



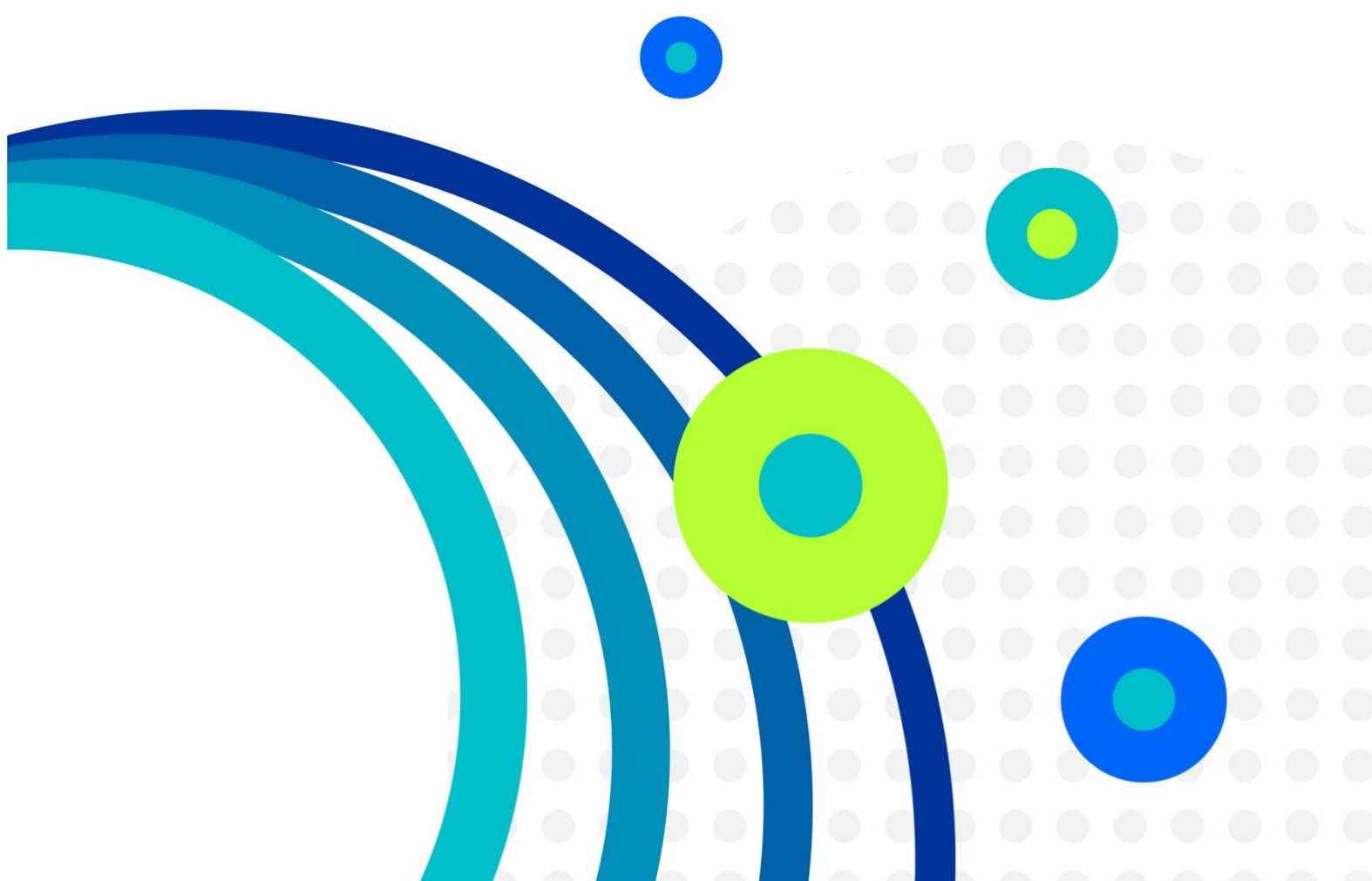
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EU4Digital: supporting digital economy and society
in the Eastern partner countries

Recommendations on implementing DESI indicators in the Eastern Partner countries

December 2023





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1. Assumptions and Limitations

1. During the preparation of this report, Ernst & Young Baltic (EY) used multiple third-party sources of information (for example, research reports, government statistics and information provided in interviews or surveys of Eastern Partner country experts and focus groups). For the purpose of developing this report EY assumed that the information provided was accurate and additional verification of provided information and data accuracy was not conducted.
2. EY is not responsible for the implementation or supervision of the recommendations included in this report outside the authorised scope of work.
3. If this report or parts of it are translated into other languages, English version shall be considered as the primary point of reference.
4. EY is not responsible for organising trainings that cover parts of DESI indicator collection and measurement that are carried out by independent subcontracted entities in EU member states.



2. Glossary and Abbreviations

Abbreviation	Term
AI	Artificial intelligence
Armenia	The Republic of Armenia
Armstat	Statistical Committee of the Republic of Armenia
Azerbaijan	The Republic of Azerbaijan
DESI	Digital Economy and Society Index
EC	European Commission
EMIS	Education Management Information System
Enterprise survey	Eurostat – Community survey on ICT usage and e-commerce in enterprises
EDI	Electronic Data Interchange
ERP	Enterprise Resource Planning
EU	European Union
EU MS	European Union Member States
EU4D	EU4Digital
EY	Ernst & Young Baltic
Geostat	National Statistics Office of Georgia
Household survey	Eurostat – Community survey on ICT usage in Households and by People
ICT	Information and communications technology
ITU	International Telecommunication Union
Labour force survey	Eurostat – Labour force survey
Moldova	The Republic of Moldova
NBS	National Bureau of Statistics of the Republic of Moldova
Questionnaire	Questionnaire of DESI Accelerator for collecting information about DESI measurement
Report	Recommendations on implementing DESI indicators in the Eastern Partner countries
SDG	Sustainable Development Goals
SMEs	Small and medium-sized enterprises
UNDP	United Nations Development Programme



3. Executive Summary

The report *'Recommendations on implementing DESI indicators in the Eastern Partner countries'* (Report) aims to provide a gap analysis between current and envisioned data collection practices in Eastern partner countries and to develop operational recommendations on regional and national level to move towards implementing full Digital Economy and Society Index (DESI) indicators collection in line with EU methodologies. These recommendations are based on the existing status of DESI indicators data collection in Eastern partner countries. Placing emphasis on the specific needs and priorities of the stakeholders in Eastern partner countries is the main principle of provision the methodological recommendations.

This document is a part of the support provided through the activity of EU4Digital Facility **'DESI Accelerator'**. The overall goal of the activity is to facilitate and support the implementation of DESI in the Eastern partner countries, through analysis of the existing DESI indicators measurement practices and delivery of capacity building for data collection institutions in the Eastern partner countries.

This Report is an aggregated document describing the current measurement status of DESI indicators in Eastern Partner countries in three out of four¹ DESI dimensions:

- Digital skills
- Digital transformation of businesses
- Digitalisation of public services²

It aims to identify the main challenges and points of improvement in terms of DESI implementation in Eastern partner countries. At the same time, the proceeding DESI Support Roadmaps will focus on the specific actionable steps and practical methodological support from EU4Digital, tailored to each Eastern partner country.

The primary data sources for this Report are the inputs from Eastern partner country representatives gathered via the *'Questionnaire of DESI Accelerator for collecting information about DESI measurement'* (Questionnaire), as well as desk research and validation events on a country level and regional level.

4. Introduction

This document analyses the current state of play in the Eastern partner countries regarding DESI indicator collection in three of the DESI domains: digital skills, digital transformation of businesses and digitalisation of public services. The monitoring of current state of DESI indicator collection was done in June-July 2023, based on the DESI indicators 2022 – the full methodological document can be accessed [here](#). This document is based on the analysis of DESI Accelerator Questionnaire as well as desk research. The initial findings were validated first on country level followed by a regional validation workshop with stakeholders from five Eastern partner countries. Although the study was done based on the DESI 2022 methodology, the results are interpreted taking in consideration the DESI development and methodological changes in 2023 and DESI integration in the *'Digital Decade report'*.

The purpose of this comprehensive approach was to ensure that the data collected in Eastern partner countries would be compatible and comparable with the data collected in the EU. Alignment of the methodologies allows to analyse and benchmark digital skills indicators between the regions effectively. Additionally, this approach allows for a more comprehensive understanding of the digital landscape in the Eastern partner countries and facilitates evidence-based decision-making for policies and initiatives related to digital economy and society development.

The analysis focuses on three main aspects: (1) cross country analysis of the current DESI indicators collected in Eastern partner countries (both – per domain and per data sources); (2) current state of play in each of Eastern partner countries; (3) country specific recommendations for further implementation of measurements for DESI indicator monitoring.

As a result of conducting this research and gathering insights through the survey, it is envisioned that Eastern partner countries will be better equipped to identify areas of improvement in their digital readiness and to develop targeted strategies to foster digital development and competitiveness in the region. The findings will serve as a basis for formulating recommendations and action plans to advance the digital transformation in Eastern partner countries and strengthen their integration into the broader European digital ecosystem.

¹ Provided that data on Digital infrastructures indicators in the Eastern partner countries is already being collected within the respective EU4Digital activity, it is not covered in the scope of DESI Accelerator

² The study was done in 2023 when the dimensions were called: Human capital; Integration of digital technology; Digital public services



5. DESI main domains, indicators, and data sources

The Report is presenting status of DESI indicator measurement in Eastern partner countries based on current DESI dimensions, indicators and data sources which are briefly presented in this Chapter.

The European Commission has monitored EU MS progress on digital and published annual DESI reports since 2014. Each year, the reports include country profiles helping the EU Member States to identify areas for priority remedial action and thematic chapters providing an EU-level analysis of the key digital policy areas. From 2023 DESI report has been integrated in the *'Digital Decade report'*, it also has been adapted to more closely follow the KPIs set out by the Digital Decade.

Each of the four DESI dimensions is divided into sub-dimensions and has a respective set of indicators which are described in more detail below in the Table 1. A full list of indicator data sources (excluding Connectivity dimension) is available in the table.

Table 1. DESI indicators and their data sources

DESI Indicator source				
Dimensions	Sub dimensions	Indicator	Source	Periodicity
1. Digital skills	1a Internet user skills	1a1 Internet use	Eurostat - Community survey on ICT usage in households and by individuals	Annual
		1a2 At least basic digital skills	Eurostat - Community survey on ICT usage in households and by individuals	Annual
		1a2 Above basic digital	Eurostat - Community survey on ICT usage in households and by individuals	Annual
		1a4 At least basic digital content creation skills	Eurostat - Community survey on ICT usage in households and by individuals	Annual
		1a5 Enterprises providing ICT training	Eurostat - European Union survey on ICT usage and eCommerce in enterprises	Annual
	1b Advanced skills and development	1b1 ICT Specialists	Eurostat - Labour force survey	Annual
		1b4 ICT graduates	Eurostat (in cooperation with National Ministries of Education)	Annual
3. Digital transformation of businesses	3a Digital intensity	3a1 SMEs with at least a basic level of digital intensity	Eurostat - European Union survey on ICT usage and eCommerce in enterprises	Annual
	3b Digital technologies for businesses	3b1 Electronic information sharing	Eurostat - European Union survey on ICT usage and eCommerce in enterprises	Annual
		3b2 Social media	Eurostat - European Union survey on ICT usage and eCommerce in enterprises	Annual
		3b3 Big data	Eurostat - European Union survey on ICT usage and eCommerce in enterprises	Annual
		3b4 Cloud	Eurostat - European Union survey on ICT usage and eCommerce in enterprises	Annual
		3b5 AI	Eurostat - European Union survey on ICT usage and eCommerce in enterprises	Annual

DESI Indicator source				
Dimensions	Sub dimensions	Indicator	Source	Periodicity
	3c e-Commerce	3b6 e-Invoices	Eurostat - European Union survey on ICT usage and eCommerce in enterprises	Annual
		3c1 SMEs selling online	Eurostat - European Union survey on ICT usage and eCommerce in enterprises	Annual
		3c2 e-Commerce turnover	Eurostat - European Union survey on ICT usage and eCommerce in enterprises	Annual
		3c3 Selling online cross-border	Eurostat - European Union survey on ICT usage and eCommerce in enterprises	Annual
4. Digitalisation of public services	4a e-Government	4a1 e-Government users	Eurostat - European Union survey on ICT usage in households and by individuals	Annual
		4a2 Pre-filled forms	eGovernment Benchmark	Annual
		4a3 Digital public services for citizens	eGovernment Benchmark	Annual
		4a4 Digital public services for businesses	eGovernment Benchmark	Annual
		4a5 Transparency of service delivery, design and personal data	eGovernment Benchmark	Annual
		4a6 User support	eGovernment Benchmark	Annual
		4a7 Mobile friendliness	eGovernment Benchmark	Annual
	4b e-Health	4b1 Access to e-health records	Service contract for the European Commission by Empirica GmbH and PredictBy	Annual

Source: DESI Methodology 2023³

DESI uses eight different data sources/surveys in total, out of which five are connected to the three dimensions under the scope of this study. The main sources of information are the Statistical Office of the European Communities (Eurostat) surveys carried out by national statistical offices which will be described and analysed in further sections of the Report. However, some data are gathered from alternative data sources, such as studies carried out by third party research organisations in cooperation with the European Commission and some indicators involve data from relevant national ministries or regulatory authorities: for more details refer to Table 2.

Table 2. Data sources and roles of national authorities

Data sources	Data collection process
Eurostat - European Union survey on ICT usage in households and by individuals	Data collected and verified by the national statistical offices supervised by Eurostat.
Eurostat - European Union survey on ICT usage and eCommerce in enterprises	

³ The full DESI 2023 methodological note can be accessed [here](#)



Data sources	Data collection process
Eurostat - Labour force survey	
Study for Digital Decade e-Health Indicators Development by Empirica GmbH and PredictBy	Data collected by Empirica from representatives appointed by the relevant ministries in every Member State.
eGovernment Benchmark	Data collected by Capgemini and verified by relevant ministries in every Member State. ¹

Source: DESI Methodology 2023

6. Data sources and methodologies for gap analysis on DESI implementation in Eastern partner countries

6.1. Questionnaire of DESI Accelerator for collecting information on DESI measurement in Eastern partner countries

The aim of the research was to identify the existing data collection methods, data sources and stakeholders involved in digital development indicator collection in Eastern partner countries, as well as the methodological alignments with DESI data sources. The primary objective was to provide recommendations and to develop support roadmaps for Eastern partner countries to enhance their digital readiness and capabilities. To achieve this, a questionnaire was designed, developed, and distributed to the country representatives involved in data collection and measurement, enabling an analysis of the current country actions in regard to DESI indicator measurement.

To ensure a comprehensive and accurate overview of each country's current situation, stakeholders from statistical offices, ministries, and other relevant institutions were actively involved in data collection via Questionnaire and in validation process.

The Questionnaire was structured into main sections to facilitate a systematic analysis:

- organisations involved in the current DESI indicator measurement;
- types of DESI related indicators currently measured in the respective country;
- compliance with the existing methodologies used in EU MS for DESI measurement;
- country future plans regarding implementation of DESI related indicator measurement and policies.

Main contact points in Eastern partner countries for the data submission of the Questionnaire are presented in the below table.

Table 3. Eastern partner country respondent organisations

Country	Organisation	Organisation unit
Ukraine	Ministry of Digital Transformation of Ukraine	Directorate for European and Euro-Atlantic Integration
Moldova	National Bureau of Statistics	Transportation, Tourism and ICT Statistics Division
	National Bureau of Statistics	Labour Statistics Department
	National Bureau of Statistics	Education, Science and Culture Statistics Section
Georgia	Geostat	Department of Methodology and Quality Management
Armenia	Ministry of Economy	Knowledge Based Economy Department
Azerbaijan	Ministry of Digital Development and Transport	Department of Strategic Analysis, Innovation, and Digitalisation

Source: Questionnaire of DESI Accelerator for collecting information about DESI measurement

6.2. Desk research

In addition to the distribution of the Questionnaire in Eastern partner countries, desk research was carried out to identify the existing data collection methods, and to identify model questionnaires for collecting digital economy and society indicators in both households and enterprises.



Particularly, the web pages and existing reports on digital development data indicators have been checked at national statistical offices websites:

- Armenia: <https://armstat.am/>
- Georgia: <https://www.geostat.ge/>
- Ukraine: <https://stat.gov.ua/en/home>
- Moldova: <https://statistica.gov.md/en>
- Azerbaijan: <https://www.stat.gov.az/>

The research also focused on determining the appropriate sample size and methodology. The findings from the desk research were additionally:

- compared with the existing EU methodologies to identify any gaps in the data collection methods;
- used as a validation tool for the information submitted by the Eastern partner countries via the Questionnaire.

6.3. Country expert validation

To validate the survey and desk research findings and research the future initiatives individual country validation workshops were organised during October – November 2023 with country representatives, statistical experts and representatives from involved stakeholders, such as: national statistical offices; ministries; ICT associations; etc. Stakeholders validated the preliminary research findings, provided their inputs and explained further development strategies for the upcoming years. Stakeholders also emphasized the challenges that countries are facing on DESI related indicator implementation and monitoring.

On November 24th, 2023, a regional DESI Accelerator event was organised with participants from Azerbaijan, Moldova, Ukraine, Armenia and Georgia to validate and finalise the regional research.

7. Regional overview

7.1. Organisations involved in digital development indicator collection and monitoring

During the research phase, one of the objectives was to identify the main stakeholders in Eastern partner countries that are involved in DESI related indicator measurement.

All countries have indicated that statistical offices are involved in DESI related indicator collection and are the main organisations involved in data collection. In some cases, additional institutions such as ministries are also involved.

Table 4. Organisations involved in indicator measurement in Eastern partner countries

Organisation type ⁴	Countries				
	Ukraine	Moldova	Georgia	Armenia	Azerbaijan
Central Bureau of Statistics	Yes	Yes	Yes	Yes	Yes
Ministry of Economy	Yes	Yes	No	No	Yes
Ministry of Education, Science, Culture and Sport	Yes	Yes	Yes	No	Yes
Ministry of Digital development/transformation	Yes	Yes	No	No	Yes
Ministry of Territorial Administration and Infrastructure/Regional development	No	No	No	No	Yes

Source: Questionnaire of DESI Accelerator for collecting information about DESI measurement

⁴ For the comparison purposes, the names of organisations are generalised and grouped into types. To reach for specific information with regard to organisations in each Eastern partner country, please see the *Chapter 8. Country pages* of the Report



7.2. Measurements of indicators per DESI domains

The scope of this DESI Accelerator includes three out of four DESI dimensions, provided that Digital infrastructures dimension in the Eastern Partner countries is covered within the respective EU4Digital activity. Therefore, the following dimensions are included in the scope of this Report:

- Digital skills (previously – human capital) dimension including general digital skills indicators, specific digital skills indicators for workforce and ICT specialists, as well as ICT skills in education.
- Digital transformation of businesses (previously – integration of digital technology) dimension including indicators on digital technologies for business, eCommerce digitalisation indicators, and eHealth record accessibility.
- Digitalisation of public services (previously – digital public service) dimension including indicators on digital public service indicators for citizens and for businesses as well as open data indicators.

Table 5. Indicator measurements in Eastern partner countries per DESI domains

Indicator type ⁵	Ukraine	Moldova	Georgia	Armenia	Azerbaijan
General digital skills indicators	Yes	No	Yes	Yes	Yes
Specific digital skills indicators for workforce/ICT specialists	Yes	Yes	Yes	No	Yes
Specific indicators measuring digital skills and use of ICT in Education	Yes	Yes	Yes	Yes	Yes
Digital technologies for business	Yes	Yes	Yes	Yes ⁵	Yes
eCommerce digitalisation indicators	Yes	Yes	Yes	Yes ⁵	Yes
Environmental sustainability in ICT indicators ⁶	No	No	No	No	No
Digital public service indicators for citizens	Yes ⁷	No	No/Partly	No	No
Digital public service indicators for businesses	Yes ⁵	Yes	No/Partly	No	No
Open data indicators ⁴	Yes	No	Yes	No	No

Source: Questionnaire of DESI Accelerator for collecting information about DESI measurement

7.2.1. Digital skills dimension

The data collected on general digital skills indicators is crucial as it provides insights on citizens' overall digital literacy and preparedness to use ICT technologies. Additionally, specific indicators on workforce and ICT specialists allow for a better understanding on the overall digital competence of the labour market. The data on general digital skills indicators in the EU case are typically collected through a country-wide household survey based on Eurostat recommendations on sample size. Majority of Eastern partner countries have indicated that they collect general digital skills indicators (except for Moldova – more detailed information in *Section 8.2 Moldova*) and specific digital skills indicators for the workforce/ICT specialists. Although measurements of ICT in education exist in Eastern partner countries, the methodologies and the classification are not in all cases aligned with the EU's proposed methodologies and classification. For example Azerbaijan follows International Telecommunication Union (ITU) methodology on digital skills and ICT usage among households, students, and both public and private sector employees. For the detailed overview, refer to *Chapter 8. Country pages* of the Report.

⁵ Three dimensions of DESI are marked by different colours in the first column

⁶ The indicator category was included in DESI 2022, no longer included in Digital Decade report 2023

⁷ Indicators will be monitored starting from 2023 (Ukraine)



7.2.2. Digital transformation of businesses

Ukraine, Azerbaijan, Moldova and Georgia have indicated that they collect indicators related to integration of digital technologies in the industry and businesses. Armenia plans to start measuring the respective indicators from 2023, due to developing a new ‘Enterprise survey’ in collaboration with World Bank. The indicators covering digitalisation of business typically have been collected through the enterprise surveys. However, for all countries some levels of deviations from the EU methodologies on indicator collection were observed.

7.2.3. Digitalisation of public services

This dimension focuses on the availability and accessibility of digital public services provided by governments to citizens and businesses. As shown in Table 5 Source: Questionnaire of DESI Accelerator for collecting information about DESI measurement, all Eastern partner countries, except for Ukraine, have indicated that they do not currently collect data for the digital public service DESI dimension. Since 2020 Ukraine has been a part of the ‘Open Data Maturity report’ (key open data indicator for DESI), however no current measurements are carried out on digital public service indicators both for citizens and businesses.

7.3. Country practices per DESI data source

Within this Report, the analysis was conducted on the six DESI data sources/surveys, following the DESI 2022 methodology.

The primary sources of information for EU Member States include surveys conducted by Eurostat in collaboration with national statistical offices:

- Eurostat – ‘Community survey on ICT usage in Households and by People’ (Household survey)
- Eurostat – ‘Community survey on ICT usage and e-commerce in enterprises’ (Enterprise survey)
- Eurostat – ‘Eurostat Labour force survey’ (Labour force survey)

Additionally, certain data are collected from alternative sources, including studies conducted by research organisations in cooperation with the European Commission. Some indicators also incorporate data from relevant national ministries or regulatory authorities.

In the upcoming sub-chapters, the data sources in Eastern partner countries will be analysed in comparison with the DESI data sources. The table below identifies the methodological alignment between Eastern partner countries and EU methodologies. It also indicates the current data sources, specifying instances where the alignment involves different methodologies. For example, Azerbaijan has an existing ‘Household survey’ following ITU methodology. In the context of this study, it will be considered as an analogue survey to Eurostat’s Household survey.

Table 6. Methodological alignment between the EU and Eastern partner countries

Methodology	Ukraine	Moldova	Georgia	Armenia	Azerbaijan
Eurostat - Community survey on ICT usage in Households and by People	Yes	No	Yes	Yes	Yes
Eurostat - Labor force survey	Yes	Yes	Yes	Yes	Yes
Eurostat - Community survey on ICT usage and e-commerce in enterprises	Yes	Yes	Yes	Yes ⁷	Yes
Studies of businesses on use of technologies ⁸	No	No	No	No	No
eGovernment Benchmark	Yes ⁹	No	No	No	No
Open data measurement studies ⁶	Yes	No	Yes	No	No

Source: Questionnaire of DESI Accelerator for collecting information about DESI measurement

⁸ Not included in Digital decade report 2023

⁹ Will be implemented from 2024



Considering future alignment prospects, the forthcoming analysis will concentrate on examining the types of data sources and their analogues in Eastern partner countries. For instance, *'Information society survey for Households'* in Georgia is compared with Eurostat's *Household survey*.

7.3.1. Household survey

As indicated in Table 6, the analysis per data source reveals that the Eurostat methodology, particularly from the *Household survey*, has currently been adopted in four out of five Eastern partner countries – Ukraine, Azerbaijan, Georgia, and Armenia. These countries have taken significant steps to synchronise the methodologies of their national household surveys with Eurostat methodologies.

In Moldova, the *'Labour force survey'* is combined with the *'Household survey'*, but it does not encompass aspects related to ICT usage or digital skills. Azerbaijan implemented the ITU methodology in 2023, focusing on measuring digital skills and the use of ICT among households, students, and both public and private sector personnel.

Although Ukraine has established alignment with Eurostat methodologies, variations in planning approaches have led to the implementation of model questionnaires with a one-year delay. In contrast, Georgia underwent harmonisation with Eurostat methodology in 2020, and it is not subject to annual modifications to reflect the current changes in the Eurostat model questionnaire.

7.3.2. Enterprise survey

All five Eastern partner countries have established data sources to assess enterprise digitalisation, however different gaps have been identified on the alignment with up-to-date EU methodologies.

In Armenia, the *'Enterprise survey'* was implemented in 2023, developed in collaboration with the World Bank. However, the newly developed survey is not aligned with the Eurostat survey, and it is currently planned as a one-time study. The country is actively seeking additional resources to ensure the possibility of running the respective survey on an annual base.

In Ukraine, despite having alignment with Eurostat methodologies, different planning approaches have led to the implementation of model questionnaires with a one-year delay.

Georgia underwent harmonisation with Eurostat methodology in 2020, but it is not subject to annual modifications reflecting changes in the Eurostat model questionnaire.

Azerbaijan currently conducts a *'Survey on ICT usage in enterprises'* that is not aligned with Eurostat methodologies. However, this survey covers the majority of aspects included in the European model questionnaire.

Moldova has set important steps in harmonisation process and currently the existing survey covers part of the DESI related indicators, and the process of technical alignment with the EU methodologies is underway.

7.3.3. Labour force survey

The *Labour force survey* is actively conducted in all five Eastern partner countries, following international methodologies, and to some extent aligned with Eurostat methodology. Notably, in Moldova, the *'Labour force survey'* is conjoined with the *'Household survey'*. Concerning DESI indicator calculations, the *'Labour force survey'* contributes data for a specific indicator – 1b1 ICT specialists. This indicator is derived from the respective profession code provided in respondents' replies.

As of now, all Eastern partner countries have successfully integrated profession codes into their questionnaires. From the perspective of DESI indicators, further alignment is unnecessary, except for the general alignment of professional code categorisation.

7.3.4. Other data sources

Throughout the Report period, Eastern partner countries were requested to present information about additional data sources for a more comprehensive exploration of potential alignment with DESI 2022 data sources. These additional sources encompassed studies on businesses regarding technology usage, eGovernment Benchmark and open data measurement studies.

Among the mentioned sources, only the eGovernment Benchmark is incorporated into the *'Digital Decade report 2023'*. An extra source integrated into the report is the *'Study for Digital Decade e-Health indicators development'* conducted by Empirica GmbH and PredictBy. This study facilitates the computation of a novel indicator – '4b1 Access to e-health records'.



As for eGovernment Benchmark, Ukraine has been included in the study from 2023. However, the remaining four Eastern partner countries are yet to be included and there are no analogous studies conducted at the country level. However, rapid development has been observed during the research and validation phases on ongoing initiatives in the eGovernment sector in Azerbaijan and Georgia.



8. Country pages

8.1 Ukraine

8.1.1. Overview

The table below provides an overview of the inputs gathered from Ukrainian representatives via ‘*Questionnaire of DESI Accelerator for collecting information about DESI measurement*’ as well as desk research findings. These inputs have been validated by Ukrainian experts to ensure applicability and quality of the following analysis.

Table 7. Results on DESI data collection in Ukraine

Results on DESI data collection		Ukraine
Organisations	State Statistic service	Yes
	Ministry of Economy	Yes
	Ministry of Education and Science	Yes
	Ministry of Digital Transformation	Yes
	Ministry of Regional Development, Construction, and Communal Living	No
Indicators	General digital skills indicators	Yes
	Specific digital skills indicators for workforce/ICT specialists	Yes
	Specific indicators measuring digital skills and use of ICT in Education	Yes
	Digital technologies for business	Yes
	eCommerce digitalisation indicators	Yes
	Environmental sustainability in ICT indicators	No
	Digital public service indicators for citizens	Yes ¹⁰
	Digital public service indicators for businesses	Yes ⁸
Open data indicators	Yes	
Methodologies	Eurostat - Community survey on ICT usage in Households and by People	Yes
	Eurostat - Labor force survey	Yes
	Eurostat - Community survey on ICT usage and e-commerce in enterprises	Yes
	Studies of businesses on use of technologies	No
	eGovernment Benchmark	Yes ⁸
	Open data measurement studies ¹¹	Yes

Source: *Questionnaire of DESI Accelerator for collecting information about DESI measurement*

8.1.2. State of play

The establishment of the Ministry of Digital Transformation in Ukraine marks a significant stride towards embracing digital transformation and aligning data collection and measurement with European methodologies. Another major achievement is a recent adoption of an order of Cabinet of Ministers approving the list of indicators of DESI in Ukraine and the procedure for collecting and exchanging data on indicators based on the EU Methodology. According to the order, Ministry of Digital Affairs will develop methodological recommendations for compiling indicators based on the EU Methodology within six months from the date of adoption.

¹⁰ The indicator measurements will start from 2023

¹¹ Open data indicator is no longer measured by DESI 2023 methodology



However, Ukraine has already demonstrated a proven record in harmonisation of its statistical methodologies with Eurostat's methodologies across major data sources:

- *Household survey*
- *Enterprise survey*
- *Labour force survey*.

While the process of aligning methodologies is underway, it's important to note that not all the data is immediately available. For instance, data on general digital skills indicators will only be accessible starting from 2025. However, the measurement of data related to eCommerce digitalisation indicators has already been established. The full set of indicators collected in 2022 through the survey '*ICT usage in enterprises*' is available in the methodological guidelines for the state statistical observation on the usage of information and communication technologies at enterprises.¹² The State Statistics Service of Ukraine plays a central role as the primary stakeholder in these surveys. As the country representatives have indicated – currently the inconsistencies between EU and Ukrainian survey approval timelines exist and this causes one year delay of the sample survey usage (for example, in 2023 Ukraine used the EU survey from Eurostat 2022).

As DESI framework is implemented within educational statistics, there may be a need to standardize the structure of indicators. This step will ensure consistency and accuracy in assessing digital skills development within the educational landscape.

Currently there has been no indication on data collection of the environmental aspect both in enterprises and households. Ukraine has not taken part in the *ICT environmental sustainability in enterprises* research and no deadline has been indicated for related data collection in similar studies.

Starting from 2023 Ukraine is included in the European eGovernment Benchmarking study and will be assessed together with the rest of EU countries.

Ukraine also participates in European initiatives, such as *Open Data Maturity*, which collects key open data indicators also used in DESI.¹³ In 2022 the Ministry of Digital Transformation published the results on the *Digital Transformation Index of Regions*. The purpose of this index was to create a foundation for research into the level of digital transformation in regional state administrations. The results allow authorities, analysts, developers and other interested parties to optimise digital transformation processes in the regions. The index covers eight domains:

1. Institutional capacity
2. Internet development
3. Development of service centres
4. 'Paperless' service provision
5. Digital education
6. Penetration of basic electronic services
7. Digital transformation of industry
8. Business card of the region¹⁴.

8.1.3. Conclusions on compliance with the EU existing survey methodologies

Community survey on ICT usage in Households and by People (Household survey)

Currently the primary data regarding households are collected through the '*Household living conditions sample survey*' which serves as the primary data source for assessing the living standards of the population in Ukraine. The '*Household living conditions sample survey*' is undergoing the alignment process to be fully harmonised with the Eurostat's '*Community survey on ICT usage in Households and by People*'. The household survey has been carried out in Ukraine since 1999 aligning with international standards and adapting to the dynamic social and demographic landscape of the country. Engaging households over a one-year period, this continuous survey is conducted quarterly. Currently Ukraine deviates from the EU methodology adopting the sample survey with one year delay, due to inconsistencies of time frame alignment. In Ukraine the sample survey of the next year is approved in the first quarter of the year as to EU it's done in the third quarter. The country representatives have indicated to continuous work with the above-mentioned issue and plan to fully align till 2025.

In the year 2020, the survey encompassed a sample population of 12,148 households, excluding those residing in temporarily occupied areas such as the Autonomous Republic of Crimea, the city of Sevastopol, and parts of

¹²https://drive.google.com/file/d/1QhFS-DS1VFXf66MecJIUGI2Ec57z_lxD/view?usp=drive_link

¹³https://data.europa.eu/sites/default/files/country-factsheet_ukraine_2022.pdf

¹⁴https://drive.google.com/file/d/1Cfgeo1rDfe8zZF3Nky_iBE5WpfXsVY5S/view?usp=drive_link



Donetsk and Luhansk regions. During this period, 7,849 households actively participated in the survey, with selected addresses representing 68.7% of the total, excluding non-residential dwellings. The sample size is in line with the EU sampling procedures. Notably, Ukraine has undertaken initiatives to harmonise its household survey methodologies with Eurostat's *Household survey* and the full alignment will be completed by 2025.

Community survey on ICT usage and e-commerce in enterprises (Enterprise survey)

Ukraine has taken steps on harmonising household survey with the methodologies of Eurostat's *Enterprise survey*. Since 2021, the updated methodology of usage of information and communications technologies at enterprises has been implemented and it is in line with the European methodologies. Currently Ukraine deviates from the EU methodology adopting the sample survey with one year delay, due to inconsistencies of time frame alignment. In Ukraine the sample survey of the next year is approved in the first quarter of the year as to in EU it's done in the third quarter. The country representatives have indicated to continuous work with the above-mentioned issue and plan to fully align the surveys till 2025. Currently the sample size in Ukraine is larger than in average European country – up to 20% of Ukrainian companies participate in the monitoring process, as comparing to EU countries – an average of approximate of 10%.

Labour force survey

Following the recommendations of International Labour Organisation, Ukraine has been conducting sample surveys of the population (households) since 1995, shifting its focus in 2019 to a labour force survey. This survey is conducted at the place of permanent residence of the population and covers persons aged above 15 (until 2019, aged 15–70), for which estimates of labour force, employment and unemployment are calculated.¹⁵ Ukraine has taken steps in harmonising its household survey with the methodologies of Eurostat's *Labour force survey* and International Labour Organisation. The sample size is in line with the EU sampling procedures – during 2020, 155.2 thousand respondents aged 15 years and over have been questioned that makes up 0.48% of resident population of Ukraine of the specified age.¹⁶

Data from Ministry of Education on ICT graduates/specialists

The Ministry of Education and Science of Ukraine collects educational statistics annually. The Unified State Electronic Database on Education provides data on the enrolment and graduation of students⁶. The data collection methodology is in line with EU methodologies, but country representatives have noted that there is still work to be done on full alignment of the categorisation of the ICT graduates to fully comply with the structured types of professions according to EU frameworks.

E-Government benchmarking

Up till now Ukraine was not included in the eGovernment benchmarking indicator calculation, but from 2023 it will be included in the general eGovernment benchmarking 2024 study. The research study had started from September 2023 and Ukraine has been included alongside with other European Union countries.

Open data portal

Ukraine is currently integrated into the open data monitoring system aligned with European methodologies, and it has been proactive in launching initiatives like the *Open Data Maturity program*. The 2021 edition of the Open data landscaping exercise assesses the maturity of 34 countries including two Eastern partner countries: Georgia and Ukraine.¹⁷ Ukraine is the leading country in Europe in open data maturity and in 2022 was defined as trend setter for the rest of the EU member states.¹⁸

8.1.4. Recommendations for DESI implementation

Ukraine has taken major steps toward establishing a collaborative framework for the advancement of its digital landscape. The State Statistics Service, in collaboration with key ministries such as the Ministry of Economy, the Ministry of Digital Transformation, and the Ministry of Education and Science, as well as key entities including the Administration of the State Service for Special Communications and Information Protection, the National Commission for State Regulation in the Fields of Electronic Communications, Radio Frequency Spectrum, and the Provision of Postal Services, has undertaken the development of a Cabinet of Ministers of Ukraine order titled '*Approval of Indicators for the Digital Economy and Society Index*'.¹⁹

¹⁵ https://ukrstat.gov.ua/druk/publicat/kat_u/2021/zb/11/Yearbook_2020_e.pdf, page 122

¹⁶ https://ukrstat.gov.ua/druk/publicat/kat_u/2021/zb/08/rab_sula_e.pdf

¹⁷ <https://drive.google.com/file/d/18SbygnbmdYG-5h3SnoblDUjNIUFwdfzm/view>

¹⁸ <https://data.europa.eu/en/publications/open-data-maturity/2022#landscaping-map>

¹⁹ <https://zakon.rada.gov.ua/laws/show/774-2023-%D1%80#Text>



This order plays a crucial role in the harmonisation process. It necessitates the creation and ratification of methodological recommendations by the Ministry of Digital Transformation. These recommendations are designed to uphold the methodological integrity of the compilation process, aligned with the DESI Methodology. Furthermore, the draft order designates the entities responsible for compiling the specified indicators and effectively addresses the collection, dissemination, and publication of data and metadata through the State Statistics Service. It was mentioned that within six months from the date of adoption of the order, the Ministry of Digital Affairs will develop methodological recommendations for compiling indicators based on the EU Methodology.

Ukraine has well established major data sources to pursue full DESI indicator calculation. The main data sources are in place and close collaboration with European stakeholders has helped to harmonise data collection methodologies. The future plans include the harmonising the data sources of eGovernment benchmarking indicators. From 2024 Ukraine will also be included in the DESI eGovernment benchmarking European study.

Ukraine has been acknowledged as a trend setter in comparison with the EU countries on Open data evaluation in 2022 and has showed the highest *Open Data Maturity* level in comparison with the EU27 countries.²⁰

Currently data related to environmental aspects of the information and communication technologies both in households or enterprises are not collected in Ukraine and based on the discussions with country representatives and research of the changed DESI methodology of the upcoming year no actions are needed at this point.

However, a successful transition requires further strategic initiatives. The country is well-advised to focus on knowledge-sharing events and capacity-building activities that can solidify the adoption of European methodologies. Moreover, tailoring individual consultations to address specific stakeholder needs and conducting in-depth analyses to identify skill gaps will play a crucial role in this transition.

8.1.5. Practical steps for full DESI implementation roadmap in Ukraine

This section outlines future steps and points of improvement for DESI implementation. The detailed action points will be identified in DESI Support Roadmaps, prepared with the involvement of national stakeholders in the countries.

Table 8. Status of alignment of data sources in Ukraine with the EU methodologies

Data sources in DESI	Data sources in Ukraine	Alignment process	Future steps
Community survey on ICT usage in Households and by People	The Household Living Conditions Sample Survey	Will be fully aligned till 2025	Continue the alignment according to the plan.
Community survey on ICT usage and e-commerce in enterprises	Information and Communication Technologies (ICT) Usage at Enterprises Survey	Will be fully aligned till 2025	Continue the alignment according to the plan.
Labor force survey	Labor force survey	Fully aligned	No additional activities required.
Data from Ministry of Education on ICT graduates/specialists	Data from Ministry of Education on ICT graduates/specialists	Fully aligned	Research possibilities to harmonise ICT graduate classification.
Environmental awareness	-	Have not been implemented	No further steps needed at the current point.
E-Government benchmarking	-	Will be included in the research study from 2023	No additional activities required
Open data portal	Open data portal	Fully aligned	No additional activities required.

Source: Questionnaire of DESI Accelerator for collecting information about DESI measurement

²⁰ <https://data.europa.eu/en/publications/open-data-maturity/2022#landscaping-map>



Harmonisation of the existing data sources

Ukraine has made substantial progress on aligning its major data sources, however harmonisation process remains ongoing, with anticipated indicators to become available by 2025. To ensure a seamless and complete harmonisation, it is strongly recommended to closely monitor the process. This vigilant oversight will help identify any potential delays, inconsistencies, or challenges, allowing for timely interventions and adjustments. Main focus should be put on harmonising the timelines with the EU survey approval schedule. Timeline alignment will ensure the comparability and integration in the common EU measurement frame. Moreover, forging a close collaboration with EU stakeholders is advised. This collaboration will facilitate a successful transition, foster effective information flow, and enhance the overall alignment process.

Additional data source implementation

Ukraine currently lacks the requisite data sources for the context of monitoring Green ICT. As currently EU methodological development shows the Green ICT indicator integration with the Eurostat surveys, Ukraine closely monitors the development and is ready to follow up the developments of the EU methodologies. Currently, there is not a need to implement additional data sources but focus on the existing data source alignment accordingly to EU guidelines. Undertaking further studies to monitor the evolution of EU-level indicator collection and potential shifts in data source strategies within upcoming DESI cycles is advisable.

Capacity building and knowledge sharing

Ukraine has demonstrated significant commitment by investing substantial resources in capacity building and knowledge sharing endeavours. To further support these efforts and achieve complete harmonisation with established EU methodologies, additional steps are essential. Conducting an in-depth assessment of capacity-building needs, involving key stakeholders in a comprehensive needs analysis, is critical. This evaluation will provide insights into specific areas necessitating further development. Armed with this understanding, Ukraine can tailor its capacity-building initiatives more precisely, optimising resource allocation. Through this strategic approach, Ukraine can elevate its capabilities and achieve comprehensive alignment with EU standards.

8.2. Moldova

8.2.1. Overview

The table below provides an overview of the inputs gathered from Moldovan representatives via ‘Questionnaire of DESI Accelerator for collecting information about DESI measurement’ as well as conducted by desk research. These inputs have currently been validated by Moldovan experts to ensure the high quality of the following analysis.

Table 9. Results on DESI data collection in Moldova

Results on DESI data collection		Moldova
Organisations	National Bureau of Statistics	Yes
	Ministry of Economic Development and Digitalization	Yes
	Ministry of Education and Research	Yes
	Ministry of Infrastructure and Regional Development	No
Indicators	General digital skills indicators	No
	Specific digital skills indicators for workforce/ICT specialists	Yes
	Specific indicators measuring digital skills and use of ICT in Education	Yes
	Digital technologies for business	Yes
	eCommerce digitalisation indicators	Yes
	Environmental sustainability in ICT indicators	No
	Digital public service indicators for citizens	No
	Digital public service indicators for businesses	Yes
Open data indicators	No	
Methodologies	Eurostat - Community survey on ICT usage in Households and by People	No
	Eurostat - Labor force survey	Yes
	Eurostat - Community survey on ICT usage and e-commerce in enterprises	Yes
	Studies of businesses on use of technologies	No
	eGovernment Benchmark	No
	Open data measurement studies ²¹	No

Source: Questionnaire of DESI Accelerator for collecting information about DESI measurement

8.2.2. State of play

The primary authority responsible for digital indicator collection in Moldova is the National Bureau of Statistics. In the country survey responses, the statistical office was identified as the sole organisation accountable for data collection efforts. However, the desk research indicates additional stakeholders, for example Ministry of Education and Research is involved in collecting indicator ‘1b4 ICT graduates’.

Moldova currently does not collect general digital skills indicators. Currently the following indicators are being collected:

- ICT specialists (‘1b1 ICT specialists’, ‘1b2 female ICT specialists’ - these data provide a representation of the total economy, without being further broken down into distinct occupations)
- Education (‘1b4 ICT graduates’)

Moldova has a joint survey which covers the labour force and households. Labour force survey is in line and fully synchronised with the Eurostat surveys, and an annual ‘Enterprise survey’ is also in line with Eurostat and

²¹ Open data indicator is no longer measured by DESI 2023 methodology



will be fully synchronised till 2025. The National Bureau of Statistics is working on the Eurostat's *Enterprise survey* integration within the country '*Enterprise survey*'.

The following indicators are collected in regard to eCommerce:

- 3c1 SMEs selling online;
- 3c2 e-Commerce turnover;
- 3c3 Selling online cross-border.

The National Bureau of Statistics also plays a significant role in collecting majority of indicators related to ICT in the education sector. The data from education institutions are collected by both the Ministry of Education and Research and Central Bureau of Statistics.

However, there is no active data collection concerning public digital services or evaluating environmental impact in enterprises. Separate initiatives have been organised to monitor environmental aspects in enterprises by studies in a joint project of European Bank for Reconstruction and Development, European Investment Bank and World Bank Group.

Open data initiatives have been launched but are not fully harmonised with the EU methodologies. Currently Moldova is not included in the joint monitoring together with the EU, although the open data portal has been implemented and desk research shows more than 1,000 available data sets available for the country.²²

In terms of future plans, Moldova intends to initiate collection of DESI-related measurements for enterprises. These plans encompass:

- 1b3 Enterprises providing ICT training;
- 3a Digital intensity;
- 3b3 Big data;
- 3b5 AI;
- 3b7 e-Invoices.

Furthermore, Moldova has demonstrated a keen interest in implementing DESI methodologies within their country, showing a commitment to enhancing their digital indicators and aligning with international standards. A mapping study was carried out by the National Bureau of Statistics of Moldova to identify DESI indicators already gathered and to be collected, as well as the responsible authorities for their implementation.

8.2.3. Conclusions on compliance with the EU existing survey methodologies

Household survey and Labour force survey

Moldova has implemented an integrated national survey that encompasses both household data measurements and labour force assessments. Organised by the National Bureau of Statistics, this survey combines data collection on households and labour force dynamics. Notably, the methodology of the labour force indicators measurement follows the methodologies set forth by the European Union and the International Labour Organisation. This comprehensive survey is conducted quarterly, it provides a robust and regular analysis of the nation's socio-economic landscape but currently does not cover the basic digital skills indicators in general society. Labour force survey in Moldova has been carried out since 2000, however in 2019 it has undergone the methodological improvements to reach more alignment with the international and EU methodologies. Starting from 2019, the sample size for the labour force survey has been 7,620 dwellings per quarter which is in line with the EU methodologies.²³ Although it would be highly recommended, country currently has indicated no plans in implementation of a separate household survey on monitoring the ICT skills and usage by individuals, due to lack of funding and capacity.

Enterprise survey

Moldova has been actively gathering data on information technologies and communications through the statistical survey '*The situation regarding computerisation and Internet connection*'. The survey collects statistics on information technologies in public administration, education, health and business; provides annual assessment of indicators in the field of computerisation and internet connection. It elaborates on the basis of exhaustive statistical survey on legal and individual persons using IT tools, computer systems and IT services. The current survey is measuring some of the DESI related indicators, but not all of them. The annual sample size of the survey is approximately 9000 units which is in line with the EU methodologies. Currently the existing survey covers part of the DESI related indicators, and the process of technical alignment with the EU

²² <https://data.gov.md/home/>

²³ https://statistica.gov.md/files/files/Metadate/en/AFM_en.pdf



methodologies is underway. According to the country representatives - the alignment process of the survey will be finalised till 2025.

Statistical data on activity in the domain of electronic communication are collected, processed and compiled by the National Regulatory Agency for Electronic Communications and Information Technology²⁴ through the survey '*The situation regarding the use of information and communication technology products*'.

In addition to this, the '*Enterprise survey*' has been conducted in Moldova which widely covers the environmental policies and their impact to enterprises. The survey is part of a joint project of the European Bank for Reconstruction and Development, the European Investment Bank and the World Bank Group.²⁵

Data from the Ministry of Education and research on ICT graduates/specialists

The Ministry of Education and Research of the Republic of Moldova collects and compiles annual statistical reports from educational institutions of various ownership forms. These reports encompass valuable data on graduates emerging from higher education institutions, particularly those specialising in the field of Information and Communication Technology (ICT). This practice ensures a consistent tracking of the countries progress in producing skilled ICT professionals in alignment with DESI.

eGovernment benchmarking

Moldova is currently not included in the eGovernment benchmarking indicator calculation, as no indications have been found nor reported in the EU4Digital DESI Accelerator survey on the respective field.

Open data portal

Moldova has established an exemplary open data e-government portal, accessible at <http://data.gov.md>. This platform serves as a pivotal element of the governance e-transformation agenda, facilitating public access to data from central public administration authorities. A significant milestone was achieved in 2015 when Moldova integrated its publicly available data with the EU's data.europa.eu platform. This collaboration has ensured seamless data sharing and accessibility. Although Moldovan data was not included in the 2021 edition assessment, the ongoing harmonisation efforts signify a proactive approach towards aligning with European standards and fostering data-driven governance. As seen in the further development of the upcoming DESI methodology, open data indicators are no longer part of the DESI calculation. Therefore, the advice regarding open data is of a recommendatory nature.

8.2.4. Recommendations for DESI implementation

In 2021, as an integral component of the EU funded Project ENI/2019/406-262 titled '*Technical Assistance to Support the National Bureau of Statistics of the Republic of Moldova*', the National Bureau of Statistics (NBS) of Moldova received substantial benefits from methodological guidance provided by experts from National Institute of Statistics of Romania. This collaboration was aimed to harmonise with internationally recognised standards and methodologies, as well as enhance the accuracy and reliability of statistical information produced by the NBS.

Through this partnership, the National Bureau of Statistics underwent a comprehensive transformation to align its practices with the recommendations and guidelines set forth by the European Union. A notable outcome of this effort was the development of a novel statistical questionnaire '*The situation regarding computerization and Internet connection*' (questionnaire no. 1-inf.rev.). This innovative questionnaire was developed to replace the previous version and was introduced starting from the year 2022.

Subsequently, the NBS enacted an official directive (NBS order no. 39, dated September 23, 2022) which signified a transition in nomenclature for the statistical survey. The revised survey '*The situation regarding the use of information and communication technology products*' (questionnaire no. 1-tic) underscored the focus on understanding and assessing the usage patterns of information and communication technology products within Moldova.

Moldova aspires to successfully implement a more comprehensive DESI indicator framework, however it is crucial for the country to embark on further strategic initiatives. The existing landscape reveals a discrepancy in alignment among major data sources, which creates the need to tailor these sources to encompass the missing indicators requisite for the accurate calculation of the DESI.

The existing data sources must undergo strategic enhancements to bridge the gaps in indicator coverage. The commitment displayed by Moldova in harmonising open data accessibility and reducing obstacles to the seamless integration of the EU's collaborative methodological approach is commendable. The country is well-

²⁴ https://statistica.gov.md/files/files/publicatii_electronice/Anuar_Statistic/2022/19_AS.pdf

²⁵ <https://microdata.worldbank.org/index.php/catalog/3720>



advised to prioritise knowledge-sharing and capacity-building endeavours, serving as cornerstones in solidifying the adoption of European methodologies.

Additionally, a personalised approach to engagement is paramount. Customised consultations must be facilitated to cater to the distinctive needs of stakeholders, fostering a nuanced understanding of the methodologies and their applications. Furthermore, conducting in-depth analysis to discern skill gaps and devising targeted interventions to address these gaps are pivotal in steering this transformative process.

As the transition unfolds, it is important for Moldova to extend its efforts towards harmonising data sources related to eGovernment benchmarking indicators. This holistic approach will serve to amplify the effectiveness of the DESI initiative and contribute to Moldova's evolution as a digitally empowered nation.

8.2.5. Practical steps for full DESI implementation roadmap in Moldova

This section outlines future steps and points of improvement for DESI implementation. The detailed action points will be identified in DESI Support Roadmaps, prepared with the involvement of national stakeholders in the countries.

Table 10. Status of alignment of data sources in Moldova with the EU methodologies

Data sources in DESI	Data sources in Moldova	Alignment process	Future steps
Community survey on ICT usage in Households and by People	Currently Labor force survey	No current plans of implementation	-
Community survey on ICT usage and e-commerce in enterprises	Informatization status and Internet connection	Will be fully aligned till 2025	Continue the alignment according to the plan.
Labor force survey	Labor force survey	Fully aligned	No additional activities required.
Data from Ministry of Education on ICT graduates/specialists	Data from Ministry of Education on ICT graduates/specialists	Fully aligned	No additional activities required.
Environmental awareness	-	Have not been implemented	Research the possibilities of indicator alignment and inclusion in the existing data sources.
E-Government benchmarking	-	Have not been implemented	Research the possibilities of indicator alignment and inclusion in the existing data source.
Open data portal	Open data portal	Has not been included in the EU study	-

Source: Questionnaire of DESI Accelerator for collecting information about DESI measurement

Harmonisation of the existing data sources

To enhance the measurement of basic digital skills within the general population, Moldova should consider methodological update of existing data sources, such as 'Labour force survey'. This could involve incorporating additional indicators and questions that are directly related to basic digital skills. Alternatively, the approach of segmenting surveys based on topical relevance could be explored. This approach would entail organising surveys to address specific subject areas, ensuring a comprehensive understanding of digital skills across the population.

Current survey 'Informatisation status and Internet connection' covers wider range of organisations including public entities, health and education institutions as well as business²⁶ in comparison with the EU methodologies, where the subject of the survey are business entities. Moldova has started the process of methodological

²⁶ https://statistica.gov.md/public/files/Metadate/en/TIC_en.pdf



alignment with the ‘Community survey on ICT usage and e-commerce in enterprises’ and is on the way of the full alignment till 2025.

Open Data Portal Implementation

While Moldova has taken the significant step of implementing an open data portal, it’s imperative to acknowledge that the country is not yet part of the EU open data monitoring framework. Conducting a meticulous analysis of the present gaps in the harmonisation process is strongly recommended. This analysis should lay the foundation for a strategic roadmap to achieve full alignment with EU standards. Following this gap analysis, a more detailed and targeted plan should be devised to facilitate a smoother harmonisation process.

Additional data source implementation

Moldova currently does not have a household survey measuring ICT related indicators for individuals on skills and ICT usage, an additional survey implementation is highly recommended. Currently there are no indications from country representatives on establishment of such survey.

Moldova currently lacks the necessary data sources for monitoring Green ICT and eGovernment benchmarking indicators. It is advisable to explore avenues for incorporating these indicators into existing data sources, such as integrating environmental aspects within the ‘Enterprise survey’. Alternatively, the creation of a new research initiative aligned with the methodologies of eGovernment benchmarking should be considered. Additionally, further studies are warranted to monitor the evolution of indicator collection at the EU level, as well as any potential shifts in data source strategies within the upcoming years of the DESI.

Capacity building and knowledge sharing

Moldova has already invested commendable resources in capacity building and knowledge sharing endeavours. To further strengthen these initiatives and ensure full harmonisation with existing EU methodologies, it’s essential to take additional actions. An in-depth assessment of capacity-building should be undertaken, involving engaged stakeholders in a thorough needs analysis. This analysis will shed light on specific areas that require further development, enabling Moldova to tailor its capacity-building efforts more effectively. By doing so, the country can amplify its capabilities and ensure a comprehensive alignment with EU standards.



8.3. Georgia

8.3.1. Overview

The table below provides an overview of the inputs gathered from Georgian representatives via ‘Questionnaire of DESI Accelerator for collecting information about DESI measurement’ as well as conducted by desk research. These inputs have been validated by Georgian experts to ensure the high quality of the following analysis.

Table 11. Results on DESI data collection in Georgia

Results on DESI data collection		Georgia
Organisations	National Statistics Office of Georgia (Geostat)	Yes
	Ministry of Economy	No
	Ministry of Education, Science, Culture and Sport	Yes
	Ministry of Economy and Sustainable Development	No
	Ministry of Regional Development and Infrastructure	No
Indicators	General digital skills indicators	Yes
	Specific digital skills indicators for workforce/ICT specialists	Yes
	Specific indicators measuring digital skills and use of ICT in Education	No
	Digital technologies for business	Yes
	eCommerce digitalisation indicators	Yes
	Environmental sustainability in ICT indicators	No
	Digital public service indicators for citizens	No/Partly
	Digital public service indicators for businesses	No/Partly
	Open data indicators	Yes
Methodologies	Eurostat - Community survey on ICT usage in Households and by People	Yes
	Eurostat - Labour force survey	Yes
	Eurostat - Community survey on ICT usage and e-commerce in enterprises	Yes
	Studies of businesses on use of technologies	No
	eGovernment Benchmark	No
	Open data measurement studies ²⁷	Yes

Source: Questionnaire of DESI Accelerator for collecting information about DESI measurement

8.3.2. State of play

The primary authority responsible for collecting digital indicators In Georgia is the National Statistics Office of Georgia, commonly known as Geostat. Geostat has been identified as a sole organisation accountable for data collection within the country.

Georgia conducts regular nationwide community surveys that focus on ICT usage in both households and enterprises. These surveys employ questionnaires that are partly aligned with the standards adopted by Eurostat – Georgia uses the Eurostat template survey from 2020 and has adopted it to better fit national specific needs. The statistical office monitors the annual changes in the EU sample survey and apply them to the nation survey, if the newly implemented modules and questions are relatable to Georgian needs. So, from the general principal aspect the methodologies are in line with the EU principles, but from the questionnaire perspective it is not fully inline and comparable to EU data. The same approach applies for both of the core Eurostat surveys – household and enterprise. In Georgia a substantial portion of digital skills indicators has already been gathered

²⁷ Open data indicator is no longer measured by DESI 2023 methodology



through these existing surveys, as well as from various other data sources. The National Statistics Office of Georgia has been instrumental in collecting essential indicators related to internet usage.

From the household survey, the following indicators are available:

- Share of population aged 15 and older by purposes of internet use:
 - participating in social networks;
 - reading online news sites/newspapers/news magazines;
 - sending/receiving e-mails;
 - telephoning over the internet/video calls (via webcam) over the internet;
 - seeking health-related information;
 - finding information about goods or services;
 - looking for a job or sending a job application;
 - internet banking;
 - downloading software (other than games software)
- Share of population aged 15 and older using the internet for buying/ordering goods or services
- Distribution of population aged 15 and older who have carried out internet related activities within last 12 months by number of activities
- Distribution of population aged 15 and older who have carried out software related activities within last 12 months by number of activities
- SDG indicator 4.4.1: Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill.

Currently, indicators related to the integration of digital technology in enterprises are partially collected. Examples of these indicators encompass Enterprise Resource Planning, Customer Relationship Management, social media usage, cloud computing adoption, Internet of Things implementation, and artificial intelligence utilisation. Additionally, web sales and Electronic Data Interchange (EDI)-type sales, which include cross-border online sales, are incorporated into the survey. Existing indicators regarding the integration of digital technology are collected through a regular nationwide enterprise survey.

In regard to ICT indicators in education, all duly authorised higher education institutions operating within Georgia bear the responsibility of documenting specific student information within the education management information system (EMIS) database. EMIS aligns its data collection efforts with the government's annual statistical work program. EMIS provides comprehensive data on student enrolments in computer technologies across various levels of general, higher, and vocational education. The uploaded data also consists of information about the higher educational institution, the education level, the academic program etc., this data includes both overall enrolment figures and gender-specific breakdowns.

It's worth noting that, according to desk research, there is an existing '*Labour force survey*' in Georgia that adheres to Eurostat methodologies²⁸.

Furthermore, Georgia has actively participated in the open data monitoring process, aligning its data practices with the EU countries. Data availability is in line with EU methodologies, enhancing comparability.

However, there are currently no indications or information available regarding indicator measurements related to eGovernment benchmarking in Georgia. This area may warrant further attention and development to align with international best practices.

8.3.3. Conclusions on compliance with the EU existing survey methodologies

Household survey

The households and individuals survey in Georgia ('*Survey on Information and Communication Technologies Usage in Households*') is currently partly in line with the EU methodologies. The survey used in Georgia is not fully aligned with the EU current sample survey, Geostat has evaluated the EU standard sample surveys and adopted it to the national needs. The household sample includes all private households of the country. Sample unit is represented by randomly selected household disregarding the number of household members and their

²⁸ <https://www.geostat.ge/media/39911/Labour-Force-Survey.pdf>



economic conditions. In 2022 sample size comprised 9,900 households, of which 5,154 households were interviewed.²⁹ The sampling methodology and the sample size is in line with the EU methodologies.

Enterprise survey

The enterprise survey in Georgia (*'ICT usage in Enterprises'*) is partly in line with the EU methodologies. The survey used in Georgia is not fully aligned with the EU current sample survey, Geostat has evaluated the EU proposed sample survey and adopted it to the national needs. The questionnaire is filled for any organisational form of business, regardless of the economic activity of the company, the size of the property and the size of the enterprise. The survey is targeted at enterprises with one and more employees and sample size is 5,000 enterprises.³⁰

Labour force survey

Labour force statistics are produced based on sample survey of households by the National Statistics Office of Georgia. The main aim of the survey is to produce labour force (employed, unemployed and population outside the labour force) indicators on the population aged 15 years and older. In 1998-2016, an *'Integrated Household Survey'* was used as the source for collecting labour force indicators. In 2017 the labour force module was separated from the *'Integrated Household Survey'* and independent *'Labour force survey'* was established. In 1998-2016 a sample size of the survey was about 3,400 households, in 2017-2018 – 6,000 households and since 2019 – 6,400 households. The methodology and the sample size are in line with the EU methodologies.³¹

Data from the Ministry of Education on ICT graduates/specialists

A desk study indicates the availability of annual educational data collection administered by the Ministry of Education and Science of Georgia through EMIS. Implemented with the support of the World Bank to ensure high data quality, EMIS offers comprehensive information on student enrolments in computer technologies across various levels of general, higher, and vocational education. The uploaded data includes information about the higher educational institution, education level, academic program, etc. This dataset comprises both overall enrolment figures and gender-specific breakdowns. The data aligns with EU methodologies.

eGovernment benchmarking

Georgia is currently not included in the eGovernment benchmarking indicator calculation, and no indications have been found nor reported in the survey on countries data collection on the respective field.

Open data portal

The 2021 edition of the Open data landscaping exercise assesses the maturity of 34 countries including two Eastern partner countries: Georgia and Ukraine.³² So Georgia as the existing open data measurement methodologies in place in line with EU methodologies.

8.3.4. Recommendations for DESI implementation

Georgia has initiated the preliminary steps towards aligning its DESI indicator measurements with the EU methodologies. The desk research analysis underscores the progress made by Georgia in moving towards full alignment. These initial steps are indicative of Georgia's commitment to enhancing its digital landscape and facilitating data comparability with its EU counterparts.

8.3.5. Practical steps for full DESI implementation roadmap in Georgia

This section outlines future steps and points of improvement for DESI implementation. The detailed action points will be identified in DESI Support Roadmaps, prepared with the involvement of national stakeholders in the countries.

²⁹ https://www.geostat.ge/media/49728/0703_111122_EN.PDF

³⁰ <https://www.geostat.ge/media/54958/European-businesses-statistics-compilers%E2%80%99-manual-for-ICT-usage-and-e-commerce-in-enterprises-2022-survey-edition.pdf>

³¹ <https://www.geostat.ge/media/39911/Labour-Force-Survey.pdf>

³² <https://drive.google.com/file/d/18SbygmbmdYG-5h3SnobIDUjNIUFwdfzm/view>



Table 12. Status of alignment of data sources in Georgia with the EU methodologies

Data sources in DESI	Data sources in Georgia	Alignment process	Future steps
Community survey on ICT usage in Households and by People	Survey on Information and Communication Technologies Usage in Households	Partly aligned ³³	Research the possibilities on implementation of full alignment.
Community survey on ICT usage and e-commerce in enterprises	ICT usage in Enterprises	Partly aligned	Research the possibilities on implementation of full alignment.
Labor force survey	Labor force survey	Partly aligned	Research the possibilities on implementation of more detailed ICT profession classification.
Data from Ministry of Education on ICT graduates/specialists	Data from Ministry of Education on ICT graduates/specialists	Fully aligned	No additional activities required.
Environmental awareness	-	Have not been implemented	Research the possibilities of indicator alignment and inclusion in the existing data sources.
E-Government benchmarking	-	Have not been implemented	Research the possibilities of indicator alignment and inclusion in the existing data source.
Open data portal	Open data portal	Fully aligned	No additional activities required.

Source: Questionnaire of DESI Accelerator for collecting information about DESI measurement

Harmonisation of the existing data sources

To enhance the measurement of DESI, Georgia should closely follow the development of EU methodologies. This entails an ongoing commitment to align its assessment methodologies with the evolving standards outlined by the European Union. Specifically, Georgia should adapt its questionnaires in response to the annual changes made by the EU in order to ensure that its measurements remain accurate and relevant. A collaborative approach with the EU can facilitate the sharing of knowledge and resources, ultimately bolstering Georgia's capacity to comprehensively measure digital indicators within its population.

Georgia has already taken important steps in this direction by aligning the general statistical principles with the recommendations of international organisations, but currently lack the more detailed alignment with current modification of the EU methodologies. However, it is recommended that Georgia continues to strengthen its cooperation with EU organisations to stay aware of the necessary changes in questionnaire design and indicator measurement.

Additional data source implementation

Georgia currently is not involved in the eGovernment benchmarking study. It is advised to research the possibility for the inclusion in the joint study. Alternatively, the creation of a new research initiative aligned with the methodologies of eGovernment benchmarking should be considered. Additionally, further studies are warranted to monitor the evolution of indicator collection at the EU level, as well as any potential shifts in data source strategies within the upcoming years of the DESI.

Capacity building and knowledge sharing

Georgia has already invested commendable resources in capacity building and knowledge sharing endeavours. To further strengthen these initiatives and ensure full harmonisation with existing EU methodologies, it's essential to take additional actions. An in-depth assessment of capacity-building needs should be undertaken, involving engaged stakeholders in a thorough needs analysis. This analysis will shed light on specific areas that

³³ <https://www.geostat.ge/en/modules/categories/561/survey-on-information-and-communication-technologies>



require further development, enabling Georgia to tailor its capacity-building efforts more effectively. By doing so, the country can amplify its capabilities and ensure a comprehensive alignment with EU standards.

8.4. Armenia

8.4.1. Overview

The table below provides an overview of the inputs gathered from Armenian representatives via ‘*Questionnaire of DESI Accelerator for collecting information about DESI measurement*’ as well as conducted by desk research. These inputs have been validated by Armenian experts to ensure the high quality of the following analysis.

Table 13. Results on DESI data collection in Armenia

Results on DESI data collection		Armenia
Organisations	Statistical Committee of the Republic of Armenia (Armstat)	Yes
	Ministry of Education, Science, Culture and Sport	No
	Ministry of High-Tech Industry	No
	Ministry of Territorial Administration and Infrastructure	No
Indicators	General digital skills indicators	Yes
	Specific digital skills indicators for workforce/ICT specialists	Yes
	Specific indicators measuring digital skills and use of ICT in Education	Yes
	Digital technologies for business	No
	eCommerce digitalisation indicators	No
	Environmental sustainability in ICT indicators	No
	Digital public service indicators for citizens	No
	Digital public service indicators for businesses	No
	Open data indicators	No
Methodologies	Eurostat - Community survey on ICT usage in Households and by People	Yes
	Eurostat - Labor force survey	Yes
	Eurostat - Community survey on ICT usage and e-commerce in enterprises	Yes ³⁴
	Studies of businesses on use of technologies	No
	eGovernment Benchmark	No
	Open data measurement studies ³⁵	No

Source: *Questionnaire of DESI Accelerator for collecting information about DESI measurement*

8.4.2. State of play

Statistical Committee of the Republic of Armenia (Armstat) is the primary organisation responsible for data collection in the country. Currently, the Ministry of Economy in Armenia is taking proactive steps by developing the ‘*Priority Action Plan for the Digital Transformation of Selected Sectors in Armenia’s Economy*’ concept. This initiative underscores Armenia’s commitment to fostering digitalisation and enhancing the digital economy within the country. These efforts align with the government’s broader focus on leveraging technology and innovation as catalysts for economic growth and competitiveness.

In the realm of general digital skills indicators, Armenia has placed particular emphasis on calculating the following key indicators:

³⁴ The indicator measurements will start from 2024

³⁵ Open data indicator is no longer measured by DESI 2023 methodology



- digital literacy,
- online participation,
- digital skills training,
- ITC specialists,
- internet use by businesses,
- digital public services.

In the domain of specific indicators measuring digital skills and the use of ICT in education, Armenia has emphasized the following indicators:

- access to ICT in schools,
- digital literacy of teachers,
- student digital literacy,
- integration of ICT in the curriculum,
- e-learning and online courses,
- digital assessment and feedback,
- open educational resources.

Armenia is presently not included in the eGovernment benchmarking indicator calculation, and there is no monitoring of the Open Data indicator. No indications have been found nor reported in the survey on data collection related to these specific fields.

Implementing the full DESI methodology in Armenia holds several potential benefits. This includes providing a standardised and internationally recognised assessment of Armenia's digital readiness, pinpointing areas of strength and those in need of improvement. The DESI can serve as a valuable benchmarking tool, allowing Armenia to gauge its digital performance against other countries in the European Union.

Moreover, adopting the DESI methodology can significantly support evidence-based policy-making and strategic planning within the digital domain. It enables the identification of priorities for investments, initiatives, and reforms that can further enhance Armenia's digital infrastructure, connectivity, digital skills, e-government services, and digital businesses.

However, it's important to acknowledge that implementing the full DESI methodology may create the need for substantial resources, rigorous data collection, and effective coordination among various stakeholders. Ensuring the availability of reliable data and indicators specific to Armenia's context is vital to accurately assess its digital performance and receive actionable insights for continued digital development.

8.4.3. Conclusions on compliance with the EU existing survey methodologies

Household survey

Armenia has in place an annual household survey – *'Integrated living conditions survey'*. The survey has only been partly aligned with EU methodologies and covers the basic indicators on computer usage. The sample size of the survey is 5,184 households, which is in line with the EU methodologies. However, the survey lacks a part of the EU survey skills related indicators.³⁶

Enterprise survey

Currently Armenia does not have an existing enterprise survey focusing on ICT usage in enterprises. However, since 2023, Armstat with the methodological and financial support of the World Bank has initiated to collect more detailed information on e-commerce by the survey *'Information and communication technology usage and e-commerce in enterprises'* within the framework of the *Economic governance, business environment and firm productivity (P172969) FCI* project. One of the modules of the survey questionnaire is on e-commerce. The survey is now underway.

Labour force survey

Currently Armenia is collecting data on labor force.³⁷ The desk research indicates that there is an existing labor force survey which uses the standard methodology and procedures applied at the internationally level in accordance with the International Labour Organisation standards. Some of the labor force reflective indicators are included in the household survey.³⁸

Data from Ministry of Education, Science, Culture and Sport on ICT graduates/specialists

³⁶ <https://armstat.am/en/?nid=208>

³⁷ <https://www.armstat.am/am/?nid=48>

³⁸ https://www.ilo.org/surveyLib/index.php/catalog/6548/data-dictionary/FA_ARM_LFS_2019_FULL?file_name=ARM_LFS_2019_FULL



Armenia currently collects data on indicators ‘number of computers’ and ‘number of schools with internet access’. This information is provided by National Center of Educational Technologies³⁹ of the Ministry of Education, Science, Culture and Sport of the Republic of Armenia. The number of graduates with the specialty ‘Information and Communication Technologies’ in the field of secondary professional and higher professional education, as well as with the specialty ‘Informatics and Information Technologies’ in the field of initial / vocational / professional education is published every year by the RA Statistical Committee, on the basis of which the number of graduates with the ICT specialty can be calculated.

eGovernment benchmarking

Armenia is presently not included in the eGovernment benchmarking indicator calculation.

Open data portal

Armenia is presently not included in the Open data portal monitoring. However, the initiative launched by the Open Data Armenia project aims to establish a basis towards sustainable open data ecosystem in Armenia.⁴⁰

8.4.4. Recommendations for DESI implementation

Currently Armenia is in the beginning process of alignment with EU methodologies regarding DESI indicator measurement. An existing household survey covers some of the respective general digital skills indicators, but the survey is not fully aligned with EU methodologies. Further steps have been taken on implementing an enterprise survey regarding ICT usage in businesses and eCommerce. With the support of World Bank Armenia plans to start developing this survey and its adaptation to national needs in 2023, although currently it’s unknown when the process would be finalised.

Regarding the labour force, Armenia has an existing labour force survey aligned with international methodologies.

Currently no measurements have been done in the field of open data, environmental aspects and eGovernment benchmarking.

8.4.5. Practical steps for full DESI implementation roadmap in Armenia

This section outlines future steps and points of improvement for DESI implementation. The detailed action points will be identified in DESI Support Roadmaps, prepared with the involvement of national stakeholders in the countries.

Table 14. Status of alignment of data sources in Armenia with the EU methodologies

Data sources in DESI	Data sources in Armenia	Alignment process	Future steps
Community survey on ICT usage in households and by people	Integrated living conditions survey	Partly aligned	Continue the alignment process, if needed invest in capacity building and gap analysis for more precise alignment.
Community survey on ICT usage and e-commerce in enterprises	Information and communication technologies (ICT) usage and e-commerce in enterprises	In process of implementation	Continue the implementation according to the plan and research possibilities to align methodologies with Eurostat. Research possibilities to devote resources for continuity of the survey
Labour force survey	Labour force survey	Partly aligned	Further work of alignment needed, sample size alignment recommended
Data from Ministry of Education on ICT graduates/specialists	Data from Armstat	Fully aligned	No further actions required

³⁹ <https://ktak.am/>

⁴⁰ <https://opendata.am/>



Data sources in DESI	Data sources in Armenia	Alignment process	Future steps
Environmental awareness	-	Have not been implemented	Research the possibilities of indicator alignment and inclusion in the existing data sources.
E-Government benchmarking	-	Have not been implemented	Research the possibilities of indicator alignment and inclusion in the existing data source.
Open data portal	-	Have not been implemented	Research the possibilities of indicator alignment and inclusion in the existing data source.

Source: Questionnaire of DESI Accelerator for collecting information about DESI measurement

Harmonisation of the existing data sources

To enhance the measurement of basic digital skills of the general population, Armenia should consider expanding its current data sources, such as the *'Integrated living conditions survey'*. This expansion could involve the inclusion of additional indicators and questions specifically related to basic digital skills. The *'Integrated living conditions survey'*, while comprehensive, may benefit from the inclusion of more in-depth inquiries related to digital proficiency. This would provide a more nuanced understanding of the population's digital capabilities and needs.

Armenia's current survey on ICT usage and e-commerce in enterprises is still in the development phase, with the support from the World Bank. Plans are underway to align this survey with international standards and practices. It is recommended that Armenia closely follows the methodologies established by the European Union for conducting such surveys. Adhering to EU methodologies can significantly enhance the alignment process, ensuring that Armenia's data is directly comparable with that of EU member states. However, to evaluate the full alignment process, including the relevance and effectiveness of the survey, it is essential to gather additional information from country representatives. These insights can shed light on the survey's target audience and its ability to capture meaningful data regarding ICT usage and e-commerce in Armenian enterprises. This collaborative approach will enable Armenia to tailor its data collection efforts more effectively and contribute to the development of a robust and internationally comparable dataset. Further information about sample size would be needed from country representatives.

Open Data Portal Implementation

While Armenia is presently not included in open data monitoring, desk research has revealed ongoing initiatives in the development of an open data ecosystem within the country. It is recommended to further endorse and bolster these open data initiatives, highlighting open data as a top priority for not only governmental institutions but also other stakeholders who can play a pivotal role in advancing this cause. To strengthen the open data ecosystem, it's essential to conduct a thorough analysis of the current gaps in the harmonisation process with international standards, particularly those set by the European Union. This analysis will serve as the cornerstone for a strategic roadmap designed to achieve full alignment with EU open data standards. As seen in the further development of the upcoming DESI methodology, open data indicators are no longer part of the DESI calculation. Therefore, the advice regarding open data is of a recommendatory nature.

Additional data source implementation

Armenia currently lacks the necessary data sources for monitoring Green ICT and eGovernment benchmarking indicators. It is advisable to explore avenues for incorporating these indicators into existing data sources, such as integrating environmental aspects within the upcoming enterprise survey. Alternatively, the creation of a new research initiative aligned with the methodologies of eGovernment benchmarking should be considered. Additionally, further studies are warranted to monitor the evolution of indicator collection at the EU level, as well as any potential shifts in data source strategies within the upcoming years of DESI, as it is seen that in future calculation Green ICT monitoring is no longer a separate study but integrated in the Eurostat surveys.

Capacity building and knowledge sharing

It is recommended that Armenia continues its path on the methodological alignment and to further strengthen these initiatives and ensure full harmonisation with existing EU methodologies. It is also essential to take additional actions. An in-depth assessment of capacity-building needs should be undertaken, involving engaged stakeholders in a thorough needs analysis. This analysis will shed light on specific areas that require further development, enabling Armenia to tailor its capacity-building efforts more effectively. By doing so, the country can amplify its capabilities and ensure a comprehensive alignment with EU standards.

8.5. Azerbaijan

8.5.1. Overview

The table below provides an overview of the inputs gathered from the representatives from Azerbaijan via 'Questionnaire of DESI Accelerator for collecting information about DESI measurement' as well as conducted by desk research. These inputs have been validated by experts from Azerbaijan to ensure the high quality of the following analysis.

Table 15. Results on DESI data collection in Azerbaijan

Results on DESI data collection		Azerbaijan
Organisations	The State Statistical Committee of Azerbaijan	Yes
	Ministry of Economy	Yes
	Ministry of Science and Education	Yes
	Ministry of Digital Development and Transport	Yes
Indicators	General digital skills indicators	Yes
	Specific digital skills indicators for workforce/ICT specialists	Yes
	Specific indicators measuring digital skills and use of ICT in Education	Yes
	Digital technologies for business	Yes
	eCommerce digitalisation indicators	Yes
	Environmental sustainability in ICT indicators	No
	Digital public service indicators for citizens	No
	Digital public service indicators for businesses	No
Methodologies	Open data indicators	No
	Eurostat - Community survey on ICT usage in Households and by People	Yes
	Eurostat - Labor force survey	Yes
	Eurostat - Community survey on ICT usage and e-commerce in enterprises	Yes
	Studies of businesses on use of technologies	No
	eGovernment Benchmark	No
Open data measurement studies ⁴¹	No	

Source: Questionnaire of DESI Accelerator for collecting information about DESI measurement

8.5.2. State of play

The State Statistical Committee of Azerbaijan serves as the central authority responsible for statistical indicator collection in the country. Additionally, various ministries, namely the Ministry of Digital Development and Transport and Innovation and Digital Development Agency under the ministry. Ministry of Education and Science plays active role for the methodology guidance for the digital development data collection and monitoring and are leading specific fields related to data collection - for example public services for business and citizens, digitalisation of education.

Azerbaijan's current data collection efforts encompass a wide array of indicators, ranging from general digital skills to specific areas within education and workforce. However, it's noteworthy that the methodologies employed are not entirely aligned with European standards and there is a room for improvement in terms of collecting all DESI-related indicators. The collected information is compiled annually and is publicly available through the *National statistical yearbook*.

⁴¹ Open data indicator is no longer measured by DESI 2023 methodology



The statistical yearbook provides comprehensive insights into various aspects of ICT usage in households and enterprises, internet access opportunities and usage patterns, the ICT development index, e-skills of the population, and key macro indicators related to the ICT sector, including the import and export dynamics of ICT products. The latest published report *'Information society in Azerbaijan 2022'* is available through the publications catalogue⁴². Additionally, main statistics regarding ICT use by citizens and enterprises, as well as digital skills statistics of Azerbaijan citizens are available on the home page of the Ministry of Digital Development and Transport.⁴³

In recent years, collaborative efforts between the UNDP and SSC have resulted in the publication of annual Sustainable development goals reports. These reports include data for nine sub-indicators related to ICT, categorizing basic, standard, and advanced ICT skills.

Looking forward, a significant upcoming initiative involves collaboration between the ITU, State Statistical Committee, and Ministry of Digital Development and Transport. Surveys measuring digital skills based on the new ITU⁴⁴ methodology are planned among households, students, and both public and private sector personnel. The first data collection round took place in September 2023. This marks the first time such surveys were conducted in Azerbaijan. The resultant report is slated for release in December 2023, with the intention to replicate this project annually thereafter.

This strategic collaboration not only signifies Azerbaijan's commitment to enhancing its digital skills assessment but also showcases the nation's proactive approach to aligning its methodologies with international standards. By engaging in these initiatives and refining its data collection methods, Azerbaijan is on the path to provide more accurate and internationally comparable insights into its digital landscape.

8.5.3. Conclusions on compliance with the EU existing survey methodologies

Household survey

Currently a household survey (*'Information society survey for households'*) has been established in Azerbaijan, but its methodology does not fully comply with the existing EU methodologies. The data from 2022 implies different sampling methodology than the one of EU survey – a data collection survey of 28.2 thousand members of households aged 7 years old and over that were selected by random sampling method, has been carried out for the purpose to obtain updated data for 2021.⁴⁵ Currently the household surveys have been performed annually from 2018-2022.

From 2023 Azerbaijan has implemented the ITU methodology for measuring digital skills and use of ICT among households, students, and both public and private sector personnel.

Enterprise survey

Currently an enterprise survey is established in Azerbaijan, but its methodology does not comply with the existing EU methodologies. While the survey covers fundamental indicators of enterprise digitalisation, many indicators of EU sample survey are absent. Aligning its methodology with EU guidelines would enhance its usefulness and at the same time would not require too much additional efforts. The sampling approach is different than for Eurostat survey – it is mandatory for all legal entities who use/ have computers.

Labour force survey

Despite the fact that a dedicated Labour force survey was not mentioned in the Questionnaire, desk research indicates that labour force-related indicators are collected annually. The latest statistical yearbook available for 2022 offers valuable insights. To strengthen this aspect, ensuring the consistent and comprehensive collection of labour force data is vital. Regular updates and adherence to international standards would bolster the reliability of this information.⁴⁶

Data from Ministry of Education on ICT graduates/specialists

Based on the national survey, the Ministry of Science and Education in Azerbaijan is actively collecting data related to ICT graduates, aligning with the 1b4 DESI indicator.⁴⁷

eGovernment benchmarking

⁴² https://www.stat.gov.az/menu/6/catalogue_st_p/KATALOQ-2023.pdf

⁴³ <https://mincom.gov.az/en/media-en/statistical-data>

⁴⁴ <https://academy.itu.int/itu-d/projects-activities/research-publications/digital-skills-insights/digital-skills-assessment-guidebook>

⁴⁵ Official publication Information society in Azerbaijan. Statistical yearbook 2022

⁴⁶ https://www.stat.gov.az/menu/6/statistical_yearbooks/source/emek_bazari_2023.zip

⁴⁷ <https://edu.gov.az/en/>



Azerbaijan, while not yet part of the eGovernment benchmarking study for DESI indicator calculation, has entrusted the Innovation and Digital Development Agency with the responsibility of monitoring e-government services and their implementation. Regular assessments and benchmarking against international standards are foreseen and could drive improvements in e-government services, enhancing citizen experiences and administrative efficiency.

Open data portal

A significant milestone in Azerbaijan's digital journey is the establishment of an open data portal by the Ministry of Digital Development and Transport. The portal, updated and improved in 2022, operates in compliance with the Laws 'On Access to Information' and 'On Information, Informatisation, and Protection of Information'. While not yet included in the EU Open Data study, Azerbaijan's commitment to open data principles lays a strong foundation for transparent governance and data-driven innovation.

8.5.4. Recommendations for DESI implementation

Currently Azerbaijan is in the process of aligning its digital indicators, a task that is ongoing. However, it's important to note that not all data sources have been aligned, and initiatives for upgrading existing methodologies have not yet been fully developed in line with existing EU standards. Despite this, the country has expressed a keen interest in future alignment with the DESI. The fundamental data sources required for this alignment are already in place within the country's infrastructure.

Efforts to align digital measurement data should be comprehensive, addressing all aspects of the existing methodologies that do not conform to EU methodologies. This process involves meticulous evaluation and modification of data collection methods, ensuring they are not only accurate but also in harmony with EU guidelines. Additionally, focusing on upgrading the existing methodologies will play a pivotal role in ensuring the reliability and comparability of data on digital skills.

Furthermore, it's crucial for Azerbaijan to actively engage with the EU and participate in knowledge-sharing events and collaborations. By doing so, the country can gain valuable insights and technical expertise, facilitating a smoother alignment process. Establishing partnerships with EU institutions and experts could significantly expedite the development of methodologies in accordance with EU methodologies. A gap analysis of the needed competences is also recommended, to address more targeted knowledge sharing process.

8.5.5. Practical steps for full DESI implementation roadmap in Azerbaijan

This section outlines future steps and points of improvement for DESI implementation. The detailed action points will be identified in DESI Support Roadmaps, prepared with the involvement of national stakeholders in the countries.

Table 16. Status of alignment of data sources in Azerbaijan with the EU methodologies

Data sources in DESI	Data sources in Azerbaijan	Alignment process	Future steps
Community survey on ICT usage in Households and by People	Information society survey for households. Since 2023- ITU methodology for measuring digital skills and use of ICT among households, students, public and private sector personnel	Partly aligned	Research gap analysis for ITU methodology and Eurostat survey and possibility to align indicators and sampling approach.
Community survey on ICT usage and e-commerce in enterprises	Enterprise survey	Partly aligned	Continue the alignment process with Eurostat survey. If needed invest in capacity building and gap analysis for more precise alignment.
Labour force survey	Labour force survey	Partly aligned	Further work of alignment needed, sample size alignment recommended.
Data from Ministry of Education on ICT graduates/specialists	Data from Ministry of Education and Science	Fully aligned	No further actions required



Data sources in DESI	Data sources in Azerbaijan	Alignment process	Future steps
	on ICT graduates/specialists		
Environmental awareness	-	Have not been implemented	Research the possibilities of indicator alignment and inclusion in the existing data sources.
E-Government benchmarking	-	Have not been implemented	Research the possibilities of indicator alignment and inclusion in the existing data source.
Open data portal		Partly aligned	Research the possibilities of indicator alignment and inclusion in the existing data source.

Source: Questionnaire of DESI Accelerator for collecting information about DESI measurement

Harmonisation of the existing data sources

To enhance the measurement of basic digital skills within the general population, Azerbaijan should consider aligning its methods with existing EU methodologies and expanding the current indicator measurements. This expansion should include the addition of specific indicators and questions related to basic digital skills. Such an approach would provide a more nuanced understanding of the population's digital capabilities and needs. Addressing this misalignment is crucial for ensuring the accuracy and comparability of the data in international contexts. Efforts to conform to EU methodologies could involve revisiting the sampling methods and survey structure.

Azerbaijan's survey on ICT in enterprises is not aligned with the current EU methodologies. It is recommended that Azerbaijan closely follows the methodologies established by the EU for conducting such surveys. Adhering to EU methodologies can significantly enhance the alignment process, ensuring that Azerbaijan's data is directly comparable with that of EU member states. However, to evaluate the full alignment process, including the relevance and effectiveness of the survey, it is essential to gather additional information from country representatives.

Open Data Portal Implementation

While Azerbaijan is presently not included in Open Data monitoring, desk research has revealed ongoing initiatives in the development of an Open Data ecosystem within the country. It is recommended to further develop these open data initiatives, highlighting open data as a top priority for not only governmental institutions but also other stakeholders who can play a pivotal role in advancing this cause. To strengthen the open data ecosystem, it's essential to conduct a thorough analysis of the current gaps in the harmonisation process with international standards, particularly those set by the European Union. As seen in the further development of the upcoming DESI methodology, open data indicators are no longer part of the DESI calculation. Therefore, the advice regarding open data is of a recommendatory nature.

Additional data source implementation

Azerbaijan currently lacks the necessary data sources for monitoring Green ICT and eGovernment benchmarking indicators. It is advisable to explore possibilities for incorporating these indicators into existing data sources, such as integrating environmental aspects within the enterprise survey. Alternatively, the creation of a new research initiative aligned with the methodologies of EU should be considered. Additionally, further studies are suggested to monitor the evolution of indicator collection at the EU level, as well as any potential shifts in data source strategies within the upcoming years of the DESI.

Capacity building and knowledge sharing

It is recommended that Azerbaijan continues its path on methodological alignment and to further strengthen these initiatives and ensure full harmonisation with existing EU methodologies, it's essential to take additional actions. An in-depth assessment of capacity-building needs should be undertaken, involving engaged stakeholders in a thorough needs analysis. This analysis will shed light on specific areas that require further development, enabling Azerbaijan to tailor its capacity-building efforts more effectively. By doing so, the country can amplify its capabilities and ensure a comprehensive alignment with EU standards.



9. Next steps of DESI Accelerator

9.1. DESI Support Roadmaps

As a next step of the activity, DESI Support Roadmaps will be developed within DESI Accelerator.

These support roadmaps for DESI implementation in Eastern partner countries will serve as a baseline for the second stage of DESI Accelerator activity in Eastern partner countries, which will focus on provision of capacity building for data collection institutions to foster DESI implementation. Thus, they will aim to identify strategic directions of technical support to be provided by EU4Digital for stakeholders of Eastern partner countries.

The support maps will focus on the action items and potential support from EU4Digital, such as:

- Methodological support in DESI implementation
- Trainings, consultations, and experience exchange activities on DESI for data collection institutions.

The involvement of national stakeholders in the development of the roadmap for DESI implementation will allow to consider and align with national needs, priorities and capabilities.



10. Annexes

[Annex 1 - DESI Methodological Note 2023](#)

[Annex 2 - Survey on ICT usage and e-commerce in enterprises 2024](#)

[Annex 3 - Survey on the use of ICT in households and by individuals 2024](#)