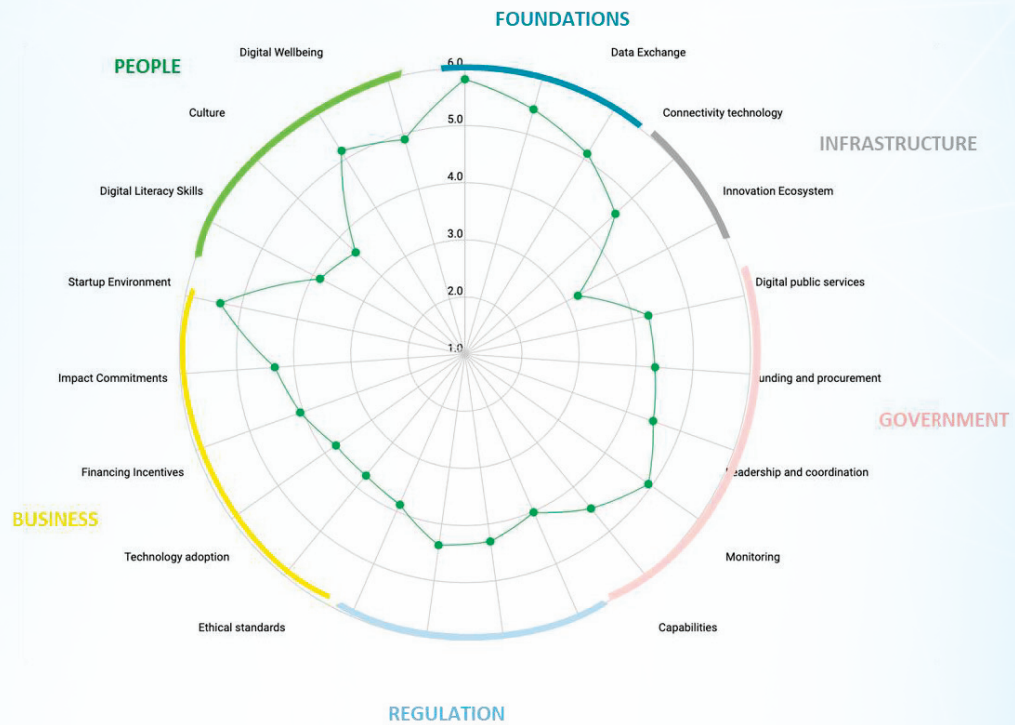
Scores per Pillar



2. Moldova DRA - RESULTS

The Government officials participating in the DRA survey scored all pillars very positively – around or higher than four. Scoring are particularly positive regarding the Government pillar, as well as People and Business ones. There is a slightly more critical perspective on regulations. Infrastructure is the pillar in which public officials are more critical, although the overall score is close to four.

Scores per Components

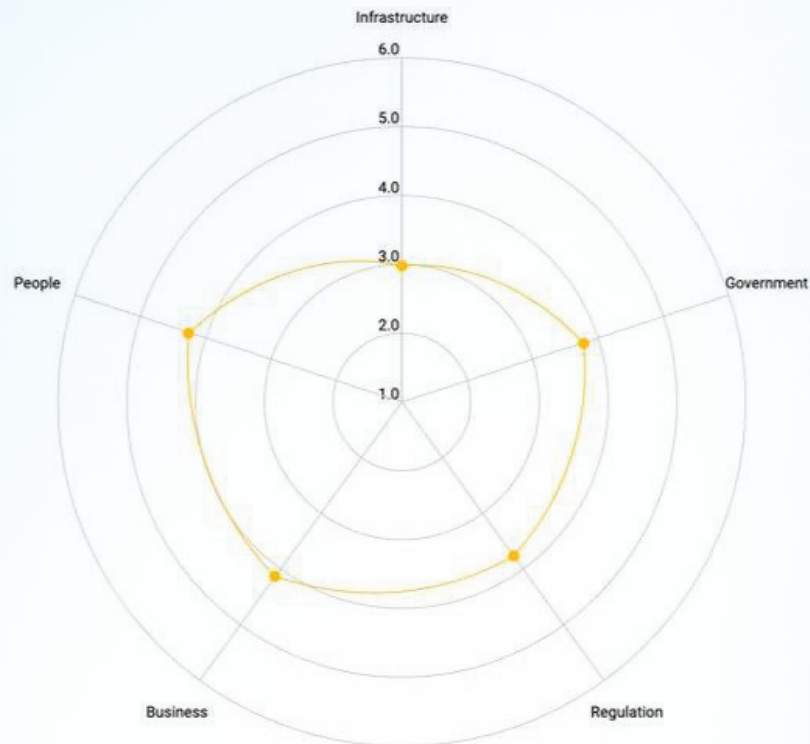


Digital payments and Startup Environment are the two components receiving better scores by Government officials. Innovation Ecosystem is remarkably the one that is perceived as one of the weakest components, which aligns with the generally moderate scores on all the Business Pillar components. Digital literacy skills and Culture are also two particular components on which the overall public perception is that more could be done to improve inclusion in public policies and promote an opener and more entrepreneurial mindset among the population.

2. Moldova DRA - RESULTS

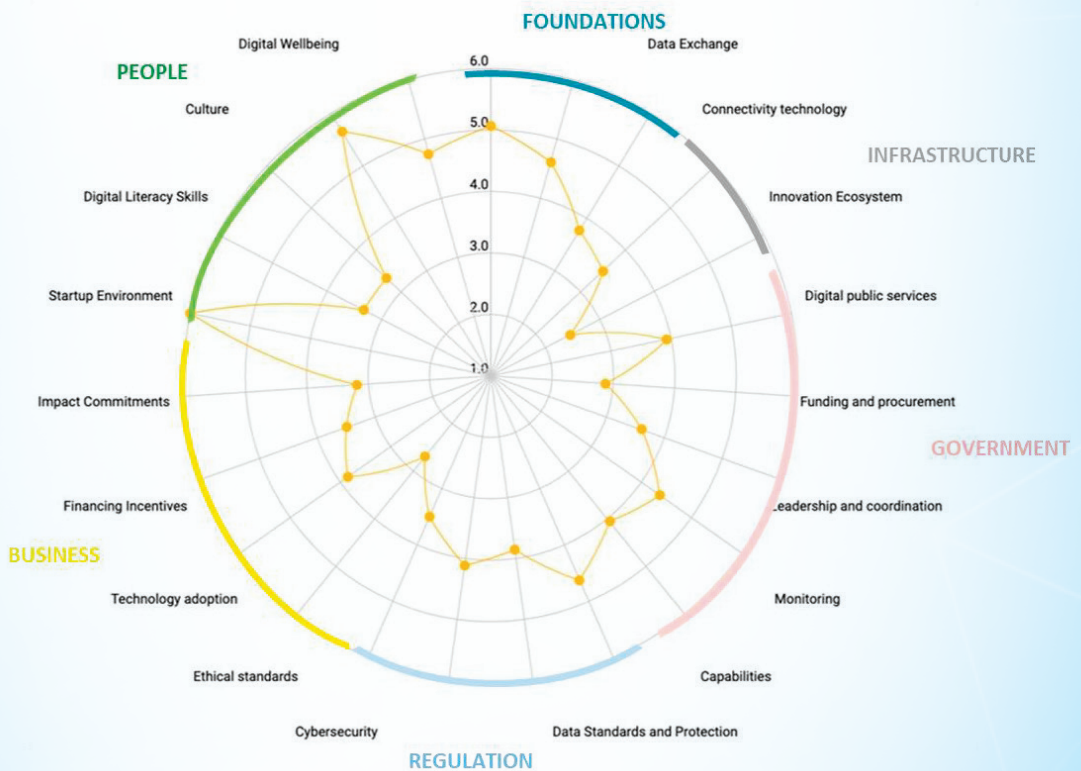
Private Sector

Scores per Pillar



Private sector respondents are more negative than the average in the **Infrastructure pillar**. Although both components of the pillar have low scores, the dynamism of the innovation ecosystem is evaluated more negative than the digital infrastructure.

Scores per Components

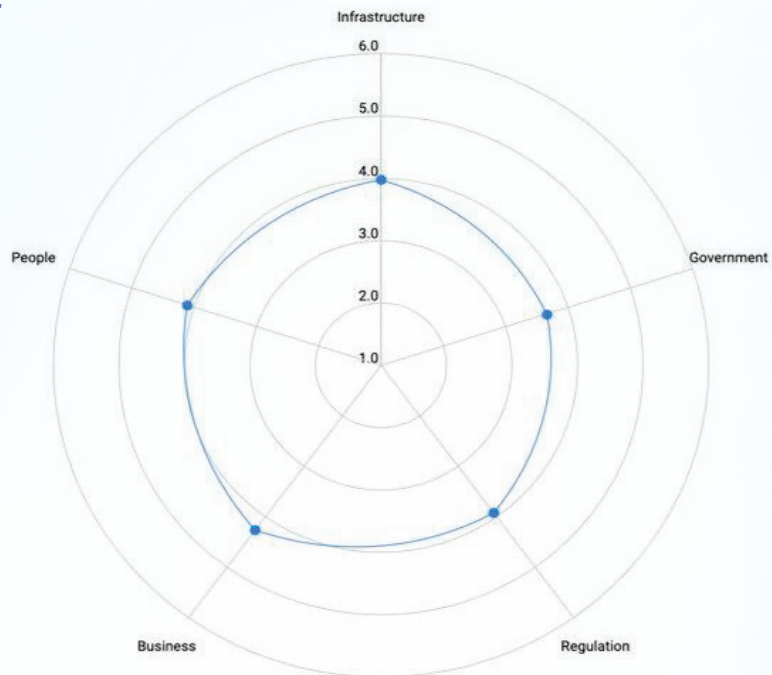


2. Moldova DRA - RESULTS

Funding is one of the components in which private sector respondents identify more challenges. Other particularly lower scores are in **Digital skills and Social perceptions or culture towards digital transformation**. The ease for doing business and opportunities (startup environment*) is particularly well ranked among these respondents.

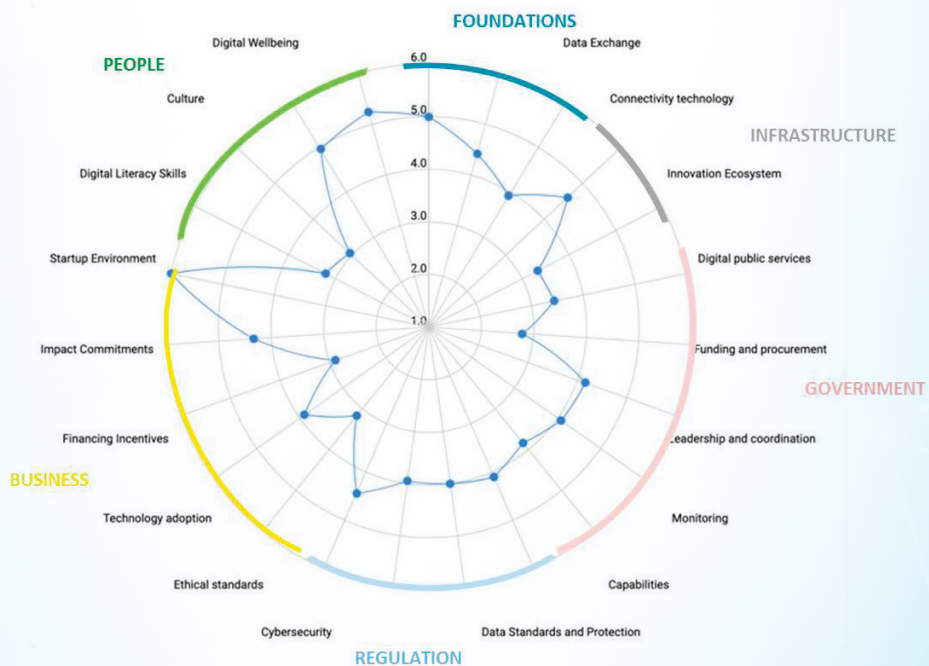
NGO and Development Actors

Scores per Pillar



NGO and international organisations answers are very aligned with the general average of scores, with all pillars approaching or surpassing Four. However, there is a slightly more critical opinion on the **Gouvernement pillar**, which is a bit lower than for the private sectors and the general average.

Scores per Components



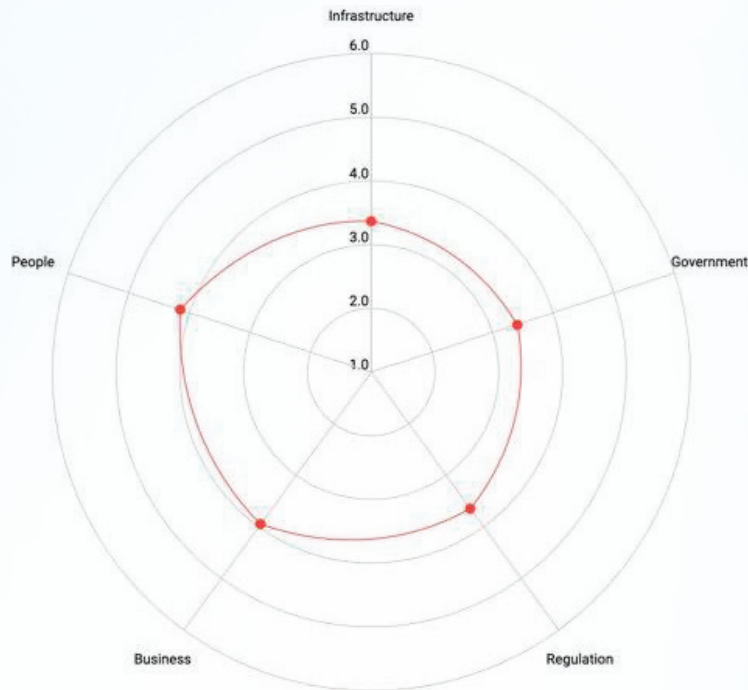
* the response rate for this component is not representative enough and needs to be understood carefully.

2. Moldova DRA - RESULTS

Digital literacy skills, culture and Funding are the least developed components for international development actors. There is however a recognition on the efforts done in improving the start-up environment* in the country. These actors evaluate less positively than private sector all the **components related to Government**, including e-service delivery.

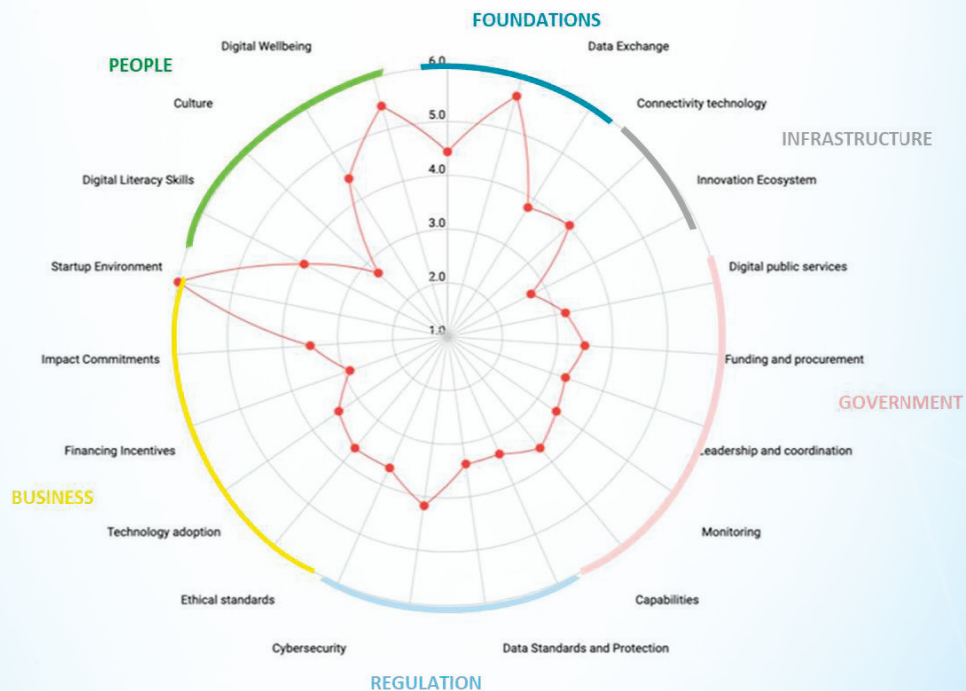
Civil Society

Scores per Pillar



Civil society organisations are the most critical group of actors, with particularly lower scoring for the Government pillar, regulations and infrastructure. The perception is more negative for all components related to the Pillars of Regulation and Government.

Scores per Components



2. Moldova DRA - RESULTS

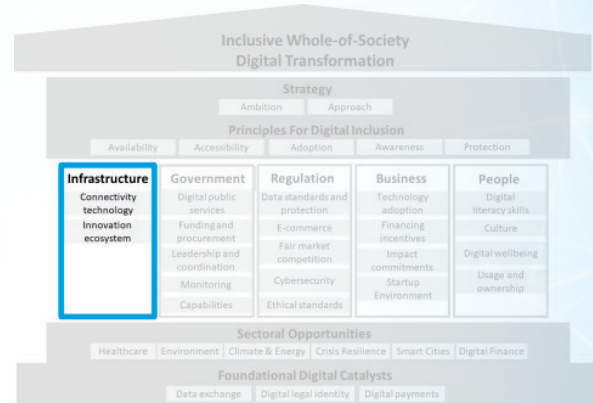
The quality of the **Innovation ecosystem, social perceptions and culture regarding digital transformation and financing incentives** are the worst rated components for this group of actors, while they also agree with the rest on the particularly positive **start-up environment***.

2.3. Presentation of Insights per Pillar

INFRASTRUCTURE

This pillar analyses to which extent the structural elements needed for the deployment of digital transformation and flourishing of a digital economy are present.

More concretely, the coverage and quality of digital infrastructure is analysed, including elements such as the availability, affordability and spread of broadband services and mobile services. For digital innovation to emerge and flourish, the existence of a dynamic environment promoting collaboration between the actors of the quadruple helix (universities, private sector, society and public sector) and a suitable business environment is also required.



DRA Country Index: 4.1



Key insights:

- The deployment of broadband line and last-mile connectivity, especially in peri-urban and rural areas is one of the key identified in this this pillar, as it reduces the already limited internal market for IT services. Transportation and energy infrastructure are also insufficiently deployed in some regions, which has also been reported to affect the potential of development of the digital sector.
- Moldova displays wide internet access and ownership of IT devices such as computers and mobile phones among its population. However, challenges can be identified in the degree of quality and affordability of this access that might limit the capacity of vulnerable groups to access some services and hamper the development of the digital economy.
- Despite growing efforts in the country to increase stakeholder cooperation for innovation and digital transformation, Moldovan companies interactions with other innovation actors are still opportunistic.

* the response rate for this component is not representative enough and needs to be understood carefully.

- There is a lack of IT professionals in the country to sustain current digital transformation efforts, ensure their sustainability in the future and enhance innovation in the sector.

DRA Grade: 4.5

1.1. Connectivity and Technology

Availability, affordability and quality of broadband internet access, mobile internet, mobile services and devices, electricity, etc.

Key insights:

- Moldova has good quality telecom infrastructure providing fast internet and good mobile network coverage. However, according to the UN DESA e- Government Index (0.56 against 7.4), the existing telecommunications infrastructure deployment in the country is below the Eastern Europe sub-region average. This can be due to the **limited development of telecom infrastructures out of the capital and limitations in last-mile delivery**. According to the Global Innovation Index (GII), some of the key weaknesses of the country on this pillar are the existence and state of general infrastructure, the logistics performance and the GDP Unit of energy use, indicating some challenges in the energy sector.
- In contrast, there is a **considerable access to internet and IT devices**. More than 70% of households have a computer and access to internet. However, **attention needs to be put in the quality and affordability of this internet access**. One of the challenges for accessing internet can be the cost of computers and devices, which varies greatly with socio-economic indicators. About 71.5% of the richest households have computers, compared to 35.7% of the poorest ones (Ricoara, 2019). Similarly, only 16,3% of inhabitants have a broadband subscription (ITU ICT Survey 2017), and only half of the population has access to mobile subscriptions. Among the survey respondents, the overall majority has access to broadband internet at home and at the office (79 and 77% respectively). They all have internet in their phone and more than 60% consider that they have a lot of data that doesn't run out, which indicates also enough capacity and speed to access to more digital services and products via mobile devices.
- Among survey respondents, the challenges that are more concerning in terms of digital infrastructures are the price of mobile data, although Moldova has one of the lowest average cost of 1GB of mobile data, according to the Cable UK international analysis. The lack of broadband networks and the difficulties to ensure last-mile connectivity is also generally perceived as an important shortcoming that impedes rural populations to benefit from digital. This phenomena can reduce internal demand for digital services, but also affect importantly the accessibility of vulnerable communities, which often rely on mobile data connections.
- In terms of increasing access to internet, there have also been some programs oriented to facilitate access for citizens and vulnerable groups via the modernization of public libraries through the program "Novateca", and there is an extensive network of wi-fi open spots to facilitate accessibility.
- Moldova developed the Interoperability Governmental Platform Mconnect, an integrated, Open Source WSO2 Middleware system that provides a platform to exchange data between authorities. However, Interoperability problems and insufficient standards are

also some of the key difficulties that survey respondents identify as major challenges to build sustainable digital infrastructure. These hamper the capacity to exchange data and link services between public administrations and can become problematic for the scaling up of services. It is possible that specific sectors of government have not been trained on how to integrate systems or suffer some challenges when collaborating with other departments and hence perceive that there is a lack of infrastructure. The Government needs to identify which are existing challenges and assess how to further exploit Mconnect to provide maximum benefits to officials and citizens.

- Finally, **market regulations generating distrust among private stakeholders are also signaled as existing limitations** in the system that are hampering the deployment of adequate infrastructure, together with **insufficient funding and energy price and reliability**.

DRA Grade: 3

1.2 Innovation ecosystem

Business interest groups (clusters), local universities and other research institutions, Local innovation partnerships, Local digital workforce, tech hubs, etc.

Key insights:

- The **dynamism of Moldova innovation ecosystem is one of the key improvement areas** highlighted in several reports, including the GII, where one of the weakest indicators is the capacity to establish innovation linkages and generate collaborations between the actors of the quadruple helix (university, industry, public sector and citizens).
- Although IT professionals in Moldova have good qualifications, **the size of the talent pool is very limited**. There are several universities and colleges providing ICT degrees, but they are a small proportion of the total. The lack of capacity to train new professionals and upskill adults with IT competencies can hamper the potential of development of the digital economy. In 2019, only 14% of researchers were dedicated to engineering and technological disciplines. Almost half of the respondents to the survey believe that in general universities were successful in graduating IT specialists, but that their capacity was limited compared to the needs of the country, and a quarter of them considered that their capacity to train digital specialists is currently quite limited. At the same time, the general perception is that **there are some incentives and facilities to attract foreign workers with IT skills, but that these are insufficient**. Almost a quarter of respondents to the survey consider that there are no incentives or sufficient support for this matter, and only 7% consider that the incentives offered by the government are enough.
- Several innovation hubs and support structures promoted by a diversity of agents have emerged during the last years, such as the IT Center of Excellence Tekwill and regional centres, including the upcoming Balti and Cahul hubs, the Fablab in Chisinau, also integrated within the resources that the Novateca Network provides. Several other private and mix platforms have emerged in the last years that provide support and facilitate contacts among innovation actors (such as MILAB Social Innovation Lab, Artcor, ZipHouse MediaCore). However, there seems to be no concrete strategy on how to leverage these resources (public or private) in an integrated manner. Respondents to the survey identified the above-mentioned entities, together with the Technical University of Moldova as key actors implementing relevant initiatives for digital transformation.

- Among survey respondents, the **Agency for Electronic Governance** is the key institutional identified as an innovation orchestration, followed by the **Serviciul Tehnologie Informației și Securitate Cibernetică (STISC)**. These two agencies seem to have succeeded in positioning themselves as the visible face of innovation policies of the Government, besides the key digital transformation actors in the country. There is also a repeated mention to the IT Digital Park, proof of the success of the initiative let by the Government to promote the IT sector in the country. Other relevant entities in this domain, also identified by respondents but less frequently are: Ministry of Economy and Infrastructure, Information Technology Service and Cyber Security, Finance Information Technologies Centre.
- In what regards private actors that enhance the innovation ecosystem, the two most cited entities are **Tekwill and ATIC**. Survey respondents also consider that **big IT corporations are active members of this ecosystem**, but any specific ones are mentioned, indicating a clear expectation for them to be a key actor, but also a lack of concrete examples, which could be due to a limited collaboration with them.

TRANSFORMATION OPPORTUNITIES

- ▶ The quality of telecoms infrastructure needs to be accompanied of better last-mile delivery, and align with also other infrastructure development plans such as road and energy. It is important to consider holistic development plans for more isolated and less-serviced areas in order to increase their economic opportunities and the potential that digital transformation can mean to them. Lack of development of rural areas can also bring in few years to depopulation and challenges on how to conserve rural environments. Many survey respondents indicated that market regulations generated distrust among private stakeholders, and they constituted limitations to infrastructure deployment. **One first step could involve analysing of current regulations on the Telecom networks and assess in partnership with key operators what incentives are needed. Exploring alternative solutions to provide internet to remote areas is also encouraged.**
- ▶ **Public programs focusing on making internet available to all groups should to be further considered.** These can be aligned with other initiatives focusing on providing digital skills. The program Novateca could be reinforced and expanded as an existing initiative that has generated results. Providing more wi-fi hotspots in public spaces, buildings can be aligned with smart city initiatives and leverage upcoming infrastructure deployments in this area. Access to devices, specially for most vulnerable groups is also important. Schools providing computers and data bundles to most vulnerable students should also be considered if there are any digital skills and e-learning programs.
- ▶ Digital infrastructure is also fundamental to ensure the smooth deployment e-services by the Government. In this and other pillars some of the **respondents indicate that Interoperability and lack of standards are important challenges in their digital transformation efforts, despite the currently operating Mconnect platform. An audit of current systems and the existing architectures used by different services, including the current the limitations experienced by users** could be a first step in order to map the degree of mismatches and advance to a more integrated system.

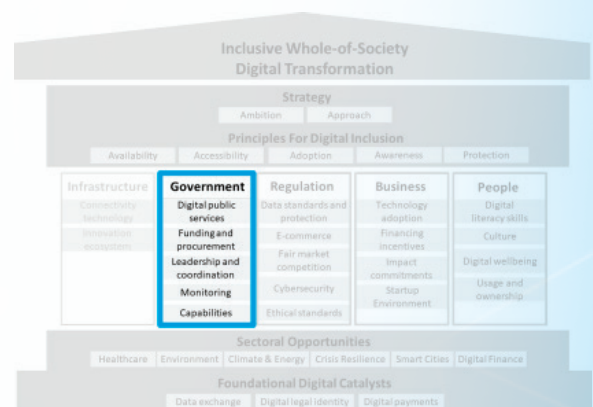
2. Moldova DRA - RESULTS

- ▶ Moldova innovation ecosystem, understood as the relations between actors from the innovation quadruple helix, has a huge potential but is underdeveloped and this is affecting the emergence and growth of its digital economy. **Science and Technology policies need to emphasize the need of collaboration between stakeholders and provide the right incentives and support to ensure knowledge transfer and protection.** Increased support for participation in international R&D programs such as European Union’s Horizon Europe can also be levers to enhance the establishment or strengthening of current relations and networks. **Science and Technology policies can support the integration of STEM knowledge in other popular and competitive domains for the Moldovan academia (such as Natural Sciences), by promoting interdisciplinary collaboration and outputs-based projects, as a means of leveraging existing strengths.**
- ▶ There is a **general concern about the availability of IT professionals in the country to implement current digital transformation projects and ensure their future sustainability.** The limited pool of highly qualified professionals and researchers also limits the capacity to innovate and provide companies with skilled talent to develop new and competitive digital services and products. **This challenge can be addressed from two different perspectives: internal education policies and attraction of foreign talent.** For the first, a first step includes assessing the skills gap from several industry sectors, with special focus on the lacking IT skills, and analyze how the current education offerings of High Education Institutions (HIE) and Technical and Vocational Education Training (TVET) centers can cope with this demand. This analysis should inform future policy developments shaping education strategies. Incentives to companies to upskill workers and provide in-company IT training can also increase the pool of current professionals. Despite the facilities provided for companies under the IT Park umbrella to obtain visas for skilled IT professionals, it seems that this has not reassured private sector representatives. An evaluation of this measure could shed some more light on the limitations of the model and indicate what professionals need to be attracted and the remaining barriers to engage them.

GOVERNMENT

The Government needs to have the capacity to execute the country’s digital transformation agenda, including the area of internal digital transformation and deployment of e-services.

In this pillar, key elements underpinning this capacity are analyses, such as the degree of development of e-services provided by the Government in key areas such as tax payment or e-participation, the detail of existing digital transformation strategies and their degree of implementation and budgetary allocation, the existing practices for measuring impact and the internal capabilities of public institutions to deploy digital services, including the availability of trained staff and internal methodologies.



2. Moldova DRA - RESULTS

DRA Country Index: 4.4



Key insights:

- It can be appreciated the effort done by Government in the deployment of e-services, as the administration offers a wide range of relevant e-services in areas commonly demanded by citizens, such as identity-related documents, property and taxes. The coverage of digital services for procedures related to business registration and for the judiciary is still limited though.
- The country has made several strategic efforts to give more visibility and structure digital transformation. However, stakeholders perceive a moderated prioritisation of this topic and a lack of a comprehensive and structural strategic approach that gives coherence at the institutional, financial and technical levels and ensures program sustainability.
- The lack of capacity to implement and sustain digital projects is a general concern, including the limited availability of skilled IT professionals. The Government has made some efforts to provide funding, technical support and hiring professionals, but these are perceived as insufficient to successfully integrate some digital projects.

2.1. Digital public services

Strategy and programmes for digitalisation of most important public services, standards for service design, data governance framework, open data, etc.

Key insights:

- The Moldovan Government has decisively invested in the digital transformation of its institutions and in providing more services to citizens. The results of these efforts position the country now at the same level as other Eastern European countries in the Online Service Index of UN-DESA.
- There are several relevant **on-line services available for citizens on key areas related to Governance and Transparent Procurement**, facilitating services such as a public procurement platform, a registry of regulations, e-petition portals for Government and Parliament, anti-corruption online center and e-integrity portal. At the same time, **citizens also have available several e-services for common procedures** such as requests of e-visas and apostilles, civil registry documents, and a unified portal for requesting government permits. However, **many essential services to citizens are yet to be digitalized, and further efforts would need to be done in this direction**. In 2016, according to Government data, the most used e-services were tax declaration, followed by e-invoicing and the digital application for obtaining a certificate of criminal record. The respondents of the survey also highlight that the most useful and accessed government e-services are the issue of birth certificates and other documents related to identity, including civil status and criminal records certificate; and property registration and cadastral plans. However, it is also **flagged that even if many services are accessible on-line, they still require physical presence to obtain a valid copy of many documents**.

2. Moldova DRA - RESULTS

- The **most demanded services that are not on-line currently** and should be, according to survey respondents, are **business registration**, which is identified by a big number of them as one of the key services to digitalize. This service could be the first of a set of business-related e-services, including those related to ease exports and e-commerce activities. It is also particularly highlighted the interest in being able to follow and interact with **the Judiciary via e-services**. Other services that respondents suggest to digitalize in priority include : car registration and health appointments.
- The Government has also provided key service such as a **digital Signature and Authentication services, and a digital payment service to be used in transactions with public institutions**. In fact, many survey respondents were familiar with the digital payment system and its National outreach (more in following sections).
- There are several regulations and internal procedures approved that effectively contribute to a coherent digital transformation, such as indications on the use of public websites and social media channels, publication of guiding principles for using these digital assets and provision of some trainings to public servants.
- There is **only one regulation reported on Data interoperability and exchange from 2018**, which was also complemented with efforts to do a multi-stakeholder partnership including different members of the government. This is a good starting point for further development of e-services and internal transformation.
- In general, there is **not much awareness regarding the use of open source technologies among the survey respondents and seems, on government procurement**. Many of them didn't reply to questions related to this topic and, among those who did, the perception is that most projects within the government do not use open source and normally use paid platforms, which generate additional costs and can cause vendor lock-in.
- **Egov.md and gov.md are the two most well-considered websites, followed by STISC website (STISC.gov.md) and Servicii.gov.md**. The elements that respondents value the most in the different public websites that they consider the best are that they provide **access to the concrete information and services that are useful for them, followed by the user-friendliness of the service and how well information is structured**.
- In contrast, Procuratura.md seems to be one of the websites that is less attractive and useful to respondents, although opinions are less majoritarian than the ones for the best website. In general, the main difficulties with the different government websites that respondents consider the worst are related to the lack of usable information and how difficult is to find the necessary services in them. The use of old technology to design the website or outdated formats is highlighted as a common shortcoming for several of them.
- Most of the survey respondents share the opinion that many **digital projects fail due to an insufficient planning for the long term** and consider that many projects are not sustainable beyond their initial phase because **there were no financial provisions to sustain the systems beyond the project implementation phase when donors' funding would be over**. Lack of trained professionals to maintain and upgrade the systems is also one of the most cited causes of program failure.
- Many respondents also have the perception that there is a **lack of coordination between governmental agencies and that there is not a concrete vision and clear priorities**. This reverts in technical problems in system architectures, interoperability and service inte-

gration. Other common reasons for project failure identified by the respondents are the **lack of customer orientation**, which results in low adoption rates and usage; **insufficient monitoring and evaluation mechanisms** for ongoing projects; and the **internal change resistance and bureaucratic barriers to deploy new services**.

2.2 Funding and Procurement

System-based approach to ICT procurement and funding strategy/budget for digital transformation

Key insights:

- In general terms, **the perception of respondents is that digital transformation is not a priority in the country, compared to other needs, but it has a relative importance. Only 21% of respondents believe that digital ranks high in the list of priorities**, and a quarter think that the Government is being innovative and bold in its strategy, while the majority considers that the push for innovation is moderate. On the opposite, very few participants in the survey considered that digital transformation is not important in the development strategies of the country.
- In general, respondents feel that procurement standards can have a limited role in enabling digital transformation projects, or that they can generate negative effects. It is possible that this reactions are also aligned with the general perception that **bureaucracy is a barrier for digital transformation**.
- Although many respondents (35%) believe that in some cases there is a suitable allocation of funds that allows to sustain projects, only 10% consider that this happens often. **These perceptions align with the common sensation expressed by respondents that there is a lack of long-term planning to ensure project sustainability in the future.**

2.3 Leadership and Coordination

High level political mandate, strategic framework, clear responsibilities. ...

Key insights:

- Moldova has a dedicated e-Governance agency with relevant competencies and a clear mandate across multiple sectors, and a dedicated executive and regulatory body – the Ministry of Economy and Infrastructure. According to GII, the Institutional governance of innovation is the one in which the country has better scoring, showcasing a good perception of citizens on the capacity of the government to formulate relevant policies in the domain. Key institutional stakeholders have their leadership on the innovation and digital domains well recognized among the public. Most respondents to the survey have mainly identified STISC and the Electronic Governance Agency as key actors coordinating digital transformation policies.
- There are several strategic tools that guide the activities of the country, including the preparations of the Moldova 2030 National Development Strategy, anchored on SDGs, concrete strategic frameworks focusing on IT digital transformation and a National Strategy for Public Administration Reform and Open administration. However, according to UN-DESA survey data, several of the strategic and regulatory frameworks focusing on digital transformation were approved between 2011 and 2013, and might need a review to adapt to current trends. **Many of the respondents have identified the Digital Moldova 2020 an overarching vision for the Government on Digital Transformation. The draft Moldova 2030 Strategy is not yet very well-known by the respondents.** In

many cases, it is understood that each Ministry has its own digital strategy. The website of the Stat Chancellery is repeatedly shared as a reference website to find information on these regards.

- At the policy level, **there is the perception that the lack of common vision and leadership in some projects and at the strategic level are also an obstacle for better implementation.** There is not a holistic and overarching digital transformation agenda with a vision and clear roadmap to provide certainty and guidance to the different efforts to ensure coherence and long-term coordination. **Corruption and bureaucracy are also perceived among respondents as an important obstacle to deploy digital solutions.**
- Among respondents to the survey, there is the generalized perception that there is some support to digital transformation across the government and that digital transformation is politically relevant: **60% believe that senior levels of the government give support to digital transformation efforts, but only 22% consider that there is strong support and dedicated staff for implementation.** However, the impression is that at the political level there is a much stronger commitment to the digital agenda, as 34% consider that political leaders do support digital transformation.

2.4 Monitoring

Monitoring and evaluation frameworks, satisfaction measurement, quality of existing KPIs.

Key insights:

- The Moldova 2030 strategy is anchored in the SDGs and aims at providing results on the 10 dimensions that are used to measure the quality of life at the EU level. Although no concrete implementation plan and monitoring framework is yet available, these initial frameworks should help to better define KPIs and measure impact of the overall strategy.
- The Government **has instituted the good practice of collecting statistics about its services and publishing them online.** There is concrete data available published on the use of several e-services such as e-Signature, e-Apostille, e-Invoices, although normally is processed data that doesn't allow independent analysis. There are published reports on the Government-led citizen satisfaction surveys. Some Ministries also conduct their own surveys and several of them are published. These surveys include key data for monitoring service performance and understanding patterns of use of on-line services.
- The **general perception among survey respondents is that digital efforts were increasing the efficiency in the government,** while only 5% believes that digital transformation is not generating relevant impacts. Likewise, most respondents (59%) to the survey did consider that there are ways in the current system to improve service delivery from the user feedback received, although very few stated to be using user feedback in their digital projects with the objective of improving them.

2.5 Capabilities

Tech talent, technology adoption, ways of working

Key insights:

- There is a concern among many respondents about the **limited capacity of the administration to deploy and sustain some digital transformation projects due to the limitations of existing infrastructure and equipment, and because of the technical complexity**

of some of these projects. The lack of proper funding is also considered relevant, especially for those projects where there is the need of an important initial investment. The lack of adequate skills to deploy, sustain and use the new systems is also a recurrent concern among respondents. Indeed, **there is a perception that internal resources can't keep up with all current innovations in terms of capacity and of upskilling.** The lack of skills is not only highlighted for the IT profiles, but also for other public workers, among which seems to be an important change resistance and conservative thinking that hampers digital transformation efforts.

- The overall perception among survey respondents is that teams do not have all the digital skills that they need to implement programs. **Lack of skills to ensure the sustainability of projects beyond their deployment, and insufficient capacity building are highlighted as key project failures and challenges in digital transformation projects in the public administration.** Almost 60% of respondents consider that teams have only partial skills to implement digital initiatives, against only 13% that considers that they have all necessary knowledge. Moreover, although there is the feeling that new IT staff is being recruited to fill in these skills gaps and contribute to projects, almost half of respondents consider that this is only in a limited amount. In parallel, although respondents indicate that there is some technical support for the implementation and evaluation of digital projects, there is a very extended perception it is not enough, and that it is mostly provided by external actors and not in-house. No concrete plans are in motion to upskill public workers with ICT and digital competences to enhance their performance and capacity to engage with new technologies.
- The perception on digital teams is that they are highly specialised teams that can be leaders on very specific projects, but they are not perceived as an innovative force within the government.

TRANSFORMATION OPPORTUNITIES

- ▶ The deployment of e-services has had a positive impact among citizens and the majority of evaluations are positive on the benefits that they bring. **The Government should continue to widen the range of available digital services reducing the need for physical interaction as much as needed and integrating additional services.** Respondents of the survey particularly highlight the desirability of **e-services for businesses, mostly business registration**, which can then open the way to a the development of more complete set of business services.
- ▶ The widening of e-services needs to be accompanied of the improvement of existing ones, particularly those that are scattered across different platforms and are using an obsolete technology, which makes them less user-friendly.
- ▶ The **digitalisation of services related to the Judiciary is also one of the most desirable e-services by survey respondents.** In future digital transformation projects and prioritisation of sectors, the Judiciary system should be also considered. Most common actions, such as checking status of a procedure, or obtaining documentation, could be some of the initial e-services to provide in this area.
- ▶ Although there is a clear identification of the e-Government Agency as leading stakeholder in the domain of innovation and digital transformation, **there is a gen-**

2. Moldova DRA - RESULTS

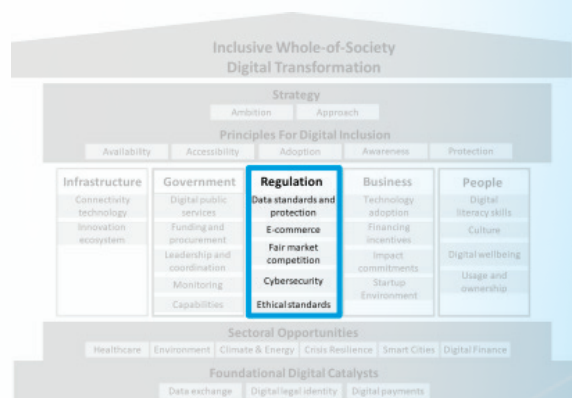
eral perspective of lack of leadership on the digital transformation domain, and limited identification of relevant strategies and guiding frameworks. While Moldova 2020 is recognised by many stakeholders, the current draft of Moldova 2030 strategy is less visible as general strategic framework and doesn't provide enough guidance in terms of digital transformation. The Government should **develop an overarching digital transformation strategy and make sure to actively engage stakeholders from all sectors** to participate in its definition, both to get valuable inputs, and to contribute to the visibility of this strategy. In parallel, it is needed a clear framework to guide digital transformation in different agencies, especially to address technical challenges such as interoperability and general services.

- For many respondents, there is a **need to improve project planning, and particularly invest in the provisions for the long term**, the general feedback is that in some cases, digital projects are not sustainable on time due to a lack of proper planning in terms of resources (financial, human, institutional). The monitoring and evaluation framework of all projects would need to further stress impact measurements after the initial implementation, and include measurement and provisions to ensure proper maintenance and upgrade activities.
- Despite the some of the efforts to upskill government officials, the provision of technical support and recent IT hires, the general perception is that these measures are not sufficient to face all the challenges and properly sustain projects beyond their deployment. **Internal upskilling programs to increase overall IT skills of public workers to adapt to new processes, incentivizing internal training of IT professionals and ensuring long term human resources planning in projects** are some of the measures that the Government can consider.

REGULATIONS

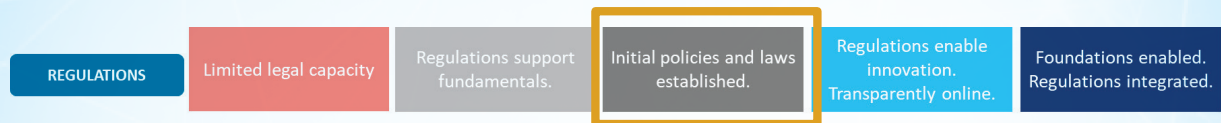
To ensure a fair, secure and. efficient digital transformation and development of the digital economy, specific regulations needs to be put in place by public bodies to organise and ensure the ethical deployment of new services and products.

In this Pillar, the DRA analyses the existence of regulations, official guidelines and standards on key sectors of fundamental importance for the development of new services such as regulations related to e-commerce or IP protection. The extent of legal coverage to basic elements of digitalisation such as data collection and sharing, digital identity and signatures and cyber-crime related laws is also assessed.



2. Moldova DRA - RESULTS

DRA Country Index: 3.9



Key insights:

- The country has suitable legal frameworks in many of the fundamental areas supporting digital transformation, including the data privacy, digital identity and authentication, and open data principles and standards. The perception on the strength and efficacy of these regulations varies greatly between topics. The county is nevertheless lacking development of regulation on new digital technologies, which leaves an legal void that can be problematic once they are further developed and commercialized.
- E-commerce is not very popular among local businesses and consumers yet. Some existing barriers to its uptake are the lack of trust on local providers and regulations on the demand side, and administrative and regulatory barriers encountered by local businesses on the supply side.
- Moldovan Government has improved its approach to cybersecurity and made efforts to align with European legislation and best practices in its Cyber Security Program 2016-2020. However, further improvements can be made in several domains, from strategy development to improved threats analysis and prevention.
- There is a generalized perception among respondents that the digital transformation programs do not focus efforts on satisfying the needs of the more vulnerable groups and addressing the digital divide. Increasing this perspective is of fundamental importance to ensure an equitable digital transformation process for all. ⁴⁸

3.1 Data Standards and Protection

Government open data, data access, international data storage, data privacy and data protection

Key insights:

- Key areas of particular relevance for enabling digital transformation are covered by specific regulations in the country. Moldova currently has a legal framework composed of a diversity of regulations on the domains of data access, data privacy and protection - including personal rights and legal requirements to collect and/or process data. Important to note, the country also has concrete regulations providing **norms governing open data policies, including standards for the publication of data**. However, several of these very important regulations (such as the data protection) were approved several years ago and need an actualization integrating recent developments or adaptation to new frameworks.
- **Digital identity, electronic certification and signature are also supported by their respective regulations**, as well as government decisions establishing the use of electronic signature and authentication in internal processes, providing a legal framework that sets some initial bases for the deployment of more services requiring digital identity. There is **only one regulation reported on Data interoperability and exchange from 2018**, which was also complemented with efforts to do a multi-stakeholder partnership including

different members of the government. This is a good starting point for further development of e-services and internal transformation.

- In general, **there is a very positive opinion regarding digital privacy regulations in the country.** More than 40% of respondents consider that the regulation is very strong, against only 1% that considers they have no effect. Moreover, there is a high degree of respondents that have an opinion or some information on the topic, with only 15% of surveyed individuals not answering or stating “unknown”. **The perceptions of respondents are particularly positive for the regulations concerning open data laws and policies,** where a similar percentage considers them to be strong and effective, against a lesser negative group.

3.2 E-commerce

Digital consumer protection, digital transactions and payments, e-signatures

Key insights:

- **The current volumes of e-commerce in the country are low,** and there is a generalized lack of specific data on the sector and its evolution. In July 2020, the Ministry of Economy and Infrastructure approved a **draft roadmap for boosting the e-commerce sector in the country,** which includes a set of 47 concrete measures to support the sector in the following years under a very holistic and comprehensive perspective. Further development of the implementation plan will be necessary to ensure its success.
- In general, the **survey responses indicate a moderated trust on the legal protection covering e-commerce. The perception is that there are relevant regulations for the key dimensions enabling e-commerce,** such as digital payments, transactions, and consumer protection, **but that they are mostly weak and could be improved.** Specifically in the regulations regarding consumer protection, more than half of respondents feel that the protection offered by the law is weak or inexistent, which explains the lack of trust in local e-commerce firms highlighted in the literature. Seems also quite evident a lack of knowledge on digital payment regulations, as only 37% of surveyed individuals provided a clear opinion on the topic, also aligned with the limited use of these financial services in the country, and the avoidance to use digital payments in online transactions of many customers.
- **Several administrative and legal barriers have been identified as elements discouraging local businesses to use e-commerce channels,** which also reduces the diversity of companies using e-commerce. These barriers are mostly related to privacy and adjustment of customer protection, and invoicing and export regulations. Some of these stoppers are already being considered in the current e-commerce roadmap developed by the Ministry.
- For the emergence of services related to e-commerce, it is fundamental to have a reliable and efficient postal system. **The perception among most respondents of the survey (42% of them) is that although the system is functional, the quality of the delivery is not as good as it could be.** On the opposite side, we see that 20% consider that the system runs smoothly and only 15% that considers that is quite difficult to get packages. Further analysis could be interesting to determine on whether these perceptions change depending on the area of residence, as probably respondents residing out of the city find more challenges to get their packages and experience a higher delivery time.

3.3 Fair Market Competition

IP law, competition and taxation, common carrier or network neutrality, fair access to communication and data channels for telco providers.

Key insights:

- Moldova is party to the majority international treaties in IPR field, including the WTO/TRIPs and 23 WIPO agreements, a list of which, including other international and regional agreements and IPR conventions. The country has its own agency for the protection of copyrights, the State Agency on Intellectual Property (AGEPI), which has been steadily improving the enforcement of the IPR laws in the country.
- The implementation IPR regulations aligned to EU Directives has brought more credibility and is well received by international actors. The latest efforts led by the Government on this area also seems to be recognized by the survey respondents. **Almost half of respondents (47%) consider that the current intellectual property law is strong, against only 1% considering it weak.** This positive opinion on the impact of regulations contrasts with less positive perceptions on other regulations.
- From a general perspective, **more than half respondents consider that the impact of current regulations on digital development is weak or very weak.** However, they have a more positive opinion on how public policy can affect the competition in the deployment of telecoms network, with a majority of 37% of respondents believing that the effect of governmental actions is strong, against a 30% considering it low or inexistent.
- The current **digital Identity laws are also considered to be relatively impactful, but still a majority or individuals think that they should be improved.** In contrast, many respondents do not have an opinion about the impact of network neutrality laws on actions of private companies, but the ones who have consider that current regulations on this regard have limited or negative effects.

3.4 Cybersecurity

Security standards and risk management, cybercrime, content filtering, breach notifications.

Key insights:

- The **Cyber Security Program 2016-2020 incorporates actions inspired by international best practices and aligning with European legislation and standards.** There is a set of basic cybersecurity requirements that apply to several government bodies and covering storing and processing, security and integrity of networks, and emergency response. However, the most relevant regulations to date on cybersecurity only establish minimum requirements of cybersecurity, but do not fully develop broader cybersecurity-related policy objectives and initiatives and effective coordination mechanisms.
- While services such as digital identity have significantly contributed to an increase of security in on-line transactions, ITU's Global Cybersecurity Report 2018 considers Moldova a country with "Medium level of commitment" to cybersecurity and an overall score of 0.662, similar to the ones of other countries in the region. The National Cyber Security Index (NCSI) developed by the Estonian e-Governance academy indicates several key areas for improvement in which the the country's scores are particularly low. Some of the dimensions to be considered are the **improvement of policy and legislation, including development of overarching strategies; the design of mechanisms of protection of essential services, and the improvement the analysis of cyber threats,** among others.

- In general, the survey results indicate a general lack of trust on the regulations on cyber crime, as the majority considers the current laws to be weak (42%). However, one fifth of the respondents do value positively existing regulations on cyber crime and that its protection is strong (20%), against 10% considering that the protection is inexistent or not knowing about the existence of such regulations.
- The general perception among surveyed individuals is that there are regulations and standards on cybersecurity, although there is room for improvement. Hence, the majority of respondents (43%) considered that the government does have in place some data privacy and security standards, although these have a limited efficiency, and 32% of respondents believe that the current standards and regulations are quite thorough. In contrast, only 2% considered that the security and privacy standards were inefficient.

3.5 Ethical standards

Standards/guidelines for emerging technology and specifically the use of artificial intelligence

Key insights:

- The country has not passed yet specific regulations on a wide range of technology-oriented topics such as AI, Blockchain, IOT, or similar.
- In general, respondents do not have the perception that the Government has an institutional focus on addressing the needs of the most vulnerable groups. More than 60% of respondents considered that the way policies are addressing the needs of these groups are weak or inexistant, while only 12% considered them to be strong. The opinions regarding to which extent the data collected by the government is for the benefit of vulnerable groups shows a very similar distribution.
- The overall perception is that the regulations in place concerning the right of citizens to access government information are positive, but they could be improved and strengthened. An important 39% of respondents consider that the current regulations granting this right are weak, against 30% that evaluate them as strong and positive. However, there are only 3% of surveyed individuals that believe that the regulations are weak or inexistent.
- The majority (41%) of respondents think that there is a content filtering law, although they deem it to be weak, against 14% that consider it to be strong.

TRANSFORMATION OPPORTUNITIES

- ▶ Several of the current regulations addressing personal data protection, digital identity or the ones establishing the standards on open data were approved more than five and seven years ago. Given the rapid technological changes and regulatory developments in these domains, it would be **recommended to conduct a gap analysis on what aspects are not yet being addressed in current regulations and proceed to their update**. With the emergence of new technologies such as blockchain or artificial intelligence, **specific regulations and development strategies addressing new technologies are also necessary**. Provided the close ties with European Union, several of the current European regulations could be transposed or serve as inspiration.

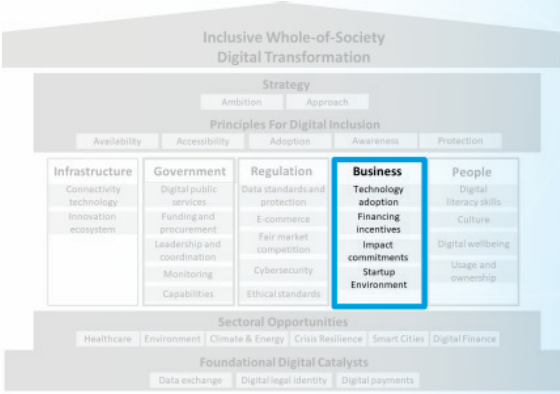
2. Moldova DRA - RESULTS

- ▶ E-commerce remains a challenging sector in Moldova both for the demand and supply sides. **The E-commerce roadmap draft includes very relevant and concrete actions addressing several regulatory and administrative challenges faced by local businesses.** These measures also need to be combined with **concrete actions to strengthen consumer protection and raising consumer trust on the system.** Delivery services and the postal agency can also play a role in the enhancement of the service. These actors might need support to reinforce their services to less serviced communities, and to ideate more effective and attractive delivery systems, while ensuring accountability on lost parcels.
- ▶ Digital transformation brings opportunities for improved service efficiency and new service provision. However, it also implies an important risk of exacerbating current inequalities and deepening the digital divide. **It is of vital importance that digital transformation strategies include a strong and decisive social inclusion perspective in their initiatives, and that concrete actions are undertaken to ensure access of all groups of society.** This includes gathering relevant data to assess the impact of digital transformation and initiatives on the different groups and ideating and investing resources on specific actions to address the digital divide.

BUSINESS

Digital transformation is a process that needs to happen all levels of the society. How the private sector is adopting ICT tools and leveraging them to enhance its competitiveness is one of the pillars that needs to be assessed to understand how digital technologies are penetrating one of the key actors of the society.

The key elements analysed in this pillar include how companies from all sectors of the economy are using digital tools such as ERP systems or digital payment services, contributing to enhance the internal demand for IT services, and also how the offer of services related to the digital economy is being enhanced, by measuring the legal and tax facilities provided to IT or tech-based companies and the ease of obtaining funding from private and public bodies for new enterprises and start-ups.



DRA Country Index: 4.0



Key insights:

- Entrepreneurs can easily create a business in Moldova, and the country ranks very positively in the domain of ease for creating a business. This contrasts with the lack of credit and financing for the private sector and new ventures, which is limited in the country, and is discouraging the emergence of new start-ups and business models.

- Moldovan SMEs are not investing at the same level as similar economies in Research and Development activities for their products, and they have a limited digital technology adoption rates. The current support mechanisms provided by the Government on this direction are vastly considered weak or ineffective. This is hampering companies' innovation capacity and their competitiveness potential in international markets, while limiting the internal market for IT-related services.
- The IT Parks Law has been a success of the recent policy developments in the country. It has lightened the tax burden for a wide number of IT and technology-based companies, eased their business operations and facilitated their attraction of foreign talent through a special visa. The reform has seen the number of newly established IT companies increase and attracted international actors to invest in the country.

4.1 Technology adoption

Extended use of digital tools in different sectors of society, use of digital payments, ERP & CRM adoption, R&D capacities and effort from private sector.

Key insights:

- **One of the country's weaknesses in terms of innovation is the business sophistication of its companies**, especially when compared with similar economies. Companies do not invest much on R&D for the improvement of their own operations and products, which reduces competitiveness in international markets. There is a relative lack of private investment in R&D activities and knowledge workers, according to the GII.
- The public sector accounts for most of the domestic IT spending in Moldova, which is also largely dedicated to the procurement of basic IT services. **Private companies investing more in IT services are large enterprises in banking, telecom and manufacturing. Companies such as SMEs and from other verticals are not harnessing the potential of digital transformation**, which is detrimental of their competitiveness and reduces the domestic market size for IT products, both basic ones and innovative services.
- Although data suggests that Moldova has a very small internal IT market, due to the lack of technology adoption by Moldovan companies, **there is the perception among respondents that the key actors of the economy are indeed adopting digital technologies in a decisive or very decisive manner** (38% and 45% respectively). This can be explained because big sectors such as banking and some manufacturing verticals are investing in digital transformation and they have visibility and leadership on the area. However, the efforts made by SMEs, which consist on 95% of all companies in the country, and other emergent companies seems to remain quite limited according to the literature.
- The National e-commerce roadmap aims at increasing the uptake of concrete digital solutions to improve small businesses competitiveness in the e-commerce domain, foreseeing targeted capacity buildings on topics such as digital marketing, and the support of national digital platforms.

4.2 Financing Incentives

Extended use of digital tools in different sectors of society, use of digital payments, ERP & CRM adoption, R&D capacities and effort from private sector.

Key insights:

- **The low availability of domestic credit and funding for the private sector is one of the key barriers to entrepreneurship and business development.** Local and international actors are not yet providing enough capital to the local industry, and there is a limited access to venture capitalists.
- GII indicates that one of the strengths of the country is the ease of resolving insolvency, which might influence positively the capacity of entrepreneurs to engage in new ventures despite a failure.
- There is the **generalized opinion that the economic mechanisms in place to support digital transformation are weak, and that they overall do not encourage companies to innovate in their methods.** Only 8% of respondents believed that financial vehicles currently available strongly promote digital transformation among companies, while more than 55% considered that they have weak effects or none.

4.3 Impact Commitments

Digital technology norms, transparency requirements, methods of reporting for companies, social impact.

Key insights:

- In general, **there is the perception that local corporations are adhering to responsible behaviors towards consumers**, with 66% of respondents considering that they adhere strongly or at least on the basics. Only 3% of respondents believe that corporations are not adhering to responsible practices, which indicate a certain level of trust towards companies. This is particularly interesting as contrasts with a recurrent mention of corruption and a constant expression of mistrust among respondents in other sections.

4.4 Start-up Environment

Ease to do business, legal and administrative barriers to start a business, support instruments to entrepreneurs.

Key insights:

- According to GII 2020, **one of the strengths of Moldova, in comparison with similar countries, is the ease of starting a business.** Already in 2017, Moldova did an important advancement in World Bank's Ease of Doing Business Ranking. According to this report for 2018, only four days are required to open a business in Chisinau.
- **In 2017, entered into force the new IT Parks law**, establishing a Virtual IT Park where registered companies can get considerable tax and administrative benefits. **This initiative has been successful in attracting and supporting IT companies working on software development, IT services and dedicated IT consulting.** During the first year, registered companies reported an increased income, profitability, and exports. The IT Park has also contributed to give more visibility to Moldova IT ecosystem, participating in several international events and networks, and has attracted more foreign-owned companies.
- International market access is fundamental for the IT sector, but due to its high fragmentation and the small size of its companies, there are some challenges for internationalization. This is partly due to a lack of structural support to companies in their trade and cluster strategies.

- **The country has an “IT Visa” program for the IT Park residents**, that brings additional benefits to foreign citizens working on the domain of IT. They can obtain a simplified regime for obtaining a temporary residence and eliminating work permits. This has been positively received by foreign investors and contributes to attract talent and improve quality of national products. However, survey respondents have indicated that they have perceived challenges in attracting foreign IT workers to cover the digital needs of the country, specially if they are not eligible to benefit from IT Park benefits.
- In general, there is the perception that startups feel comfortable in the country, although the question has received many neutral answers.

TRANSFORMATION OPPORTUNITIES

- ▶ Data from different reports indicates that many companies in the country are not investing meaningfully in digital or technological transformation. **Further research is recommended to understand which are the barriers that small companies are facing, and design targeted initiatives to enable their digitalisation. The adoption of digital tools by SMEs and other productive sectors of the economy, such as agriculture and services, can bring important competitiveness gains and improve their positioning in international markets.** At the same time, increasing both the adoption of new tools and the appetite for innovation should contribute to increase the internal IT market, which is still quite based on outsourcing and provision of basic IT services and highly dominated by public sector demand.
- ▶ The Government has yet to regulate about new technologies such as blockchain, Artificial Intelligence or IOT. The lack of regulations on these areas is accompanied by a lack of strategy on how to harness their potential locally. It would be recommended to consider **developing focused strategic roadmaps on concrete IT technologies and how they can bring competitiveness gains on specific economic sectors of the country.** These roadmaps should be supported by aligned actions and incentives in the Science and Technology programs and have the objective to encourage innovation in the IT sector and the uptake of innovations by established sectors such as automotive, agrotech and biotech.
- ▶ The IT Parks initiative has been successful in providing better conditions to IT companies to establish and grow, and to give further visibility to the Moldovan IT sector. As a major structure, **this initiative can be further developed and structure services to these companies beyond the current operation benefits.** IT Park could be a channel for the Government to promote further clusterisation of the fragmented IT landscape, offer internationalisation support services, specialised trainings, and promote research and development activities and partnership with innovation stakeholders, etc. The current e-commerce roadmap is considering to extend some of the benefits of IT Park members to other sectors. In the same line, it could also provide an opportunity to leverage the system to implement other actions in the plan such as creating a National Brand or facilitating export for the participating companies.

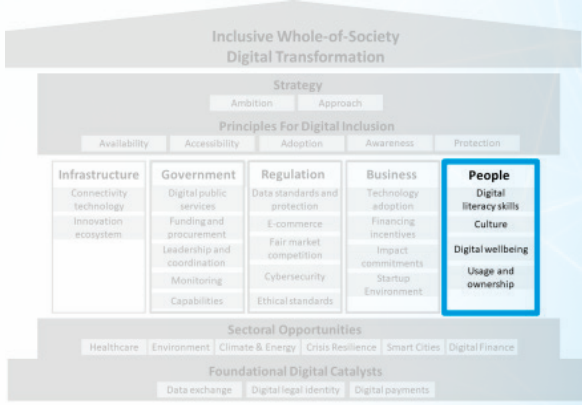
2. Moldova DRA - RESULTS

► Currently, the Government is the main consumer of IT services, which positions it in a unique position to generate further demand for more innovative and advanced services, promoting more innovation and R&D among IT companies. **Initiatives promoting co-creation of digital solutions, start-ups challenges and living-lab like initiatives** can increase the visibility to the IT sector, raise awareness on the opportunities of innovation and provide improvement opportunities to existing companies and digital entrepreneurs.

PEOPLE

The whole of society needs to be ready for digital transformation. For citizens, the basic elements that are needed to benefit and participate of this transformation include having a set of basic digital skills to use internet and access basic digital services in a safe, informed and responsible manner.

In this pillar it is analysed to which extent different groups of citizens are able to enjoy the benefits of digital transformation, as well as the general perceptions and mindset of the population in what regards digital services usage and creation, including trust and responsible usage of internet. Cultural approaches towards entrepreneurial risk are also taken into account, considering their importance to the creation of new business models related to the digital economy.



DRA Country Index: 4.3



Key insights:

- The general attitude towards digital transformation is positive, although there is not a particular social push for it the access to e-services have been increasing in the last years. In what regards attitudes towards entrepreneurial risk, Moldovan society doesn't seem to reward or incentivise entrepreneurial mindsets, although there is not a particular aversion to risk.
- There is a lack of awareness from the public on the importance of digital inclusion, and the generalised opinion is that public transformation initiatives and programs do not target particularly the inclusivity of most vulnerable groups.
- Moldova has a good basic education system that ensures the base to develop more advanced and professional digital skills. Despite this potential, there are few programmes to attract more talent to STEM careers and the lack of specialised IT skills among the

population and limited human development are growing concerns about respondents. The gap could be even greater between rural and urban contexts, where differentiated access and use of digital services is observed.

5.1 Digital Literacy skills

Ability to use digital technology from different groups of society; particularly of traditionally marginalized groups of society.

Key insights:

- Moldova has a high secondary gross enrolment ratio (86%), a very positive mark compared with some other LMICs. This informs about the existence of a minimal level of schooling and acquired competencies in mathematical and linguistic skills that are necessary to build more capacities on the IT domain. However, the **Human Capital Index is below the sub-region average, and there are not many focused policies promoting STEM careers among youth or increased training capacity of public institutions.** Respondents to the survey raise the majoritarian concern on the limited capacity of the country to graduate enough IT professionals to ensure sustainability of projects and feed a growing IT private market (more insights on further IT professional education are discussed in the “Innovation Ecosystem” component).
- **The general perception among respondents is that there are some efforts to close the digital divide for vulnerable groups, but the overall effect of these efforts are weak.** We can observe that this perception is generalized on what regards marginalized groups, religious minorities and women and girls. In the three cases, between 30-40% of respondents considered that some efforts are underway to support these groups, but that they are weak and have limited effects, while between 7-11% of respondents consider that there are no efforts to support these groups, and a proportion between 10- 20% believes that the effects are quite strong. **These perceptions seem to be aligned with quantitative data about existing inequalities in what regards access to internet according to location, gender and socio-economic level.** According to a study conducted by the National Bureau of Statistics with the support of UNDP Moldova, UNWomen and Sweden, the share of those who have access to a computer is directly correlated with the level of wellbeing and education. About 71% of richest households have computer compared to 35.7% of the poorest ones. Regarding gender, only 4.6% of girls studying in High Education choose STEM careers, and only 31% of jobs in the ICT sector are occupied by women who also earn 33% less in average than men.
- **There is also a considerable number of respondents that do not have an opinion about the topic, indicating that there might be a lack of interest or limited awareness raising and communication about these topics in general.** In one of the questions asking on whether inclusivity is a priority for digital transformation, only 20% of participants replied.

5.2 Culture

Trust in digital technologies, attitudes towards entrepreneurial risks, social norms for use and ownership of internet and technology.

Key insights:

- There is the **majoritarian perception that internet has had a very strong impact on the lives of individuals**, with more than 66% of respondents agreeing on this, and only 5% indicating that they don't think that internet hasn't impacted lives in a relevant way.
- According to survey data, people are not particularly excited about embracing technology solutions. **More than half of respondents (53%) consider that people look at technology with interest, but only 10% believe that they are particularly keen or excited to use it.** On the opposite, 15% consider that in general citizens are nervous or don't feel completely comfortable about the use of technology.
- Between 2012 and 2016 the access to electronic services provided by the Government more than doubled (from 12% to 30%). Although no further data is available, it is to be expected that this number has continued to rise with the increased number of public services digitalized. **The increase of transactions using digital identity and payment also indicate a growing trust and ease of using internet for transactions such as payment of taxes, registrations, etc.**
- Most respondents believe that the general attitude towards entrepreneurial risk is neutral (40%), while 15% consider it positive and 10% that it is negative. Although there is not a negative disposition to initiative business ventures, as the perceived aversion to risk is not too elevated, these results also seem to indicate that **in general, society does not encourage and reward entrepreneurial mindsets.**

5.3 Usage and Ownership

Ability to use digital technology from different groups of society; particularly of traditionally marginalized groups of society.

Key insights:

- There are clear **differences on the access to public services and websites between the Capital region and the North and South regions, indicating a possible digital divide between these groups and different behavioral patterns** – the former looking for information about public services and doing on-line transactions with the government more often than the latter.
- Although it can be observed an increase of public awareness on the benefits of digital government services and a positive attitude towards digital transformation initiatives, the full potential of digitalization is not yet valued by most citizens, which mostly appreciate the reduction of time in accessing services, but don't assess the gains in transparency and security. Awareness raising campaigns or targeted messaging can increase the value given to digital transformation for citizens.

TRANSFORMATION OPPORTUNITIES

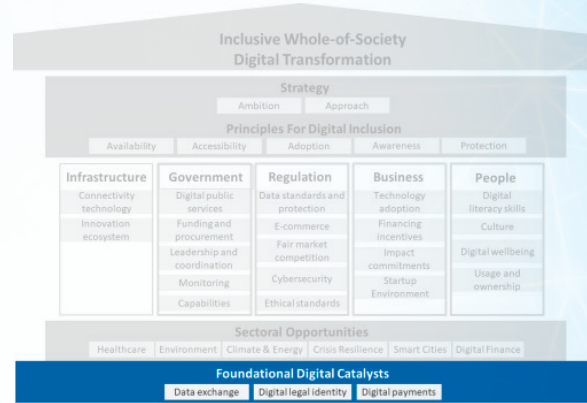
- ▶ **Further research gathering data on the impact of digital transformation on vulnerable groups and their special needs should be made, and concrete strategies to ensure inclusive approaches should be developed.** Special attention needs to be paid to the challenges experienced by rural areas that suffer reduced connectivity and vulnerable groups that have more difficulties for enjoying the possibilities of digital transformation, such as families with fewer economic resources to afford connectivity and devices, groups with particular challenges to develop digital skills, and communities for which acquiring digital skills can be a way out of poverty and provide economic opportunities.
- ▶ As suggested in other pillars, **policies increasing the National IT talent pool need to be put in place**, as well as an incentive to increase the number of students in STEM careers, with a particular focus on women and girls. **Identifying private sector's needs of IT profiles, and conducting a gap analysis on the current educational system regarding IT professionals (including HIE, TVET) are first steps towards shaping a long term strategy to generate IT talent.** The skills competences provided at primary and secondary schooling levels are also elements to take into account. Partnerships and incentives directed to private companies to enhance upskilling of workers can also impact importantly the level of digital skills of adults already in the labor market. Bootcamps and targeted capacity building programs for youth or to change career paths can also contribute to increase the amount of IT professionals in the economy.
- ▶ Initiatives **promoting entrepreneurship, facilitating dialogue between startups and increasing the visibility of successful businesses created in the country could also increase the interest of youth for entrepreneurship.** Adapted training and business support services targeted to young entrepreneurs, university and TVET students could support the emergence of new ventures on specific sectors and promote an entrepreneurial mindset among population.
- ▶ Citizens value positively the speed and comfort of using e-services for several procedures with public administration, but other positive outcomes of digital transformation such as increased accountability and security of transactions is not particularly recognised. Perceptions on how users value these aspects should be included in the monitoring and design policies to enhance security and trust on institutions.

2. Moldova DRA - RESULTS

2.4. Foundational Digital Catalysts

FOUNDATIONAL DIGITAL CATALYSTS

Digital catalysts are overarching digital systems which can accelerate progress in all parts of the digital transformation. They include platforms and frameworks to facilitate data management and exchange, the systems supporting basic services such as the use of digital legal identity; and the environment enabling digital payments and finance.



All these elements are developed through a combination of regulations, existing practices and infrastructures and support from the Government and different societal actors.



Key insights:

- Moldova has made important efforts on promoting Open Data across governmental entities. There is a set of standards for publishing data available to government officials, a dedicated open data portal. Updated information on use and satisfaction of public e-services is frequently disclosed. However, the publication of data on-line and the nature of this data is not yet compulsory or completely regulated, and many raw datasets are not published.
- Digital payments are not yet very popular among the general population. Although the M-pay system for transactions with the government is used in an increasing number of operations every year, Moldovans still do not use digital payments for many of their e-commerce transactions. Similarly, e-money is not very extended in the country, and is barely used also for the M-pay system.
- The Government has greatly invested in building the digital infrastructure and systems for digital identity, a service increasingly being adopted by citizens in their transactions with the public authorities. Mobile identity and signature are also available, and provided in partnership with key operators.

1. Data Exchange

Ability to use digital technology from different groups of society; particularly of traditionally marginalized groups of society

Key insights:

- There are **several regulations addressing the reuse of data in the public sector, establishing open data principles and promoting concrete methodologies for open data publishing**. However, these regulations are slightly outdated (2014) and could be improved using more recent guidelines, also adapting to EU principles and standards. There is an open government data platform (date.gov.md) providing basic information and datasets.
- Since 2014, there is a regulation addressing the publication of government expenditure, although there is no obligation to digitally publish the data on the Ministry of Finance Open Data Catalogue. However, Moldova approved a **National Open Government Action Plan for the period 2019 – 2020** incorporating a high-priority section on publicizing budget expenditure.
- Almost half of respondents believe that there is a national sharing system, although 41% consider that its outreach is quite limited and not fully open.

2. Digital Identity

National digital legal identity system covering the entire population; possibility to use for stakeholders to access services and for transactions.

Key insights:

- Building on concrete regulations (see Pillar on Regulation) on digital identity, the Government also provides services to enable mobile and electronic signature to citizens. In fact, there are several devices available for Moldovan citizens to access digital identification services, from smartcards, USB tokens, electronic ID cards, to Mobile eID.
- As part of a digital transformation initiative supported by the World Bank, Moldova implemented an ambitious Mobile e-Identity project through which citizens could access a simple way of signing documents and transactions online. The project was executed through an innovative Public Private Partnerships among the eGovernment Agency, the State Certification Authority and three mobile operators in the country (Orgrande, Moldcell and Telia Sonera). These electronic identification system and signature is used mostly for interaction with public services, although some private services also allow authentication of individuals via the system.
- **A wide majority of respondents are aware that it exists a national digital identity system in Moldova that is operational for a diversity of transactions.** 12% of respondents thought that the system is usable only in specific operations, while only a 10% considered that there is no digital identity system in the country operational at national level.

3. Digital Payments

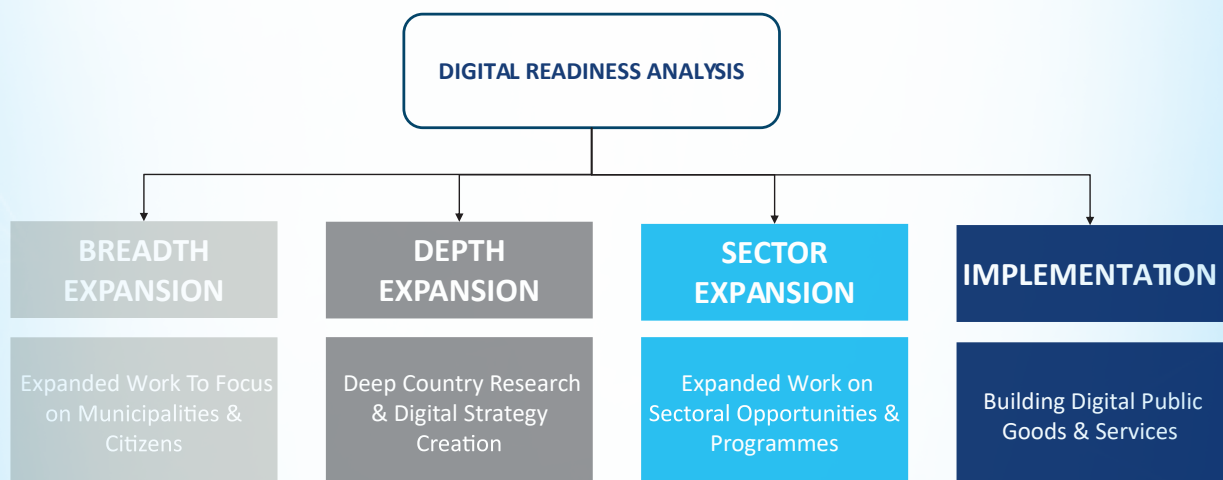
Digital payments ecosystem which includes digital financial service providers, digital financial services, provider support services and enablers.

Key insights:

- The Government has enabled the e-Payment Gateway (Mpay), which was already used in almost 50 different groups of services and facilitated more than 12 million transactions between citizens and businesses and the government. **The vast majority of respondents (72%) agree that there is a National digital Payments systems, which indicates that the majority is familiar with MPay is familiar.** Only 11% of surveyed individuals thought that there only exist private payment systems.
- In 2018, the **European Union approved the Payment Services Directive (PSD2, Directive (EU) 2015/2366.** This regulation obliges banking institutions to open consumer data to third parties, opening business possibilities for new digital financial services provided by other operators, and digital payment options for consumers all across the UE. The dispositions of the directive also aim to create a more integrated banking system, enhance safety of payments and ensure consumer protection, some of the key challenges highlighted for e-commerce. **The alignment of National legislations in the directions set by this EU framework can contribute to enhance dynamism in the fintech and digital payments sector in the country,** while enhancing the integration with the block economic area.
- Moldova joined the “Better than Cash Alliance” and is also participating in other intentional initiatives to promote the uptake of digital money, although it stills lacks the approval and implementation of more substantive policies and partnerships in this domain. E-Money is not very extended in Moldova, and its use within the Mpay system remains very marginal (only 1,15% of payments are done with it).
- The current **E-commerce Roadmap developed by the Ministry of Economy and Infrastructure identifies several administrative and regulatory challenges related to the use of e-payments and is making interesting proposals to address them,** such as adaptations to adapt invoicing mechanisms, domestic special regimes for digital transactions, simplified fiscal mechanisms. The roadmap also includes incentives to increase cashless payments among consumers and businesses.

TRANSFORMATION OPPORTUNITIES

- ▶ Open data regulation is slightly outdated and could benefit from a review and some updating, particularly incorporating new standards and guidelines on how to share data, formats, frequency and platforms. **An Open Data strategy for the Government also establishing which information is compulsory to be published by all Ministries, standardising formats and on a same platform would increase the degree of transparency of the administration.** An open data strategy would also benefit from public engagement in its definition, as private companies, universities or interest groups could indicate the current limitations of shared data and contribute to set standards to ensure future data usability and exploitation.
- ▶ In other pillars there are mentions on the challenges of the lack of interoperability and standard setting between different departments and agencies of the Government. **An audit of current systems, including data base usage and existing architectures would be a first step to rationalise current systems and set the bases for some basic guidelines to follow and ensure interoperability,** as new data is collected, and new digital services are open to the public.
- ▶ Digital payments are still quite marginal in Moldova, and even in e-commerce transactions there is an important use of cash payments in detriment of digital ones. Mobile money is also rarely used in transactions. Part of this is the reluctance and distrust of citizens to use this type of payments, so **increasing the security measures for them and effectively communicating to the public about them is a necessary part to increase the adoption of digital payments also between private stakeholders.** Financial institutions are also key actors that can partner with the government to build trust, develop more secure systems and innovate to create more attractive services to users.



Data used in the Inclusive Data Repository scoring

- World Bank Sustainable Energy for All database
- Telecommunication Infrastructure Index (TII)
- Infrastructure Connectivity Technology (ITU)
- *GSMA Mobile Connectivity Index*
- Ookla for Good (datasets)
- Universal Postal Union,
- Online-Service-Index (OSI)
- E-Participation index,
- UNCTAD Business-to-Consumer (B2C) E-commerce Index
- World bank Doing Business Index,
- WEF Ease of Doing Business,
- DESA Human Capital Index (HCI)
- Chain analysis- Cryptocurrency Adoption Index
- UNITAR E-waste generated, kilograms per inhabitant
- World Bank G20 Financial Inclusion Indicators
- World Bank ID4D

International Indexes

- ▶ **Global Innovation Index (2020)** , Cornell University and WIPO
<https://www.globalinnovationindex.org/Home>

- ▶ **ICT Development Index (IDI) (2017)**, International Telecommunications Union (ITU)
<https://www.itu.int/net4/ITU-D/idi/2017/>

- ▶ **E-Government Development Index (2020)**, United Nations Dpt. Of Economic and Social Affairs (UN-DESA)
<https://www.itu.int/net4/ITU-D/idi/2017/>

- ▶ **National Cyber Security Index (NCSI) (2020)**, e-Governance Academy
<https://ncsi.ega.ee/>

- ▶ **Global Cybersecurity Index (GCI) (2018)**, International Telecommunications Union (ITU)
<https://www.itu.int/en/ITU-D/Cybersecurity/Pages/global-cybersecurity-index.aspx>

- ▶ **Worldwide mobile data pricing 2021**, Cable co UK)
<https://www.cable.co.uk/mobiles/worldwide-data-pricing/>

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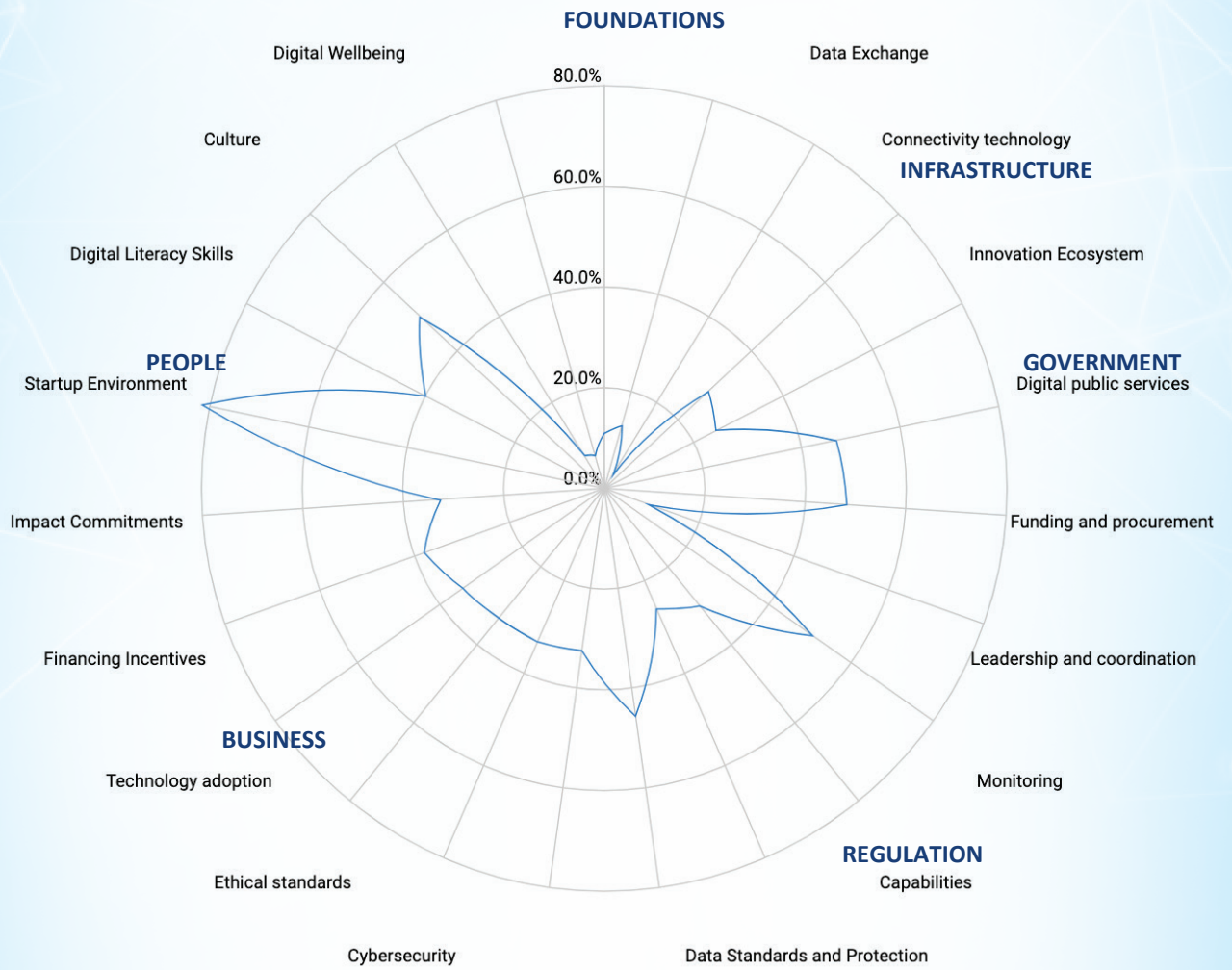
Skipped and Unknown Response Rate

Pillars: Compiled



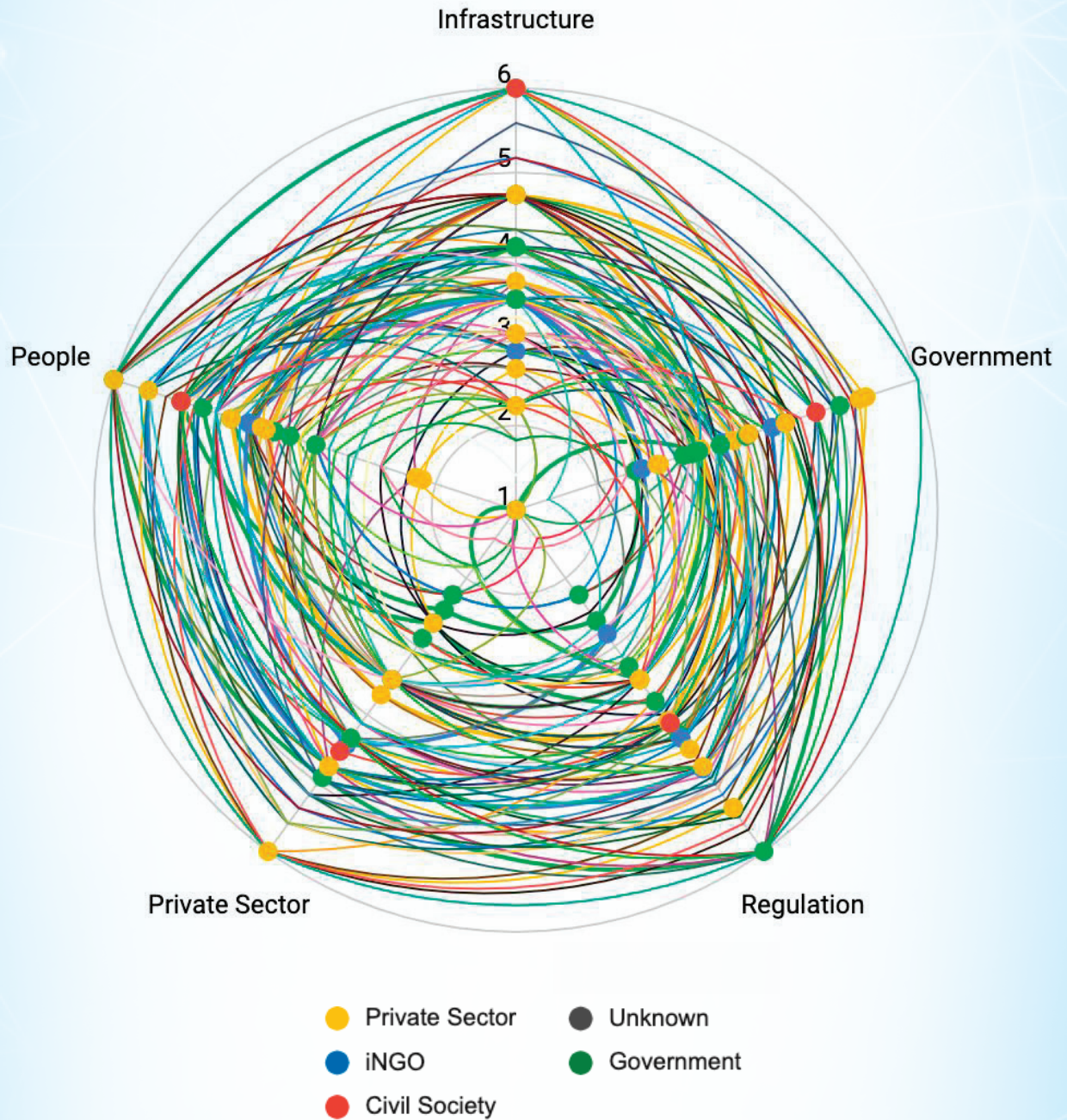
Skipped and Unknown Response Rate

Pillars: Unique



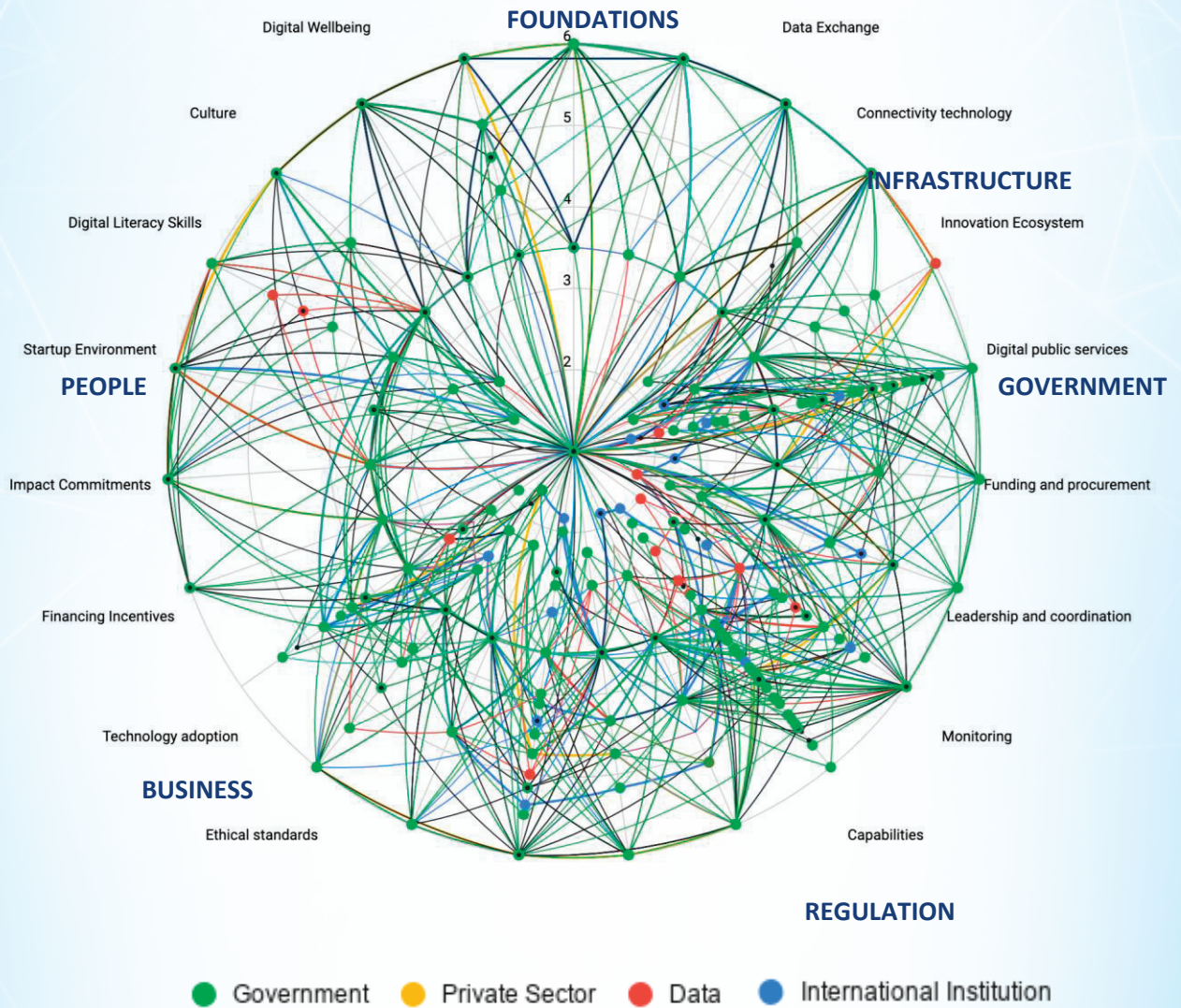
Sub-Pillar Distribution of Answers

Pillars: Compiled



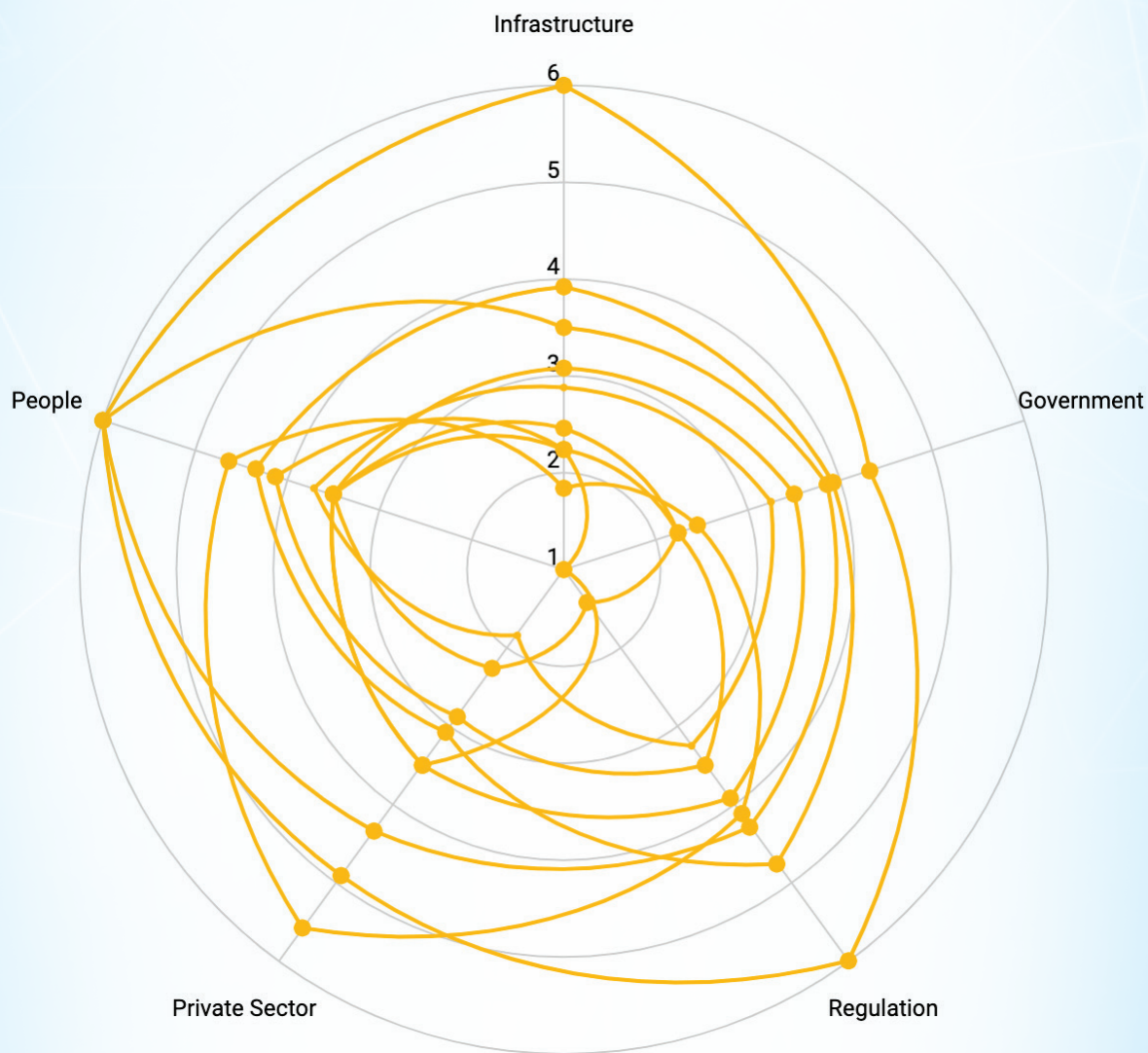
Sub-Pillar Distribution of Answers

Pillars: Unique



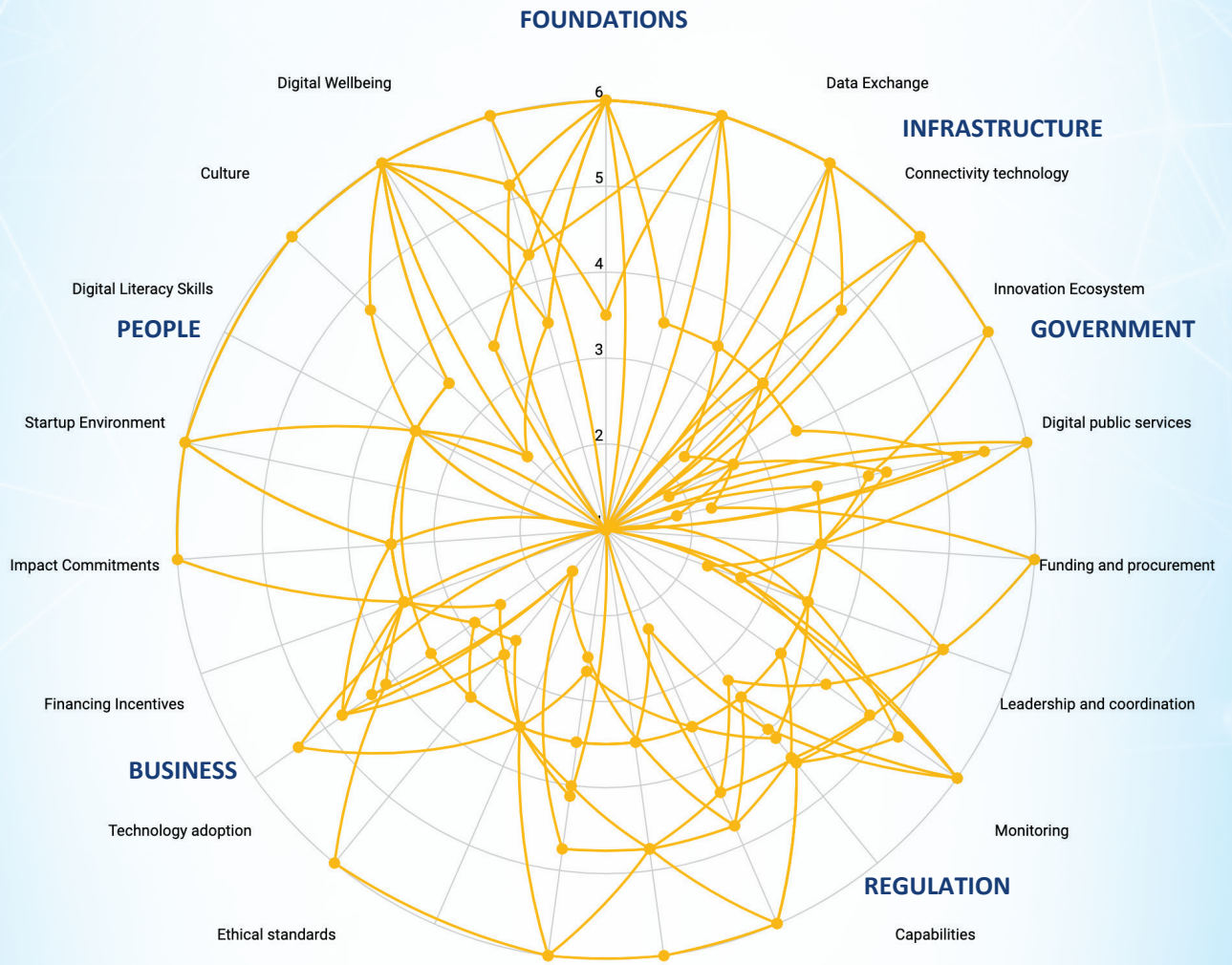
Sub-Pillar Distribution: PRIVATE SECTOR

Pillars: Compiled



Sub-Pillar Distribution: Private Sector

Pillars: Unique



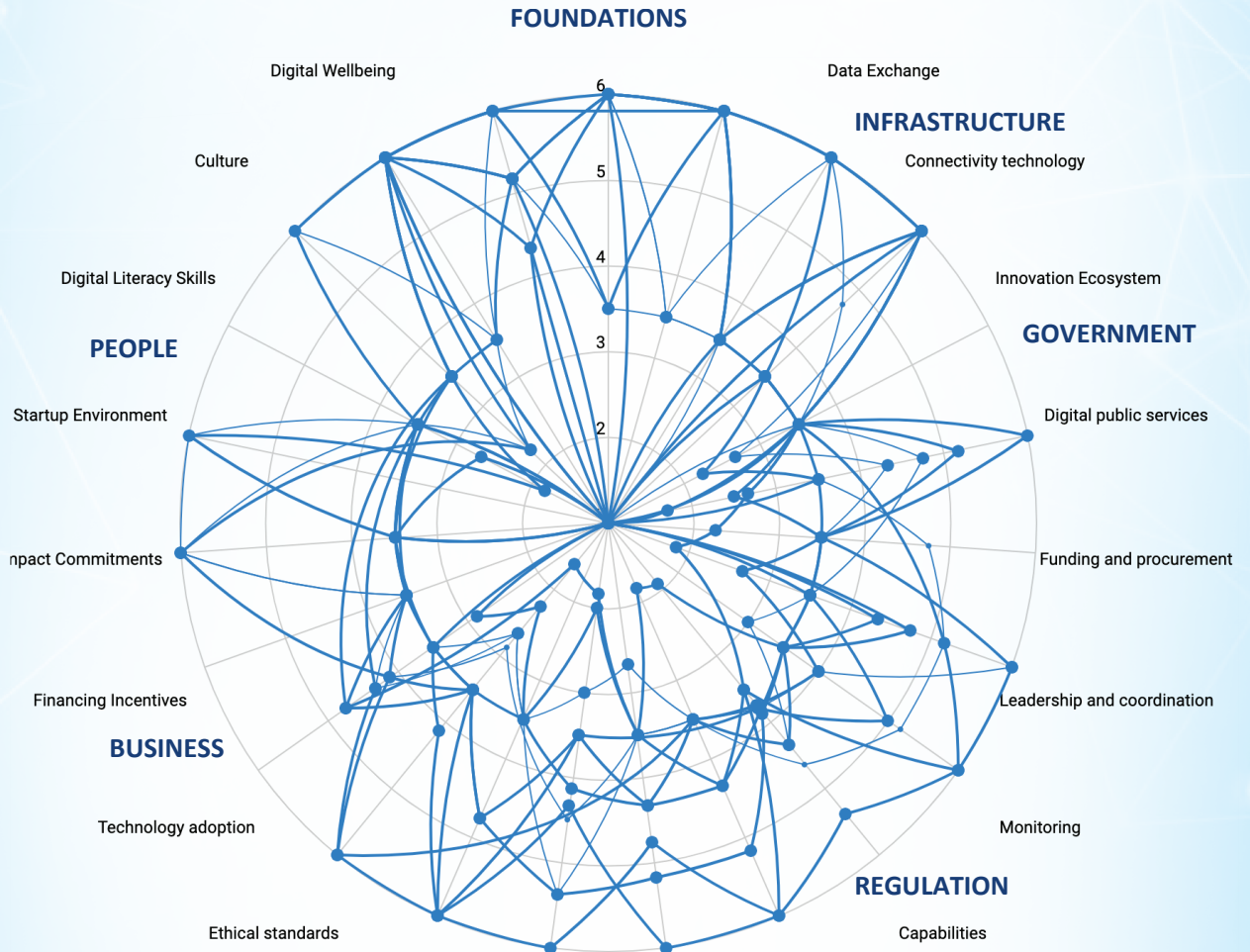
Sub-Pillar Distribution: NGO and Development Actors

Pillars: Compiled



Sub-Pillar Distribution: NGO and Development Actors

Pillars: Unique



Sub-Pillar Distribution: Civil Society

Pillars: Compiled



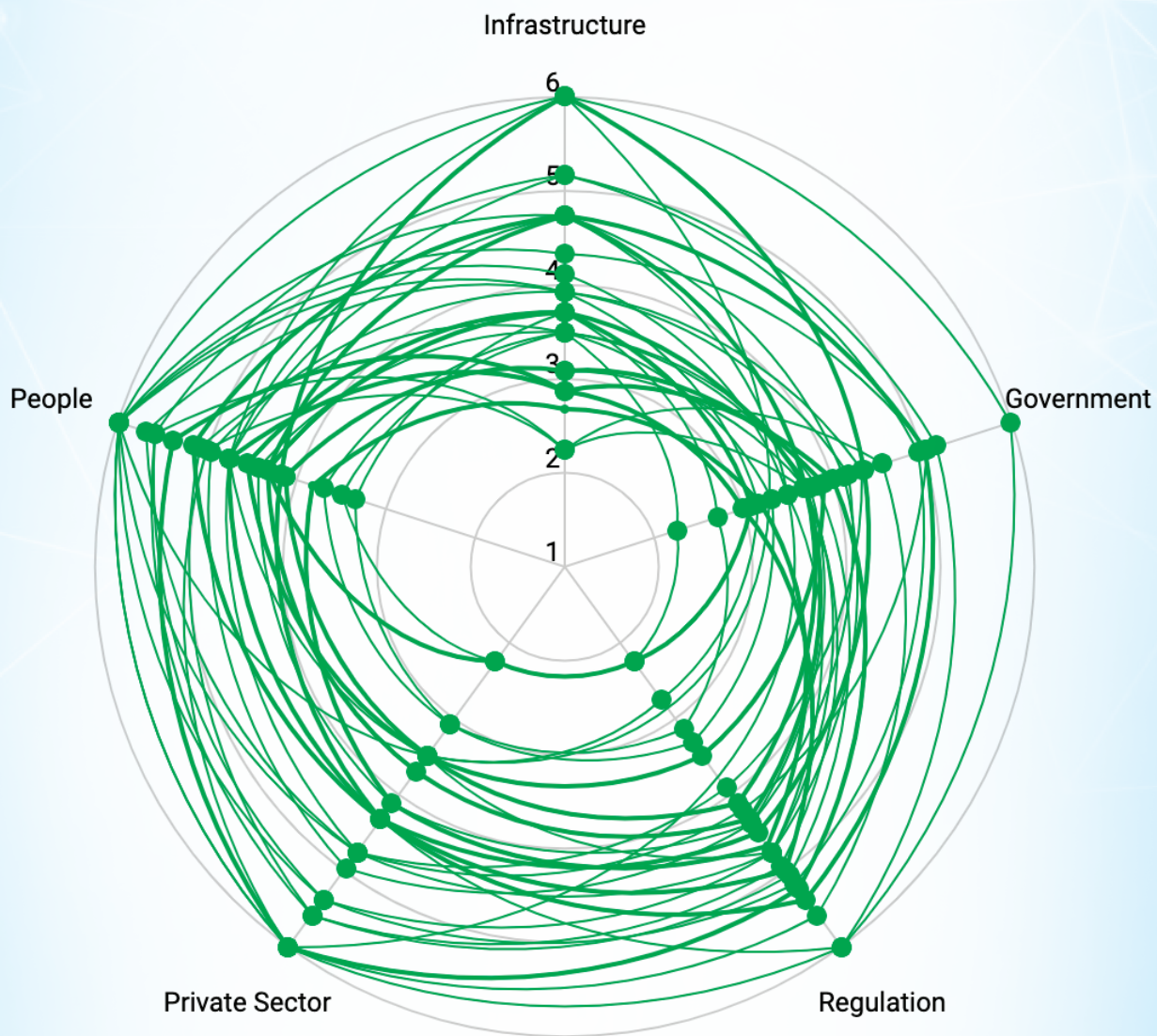
Sub-Pillar Distribution: Civil Society

Pillars: Unique



Sub-Pillar Distribution: Government

Pillars: Compiled



Sub-Pillar Distribution: Government

Pillars: Unique

