





Methodological report Information society

Statistics Poland
Statistical Office in Szczecin

Content-related works

Statistical Office in Szczecin. Centre for Science, Technology, Innovation and Information Society Statistics

Supervised by

Magdalena Wegner

Editorial team

Michał Gatowski, Mateusz Gumiński, Wojciech Guzowski, Michał Huet, Katarzyna Juszcak, Patrycja Krupska, Mariola Kwiatkowska, Aneta Malesza, Piotr Mordan, Magdalena Orczykowska, Joanna Piotrowska

Cooperation

Dawid Formella – Statistical Office in Łódź, Centre for Mathematical Statistics (with regard to “Survey method” for the survey on ICT usage in enterprises)

Karolina Warno – Statistics Poland, Survey Methodology Department (with regard to “Survey method” for the survey on ICT usage in households and by individuals, and in the survey on the use of advanced technologies in industry)

Wiesław Strzelecki – Statistical Computing Centre, Data Collection Systems Department (a description of application design with regard to “Characteristics of data gathering tools” for the survey on ICT usage in households and by individuals)

Editorial work

Elżbieta Klimaszewska

Typesetting and graphics

Jerzy Rożek

Methodological report approved by Statistics Poland Methodological Commission

Publication available on website

<https://new.stat.gov.pl>

When publishing Statistics Poland data — please indicate the source

Preface

New information and communication technologies (ICT) are one of the key factors changing the world. Their continuous development and ubiquitous availability of digital products constitute a priority supporting the economic and social development of the state.

Information has become one of the main production factors as a result of continuous development of technology. On the one hand progress contributes to generate increasing information resources, but on the other hand the development of these resources is becoming a condition for creating new technologies, products, solutions.

The following publication aims at presenting the methodology of the survey on the information society conducted according to the Programme of Statistical Surveys of Official Statistics. The methodological report, prepared by employees of the Centre for Science, Technology, Innovation and Information Society Statistics at the Statistical Office in Szczecin, was divided into two parts. The first part covers surveys on ICT usage by in public administration units, in households and by individuals, and in enterprises. While the second part involves the survey on the use of advanced technologies in industry. It includes information on the subjective and objective scope of the surveys, used tools, organisation of surveys and forms of disseminating results.

The current update covers the years 2023–2026. Information concerning changes in relation to the previous editions of the Methodological report is included in annex 6.

Handing over the following publication, we would be grateful for any suggestion regarding its content and the scope of conducted statistical surveys. Your comments will be a valuable source of information for us.

Director
of the Statistical Office in Szczecin



Magdalena Wegner

Szczecin, August 2026

Metadata

Title of the methodological report	Methodological report Information society
Authors	Statistical Office in Szczecin Centre for Science Technology Innovation and Information Society Statistics
Subjective scope of the survey	SSI-03: public administration units; SSI-10: households with at least one person aged 16-89; SSI-01: national economy entities hiring at least 10 persons whose main economic activity is classified into the following sections of the Polish Classification of Activities PKD 2007 C, D, E, F, G, H, I, J, L, M, N or group 95.1, whereas into the following sections of PKD 2025 C, D, E, F, G, H, I, J, K, M, N, O or group 95.1; selected ¹ national economy entities belonging to enterprise groups according to Regulation (EU) 2019/2152 of the European Parliament and of the Council of 27 November 2019 on European business statistics, repealing 10 legal acts in the field of business statistics; SSI-04: national economy entities hiring at least 10 persons whose main economic activity is classified into the following sections of the Polish Classification of Activities B, C, D, E (both by PKD 2007 and PKD 2025).
Objective scope of the survey	Information society
The type and method of the survey	SSI-03: full-scale method; SSI-10: sample method with a drawn sample amounting to 0.06%; SSI-01: sample method with a drawn sample amounting to 18% (concerns entities hiring 10-249 persons), full-scale method (concerns entities hiring at least 250 persons); SSI-04: sample method with a drawn sample amounting to about 25%.
Data collection tools/data sources	Tool: SSI-03, SSI-01 and SSI-04: on-line questionnaire on the Reporting Portal, Survey IT System SSI-10: Internet self-enumeration (CAWI), telephone interview, personal interview (CAPI) Questionnaires: SSI-03 – Questionnaire on ICT usage; SSI-04 – The use of advanced technologies in industry Data source: information systems of the Ministry of Finance – data on deducing from taxation base tax-deducting expenses for robotisation CIT-RB
Presentation of survey results	News release and publications: ICT usage by public administration units , Information society in Poland , The use of advanced technologies in industry Publications: Information society in Poland , The use of advanced technologies in industry Databases: Local Data Bank (BDL) , Macroeconomic Data Bank (BDM) , Knowledge Databases (DBW) , STRATEG , Eurostat database , OECD database , ITU database Yearbooks: Concise Statistical Yearbook of Poland , Statistical Yearbook of the Republic of Poland , Statistical Yearbook of Voivodships Leaflet: How do we use the Internet?
Classifications used	Polish Classification of Activities (PKD 2007; PKD 2025) – PKD 2007 , PKD 2025 Classification of Occupations – KZiS Classification of Territorial Units for Statistics – NUTS classification
Date of compiling methodological report	August 2026

¹ A selection criterion is belonging of legal entities to enterprise groups included in the survey on the basis of the above mentioned criteria.

Contents

	Page
Preface	3
Metadata	4
Symbols	7
Introduction	8
Part 1	
1. Survey on ICT usage in public administration	9
1.1. Subjective and objective scope of the survey	9
1.2. Survey method	9
1.3. Characteristics of data gathering tools	10
1.4. Selected variables from the survey	10
1.5. Organisation and management of the survey implementation	11
1.6. Data presentation	12
1.7. Survey evaluation – preliminary assessment of the survey quality and data reliability	12
2. Survey on ICT usage in households and by individuals	13
2.1. Subjective and objective scope of survey.	13
2.2. Survey method	14
2.3. Characteristics of data collection tools	17
2.4. Selected variables used in the survey	18
2.5. Organisation and management of the survey implementation	19
2.6. Data presentation.	21
2.7. Data evaluation – preliminary assessment of the survey quality and data reliability.	24
3. Survey on ICT usage in enterprises	26
3.1. Subjective and objective scope of survey.	26
3.2. Survey method	28
3.3. Characteristics of data collection tools	30
3.4. Selected variables in the survey.	30
3.5. Organisation and management of the survey implementation	34
3.6. Data presentation.	34
3.7. Data evaluation – assessment of the survey quality and data reliability.	35
Part 2	
4. The use of advanced technologies in industry	37
4.1. Subjective and objective scope of the survey	37
4.2. Survey method	38
4.3. Characteristics of data collection tools	39

4.4. Main variables in the survey	40
4.5. Organisation and management of the survey implementation	42
4.6. Data presentation.	42
4.7. Survey evaluation – assessment of the survey quality and data reliability	43
Definitions of basic concepts used in surveys on the Information Society	44
Bibliography.	48
Annex	49
Attachments	51
1 SSI-03 Questionnaire on ICT usage in public administration units	
2 SSI-10G ICT usage in households. Questionnaire for households	
3 SSI-10I ICT usage in households. Questionnaire for individuals	
4 SSI-01 Questionnaire on ICT usage in enterprises	
5 SSI-04 The use of advanced technologies in industry	
6 Changes in Methodological report	

Symbols

Symbol	Description
ADSL	Asymmetric Digital Subscriber Line (faster downloading than uploading)
BSJ	Base of Statistical Units
CAPI	Computer Assisted Personal Interviewing
CAWI	Computer Assisted Web/Internet Interview
CV	Coefficient of variation
DEGURBA	Degree of urbanisation classification
DG-1	Report on economic activity
EBS	Regulation of the European Parliament and of the Council No. 2019/2152 establishing a uniform system of international information society statistics
EC	European Community
EU	European Union
EUROSTAT	Statistical Office of the European Union
F-01/I-01	Report on revenues, costs, financial result and expenditures on fixed assets
Statistics Poland	Statistics Poland
ICT	Information and Communication Technologies
JSP	First degree units
NACE	Classification of Economic Activities in the European Union
NUTS	Classification of Territorial Units for Statistical Purposes
PBSSP	Statistical Survey Program of Official Statistics
PKD	Polish Classification of Activities
SDSL	Symmetric Digital Subscriber Line (the same downloading and uploading speed)
SE	Standard error
SIB	IT system of the survey
SP	Yearly enterprises survey
VDSL	Very-high-bit-rate Digital Subscriber Line (much higher speed than ADSL but over shorter distance)
ZIT	Integrated territorial investments

Introduction

Information and Communication Technologies (ICT) are crucial in creating new sources of income and employment. Therefore, they have significant economic importance and their impact reaches far beyond the economic sphere. This is because ICT are general purpose technologies that cut across all aspects of social and economic life. Companies are changing their internal organisation to use them effectively. Public administration is adjusting ways of interaction with citizens and businesses. New means of communication are creating new behaviour patterns and the customer behaviour is changing. This issue constitutes one of the Polish and European development policy pillars.

The survey on usage of communication and information technologies aims at monitoring the level of access and usage of technologies in public administration units, enterprises, households and by individuals, as well as the use of advanced technologies in industrial enterprises.

The publication contains four chapters as well as an annex and attachments. The first chapter concerns characteristics of the survey on ICT usage in public administration units – government administration, including central offices, and local self-government administration. The second chapter includes issues concerning the survey on ICT usage in households and by individuals. The third chapter presents methodology of the survey on ICT usage in enterprises. The survey on the use of advanced technologies in industrial enterprises is presented in the fourth chapter.

The surveys concerning the usage of information and communication technologies in enterprises and households are conducted on the basis of the model questionnaires developed by statistical offices of the EU Member States and the Statistical Office of the European Union (Eurostat). An obligation to conduct surveys in enterprises in all Member States has been imposed by Regulation No. 2019/2152 establishing a uniform system of information society international statistics. ICT usage surveys have been conducted in all EU Member States on the basis of Regulation (EU) 2019/1700 of the European Parliament and of the Council of 10 October 2019 establishing a common framework for European statistics relating to persons and households. The above mentioned regulation has been in force since 2021. Commission implementing regulations, which describe in detail topics surveyed in the following reference year, are issued annually on the basis of Framework Regulations.

The Act of 29 June 1995 on Official Statistics (Journal of Laws of 2024, item 1799, as amended) and the annual regulations of the Council of Ministers concerning the Programme of Statistical Surveys of Official Statistics establishing the survey programme for a given year are the basis for conducting the survey Information society indicators in Poland.

Part 1

1. Survey on ICT usage in public administration

The survey ICT usage in public administration units in 2014 was conducted for the first time in 2015 by Statistics Poland as research work. It enabled obtaining information on availability of e-services, and the level of maturity and level of use by citizens and enterprises as well as the level of digitalisation of public administration units. The survey covered all commune, country, voivodship and marshal offices. In 2016 another edition of the survey was conducted as part of official duties supported by the letter of intent concerning co-operation between the Ministry of Regional Development and the President of Statistics Poland. The survey also covered government administration, including central offices. In comparison with the previous edition, the objective scope was significantly reduced but strategic information was collected. In 2017, preparatory works started for the survey which was conducted in 2018 as research work Acquiring indicators on e-administration to support the system of programming and monitoring cohesion policy in the financial perspective 2014-2020. The survey covered the years 2016 and 2017, and its objective scope was significantly increased. Since 2019 data on digitalisation of public administration units and e-services provided by these units have been collected within the Programme of Statistical Surveys of Official Statistics. The survey SSI-03 ICT usage by public administration units was created for domestic purposes.

1.1. Subjective and objective scope of the survey

The survey aims at, firstly, gathering information on usage of modern ICT in public administration units as well as ways and degree of use, secondly, gathering data on types and availability of public services provided via the Internet by public administration units.

The subjective scope of the survey covers public administration units in a breakdown by:

- government (state) administration units, including central offices,
- local self-government administration units in a breakdown by commune, country and marshal offices.

The following criteria are taken into account during the selection of units for the survey:

- ownership form: ownership of State Treasury, state legal persons, local self-government units or local self-government legal persons,
- specific legal form: funds, public administration bodies, state inspection and law enforcement bodies, state organisational units, commune self-government organisational units, county self-government organisational units, voivodship self-government organisational units,
- type of funding: self-financing units that are not budgetary units or self-government budgetary entities and budgetary units,
- type of unit: government and public authorities sector, including: ministries, selected units supervised by ministries, selected units supervised by the Prime Minister and local self-government sector,
- type of conducted activity according to the Polish Classification of Activities (Polish Classification of Activities 2007). The survey covers units that conduct activities classified by the Polish Classification of Activities (PKD 2007) into section O Public administration and defence; compulsory social security, excluding class 84.21.Z – Foreign affairs, and by PKD 2025 to section P.

Data on digitalisation of public administration units as well as type and level of availability of public services provided via the Internet by public administration units are the subject matter of the survey.

1.2. Survey method

Indicators on ICT usage by public administration units are collected within an annual, full-scale survey which covers units included in the population on the basis of previously determined features. The statistical population is established on the basis of a unit selection algorithm from the Base of Statistical Units. Units are selected on the basis of: type of activity, specific legal form, ownership form, financing type, type of unit – a designation introduced for statistical purposes. The survey file is created on the basis of units selected from the Base of Statistical Units and includes the following information: REGON number, type of unit, name, territorial symbol, address, e-mail and telephone number, legal and economic activity, type

of conducted activity, size class, number of persons employed, type of financing, ownership form and specific legal form. It also includes answers given by the unit in the previous edition of the survey if it fulfilled its statistical obligation for the purpose of correct validation of data collected in the currently conducted survey.

1.3. Characteristics of data gathering tools

The survey ICT usage in public administration units is conducted via the Reporting Portal of Statistics Poland with the use of an electronic questionnaire (Computer Assisted Web Interview method – CAWI) which constitutes a basic tool for collecting data. If a unit does not have an active account on the Reporting Portal, it is possible to fill in and submit a questionnaire in a paper form.

An electronic questionnaire is a representation of the questionnaire SSI-03 determined in the Programme of Statistical Surveys of Official Statistics for a given year.

Answers are given on an electronic questionnaire via:

- ticking a correct answer or selecting from a list – a so-called ‘glossary’,
- providing a numeric value in a box.

1.4. Selected variables from the survey

Due to the dynamic development of ICT and the systematic extension of the scope of electronic services provided by public administration units, the scope of questions included in the questionnaire may change in the subsequent years while maintaining the comparability of data included in national strategies. The questionnaire may include questions enabling obtaining data in accordance with the needs of users reported as remarks to the Programme of Statistical Surveys of Official Statistics. Main variables are presented below:

Access to the Internet.

This category includes broadband fixed lines (e.g. ADSL, SDSL, VDSL, optic fibre network, cable TV network, public Wi-Fi), broadband mobile lines (e.g. at least 3G) and narrowband mobile lines.

Maximal contracted speed of the fastest fixed Internet connection falling within determined bands.

Equipping persons employed with mobile devices enabling mobile connection with the Internet for professional purposes.

Providing remote access to resources, outside the premises.

This category includes remote access to:

- official e-mail,
- official documents in order to modify them,
- data of a unit,
- apps dedicated for a unit.

Implementation of an information security management system in accordance with ISO 27001 standard.

Hiring ICT specialists.

Providing ICT training to persons employed – in a breakdown by training for ICT specialists and other persons employed.

Performing tasks related to ICT support.

Tasks related to ICT include: maintenance of ICT infrastructure, supporting users of office software, development and maintenance of software, business management systems, Web solutions, ensuring ICT security and data protection. Development and maintenance of software is understood as developing tailor-made, customised software from scratch as well as customisation of purchased, packaged, off-the-shelf software. The sole purchase of standard software in regular sales (without any modification) is not a task related to ICT similarly to a standard update of regular antivirus software.

Using electronic document management system (EDMS).

Using AI solutions.

Using e-Delivery system - the registered electronic delivery service.

Using e-Procurement platform.

Having Open Data policy or strategy.

Providing online data from public registers or other data resources collected by an office.

Using Business Intelligence tools.

Using cloud computing solutions.

Meeting requirements of the Act of 4 April 2019 on digital accessibility of websites and mobile applications of public entities (Journal of Laws of 2023, item 1440) by websites.

Providing applications which can be downloaded on a mobile device.

Expenditures on ICT, of which expenditures on:

- IT equipment,
- telecommunications equipment.

1.5. Organisation and management of the survey implementation

The survey on ICT usage in public administration units is conducted by the Statistical Office in Szczecin. Employees of the Centre for Science, Technology, Innovation and Information Society Statistics form the author team. A detailed schedule of survey organisation: collecting and processing data, preparing control and output tables, disseminating data, is included in the survey schedule prepared in co-operation with the Survey Organisation and Registers Department of Statistics Poland.

Tasks of the author team during survey implementation include:

- preparing a survey schedule,
- preparing a questionnaire,
- preparing assumptions for control of a questionnaire,
- selecting units for the survey,
- preparing the survey file in accordance with a determined structure,
- verification of the survey file,
- testing the survey questionnaire via the Reporting Portal,
- conducting the survey via the Reporting Portal,
- supervision over the survey conduct,
- preparing the IT system of the survey,
- processing and validating data,
- preparing output tables,
- analysis and acceptance of output tables,
- disseminating data, including compiling data and preparing analyses for publications,
- updating databases,
- co-operation with public administration units with regard to the survey objective scope.

Survey coordinators co-operate with a team of programmers from the Centre for Data Engineering in the Statistical Office in Szczecin. The Centre supports processing of data collected from respondents, which contributes to effective compilation and analysis of results. The tasks of the team include, i.a. developing the IT system of the survey as well as new functionalities which streamline everyday work of statisticians and coordinators.

Statisticians, who are employees of the Survey Implementation Department at the Statistical Office in Szczecin, are responsible for direct contact with respondents and collecting data. Their tasks include explaining and correcting mistakes, registering

paper questionnaires in the IT system of the survey as well as monitoring timely submission of questionnaires and sending reminders to entities which did not submit a questionnaire on time. Implementation of the survey requires co-operation with other units of Statistics Poland. Employees of the Statistical IT Centre in Radom also take part in the survey. Their tasks include preparing on-line questionnaire on the Reporting Portal, maintaining its functionalities and sending notifications to users of the Reporting Portal concerning reporting obligation and its upcoming due date.

1.6. Data presentation

Data on ICT usage in public administration units are presented by type of unit, in a breakdown by state administration and local self-government administration, by commune, county and marshal offices. Indicators are presented in accordance with territorial division on a national and voivodship level, NUTS 1 level (macroregions), as well as NUTS2 (regions) level in accordance with NUTS classification in force during a reporting year. More information regarding NUTS classification can be found on the Statistics Poland website. [Statistics Poland | Regional Statistics| Territorial Units| NUTS Classification](#).

Data collected annually concern the reporting period from 1 January to 31 December of a survey year. Survey results are presented as output tables on the website of Statistics Poland (thematic area – Science and technology) once a year in May (data for the previous year). A summary of basic results of the survey is presented as news release (in May). A complete analysis of results is provided in the publication Information society in Poland in (...) published in December. Selected information on ICT usage in public administration units is also presented on the website of Statistics Poland in STRATEG database.

Meeting users' needs: government and local self-government administration, academia, media, citizens and organisations monitoring the implementation of public tasks.

Selected links to websites with data and information concerning ICT usage in public administration units presented as publications or a databases:

- Publication [Information society in Poland in \(...\)](#), Output tables: [The use of ICT in public administration units in 2024](#)
- [STRATEG](#)

1.7. Survey evaluation – preliminary assessment of the survey quality and data reliability

Data on ICT usage in public administration units have high completeness (almost 100%). The portal application with implemented validation rules ensures logical and arithmetic control of data. The quality and accuracy of data are checked after works in the Reporting Portal are finished with the use of the IT system of the survey. It includes the function of searching, filtering and generating reports, which enable analysis of completeness and consistency of a dataset, detecting cases differing from assumed correct situation. Tables with results are subject to detailed analysis in order to verify correctness of data.

The quality report for the survey SSI-03 can be found on the following website:

[Quality Reports](#)

2. Survey on ICT usage in households and by individuals

The survey on ICT usage in households and by individuals was introduced to the programme of statistical surveys of official statistics in 2004, initially as a pilot survey included in the Household Budget Survey and since 2005 as a stand-alone annual survey.

The survey on ICT usage in households and by individuals began in the EU in 2002. It covered about 120 000 households and 200 000 individuals in all Member States. Since 2021 the surveys on ICT usage have been conducted in all EU Member States on the basis of Regulation (EU) 2019/1700 of the European Parliament and of the Council of 10 October 2019 establishing a common framework for European statistics relating to persons and households, based on individual data collected with the use of a sampling method. This regulation, together with a supplementing regulation determining the number and name of variables for the field “using information and communication technologies”, creates a uniform system of international statistics enabling comparisons of ICT indicators.

2.1. Subjective and objective scope of survey

Subjective scope

A household with at least one person aged 16-89 and all household members in this age group constitute an observation unit in the survey on ICT usage in households and by individuals. Since 2025 the upper age limit has been increased under the Eurostat grant agreement. Previously, households with at least one person aged 16-74 and all household members in this age group were surveyed. Households in collective accommodation establishments (boarding house, workers' hostels, pensioners' houses, monasteries, etc.) are excluded from the survey, except for households of workers living in those establishments on account of employee services (e.g. manager of a hotel, janitor). Households of foreign citizens living in Poland permanently or for a prolonged period and using Polish language take part in the survey.

Household – is a group of related or non-related persons, sharing common residence and sharing household expenses or daily needs (a multiperson household) or a person making a living on his/her own, regardless of living with other persons or alone (a one-person household). Family members living together but making a living separately are different households. A size of household is determined by the number of persons making up its composition.

The household composition includes:

- persons living together in a household and making a living together, living or intending to live in a household for at least one year,
- persons absent from the household on account of work if income from such work is transferred to the family to make a living,
- persons absent from the household aged up to 15 years, learning away from the place of residence, living in boarding houses, dormitories or private houses,
- persons absent from the household during the surveyed period, staying in education and care facilities, care centres or hospitals if an actual or intended stay away from the household is shorter than a year.

The household composition excludes:

- persons absent from the household aged over 15 years, learning away from place of residence, living in boarding houses, dormitories or private houses,
- persons staying in prisons,
- persons absent from the household during the surveyed period, staying in education and care facilities, care centres or hospitals if an actual or intended stay away from the household is longer than a year,
- persons staying in the household during the surveyed period (a guest), present in the household or intending to stay for a period shorter than a year,
- tenants, including pupils and students at lodging (except for when they are treated by a surveyed household as members),
- persons renting out a room or bed for the period of work in a given locality (it concerns such works as meliorations, parcel measurements, logging, construction),

- persons living together with the household, employed by this household, e.g. home help, agriculture workers, pupils and apprentices).

Objective scope

The objective of the survey is ICT usage in households and by individuals.

Questions in Polish questionnaires are prepared on the basis of a model questionnaire developed by Eurostat. A model questionnaire is prepared in collaboration between Eurostat and Member States. The structure of a questionnaire is prepared on the basis of jointly defined questions and answers during meetings of working groups and task forces attended by coordinators of national surveys (Poland is represented by employees of the Statistical Office in Szczecin). Representatives of the European Commission and the OECD, who suggest new issues to be included in the survey, also take part in meetings.

The Polish questionnaire for households (compliant with a model questionnaire) includes questions concerning, among others:

- access of household to the Internet,

The Polish questionnaire for individuals (compliant with a model questionnaire) includes questions concerning:

- use of the Internet (when last use? how often?),
- purposes of using the Internet (in a breakdown by: communication, access to information, civil and political participation, health, professional life, entertainment),
- use of e-government (purposes of using, reasons for not submitting forms),
- use of electronic identification,
- use of e-commerce (when last purchase? types of bought or ordered goods or services),
- use of artificial intelligence,
- use of the Internet of Things (what devices or systems?, encountered problems),
- digital skills,
- performing privacy-related activities,
- green ICT.

An annex (table 1 and 2) includes the objective scope of the household survey since 2005.

Recipients of data from the survey *ICT usage in households and by individuals* include entities interested in monitoring the development of the information society, especially the Ministry of Digitalisation, the Ministry of Development Funds and Regional, local self-government units, voivodship offices, ICT enterprises, academia, media, citizens and organisations monitoring the implementation of public tasks.

The examples of using indicators concerning ICT usage in households in strategies, documents, etc. can be found in: the Strategy for Responsible Development, the Human Capital Development Strategy 2030, the National Strategy for Regional Development 2030 and the Path to the Digital Decade programme.

2.2. Survey method

Survey method

ICT usage in household and by individuals is a representative survey conducted via the Internet method, a direct interview or a telephone interview. When the survey begins respondents have an opportunity to fill in a questionnaire by themselves on a dedicated website. If they do not fill in a questionnaire or they make errors, interviewers will visit them and conduct a direct interview. Participation in the survey is voluntary. The household survey is conducted in April and May every year. The first pilot study conducted in July 2004 was an exception. A few reference periods depending on the type of collected information are used in the survey. Gathered data concern the last 3 months (this period should cover the first quarter of the year to ensure international comparability), the last 12 months and as of a given date.

Sampling

Two stage sampling with stratification at the first stage is used in the survey. Firstly, primary sampling units are drawn, then – dwellings.

Primary sampling units are selected on the basis of statistical regions determined for statistical censuses. A minimal number of addresses, which should be included in a primary sampling unit, depends on the size of a locality. Therefore, smaller statistical regions are linked with neighbouring ones. There are about 30 thousand primary sampling units in total.

Primary sampling units are divided into 217 strata taking into account division into subregions and size classes of localities. In the biggest cities a few strata were created by joining neighbouring districts. Big cities usually constituted strata alone. In the case of smaller cities and rural areas, groups of cities of similar size and rural areas belonging to one subregion constituted strata.

Primary sampling units are selected to a sample according to the following rules:

- the number of primary sampling units from a given stratum is approximately proportionate to the number of dwellings in a given stratum,
- the likelihood of choosing each primary sampling unit is proportionate to the number of dwellings in it – PPS sampling (a systematic sampling using Hartley-Rao method¹ is used for primary sampling units ranked in random order).

A sample is composed of two parts. The first part is a sample with 675 primary sampling units – drawn one year before the survey, taking part in the survey for the first time. The second part is a sample with the same size of 675 primary sampling units – drawn two years before the survey, taking part in the survey for the second time (it is a continuing sample from the previous year).

During the second stage, six dwellings for the main sample and twelve dwellings for the reserve sample are drawn using a simple sampling method in every primary sampling unit. The overall number of dwellings in the main sample amounts to 8100 (4050 in a new sample and 4050 in a continuing sample).

Generalisation of survey results

In sample surveys only a small part of the population is surveyed and information collected from households and individuals is generalised to the entire population using appropriate weights and estimation methods.

Firstly, weights resulting from drawing are calculated for every household:

$$w_{los} = \frac{N_h}{n_h}$$

where:

N_h	number of dwellings in a stratum h ,
n_h	number of dwellings drawn from a stratum h

Then, weights from drawing are adjusted in two stages. Firstly, weights are adjusted in relation to completeness. Values of two ratios R_a and R_g are determined. Information concerning conducting an interview included in variables Y1 and Y2 (Questionnaire for households SSI-10G, Section Y – Conducting an interview) is used for this purpose.

R_a is a ratio of all households (Y1=1, 2), excluding dwellings which do not belong to the surveyed population (Y2=1,2,3,4 – there is no such address, unoccupied dwelling, demolition of a dwelling or change of dwelling's use) to the number of all households with which contact was made (Y1=1 or Y2=10,13). The number of households is calculated with the use of weights from drawing but only one household from a dwelling is taken into account.

$$R_a = \frac{N - N_2}{N_1}$$

where:

N_1	weighted number of dwellings in which contact was made with a household (Y1=1 or Y2=10,13),
N_2	weighted number of dwellings excluded from the surveyed population (Y2=1,2,3,4),
N	weighted number of all dwellings (Y1=1, 2).

¹ D. Hartley, J. N. K. Rao "Sampling with Unequal Probabilities and without Replacement" (1962).

R_g is a ratio of the number of households with which contact was made ($Y1=1$ or $Y2=10,13$), except for those without a person aged 16-89 ($Y2=13$), to the number of households with which an interview was conducted ($Y1=1$), except for those without a person aged 16-89 ($Y2=13$), that is a ratio of the number of households with which an interview was conducted ($Y1=1$) or refused to participate ($Y2=10$) to the number of households with which an interview was conducted.

$$R_g = \frac{N_{11} + N_{12}}{N_{11}}$$

where:

N_{11}	weighted number of surveyed households ($Y1=1$),
N_{12}	weighted number of households which refused to participate ($Y2=10$)

Next, a weight from drawing is multiplied by a product of R_a and R_g for every dwelling. Weight obtained in such way is called w_1 .

$$w_1 = w_{los} \times R_a \times R_g$$

The above mentioned adjustment is done for six classes of localities:

1. Warsaw,
2. Kraków, Łódź, Poznań, Wrocław and Gdańsk, Gdynia, Sopot,
3. other cities with over 100 thousand inhabitants,
4. cities with 20 thousand to 100 thousand inhabitants,
5. cities with up to 20 thousand inhabitants,
6. rural areas.

Calibration of weights is another step. External data for calibration concern households and individuals. 10 classes of households and 24 classes of individuals are created. A classification of households is prepared on the basis of the following criteria: the number of persons in a household (one-, two-, three-, four-, five- or more persons) and place of residence (urban/rural area). Data on the number of households with at least one person aged 16-89 came from the current estimates of households of the resident population.

A classification of individuals is prepared using three criteria: sex, age and place of residence (urban/rural area). External data come from current estimates of the resident population and were adjusted by the number of persons living in collective accommodation establishments from the National Census of Population and Housing 2021.

Calibration aims at such "adjustment" of weight w_1 so that the ratio of final weight w_2 to weight w_1 is as close to one as possible. At the same time, it aims at ensuring generalisations with final weights reflect determined external data.

Weights for individuals w_{os} are determined separately. Firstly, weight w_2 of a household to which a person belongs is attributed to every person. Next, it is adjusted taking into account non-responses of individuals in classes: urban/rural area, sex, age group (24 classes). The ratio R is determined to calculate w_{os} .

R is a ratio of the number of all persons in surveyed households to the number of persons who were surveyed ($Y11=1, 2$). Information concerning conducting an interview included in variable $Y11$ (Questionnaire for individuals SSI-10I, Section Y – Conducting an interview) is used.

$$R = \frac{M_1 + M_2}{M_1}$$

$$w_{os} = w_2 \times R$$

where:

M_1	weighted number of surveyed individuals ($Y11=1,2$)
M_2	weighted number of not surveyed individuals ($Y11=3$)

Precision of results

The results of sample surveys are always affected by sampling errors resulting from the fact that a small part of a population is surveyed and results are generalised. Standard error and coefficient of variation (CV) are the measures of these errors applied to the results of this survey. Minimal error usually occurs for data for the whole country, while the biggest – for data in social and economic groups which are not numerous in the whole population (e.g. households with one adult or a child/children under 16 years). Precision indicators are calculated using formulas for two-stage stratified sampling, with the linearisation method additionally applied for ratios – an auxiliary variable is created and its variance is determined in the same way as for the total value.

2.3. Characteristics of data collection tools

Model questionnaires and data collection tools

In the survey on ICT usage two types of questionnaires are used:

- SSI-10G – a household questionnaire
- SSI-10I – an individual questionnaire.

Questionnaires used in the survey have a strictly determined layout. A heading includes a symbol of a voivodship, the number of a household, logo of Statistics Poland and contact address, symbol of the survey and its name. A further part includes sections corresponding to the objective scope of the survey. In a questionnaire SSI-10I (an individual questionnaire) the penultimate section concerns characteristics of a surveyed person. The last section in both questionnaires concerns conducting an interview with possible notes of an interviewer, date of conducting an interview and duration of an interview. Current model questionnaires are available on the website [Home Page | Social surveys](#).

Data collection methods

The survey is conducted with the use of CAPI method, telephone interview and CAWI.

In order to register data, interviewers use tablets with CAPI software (Computer Assisted Personal Interview) which is an electronic version of a questionnaire together with a control system for entered data with regard to their logical and calculating integrity. Collected results are then sent via the Internet to a central database for further processing. This system makes work of interviewers easier and significantly reduces the number on systematic errors occurring during data collection.

A dedicated CAWI application to collect data from respondents is also used.

An application represents the questionnaires SSI-10G ICT usage in households – a household questionnaire and SSI-10I ICT usage by individuals – an individual questionnaire which are considerably personalised due to the electronic implementation. An application is intended for work in an Internet browser and thanks to integration with a system for managing questionnaire surveys CORstat, it uses a number of services related to authentication and monitoring the implementation of the survey.

Before CAWI application is developed, assumptions based on routing prepared for CAPI are determined. Functionalities of an application which are important for persons working in web browser environment are described in detail.

Works involved in developing CAWI application are divided into a server-side component (managing database servers, application servers) and a client-side component (questionnaire logic - routing navigation, validation and the application's user interface).

A server-side component uses Tomcat server. Communication with an application takes place via REST (Representational State Transfer) API services. Data are stored in SQL Server and Cassandra Databases.

Client-side applications are developed using technologies applied commonly to develop Internet applications, that is JavaScript languages (TypeScript), HTML, CSS (SASS).

From an architecture perspective, client applications consist of the following components:

- an engine for questionnaire handling (executing questionnaire logic, data processing, creating a questionnaire's view model),

- a questionnaire application developed using the Vue 3 framework (responsible for rendering the graphical user interface of the questionnaire based on the view model provided by the engine. The questionnaire application is embedded within the wrapper application.
- a wrapper application (CAWI and CAPI) also developed using the Vue 3 framework (responsible for,—depending on the survey mode, data exchange with the server layer, client-side user authentication, preliminary verification of browser compatibility and other channel-specific functionalities, such as offline data storage in CAPI).

The user interface design is based on the Material Design standard widely used in Google products.

After developing an application, it undergoes testing to verify the correctness of the implemented validation rules and the overall organisation of the survey on the website. If any issues are identified during testing, they are corrected before the survey begins to fully finalise the production version. It is published on the website concerning the [SSI-10 survey](#).

Thanks to the use of an Internet application technology, technological neutrality of a tool is ensured (a respondent can run an application in any system environment offering Internet access), without the need to install additional items on a computer which could raise doubts with regard to IT security and, in consequence, decrease the interest in the survey.

A flexible design and up-to-date technical solutions allow the conclusion that a highly innovative tool, which can be developed during subsequent similar surveys, is used in the survey.

Access to an electronic questionnaire application requires confirmation of eligibility and identity of a user. Authenticating data of users with a login and password are generated in CORstat system and then distributed on the basis of a received survey file. Successful logging to an application is confirmed by displaying a start screen with identifying data of a unit (main unit), which means that a user works for an appropriate unit. A user is directed to a substantial part of a questionnaire after pressing a button “Fill-IN”.

An electronic questionnaire application in the survey SSI-10 ICT usage in households is divided into functional modules displayed in different views within one website, designed in a coherent layout making an application ergonomic and user-friendly. It is worth mentioning that responsiveness of an application, which enables work on various types of devices, i.e. PC, tablet, telephone, was ensured.

2.4. Selected variables used in the survey

Access to the Internet.

Access to the Internet includes both fixed and mobile Internet connection.

Fixed connections cover wired and wireless connections, e.g. DSL, ADSL, VDSL, cable modem, fiber optic cable, satellite connections, public radio connections (Wi-Fi).

Mobile connections include connections via mobile phone network, at least using 3G, e.g. 4G/LTE, 5G, via a SIM card or USB card, a mobile phone or smartphone as a modem.

Using the Internet in the last 3 months.

Not using the Internet.

Using the Internet on a regular basis.

Regular Internet users include persons using the Internet at least once a week.

Using the Internet for communication.

Communication is understood as doing the following activities:

- sending and receiving e-mails,
- making voice or video calls over the Internet,
- participating in social networks,
- using instant messaging.

Finding information about goods or services.

Listening to music over the Internet.

Watching Internet streamed TV, using VOD.

Watching video content from sharing services.

Using e-health services.

Using Internet banking. Using e-government.

Using e-government is understood as:

- obtaining information from websites or apps,
- downloading/printing official forms,
- making an appointment in the office,
- receiving official communication,
- submitting completed forms on-line (e.g. tax declarations).

Not sending completed forms via the Internet.

Buying goods and services over the Internet.

Using artificial intelligence.

Using electronic identification.

Carrying out computer related activities.

Computer or mobile device related activities include:

- copying or moving files between folders, devices or on the cloud,
- downloading or installing software or applications,
- changing settings of software, app or device.

Carrying out software related activities.

Software related activities include:

- using advanced word processing software,
- creating presentations or documents integrating text, pictures, tables or charts,
- using spreadsheet software,
- using software to edit photos, video or audio files,
- writing a code in a programming language.

Using the Internet of Things.

Performing privacy-related activities.

2.5. Organisation and management of the survey implementation

The Statistical Office in Szczecin conducts the survey on ICT usage in households and supervises it substantially. It is also responsible for compiling output tables. The Statistical IT Centre is responsible for the organisation of processing information and software.

The substantial supervision is performed in the Centre for Science, Technology, Innovation and Information Society Statistics by a team of employees under a direction of a survey coordinator.

The tasks of a substantial team include:

- preparing the programme of statistical surveys of official statistics,
- preparing model questionnaires for the survey,
- preparing assumptions for logical and calculating control,

- preparing templates of output tables together with algorithms,
- preparing a survey schedule,
- assigning tasks related to the survey implementation,
- supervision over the course of the survey,
- controlling errors in a dataset,
- analysing tables with actual and generalised data,
- approval of a national dataset,
- preparing templates and data for publication,
- preparing algorithms for computing data for Eurostat,
- verification of data computed for Eurostat,
- marking unreliable data,
- on-going monitoring of issues related to the information society,
- co-operation with institutions on a national level and with Eurostat.

A substantial team closely co-operates with:

- the Survey Organisation and Registers Department in relation to creating model questionnaires, schedules and provisions in the Programme of Statistical Surveys of Official Statistics,
- The Statistical IT Centre in relation to designing an electronic questionnaire and an application for data collection,
- the Centre for Data Engineering in the Statistical Office in Szczecin in relation to assumptions for a survey IT system, computing output tables and transmission of data to Eurostat,
- interviewing coordinators in statistical offices in relation to on-going explanation of issues and problems concerning implementation of the survey.

Interviewers who are employees of statistical offices conduct the survey in all voivodships. Their duties include contacting persons from all drawn dwellings (from the main sample) and conducting interviews with all households living in a given dwelling. Dwellings drawn for the survey are used in two editions of the survey, in two subsequent years. Obtaining the largest number of reliable answers and ensuring respondents' confidentiality is also a responsibility of an interviewer.

The survey has to be implemented in accordance with a prepared handbook and adhering to ethics of a statistician, especially the principle of respecting a respondent, maintaining statistical confidentiality and protecting collected data – pursuant to the Act of 29 June 1995 on Official Statistics (Journal of Laws of 2024, item 1799, as amended).

A coordinator who is responsible for implementing a task in a given survey area supervises the work of interviewers. Areas are divided in accordance with a territorial division into voivodships. Inspectors help coordinators in their work.

INSPECTOR – a person chosen from employees of a statistical office whose knowledge and experience allow to supervise an implementation of the survey (interviewing, registering data, transferring data, analysis and revision) by a group of interviewers.

COORDINATOR – a person responsible for a proper course of the survey, proper training of interviewers and inspectors as well as supervision over their work. He/she is an employee of a statistical office, has complex knowledge about methodology of the survey, sociological aspects of interviewers' work and impact of errors on the quality of data. Due to a territorial range of activities, coordinators are established in branches and in voivodships.

Before the survey begins, a letter of the President of Official Statistics and a leaflet presenting selected results of the survey on ICT usage from the previous years are sent to families living in drawn dwellings. The President's Letter emphasises the significance of the survey for official statistics, encourages Internet self-enumeration as well as contains basic information regarding the course of the survey and publishing results as well as guaranteed complete confidentiality of collected information.

2.6. Data presentation

Forms of publication and databases with results

Results of surveys are disseminated by Statistics Poland in the form of publications, news releases and output tables. They are available on the website in [Statistics Poland - Information Service](#). The main publication which is an analysis of data collected in a surveyed year is *Information society in Poland in (...)*. The basic scope of information is also published in statistical yearbooks.

Survey results are also transferred to EUROSTAT where they are published after comparison with results from other EU Member States. The main form of information dissemination is a database on Eurostat website as well as statistical publications (also electronic) and short articles published as news.

The most important tools for disseminating data from the survey on the ICT usage in households:

Statistics Poland website

Tables – selected indicators (total, by age and sex, age and education, education and sex, employment situation, type of household, income groups of household, class of place of residence, degree of urbanisation, using social assistance and disability, type of Internet connection at home, NUTS 1 macroregions and class of place of residence, voivodships and NUTS 2 regions, parts/regions and degree of urbanisation, Integrated Territorial Investments, NUTS 1 macroregions and age.

Publication *Information society in Poland in (...)*

Published annually in December, available in a paper and electronic version. It includes selected indicators in a breakdown by age, sex, regions, voivodships, education, employment situation, place of residence, degree of urbanisation and comparisons with EU Member States [Information Society in Poland in 2025 | Publications | Statistics Poland - Information Service](#).

Leaflet *How do we use the Internet?*

Published annually in March, available in a paper and electronic version. It includes indicators: access to the Internet, use of e-government, use of e-commerce, purposes of using the Internet [How do we use the Internet](#)

Concise Statistical Yearbook of Poland

Published annually in July, available in a paper and electronic version. It includes indicators: access to the Internet, purposes of using the Internet in a breakdown by class of place of residence

[Concise Statistical Yearbook of Poland 2025 | Statistics Poland - Information Service](#)

Statistical Yearbook of the Republic of Poland

Published annually in December, available in a paper and electronic version. It includes indicators: access to the Internet, purposes of using the Internet in a breakdown by class of place of residence [Statistical Yearbook of the Republic of Poland | Statistics Poland - Information Service](#).

Eurostat website

Tables – selected indicators in comparison with other countries, published annually [Database - Eurostat](#).

Eurostat publication Digitalisation in Europe

It includes selected indicators in comparison with other countries, published annually [Digitalisation in Europe – 2025 edition - Interactive publications - Eurostat](#).

Macroeconomic Data Bank

It includes selected indicators (by classes of place of residence, education, selected groups of goods and services), updated annually [Microeconomics Data Bank](#).

STRATEG

It includes selected indicators in total, updated annually [STRATEG](#).

Knowledge databases

It includes selected indicators (total, by age and sex, age and education, education and sex, class of place of residence, voivodship), updated annually [Home Page | Knowledge Databases](#).

Breakdowns**HOUSEHOLD SURVEY**

Survey results concerning households are presented in the following breakdowns:

Breakdown E – by type of household

This breakdown presents households with children under 16 years and without children under 16 years. Next, each group is divided into a household with one, two or three adults.

Breakdown F – by income group of a household after calculating quartile groups

Division of households according to income into quartile groups consists in ranking households according to an average net monthly income and then in dividing obtained set into four equal parts.

The first quartile group includes $\frac{1}{4}$ of households with the lowest income, the second – households with income higher than the first group but still below the value of income dividing a set of households into halves, the third - $\frac{1}{4}$ of households with income higher than in the second group but not included in the fourth group which includes $\frac{1}{4}$ of households with the highest income.

Breakdown F-q – by income group of a household after calculating quintile groups

Division of households according to income into quintile groups consists in ranking households according to an average net monthly income and then in dividing obtained set into five equal parts.

The first quintile group includes $\frac{1}{5}$ of households with the lowest income, the second – households with income higher than the first group but still below the value of income dividing set of households into halves, the third one includes households with income the closest to the value of median, the fourth – $\frac{1}{5}$ of households with income higher than in the third group but not included in the fifth group which includes $\frac{1}{5}$ of households with the highest income.

Breakdown H – by class of place of residence

Three classes of place of residence are used in the survey:

- big cities – with the number of inhabitants exceeding 100 000,
- smaller cities – with the number of inhabitants below 100 000,
- rural areas.

Breakdown I – by degree of urbanisation

Breakdown of households by degree of urbanisation (DEGURBA) is used to classify local administrative units. It is based on the measurement of geographical contiguity and population density in 1 km² grid cells (a one-kilometre grid), a typology based on a grid with a resolution level of 1 km² is used for this purpose (this typology classifies grid cells into “urban centres”, “urban clusters” and “rural grid cells”).

Includes three categories:

- cities (densely populated areas) – local administrative units where at least 50% of the population lives in one or more urban centres.
- towns and suburbs (intermediate density areas) – local administrative units where less than 50% of the population lives in an urban centre and at least 50% of the population lives in an urban cluster. Time either a total population of at least 50 000 inhabitants or is contiguous to a densely populated area.
- rural areas (thinly populated areas) – local administrative units where more than 50% of the population lives in rural grid cells.

Breakdown M – by NUTS 1 macroregions and class of place of residence

This breakdown presents households by classes of place of residence (like in a breakdown H) and macroregions in accordance with the following classification.

Table 1. Division of Poland by macroregions

Macroregions	Voivodships included in a macroregion
Central	Łódzkie, Świętokrzyskie
South	Małopolskie, Śląskie
East	Lubelskie, Podkarpackie, Podlaskie
North-West	Wielkopolskie, Zachodniopomorskie, Lubuskie
South-West	Dolnośląskie, Opolskie
North	Kujawsko-pomorskie, Warmińsko-mazurskie, Pomorskie
Mazowieckie voivodship	Mazowieckie

Source: own work.

Breakdown S – by parts/ regions and class of place of residence

This breakdown presents households by class of place of residence (like in a breakdown H) and regions (West, Central and East) – in accordance with the following classification.

Table 2. Division of Poland by parts/regions

Parts/Regions	Voivodships included in a region
East Poland	Lubelskie, Podlaskie, Podkarpackie, Świętokrzyskie, Warmińsko-mazurskie
Central Poland	Kujawsko-pomorskie, Łódzkie, Małopolskie, Mazowieckie, Pomorskie, Śląskie
West Poland	Dolnośląskie, Lubuskie, Opolskie, Wielkopolskie, Zachodniopomorskie

Source: own work.

Breakdown T – by less developed and more developed regions

In accordance with the following classification.

Table 3. Polish regions by level of development

Specification	Voivodships included in a region
More developed regions	Mazowieckie
Transition regions	Dolnośląskie, Wielkopolskie
Less developed regions	Kujawsko-pomorskie, Lubelskie, Lubuskie, Łódzkie, Małopolskie, Opolskie, Pomorskie, Podlaskie, Podkarpackie, Śląskie, Świętokrzyskie, Warmińsko-mazurskie, Zachodniopomorskie

Source: own work.

Breakdown W – by voivodships and regions NUTS 2

In accordance with NUTS 2 classification.

Breakdown Z – by Integrated Territorial Investments

In accordance with classification of integrated territorial investments.

INDIVIDUAL SURVEY

Survey results concerning individuals are presented in breakdowns described above for households (apart for break-downs by type of household) and additionally by the following breakdowns:

Breakdown A – by age and sex

Age is given in complete years in bands: 16–24, 25–54, 25–34, 35–44, 45–54, 55–74, 55–64, 65–74, 16–59, 60–74 years.

Breakdown B – by age and education

This grouping includes three levels of attained education:

- tertiary education including persons with bachelor, engineer or master degree or persons with academic degree or title (doctor, habilitated doctor, professor),
- secondary education including persons who graduated from secondary school, vocational schools and post-secondary schools,
- lower secondary or primary education including persons who graduated from primary school, lower secondary school or a small group of persons without any education.

Breakdown C – by education and sex**Breakdown D – by employment situation**

1. In the labour force:
 - a. employee or self-employed:
 - employee,
 - self-employed,
 - farmers,
 - b. unemployed;
2. Not in the labour force:
 - a. student,
 - b. in retirement and others.

Breakdown J – by using social assistance and disability

This grouping presents a breakdown by persons using social assistance, persons with disability and persons with disability using social assistance.

Breakdown M2 – by NUTS 1 macroregions and age

This grouping includes a breakdown by age (like in groups in breakdown A) and macroregions in accordance with NUTS 1 classification (like in breakdown M).

Breakdown O – by citizenship

This grouping includes a breakdown by Polish citizenship, other than Polish, of which Ukrainian.

Breakdown P – by national economy sector (PKD) of an employer

This grouping includes a breakdown by the Polish Classification of Activities of enterprises in which individuals are employed.

2.7. Data evaluation – preliminary assessment of the survey quality and data reliability

When interviewers finish their work a dataset is checked with regard to logical and calculating correctness in two stages – firstly on a voivodship level, next – on a national level. During control inspectors and substantial coordinators clarify with interviewers ambiguous situations or errors in entered data.

Next, after accepting datasets in each voivodship, control of correctness and completeness of datasets on a national level is performed. Works on completeness of datasets include also imputation of missing answers resulting from a possibility to not provide answers by respondents due to a sensitive nature of collected information, for example questions about households' income.

Imputation (replacing data missing in a dataset with artificially created imputation values) is used only for item nonresponse, that is a lack of answer to a single question for a given household or a person. Imputation does not include unit nonresponse, that is all data for households or individuals with whom an interview was not conducted.

A hot-deck method, belonging to the group of stochastic methods (which do not distort distribution of variables), is used for imputation. It consists in replacing missing data with values from the so-called donors drawn from complete records. It means that imputed values of missing data are drawn from records fulfilling determined criteria of similarity, that is records belonging to the same imputation layer (group).

The quality reports for the survey SSI-10 can be found on the following websites:

[Quality Reports](#)

[ICT usage in households and by individuals \(isoc_i\)](#)

3. Survey on ICT usage in enterprises

The survey on ICT usage in enterprises has been conducted by statistical offices of EU Member States since 2002. In the first edition 15 Member States participated and 137 thousand enterprises employing at least 10 persons were covered. In Poland the first survey was conducted in 2004. It was a pilot survey and 6 thousand enterprises operating across the whole country took part in it. Since 2021 Regulation No. 2019/2152 (hereinafter referred to as EBS) establishing a uniform system of international information society statistics has imposed an obligation to conduct the survey in all Member States. It constitutes a basis for including this survey into the programme of statistical surveys of official statistics. Every year, Commission Implementing Regulations are also adopted, specifying in detail, among others, the subjective and objective scope of the survey as well as the deadline for data submission to Eurostat.

3.1. Subjective and objective scope of survey

Subjective scope

Information on ICT usage in enterprises is presented by legal units for the purposes of national publications and Statistics Poland databases.

Therefore, the following criteria are taken into account when units for the survey are selected:

1. basic legal form: legal person, organisational unit without legal personality, natural person conducting economic activity,
2. special legal form: professional partnership, joint stock company, limited liability company, registered partnership, partnership, limited partnership, limited joint-stock company, company included in provisions of acts other than commercial companies code and civil code, state enterprises, cooperatives, branch of foreign company, company without special legal form.
3. number of persons employed – at least 10 persons,
4. type of conducted economic activity according to the Polish Classification of Activities. The surveys cover entities which conduct economic activity classified according to the Polish Classification of Activities (PKD 2007) to the following sections and divisions:
 - Section C – Manufacturing,
 - Section D – Electricity, gas, steam and air conditioning supply,
 - Section E – Water supply; sewerage; waste management and remediation activities,
 - Section F – Construction,
 - Section G – Wholesale and retail trade; repair of motor vehicles and motorcycles,
 - Section H – Transporting and storage,
 - Section I – Accommodation and food service activities,
 - Section J – Information and communication,
 - Section L – Real estate activities,
 - Section M – Professional, scientific and technical activities,
 - Section N – Administrative and support service activities,
 - Section S – Other services activities –group 95.1 Repair of computers and communication equipment.

Results included in Eurostat databases are presented by a statistical unit “enterprise”.

“An enterprise” according to Regulation (EU) of the European Parliament and of the Council No. 2019/2152 of 27 November 2018, Article 1a, and the Council Regulation (EEC) No 696/93 of 15 March 1993 - is the smallest combination of legal units that is an organisational unit producing goods or services, which benefits from a certain degree of autonomy in decision-making, especially for the allocation of its current resources. An enterprise carries out one or more activities at one or more locations. An enterprise may be a sole legal unit.

An enterprise is an economic entity which can therefore, under certain circumstances, correspond to a grouping of several legal units. Some legal units, in fact, perform activities exclusively for other legal units and their existence can only be explained by administrative factors (e. g. tax reasons), without them being of any economic significance. A large proportion of the legal units with no persons employed also belongs to this category. In many cases, the activities of these legal units

should be seen as ancillary activities of the parent legal unit they serve, to which they belong and to which they must be attached to form an enterprise used for economic analysis.

Since 2026, indicators published in Statistics Poland publications will be presented in breakdowns by the Polish Classification of Activities 2025 (PKD 2025) under a requirement to transfer data to Eurostat according to the new classification NACE Rev.2.1. According to PKD 2025, the subjective scope of the survey will cover enterprises classified to the following sections:

- Section C – Manufacturing,
- Section D – Electricity, gas, steam and air conditioning supply,
- Section E – Water supply; sewerage; waste management and remediation activities,
- Section F – Construction,
- Section G – Wholesale and retail trade,
- Section H – Transporting and storage,
- Section I – Accommodation and food service activities,
- Section J – Publishing, broadcasting, and content production and distribution activities,
- Section K – Telecommunication, computer programming, consulting, computing infrastructure and other information service activities,
- Section M – Real estate activities,
- Section N – Professional, scientific and technical activities,
- Section O – Administrative and support service activities,
- Section T – Other services activities – group 95.1 Repair and maintenance of computers and communication equipment.

Objective scope

The subject matter of the survey is ICT usage in enterprises. A detailed objective scope is prepared on the basis of a model questionnaire which all Member States are required to implement. A model questionnaire is prepared in cooperation of Eurostat with Member States. During meetings of Working Groups and Task Forces, which attend national coordinators of surveys (Poland is represented by employees of the Statistical Office in Szczecin), a structure of a questionnaire is determined on the basis of jointly defined questions and answers. Representatives of the European Commission and the OECD who suggest new topics to be included in the survey also take part in meetings.

Due to the dynamic development of the information society, the need for data characterising this development is enormous.

In view of the limited length of a questionnaire due to the problem of response burden, the objective scope of a model questionnaire partially changes year by year. Some issues are surveyed permanently, while other once, biennially or triennially. An annex (table 3) presents an objective scope of enterprise surveys since 2005.

Apart from issues which are important on a European level, issues significant for Poland are also surveyed. During annual consultations concerning the programme of statistical surveys of official statistics proposals concerning issues that should be covered by the survey are submitted.

Indicators collected via an enterprise survey are used to monitor the level of implementing the Digital Decade policy programme 2030. This document presents a vision and objectives of Europe's digital transformation by 2030. Solidarity, care for welfare and sustainable development are key values which are supposed to guarantee successful digital transformation of the EU. Four main goals include:

- a digitally skilled population and skilled digital professionals,
- secure and sustainable digital infrastructures,
- digital transformation of businesses,
- digitalisation of public services.

Collected indicators are also used by public administration bodies to verify national and local strategies such as the strategy for Responsible Development for the period up to 2020 (with a perspective up to 2030), the National Strategy of Regional Development 2030, the Productivity Strategy 2030 Update, and the National Urban Policy 2030. Recipients of data include also scientific entities, media, individuals and international organisations (i.a. Eurostat, OECD and UNCTAD).

3.2. Survey method

Survey on ICT usage in enterprises is a survey conducted via an on-line questionnaire. It includes a random sample (entities employing 10-249 persons) and a full population (entities employing at least 250 persons). The survey covers legal units and since 2025 also selected national economy entities belonging to an enterprise group singled out during a profiling in accordance with Regulation (EU) 2019/2152 of the European Parliament and of the Council on European business statistics (EBS). Additionally, in 2026 the subjective scope of the survey was extended into units engaged in financial and insurance activities.

The survey frame is generated from the Base of Statistical Units on the basis of criteria described in a part regarding subjective and objective survey scope. It is the basis for drawing a sample.

Sampling

A stratified sampling scheme is used in the survey; 1155 strata were singled out. Basic strata are determined on the basis of conducted economic activity according to PKD (25 categories, variable RD) and employment (3 size classes, variable WLK). An upper stratum is used in the survey – entities with at least 250 persons employed and belonging to primary strata, with a size of less than 200, are included in the sample with a probability equal to 1.

The remaining part of a sample is divided into sampling strata according to above mentioned criteria, supplemented with a territorial classification of NUTS 2 level (voivodships, taking into account division of Mazowieckie Voivodship into 2 regions), Applied sample allocation to sampling strata combined proportional allocation to size of a stratum (60%) and proportional allocation to root from this size (40%). Size in stratum refers to a sum of 60% of amount derived from proportional allocation and 40% of amount derived from proportional allocation to root from this amount. Such solution aims at improving precision of estimating at the level of strata (compared to pure proportional allocation) and results in a slight overrepresentation of the smallest strata at the expense of bigger ones, especially in not numerous breakdowns.

The selected sample is supplemented by taking into account the structure of the enterprise groups, to which the sampled entities may belong, identified during profiling. The aim is to adhere to the principle that an enterprise group is either fully included in the sample or remains entirely outside. In accordance with Eurostat recommendations, if any legal unit selected for the sample is a part of an enterprise group, the remaining legal units belonging to that group are also included in the survey.

In a pilot survey conducted in 2004 the sample amounted to 6.5 thousand enterprises. In subsequent years, the sample size was increased due to the expansion of the scope and level of detail in the presentation of results. In 2026, the sample selected according to standard assumptions amounted to 19.9 thousand units, and after taking into account profiled units as well as entities engaged in financial and insurance activities – 28.8 thousand units.

A survey file includes information necessary for proper implementation of a survey during all stages, especially name of an entity, contact details, legal form, ownership form, type of main activity, location according to the registered seat, number of persons employed and contact details of a person filling in Statistics Poland questionnaire.

Moreover, information on answers given by an enterprise in the previous edition of the survey as well as DG-1 and F-01 surveys is collected in order to improve validation of data and maintain integrity with other surveys.

Generalisation of survey results

In sample surveys, only a randomly selected portion of the population is surveyed and information obtained from the surveyed units is generalised to the entire population using appropriately calculated weights. Generalisations apply to all variables included in the survey.

Generalizations are carried out in two frameworks corresponding to different definitions of a statistical unit: according to national units (for national purposes) and according to enterprise groups (where a group constitutes the unit) for the purposes of European statistics. Due to the difference in defining a unit and slight differences in the subject scope¹, the final weights are determined separately for both of these frameworks and may differ.

The initial weights for national units result from the adopted allocation in the stratified sampling design and are equal to

1. In some cases, a part of a group included in European generalisations may not be included in the national generalisation, as the assessment of the target population eligibility criteria may differ at the national unit level compared to the group level (which comprises several national units).

the ratio of the population size to the sample size in a given stratum.

$$weight_{initial, h} = \frac{N_h}{n_h}$$

where:

weight $a_{initial, h}$	weight resulting from sampling scheme in stratum h,
N_h	size of stratum h in a frame
n_h	number of drawn units in stratum h.

In the case of units belonging to groups, initial weights are calculated within a two-stage process, taking into account the selection probabilities of national units and their inclusion through group dependencies, and applying calibration to the population size. To calculate the initial inclusion probabilities, the selection probabilities estimated at the stratum level are used. On this basis, the probability of being included in the sample based on group dependencies if another entity is selected is also estimated. The inverse of the selection probability constitutes the initial weight, which is subject to further calibration to ensure that the generalisations align with the size and structure of the population.

Prior to generalisation, the initial weights are adjusted for non-response. This adjustment takes into account both the non-response phenomenon and information regarding the reasons for not obtaining data from a portion of the sampled entities. Based on the survey participation response codes (RA), ratios used to adjust sampling weights are determined at the level of strata aggregated to breakdown WLK x RD.

$$R_{adjustment} = \frac{N_1 + N_2 + N_4}{N_1} \left(1 + \frac{N_3}{N - N_3} \right)$$

$$weight_{final} = weight_{initial} \times R_{adjustment}$$

where:

$R_{korygujący}$	adjustment factor,
N	weighted size of a drawn sample covering units within the survey scope (N1, N2 and N4), with not verified survey scope eligibility (N3) and units which were verified during the survey as outside survey scope,
N_1	weighted size of a surveyed sample (RA=01),
N_2	weighted number of entities which refused to participate in the survey (RA=22),
N_3	weighted number of entities with which contact was not established (RA = 24),
N_4	weighted number of entities which were exempted from the obligation to participate in the survey due to random events (RA = 25).

In the above procedure, the weighted sizes are determined using the initial sampling weights. An adjustment factor constitutes an estimate of the ratio of the number of units that should have been surveyed (i.e. were sampled and belong to the target population) to the number of units actually surveyed in a given stratum. The group of units belonging to the target population includes all cases of refusals and – in the appropriate proportion – a part of the non-contact cases.

In the case of generalisations by enterprise groups, it is crucial to assign an identical final weight to all constituent entities (and thus to the entire unit). For this purpose, the final weight in this framework is determined by averaging the weights previously assigned to the units belonging to a given group.

Precision of results

The results of sample surveys are subject to sampling errors resulting from the fact that the survey covers only a part of the population and obtained information is subsequently generalised to the entire population. When assessing the uncertainty of estimates caused by a sampling error, the term "precision of results" is used – greater uncertainty (error) means lower (worse) precision. Low precision of estimates, which may result from an insufficient sample size, negatively affects the reliability of the obtained results.

The precision measures used in the survey of non-financial enterprises are the standard error and the coefficient of variation calculated on its basis (relative standard error). These are measures of sampling error. Precision indicators are calculated analytically, taking into account the stratified nature of the sampling design. Issues regarding data quality are described in more detail in the section “Survey evaluation – assessment of the survey quality and data reliability”.

3.3. Characteristics of data collection tools

The survey ICT usage in enterprises is conducted via the Statistics Poland Reporting Portal with the use of an electronic questionnaire (Computer Assisted Web Interview method – CAWI) which constitutes a basic tool for collecting data. If an enterprise does not have an active account on the Reporting Portal, it is possible to fill in and submit a questionnaire in a paper form. Moreover, a respondent can fulfil a reporting obligation by providing necessary information to a statistician during a telephone interview.

An electronic questionnaire is a representation of a questionnaire SSI-01 determined in the Programme of Statistical Surveys of Official Statistics for a given year.

Answers are given via:

- ticking a correct answer or selecting from a list – a so-called “glossary”,
- providing a numeric value in a box.

3.4. Selected variables in the survey

Access to the Internet.

Concerns access to the Internet via a fixed connection (also wireless, e.g. Wi-Fi) and a mobile connection.

Persons employed with access to the Internet.

Broadband access to the Internet.

This category includes fixed broadband connections (e.g. ADSL, SDSL, VDSL, fiber optic technology, cable technology, public Wi-Fi) and mobile broadband connections (e.g. at least 3G).

Using fixed broadband connections to the Internet for business purposes.

This category includes DSL technologies (ADSL, SDSL, etc.) and other, e.g. fiber optic technology, cable technology, satellite connections, fixed wireless connections.

Using mobile broadband connections to the Internet for business purposes.

A mobile connection to the Internet means the usage of portable devices (e.g. laptops, tablets, smartphones) connected to the Internet via mobile telephone networks. Mobile connections should not be confused with wireless connections (e.g. Wi-Fi, Bluetooth).

Providing persons employed with portable devices that allow Internet connection via mobile telephone networks.

Having a website.

Functionalities of a website.

The following functionalities are distinguished:

- description of goods or services, price lists,
- online ordering or reservation or booking, e.g. shopping cart,
- possibility for visitors to customise or design online goods or services,
- tracking or status of orders placed,
- personalised content on the website for regular/recurrent visitors,
- links or references to the enterprise's social media profiles,

- advertisement of open job positions or online job application.

Using social media, e.g. Facebook, LinkedIn, Instagram, X.**Using social media for certain purposes.**

The following purposes of using social media can be distinguished:

- developing the enterprise's image or marketing products (e.g. advertising or launching products),
- obtaining or responding to customer opinions, reviews, questions,
- involving customers in development or innovation of goods or services,
- collaborating with business partners (e.g. suppliers) or other organisations (e.g. public authorities, non-governmental organisations),
- recruiting employees,
- exchanging views, opinions or knowledge within the enterprise.

Using services of electronic public administration.

Electronic public administration – public administration using ICT, which together with organisational changes and acquiring new skills by persons employed is supposed to improve public services and democratic processes as well as stronger support for programs created by administration.

Employing ICT specialists.

ICT specialists are employees for whom ICT is the main job. This term should not correspond to “ICT professionals” used in classification of occupations ISCO 08 (25 Information and communications technology professionals, broken down to 251 Software and applications developers and analysts, and 252 Database and network professionals). In the survey it is important to grasp a broader context concerning specialist; the key factor is performing ICT-related activities during most of working time. This definition is quite flexible, however, Methodological Manual for statistics on the Information Society recommends considering the following ISCO 08 occupation groups as ICT specialists:

- 133 Information and communications technology service managers
- 2152 Electronics engineers
- 2153 Telecommunications engineers
- 2166 Graphic and multimedia designers
- 2356 Information technology trainers
- 2434 Information and communications technology sales professionals
- 25 Information and communications technology professionals
- 251 Software and applications developers and analysts
- 252 Database and network professionals
- 35 Information and communications technicians
- 351 Information and communications technology operations and user support technicians
- 352 Telecommunications and broadcasting technicians
- 7422 Information and communications technology installers and servicers

Providing ICT training to persons employed – in a breakdown by ICT specialists and other persons employed**Recruiting ICT specialists.****Difficulties in filling vacancies for ICT specialists .****Performing ICT functions by own employees and/or external suppliers.**

ICT functions include maintenance of ICT infrastructure, support for office software users, development and support for software, business management systems, web solutions, ICT security and data protection. Development and maintenance of software is understood as developing tailor-made, customised software from scratch as well as customisation of purchased, packaged, off-the-shelf software. Sole purchase of standard software in regular sales (without any modification)

is not a task related to ICT as well as a standard update of regular antivirus software.

Using open data for business purposes.

Public open data are data of institutions, offices which every citizen can use.

Using a determined categories of open data for business purposes.

The following categories of public open data can be distinguished:

- economy and finance,
- spatial data,
- transport,
- culture, sport, leisure,
- environment,
- education,
- other.

Purchasing cloud computing services.

Cloud computing services offer a possibility to use scalable ICT services with the use of the Internet. Services offered in a cloud include access to software, using certain computing power, data storage.

Mentioned services:

- are delivered from the servers of service providers,
- can be easily scaled up or down (e.g. the number of users or change of storage capacity),
- can be changed or adjusted on-demand (on-demand self-service), that is without human interaction with the service provider,
- are paid for, either per user, by capacity used, or they are pre-paid.

The following categories of cloud computing services can be distinguished:

- e-mail,
- office software, e.g. Office 365,
- hosting the enterprise's database, e.g. EnterpriseDB,
- storage of files, e.g. Dropbox, Amazon S3,
- finance and accounting software,
- software application for managing information about customers – CRM,
- computing power to run the enterprise's own software, e.g. Amazon EC2.

Receiving orders for goods or services placed via a website or apps.

Sales via websites (online stores) includes orders placed by customers via an enterprise's website (online store, extranet, app) as well as orders received from customers via e-commerce platforms, auction services and related apps. Orders placed via manually types e-mails should be excluded.

Value of net sales via websites (online stores) or apps.**Issuing given types of invoices.**

The following types of invoices can be distinguished:

- structured electronic invoices suitable for automated processing (e.g. EDI, XML systems),
- electronic invoices not suitable for automated processing (e.g. e-mails, e-mail attachment as PDF, TIF, JPEG),
- paper invoices (no electronic counterpart).

Using ICT security measures.

- identification and authentication with a strong password,
- identification and authentication using biometric methods,
- identification and authentication using at least two methods,
- encryption of data, documents, and emails,
- performing data backups and storing them within an enterprise or in other locations,
- access control to the enterprise network,
- use of VPN connections,
- storing logs for post-incident analysis related to ICT security,
- periodic assessment of the probability and impact of ICT security incidents,
- performing ICT security tests,
- an ICT security system reporting hazardous events, other than software,
- antivirus software and default firewalls.

Problems resulting from a cybersecurity incident.

3D printing.

3D printing refers to the use of special printers owned by an enterprise as well as the use services provided by other enterprises for the creation of three dimensional physical objects using digital technology.

Using industrial or service robots.

An industrial robot – automatically controlled, manipulator, fixed in place or mobile, programmable in three or more axes, for automation of industrial processes.

A service robot – a machine that has a degree of autonomy that enables it to operate in complex and dynamic environment.

Using ERP.

ERP (Enterprise Resource Planning) – the type of software supporting information exchange between various enterprise departments (e.g. manufacturing, accounting, sales).

Using CRM.

CRM (Customer Relationship Management) – the type of software used to manage information about customers. It enables, i.a. storing clients' contact data, creating history of contacts with a client, preparing individual sales offers.

Using the Internet of Things.

Internet of Things – a network of devices or systems interconnected via the Internet or an internal network collecting and exchanging data.

Using artificial intelligence technologies.

Artificial intelligence technologies – all technologies such as: text mining, computer vision, speech recognition, natural language generation, machine learning, deep learning. They are used to gather or process data to forecast, recommend or make decisions.

Conducting data analytics internally.

Outsourcing data analytics to other entities.

Data analytics – refers to the use of technologies, techniques or software to analyse data in order to extract patterns, trends and insights, leading to, among others, better business decision-making or reduced operating costs.

The use of information and communication technologies to reduce electricity consumption and improve energy efficiency.

The use of information and communication technologies to reduce the consumption of raw materials and materials used in production.

3.5. Organisation and management of the survey implementation

The Statistical Office in Szczecin constitutes an author team implementing the survey on ICT usage in enterprises. Employees of the Centre for Science, Technology, Innovation and Information Society Statistics, who are responsible for organisation of survey implementation and development, compilation, analysis and presentation of results, are a coordinating team. Its duties also include improving methodology of the survey and mainly adjusting it to the methodology of community surveys developed by Eurostat. Therefore, it is necessary to co-operate with Eurostat and other Member States to define common subject matter of the survey, especially identifying and exploring new phenomena related to the dynamic development of information society. The main tasks of coordinators include:

- preparing assumptions for selection of frame and sample for the survey,
- verification of a survey file,
- preparing model questionnaires for the survey,
- preparing assumptions for logical and calculating control,
- preparing templates of result tables together with algorithms,
- preparing a survey schedule,
- assigning tasks related to implementing survey,
- supervision over the course of survey (i.a. on-going clarification of doubts reported by statisticians or reporting units),
- controlling errors in a dataset,
- analysing tables with actual and generalised data,
- approval of a national dataset,
- preparing templates and data for publication,
- preparing algorithms for data for Eurostat,
- verification of data for Eurostat, marking unreliable data and statistical confidentiality,
- on-going monitoring of issues related to the information society.

Survey coordinators co-operate with a team of programmers from the Centre for Data Engineering in the Statistical Office in Szczecin. The Centre supports processing of data collected from respondents and contributes to effective compilation and analysis of results. The tasks of the team from the Centre for Data Engineering include, i.a. developing Survey IT System and creating new functionalities which can streamline everyday work of statisticians and coordinators.

Employees of the Statistical Office in Szczecin are responsible for direct contact with respondents - branch in Koszalin.

Their tasks also include registering paper questionnaires in Survey IT System as well as sending paper based correspondence, that is sending reminders about a reporting obligation.

Implementation of the survey requires co-operation with other units of Statistics Poland:

- the Statistical Office in Łódź – responsible for preparing graphic layout of questionnaires, sampling, generalising survey results and estimating precision of survey results,
- the Statistical IT Centre – responsible for, developing an application for all surveys on the Reporting Portal, supporting functionalities of the Reporting Portal (sending reminders to its users, e.g. about an imposed reporting obligation, impending date of fulfilling a reporting obligation).

3.6. Data presentation

Indicators collected from the enterprise survey are presented according to the following groupings:

- class of enterprise size; size of an enterprise is determined on the basis of the number of persons employed. Three size classes can be distinguished:
 - small enterprises – in which the number of persons employed amounts to 10–49,
 - medium enterprises – in which the number of persons employed amounts to 50–249,
 - large enterprises – in which the number of persons employed exceeds 249,

- type of conducted economic activity; data published in a breakdown by sections, selected divisions, groups and classes on the basis of the Polish Classification of Activities (PKD 2007) coherent with the European classification NACE Rev.2, since 2026 on the basis of PKD 2025 coherent with NACE REV. 2.1,
- ownership form; national and foreign ownership can be distinguished on the basis of symbols used in the Base of Statistical Units,
- territorial division in accordance with an administrative division on a national and voivodship level as well as classification – on NUTS1 (macroregions) and NUTS2 (regions) levels.

It should be emphasised that the results of enterprise surveys are published at the end of year in which the survey is conducted due to substantial information needs of users. News release Information society in Poland in (...), which is published in October of a given year, is an announcement of “releasing data”. Detailed results are published in the publication Information society in Poland in (...), published in December, and output tables. The mentioned above publications are available on the website of Statistics Poland in a thematic area Digital economy and telecommunications also includes an archive with publications from the previous years. Results of enterprise surveys are published as well in:

- general publications:
 - Concise Statistical Yearbook of Poland,
 - Statistical Yearbook of the Republic of Poland,
 - Statistical Yearbook of Industry,
 - Statistical Yearbook of Voivodships,
 - Statistical Yearbook of ... Voivodship,
- Internet databases:
 - [Eurostat database](#)
 - [Local Data Bank](#)
 - [STRATEG](#)
 - [Knowledge Databases](#)
- other commemorative publications, leaflets, etc.

In accordance with information provided in chapter 3.1, data by a statistical unit enterprise are presented in Eurostat database. Indicators on ICT usage in enterprises will be still presented by legal units for the purposes of national publications and Statistics Poland databases. This approach is designed to maintain the comparability of presented data.

3.7. Data evaluation – assessment of the survey quality and data reliability

The survey is also subject to non-sampling errors such as overcoverage errors, unit non-response and item non-response. a Overcoverage errors occur when there are entities in the survey file which are outside the survey scope or do not exist (e.g. liquidated entities, not removed from the frame). The share of such entities in the survey file does not exceed 1% of all entities. Item non-responses concern auxiliary variables (the number of persons employed, operating revenues). The share of entities with item non-responses for those two variables does not exceed 5% of all enterprises fulfilling their reporting obligation. Missing data are collected from other sources in order to minimise errors:

the number of persons employed – from the survey DG-1 Report on economic activity or the Base of Statistical Units ,
operating revenues – from the surveys F-01/I-01 Report on revenues, costs, financial result and expenditures on fixed assets, SP Yearly enterprises survey or using imputation of data.

The share of records for which items non-response imputation² is applied does not exceed 1% of size of an output dataset. Completeness of the survey amounts to about 70%.

Efforts are made to make fulfilling a reporting obligation easier for respondents, i.a. by developing user-friendly, functional and personalised to the greatest extent electronic questionnaires. A personalised questionnaire is partially filled in with

² The type of imputation used for filling in missing information about statistical units which took part in a survey but did not provide answers for individual questions (imputation applies only to specific fields in a given record).

data collected from other questionnaires previously submitted by a respondent to avoid submitting the same information several times. Moreover, a respondent can contact a statistician, a so-called “assistant” who “leads” him/her through the whole process of fulfilling a reporting obligation if there are problems with filling in a questionnaire.

An electronic questionnaire is tested before it is available on the Reporting Portal. Testing consists in assessment of usefulness of an application and checking correctness of implemented validation rules ensuring logical and calculating control of data entered by a respondent.

Validation rules are developed by a team of coordinators before preparation of an application. Due to a year-on-year changing objective scope of the survey, they have to be thoroughly verified before each subsequent edition because a properly functioning application is crucial for the process of collecting good quality data.

Control of quality and accuracy of data takes place also after closing the Reporting Portal with the use of the Survey IT System. Usually it is necessary to contact a respondent to receive explanations or make a correction in a report.

The quality reports for the survey SSI-01 can be found on the following websites:

[Quality Reports](#)

[ICT usage in enterprises \(isoc_e\)](#)

Part 2

4. The use of advanced technologies in industry

The innovative project *The development of methodology and survey of the degree of adjustment of selected enterprises to the economic requirements of the fourth wave of the industrial revolution (Industry 4.0)* was conducted in 2020. Due to the significant interest in the results, the survey SSI-04 *The use of advanced technologies in industry* was permanently included in 2024 into the programme of statistical surveys of official statistics in a two-year cycle. It enables gathering information regarding the use of advanced technologies in enterprises, purposes of using them, benefits from using them as well as workforce changes in the workforce resulting from this process.

The survey SSI-04 was created to meet domestic needs. Its results are not transferred to international organisations or databases. Due to the close thematic link with the survey SSI-01 *Questionnaire on ICT usage in enterprises*, the same terms and definitions are applied in SSI-04. It guarantees methodological coherence with Eurostat's guidelines regarding ICT surveys. SSI-04 focuses on the use of advanced technologies, selected definitions and examples drawn from the survey SSI-01 are verified in each case and, where necessary, adapted to the survey's specific objective scope.

Unlike the survey SSI-01, covering entities whose main activity is classified according to PKD 2007 to sections C, D, E, F, G, H, I, J, L, M, N and group 95.1, according to PKD 2025 to sections C, D, E, F, G, H, I, J, K, M, N, O (described in chapter 3.1 Subjective and objective scope of the survey), in which the use of all information and communication technologies in enterprises as well as their mere use is analysed, the survey SSI-04 covers only entities classified to sections B, C, D, E (according to both PKD 2007 and PKD 2025) and focuses on results and consequences of implementation of these technologies.

4.1. Subjective and objective scope of the survey

The objective scope of the survey is the use of advanced technologies in industrial enterprises, especially the process of their implementation, extent of use and further development as well as objectives and barriers related to their use. Due to a dynamic development of technology, the objective scope of the survey will be updated and adjusted to the latest trends and innovations on a regular basis in order to ensure it remains fully up to date and relevant in the evolving technological landscape.

The following criteria are taken into account when units are selected for the survey:

1. basic legal form: legal person, organisational unit without legal personality, natural person conducting economic activity;
2. special legal form: professional partnership, joint stock company, limited liability company, registered partnership, partnership, limited partnership, limited joint-stock company, company included in provisions of acts other than commercial companies code and civil code, state enterprises, cooperatives, branch of foreign company, company without special legal form;
3. number of persons employed – at least 10 persons;
4. type of conducted economic activity according to the Polish Classification of Activities (PKD). The survey covers entities which conduct economic activity classified according to the Polish Classification of Activities (PKD) to the following sections and divisions:
 - Section B – Mining and quarrying,
 - Section C – Manufacturing,
 - Section D – Electricity, gas, steam and air conditioning supply,
 - Section E – Water supply; sewerage; waste management and remediation activities.

4.2. Survey method

The survey frame for the survey SSI-04 *The use of advanced technologies in industry* is created using File Generator¹ on the basis of data from the Base of Statistical Units (BJS).

The survey frame includes legal person, organisational unit without legal personality, natural person conducting economic activity whose main economic activity was classified according to the Polish Classification of Activities (PKD) to sections B, C, D and E. A frame is a basis for sampling.

8500 units are included in a sample.

Sampling

Stratified sampling was applied. The following criteria were used for stratification:

- size class (WLK)
- type of economic activity at level of PKD section (RD)
- voivodship (WOJ)

A total of 638 strata was singled out, including:

- 30 strata covering so-called small divisions, that is defined as $WLK \times RD$;
- 608 strata covering so-called big divisions, that is defined as $WLK \times RD \times WOJ$.

The size of sample was assigned to stratum covering small divisions, proportionally to the number of entities in a stratum.

The remaining part of the sample was allocated in two stages.

In the first stage, voivodship allocation proportional to root of the number of entities in a voivodship was used.

In the second stage, the assigned number of entities was divided proportionally among strata defined according to criterium $WLK \times RD$ for each voivodship.

After determining the final allocation, selection of entities was performed in accordance with simple random sampling without replacement scheme, independently in each stratum.

Generalisation of survey results

Indicators estimated based on a sample survey should reflect the parameters of the entire population. Therefore, data obtained from respondents undergo a generalisation procedure which results in assigning an appropriate weight to each sample unit.

The generalisation process covers all variables included in the survey. Generalising the global value of a selected characteristic within a given class (i.e. according to the definition of an output cell in a table) consists in determining the weighted sum—multiplying the value of the characteristic by its corresponding weight assigned to a given record, and then summing the resulting products for all units belonging to the class in question.

In the case of estimating the average value of a characteristic in a specific class, the calculated weighted sum is divided by the sum of weights assigned to the units included in the calculation. If ratio-type parameters are determined, the estimation procedure involves prior calculation of the weighted sums of the numerator and denominator, and then determining the ratio of these values.

For qualitative variables, a set of binary variables is created for each variable, corresponding to all valid response options. A value of 1 indicates the occurrence of a given category in a record, while 0 indicates its absence. Generalising the distribution of responses consists in multiplying the values of these variables by the appropriate weights and then aggregating them in the specified cross-sections, which allows for estimating population counts for individual response categories.

Primary weight results from an adopted allocation in a stratified sampling scheme and is equal to the ratio of the size of a frame to the size of a drawn sample in a given stratum.

¹ An application used to prepare the survey file enables preliminary selection of units and assigning to them features required during survey implementation and data processing.

In order to generalise results, primary weights were adjusted, resulting from applied drawing scheme.

In the case of very large entities (employing at least 250 persons), primary weights were not adjusted.

Adjustment of weights using coefficients determined on the basis of information on sample completion was performed for large and medium entities. By using data regarding the whole sample, included in symbols of participation in the survey (RA), coefficients adjusting weights from sampling in the following breakdowns were estimated:

- sector × PKD section × voivodship;
- in the case of section C – sector × subregion, where sector means an ownership sector: public or private.

Calculated multipliers were used to adjust primary weights for entities classified into determined groups.

An adjusting multiplier wk is calculated with the use of the following formula:

$$wk = \frac{N_1 + N_2 + N_3}{N_1} \cdot \frac{N_1 + N_2}{N_1 + N_2 + N_4}$$

where:

N_1	weighted size of the surveyed sample (RA = 01),
N_2	weighted number of entities which refused to fill in a questionnaire (RA = 22),
N_3	weighted number of entities with which contact was not established (RA = 24),
N_4	weighted number of entities which do not belong to the surveyed population (RA = 11, 13, 14, 15).

In the above mentioned formula, primary weights resulting directly from sampling are used for summing up. An adjusting multiplier is an estimated ratio of the number of entities that should be surveyed to the number of surveyed entities in a given stratum. All cases of refusal and, proportionally, some cases of lack of contact were included in the estimated population.

The final weight is assigned only to entities which participated in the survey (RA=01) and constitutes a product of sampling weight and an adjusting multiplier wk .

If required data were missing, imputation including item non-response in small number of entities was conducted. Stratified hot-deck method was applied which largely ensures consistency of responses within thematic sections of the questionnaire, without the need to apply separate imputation procedures for individual variables.

Precision of results

Generalisation of results of a sample survey requires maintaining appropriate precision of estimation.

In the survey SSI-04 relative errors of estimation are calculated on the basis of the value of analysed features and weights assigned to each surveyed entity.

Variance of global value feature y is calculated separately in each stratum and then results for all strata are summed up. In the case of ratio of two features (x/y), a linear method is applied – an auxiliary variable is created and its variance is determined in the same way as for the global value. Standard error is a root of variance and coefficient of variation (CV) is a ratio of a standard error to estimated value.

4.3. Characteristics of data collection tools

The survey *The use of advanced technologies in industry* is conducted via the Reporting Portal of Statistics Poland with the use of an electronic questionnaire (Computer Assisted Web Interview method – CAWI) which constitutes a basic tool for collecting data. If an entity does not have an active account on the Reporting Portal, it is possible to fill in and submit a questionnaire in a paper form. Moreover, a respondent can fulfil a reporting obligation by proving necessary information to a statistician during a telephone interview.

An electronic questionnaire is tested before it is made available on the Reporting Portal. Testing consists in assessment of usefulness of an application and checking correctness of implemented validation rules ensuring logical and calculating control of data entered by a respondent.

Validation rules are developed by a team of coordinators before preparation of an application. Due to a year-on-year changing objective scope of the survey, they have to be thoroughly verified before each subsequent edition because a properly functioning application is crucial for the process of collecting data of good quality.

If errors or inconsistencies occur or an entity provides incorrect answers, an appropriate message informing where data should be verified is displayed. There are two types of error, so-called absolute errors which do not allow a questionnaire to be approved and relative errors which are only informative and do not block such possibility. In the case of an absolute error, data should be corrected or a respondent should reach out to a contact person to clarify doubts and approve a questionnaire. Approving data in the Reporting Portal means fulfilling a reporting obligation by an entity. Answers are given on an electronic questionnaire via:

- ticking a correct answer e.g. in a yes/no question,
- ticking a correct answer or selecting from a list – a so-called “glossary”,
- providing a numeric value in a box.

An electronic questionnaire is a representation of a questionnaire SSI-04 determined in the Programme of Statistical Surveys of Official Statistics for a given year and contains questions concerning:

- the use of advanced technologies by specific technologies,
- benefits related to their usage,
- purposes of their implementation,
- workforce changes due to technology implementation,
- reasons for not using advanced technologies.

A model questionnaire for 2025 constitutes an annex 5 to the following report and is also available on the Statistics Poland website.

Further forks take place after closing the Reporting Portal with the use of Survey IT System (SIB). It has functionalities enabling searching, filtering and generating reports. Thanks to them it is possible to analyse completeness and coherence of a dataset, detecting cases differing from assumed correct situation. Quick diagnosis of errors allows immediate implementation of corrective actions. Usually it is necessary to contact a respondent to receive explanations or make a correction in a questionnaire.

4.4. Main variables in the survey

Advanced technologies are developing at a rapid pace, constantly leading to new solutions and tools that significantly impact the functioning of the industry. Due to the dynamic nature of these changes, the scope of questions included in the questionnaire may change. The questionnaire may incorporate additional questions to gather data in accordance with the needs of the recipients reported to the Programme of Statistical Surveys of Official Statistics. Main variables are presented below:

Using external cloud computing services.

Cloud computing consists in the remote provision of server spaces, computing power and software over the Internet network. In this model data are stored and processed on servers connected to the so-called virtual cloud, which enables access to resources from any place and with any device.

Using the Internet of Things.

The Internet of Things refers to devices or systems, commonly referred to as “smart”, interconnected via the Internet or an internal network. They collect and exchange data with each other and can be controlled through the Internet or an internal network.

Processing or commissioning data processing with the use of Big Data algorithms.

Big Data – data generated by electronically performed activities or as a result of communication between devices (M2M – Machine-to-Machine), e.g. based on social media user activity, mobile device user activity, mobile applications, and information from production processes.

Using Big Data analytics refers to using techniques, technology and software to perform Big Data analyses (large volumes of data whose features are mentioned above) collected within the enterprise itself.

Using artificial intelligence technologies.

Artificial intelligence refers to systems that use such technologies as text mining, computer vision, speech recognition, natural language generation, machine learning and deep learning. They serve to collect or process data for the purpose of forecasting, recommending or decision-making. Systems using artificial intelligence can be a part of computer software (e.g. chatbots, image recognition software, data analysis software based on machine learning) or embedded in devices (e.g. collaborative robots working on assembly lines).

Using industrial automation solutions.

Industrial automation is a collection of technologies and control systems that enable the automation and optimisation of production, assembly, quality control and product transportation processes within industrial plants.

Industrial automation involves the use of robotics, machinery and control systems to perform tasks traditionally carried out by humans. Automation can improve efficiency, quality and safety in manufacturing and other industrial applications.

Automation technology encompasses a wide range of tools and technologies, such as robots, numerically controlled (NC) machine tools, programmable logic controllers (PLC), computer numerical control (CNC) systems and industrial sensors. Automation systems can be integrated with existing production lines or operate independently to collect data for predictive equipment maintenance.

Industrial automation technologies.

Production machines or devices supporting production operations equipped with human-machine interfaces.

The degree of the use of advanced technologies use in daily operations.

Benefits achieved due to the use of advanced technologies.

The implementation period of advanced technologies.

The purpose of using advanced technologies.

Reasons for not using advanced technologies.

Workforce changes related to the use of advanced technologies.

Planned workforce changes related to the use of advanced technologies.

Specialists employed in relation to the implementation of advanced technologies.

Change in the total number of positions due to the use of advanced technologies.

Expenditures on advanced technologies over the past 2 years.

Identification of risks associated with the use of advanced technologies.

Investment plans for the expansion and development of advanced technologies.

A detailed list of variables is available on the Statistics Poland website:

[A detailed format for sending data sets](#). The package name defines a group of baseline variables characterising a substantive area of a similar subject matter, regardless of the object of observation.

The detailed list of variables is a standardised compilation generated and published for every survey. However, not all elements of the description are always present for every variable (this depends, among others, on the type of variable).

4.5. Organisation and management of the survey implementation

The Statistical Office in Szczecin constitutes an author team implementing the survey SSI-04 *The use of advanced technologies in industry*. Employees of the Centre for Science, Technology, Innovation and Information Society Statistics, who are responsible for organisation of survey implementation and development, analysis and presentation of results, are a coordinating team. Its duties also include improving the methodology of the survey and mainly identifying and exploring new phenomena related to the dynamic development of information society. Main tasks of coordinators include:

- preparing assumptions for selection of frame and sample for the survey,
- verification of a survey file,
- preparing model questionnaires for the survey,
- preparing assumptions for logical and calculating control,
- preparing templates of output tables together with algorithms,
- preparing a survey schedule,
- assigning tasks related to implementing survey,
- supervision over the course of survey (i.a. on-going clarification of doubts reported by statisticians or reporting units),
- controlling errors in a dataset,
- approval of a national dataset,
- preparing templates and data for publication,
- on-going monitoring of issues related to the information society.

Survey coordinators co-operate with a team of programmers from the Centre for Data Engineering in the Statistical Office in Szczecin. The Centre supports processing of data collected from respondents and contributes to compilation results as output tables. The tasks of the team from the Centre for Data Engineering include, i.a. developing Survey IT System (SIB) and creating new functionalities which can streamline everyday work of statisticians and coordinators.

Employees of the Statistical Office in Szczecin, branch in Stargard, are responsible for direct contact with respondents. Their tasks include explaining and correcting errors as well as registering paper questionnaires in Survey IT System. Statisticians are also responsible for monitoring timely submission of questionnaires as well as sending reminders to reporting units which did not submit a questionnaire on time.

Implementation of the survey requires co-operation with other units of Statistics Poland:

- the Statistical Office in Łódź – responsible for preparing graphic layout of questionnaires,
- Survey Methodology Department – responsible for sampling and generalising survey results,
- the Statistical IT Centre – responsible for designing an online questionnaire on the Reporting Portal, supporting functionalities of the Reporting Portal (sending reminders to its users, e.g. about an imposed reporting obligation, impending date of fulfilling a reporting obligation).

The survey has to be implemented in accordance with a prepared handbook and adhering to ethics of a statistician, especially the principle of respecting a respondent, maintaining statistical confidentiality and protecting collected data – pursuant to the Act of 29 June 1995 on Official Statistics (Journal of Laws of 2024, item 1799, as amended).

4.6. Data presentation

As wide as possible range of variables is selected for publication, taking into account statistical confidentiality. Data on the use of advanced technologies in industrial enterprises are presented by the following breakdowns:

- territorial – this breakdown classifies data by voivodships;
- by size classes – this breakdown is based on the number of persons employed in a unit and includes a division of units according to the following classes:
 - 10–49 persons employed,
 - 50–249 persons employed,
 - at least 250 persons employed;

- type of main economic activity by PKD– in accordance with subjective scope of the survey, for PKD sections and divisions.

Firstly, survey results are presented in a news release *The use of advanced technologies in industrial enterprises in ...*, published in November. The first publication of survey results was issued in July 2025 as a folder due to novel character of the survey. Starting with subsequent editions, survey results will be published every two years in the publication *The use of advanced technologies in industrial enterprises in ...*, planned for December. Mentioned forms of publication are available on the Statistics Poland website in the thematic area – [Science and Technology Information Society](#).

Moreover, data are also published in social media (i.a. Facebook, X).

4.7. Survey evaluation – assessment of the survey quality and data reliability

Efforts are made to ensure the highest possible quality of output data. Thanks to extensive logical and arithmetical assumptions integrated into the electronic questionnaire, the risk of survey errors and data discrepancies is reduced. Responses provided in the questionnaire are analysed and verified against information reported in other questionnaires, to the extent that they relate to surveyed advanced technologies. In case of any doubts regarding the correct completion of the questionnaire, respondents can reach out to a substantive contact person who provides assistance with filling out the questionnaire and clarifies methodological issues.

Contact details of employees supporting respondents are available on the Reporting Portal within questionnaire SSI-04 and on the Statistics Poland website [Survey Forms | Contact Persons](#).

During the first edition of the survey, employees of the Statistical Office in Szczecin organised a chat session on the Reporting Portal in order to improve the quality of the collected data. Reporting units could ask questions which were answered by the survey coordinators, thereby resolving issues related to completing the questionnaire SSI-04.

Data from the survey SSI-04 are also compared with results from the survey SSI-01 *ICT usage in enterprises* to verify provided answers.

The portal application with implemented validation rules ensures logical and arithmetic control of data. An electronic questionnaire is tested before it is available on the Reporting Portal. Testing consists in assessment of usefulness of an application and checking correctness of implemented validation rules ensuring logical and calculating control of data entered by a respondent.

The quality and accuracy of data are also checked after work in the Reporting Portal is finished with the use of the Survey IT System. Lastly, tables with results are subject to detailed analysis in order to verify correctness of data.

The quality report for the survey SSI-04 can be found on the following website:

[Quality Reports](#)

Definitions of basic concepts used in surveys on the Information Society

Information society indicators

3G, 3G+ – the 3rd generation mobile phone networks based on UMTS technology or its improvement (3+) HSDP. As opposed to the second generation networks (2G) built mainly to provide users with voice calls, 3G networks are designed to optimise data transfer.

4G, LTE – the 4th generation mobile phone networks, a successor of 3G networks. In comparison with the network of the previous generation, main advantages of this network include greater speed of data transfer and smaller delays. The network was designed to allow transfer of large amount of data, including streaming of video files.

5G – an acronym standing for the fifth generation of mobile networks. This network is much faster than previously operating networks and allows millions of additional devices to connect to the Internet, enabling a positive transformation across many areas of life

ADSL (Asymmetric Digital Subscriber Line) – broadband digital technology allowing users to connect with a computer network, e.g. the Internet, enabling downloading data with speed faster than their uploading, that is asymmetrically.

Anti-virus program – a computer program used to detect and destroy computer viruses, currently frequently adopted to destroy other malware programs, e.g. spyware, trojan horses, rootkits.

Application – every stand-alone program or an element of software package which is not included in system software (an operating system). Examples of such software are: text processors, spreadsheets, programs for running databases, graphic design programs, programs for playing and editing multimedia, etc. Usually applications do not include computer games, however, from a technical point of view there are no differences between a game and any other program.

Artificial intelligence (AI) – software systems using such technologies as text mining, computer vision, speech recognition, natural language generation, machine learning, deep learning used to gather or process data to forecast, recommend or make decisions. They can be a part of computer software or embedded in devices.

BI (Business Intelligence) – a collection of practices, methodologies, tools and information technologies used to collect and integrate data to provide information and knowledge to the right persons in the right place at the right time¹.

Broadband connection – a type of Internet connection characterised by high speed of information transfer measured in kb/s (kilobit per second), Mb/s (megabit per second) or Gb/s (gigabit per second). Due to fast technical advancement in telecommunications, determining cut-off bandwidth above which a given connection is considered broadband may become outdated shortly after adopting a definition. Therefore, broadband connections are defined on the basis of a type of Internet connection in the Community ICT surveys. According to such definition, broadband access is enabled by DSL technologies (ADSL, SDSL, etc.), cable TV networks (a cable modem), mobile phones operating at least 3G networks (UMTS, EDGE, etc.) and other, e.g. satellite connections, fixed wireless connections (a radio network). Broadband connections enable transferring high quality images, videos, watching TV or playing Internet games, making calls via the Internet with a possibility to see an interlocutor and allow using various advanced Internet services.

Cloud – storage space in the Internet (cloud computing) is a separate space where files, e.g. from a telephone, are sent. It means that every file uploaded to a folder is automatically copied to a server. A user has access to these resources regardless of a location, via any computer connected to the Internet².

Computer network – a group of computers or other devices connected to exchange data or share various resources, for example:

- using shared devices, e.g. printers, scanners,
- using shared software,
- using a central database,
- transmitting information between computers (messages, emails, files).

Computer viruses – malware or fragments of a code which can “infect” other useful programs (“carriers”) to spread and attack other computers. In the less strict sense, all malware are called viruses.

CRM (Customer Relationship Management) – software used for managing relationships with customers.

¹ Methodological Manual for statistics on the Information Society, Eurostat, 2016.

² Methodological Manual for statistics on the Information Society – households, Eurostat, 2018.

Database – an ordered collection of information from a given field together with tools for collecting, transforming and searching it.

DSL (Digital Subscriber Line) – a family of technologies enabling broadband connection to the Internet with the use of a traditional copper telephone cable (ADSL, SDSL).

EDI – electronic interchange of information, commercial or administrative data (invoices, bank transfers, orders) between organisations or enterprises.

e-Delivery – the registered electronic delivery service.

e-health – are all applications of ICT in order to prevent diseases, diagnostics, treatment, follow-up or leading a healthy lifestyle. Such tools are used for communication between patients and service providers from the healthcare sector, transferring data between institutions and direct contact between patients as well as employees of healthcare. They may also include information networks related to health, electronic records, telemedicine services, mobile or wearable communication devices used to support a patient and monitor his/her condition³.

Electronic commerce, e-commerce – comprises transactions conducted via computer networks; in the case of natural persons – only via the Internet. Goods and services are ordered electronically but the payment and delivery of ordered goods or services can be done in any form (also off-line). Orders placed via telephone, fax and manually types e-mails (not processed automatically) are not included in e-commerce⁴.

Electronic document management system (EDMS) – IT system for electronic management of documents enabling carrying out clerical tasks, documenting handling of cases and collecting and creating electronic documents⁵.

Electronic invoice – a document used to carry out electronic transactions, including information concerning due payment⁶.

Electronic public administration – ICT usage by public administration, which together with organisational changes and acquiring new skills by persons employed is supposed to improve the quality of public services, strengthen involvement of citizens in democratic processes as well as support for state policies⁷.

e-mail – a service consisting in sending messages, including text with attachments, between owners of e-mail inboxes via the Internet or other computer network⁸.

e-Procurement – a platform that provides an efficient, unified, electronic public procurement process in Poland that meets the needs and expectations of stakeholders.

ERP (Enterprise Resource Planning) – software used to manage resources of a unit by disseminating information between different sections of a unit.

File – a collection of data on a computer disk or other storage medium (a memory card, pendrive, DVD, etc.). Contents of a file can include: a program, word processor documents, databases, spreadsheets, image, video, etc.

Firewall – a computer program or device (e.g. an appropriately configured router) used to protect a computer or the whole local network (e.g. home) from attacks from the Internet. Basic functions of firewall include:

- filtering the flow of information between a protected computer or a local network and the Internet,
- blocking connection attempts from specific network locations (or, for example, blocking all connection attempts initiated from the outside),
- blocking the network connectivity of specific programs or connectivity using specific communication protocols,
- hiding communication ports – a computer or home network is then not "visible" to potential "attackers",
- monitoring and logging network traffic for subsequent threat analysis.

Government administration – authorities performing administrative functions which are governed by the Council of Ministers⁹.

3 <https://www.prawo.pl/zdrowie/ehealth,235380.html> [access: 08.07.2019]

4 Methodological Manual for statistics on the Information Society – households, Eurostat, 2018.

5 Regulation of the Council of Ministers of 18 January 2011 on office instructions, uniform material list of files and instruction regarding organisation of scope of activities of company archives (Journal of Laws 2011, No. 14, item. 67).

6 Methodological Manual for statistics on the Information Society – households, Eurostat, 2018.

7 A. Dąbrowska, M. Janoś-Kresło, A. Wódkowski, E-services and information society, Warsaw 2009, Difin, p. 47.

8 <http://staff.uz.zgora.pl/amajczak/sieci-komputerowe/PE.html> [access: 08.07.2019]

9 Constitution of the Republic of Poland article 146, item 3.

ICT – (Information and Communication Technologies) – a family of technologies processing, gathering and transferring information in an electronic form.

ICT specialist – a person employed for whom work in the ICT field is the main task.

Industrial robot – an automatically controlled, manipulator, fixed in place or mobile, programmable in three or more axes for automation of industrial processes.

Instant messaging – a program used to exchange messages in the Internet. Such messages are delivered in short time intervals. Unlike e-mail, instant messaging not only delivers messages but also exchanges information about presence of users in the network, which allows treating exchange of messages as an ordinary conversation. Currently, instant messaging is used to exchange text messages, images, videos as well as make voice and video calls.

Internet – a global public computer network based on a communication protocol TCP/IP. It is a network that consists of millions of local networks and single computers worldwide. Such services are available within the Internet as www, e-mail, FTP, etc.

Internet banking – banking operations carried out by a customer via the Internet. This service may allow inspect the balance of a bank account and possibly receive general information about banking services or active carrying out of operations on bank accounts¹⁰.

Internet of Things (IoT) – is a concept that all computer devices, machines, buildings, animals and people have unique identifiers and have a possibility to collect and then transferred between them via the Internet. Currently, the main groups of IoT devices include:

- wearables, that is all elements of clothing, bands, watches, etc.
- smart home appliances – lightning, heating, monitoring, safety appliance and systems, etc.
- consumer electronics, e.g. fridges, ovens, coffee machines, scales, etc.

Internet services – services consisting in delivering directly to a recipient's computer games, videos, music, computer programs and other products via the Internet as well as developing and maintaining enterprise websites, database apps and online stores, registering Internet domains, hosting including access to e-mail accounts and maintaining mentioned services on servers of an enterprise providing a service as well as advertisement and marketing in the Internet.

Intranet – an internal separated network of an enterprise based on solutions used in the Internet, that is the same standards, protocols and programs, covering all entities of an enterprise (office, establishments, branches).

Local self-government administration – public authorities set up to implement tasks of the state in the field. Commune, county and voivodship self-government are established under law associations of all inhabitants of a commune, county or voivodship which have a legal personality and implement tasks related to public administration¹¹.

Logging – an identification procedure allowing determined users to get access to a computer, computer network or website, e.g. transaction service of an Internet bank. Logging usually requires typing an identifier (login) and password¹².

Mobile access to the Internet – using portable devices connecting with the Internet via mobile telephony networks.

Mobile application – a special type of application designed to run on mobile devices, such as smartphones and tablets. Applications can be installed on a device by the manufacturer or by a user during its use. They are divided into many categories (e.g. office, advertising, entertainment, shopping), and the most popular ones include weather, banking, music, as well as maps and navigation apps.

Online – a mode of operation of a computer or other electronic device consisting in connecting with a computer network (e.g. the Internet). In the context of using services or ordering goods or services, it means – via the Internet, directly from a vendor and on an ongoing basis (during a connection).

Open Data – data generated by a public administration authority (or commissioned by it) which are available for every interested persons for using, processing and disseminating for any purpose.

Operating system – software managing computer equipment, creating environment to run and control all other programs (applications). Modern operating systems have many integrated applications increasing their functionality or enabling controlling a computer and programs thanks to conducting simple operations on screen with the use of a mouse device or other graphics devices facilitating communication with a user.

¹⁰ Methodological Manual for statistics on the Information Society – households, Eurostat, 2018.

¹¹ E. Ochendowski, Administrative law, Toruń 1999, Towarzystwo Naukowe Organizacji i Kierownictwa Dom Organizatora, p. 18-19.

¹² <https://sjp.pwn.pl/szukaj/logowa%C4%87%20si%C4%99.html> [access: 09.07.2019]

Optical fibre – a type of cable used to send signals in which light is the medium of information.

Portable device – a device enabling mobile or wireless access to the Internet (e.g. notebook, netbook, laptop, tablet, smartphone, PDA).

Public administration – activities overtaken by the state and implemented by its dependent authorities as well as authorities of local self-government consisting in meeting collective and individual needs of citizens resulting from coexistence of people in communities¹³.

Service robot – a machine that has a degree of autonomy that enables it to operate in complex and dynamic environment.

SDSL (Symmetric Digital Subscriber Line) – a broadband digital technology allowing a user to connect with the Internet, allowing uploading and downloading data with the same speed, that is symmetrically.

Smartphone – mobile phones with an operating system (e.g. Android or iOS) combining functions of a mobile phone and a handheld computer. They usually have a touch screen. They allow users to use the Internet, including mobile apps¹⁴.

Social network service – an Internet portal or a content-intensive website allowing making and maintaining social relationships with other users (e.g. acquaintances – Facebook, persons with similar interests – X, persons with similar professional interests – LinkedIn) or enabling exchange and presentation of multimedia content (images, music, videos – e.g. Instagram, TikTok or YouTube). Social network services usually allow creating a user profile (a set of publicly available information about a person) and offer many tools facilitating communication between users (chats, discussion forums and lists, blogs, instant messaging) or searching related information¹⁵.

Software – all instructions and procedures (programs) and data linked with them allowing computers and other programmable devices to perform determined functions. Software is often understood as a synonym of a computer program, even though, it has broader meaning – it also covers programs used by other devices. Software includes operating programs, applications, software developing programs, programs controlling functioning of other devices (TV sets and other electronics, calculators, mobile phones, computer components, e.g. DVD recorders) – so-called firmware, as well as various programs used by devices and network or telecommunications systems, etc.

Spatial data – all data referring directly or indirectly to a given location or geographic area¹⁶.

Spreadsheet – a computer program used to carry out financial calculations, statistical compilations, etc. with the use of tables¹⁷.

Tablet PC – a small portable computer with a touch screen and a screen keyboard. Bigger than a smartphone. Depending on a type, combining features of a smartphone and netbook to a smaller or bigger extent.

Text processors (advanced text editor) – a program enabling editing and formatting text as well as creating or pasting other objects to a document, e.g. tables or charts. Unlike simple text editors, a created document has to include information about way of displaying it and an image of a printed version.

WCAG 2.0 on AA level – guidelines regarding accessibility of web content; a set of recommendations which should be followed to ensure access to web content to a possibly broad group of users, including persons with disabilities. AA level

– commonly considered as an optimal level of accessibility; websites on AA level meet specific criteria which allow a broad group of users, e.g. persons with disabilities, to access them¹⁸.

Website – a collection of documents (containing usually text as well as graphics, animations, etc.) in the Internet concerning a determined topic, covering an initial document, called a homepage, and usually documents related to it – another pages and hyperlinks to other websites. Websites are encoded in HTML language, read by programs called Internet browsers, e.g. Mozilla Firefox, Google Chrome, Microsoft Edge, Opera or Safari.

Wi-Fi (Wireless Fidelity) – a set of standards created to build wireless computer networks. A specific application of Wi-Fi is building local networks based on radio communication, that is WLAN (Wireless Local Area Network).

xDSL – a collective term for all DSL technologies, where x means various categories of DSL, e.g. ADSL, IDSL, HDSL, SDSL.

¹³ Adam Błaś, Jan Boć, Jan Jeżewski Public administration wyd. Kolonia Limited, Poznań, 2004.

¹⁴ Methodological Manual for statistics on the Information Society – households, Eurostat, 2018.

¹⁵ Methodological Manual for statistics on the Information Society – households, Eurostat, 2018.

¹⁶ Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (OJ L 108).

¹⁷ <https://sjp.pwn.pl/slowniki/arkusz%20kalkulacyjny.html> [access: 08.07.2019]

¹⁸ <http://wcag20.widzialni.org/standard-wcag,m,mg148>

Bibliography

Act of 29 June 1995 on Official Statistics (Journal of Laws of 2024, item 1799, as amended)

Adam Błaś, Jan Boć, Jan Jeżewski, Public administration, wyd. Kolonia Limited, Poznań, 2004

A. Dąbrowska, M. Janoś-Kresło, A. Wódkowski, E-services and information society, Warsaw 2009, Difin, p. 47

Commission Regulation (EU) 2018/1798 of 21 November 2018 implementing Regulation (EC) No 808/2004 of the European Parliament and of the Council concerning Community statistics on the information society (Official Journal L 296/2, 22/11/2018)

E. Ochendowski, Administrative law, Toruń 1999, Towarzystwo Naukowe Organizacji i Kierownictwa Dom Organizatora, p. 18–19 Information society in Poland. Results of statistical surveys in the years 2013-2017, Statistics Poland, Warsaw, 2017, p. 11 Methodological Manual for Statistics on the Information Society, Eurostat, 2016

Methodological manual for statistics on the Information Society, Eurostat, 2019

Regulation of the Council of Ministers on the programme of statistical surveys of official statistics for the year 2019

Regulation of the Council of Ministers of 18 January 2011 on office instructions, uniform material list of files and instruction regarding organisation of scope of activities of company archives (Journal of Laws 2011, No. 14, item. 67)

Regulation (EC) No 808/2004 of the European Parliament and of the Council of 21 April 2004 concerning Community statistics on the information society (Official Journal L 143, 30/04/2004)

https://mfiles.pl/pl/index.php/System_zarz%C4%85dzania_jako%C5%9Bci%C4%85

<http://www.gisplay.pl/gis/definicje-gis.html>

<http://wcag20.widzialni.org/standard-wcag,m,mg148>

Annex

Table 1. The survey on ICT usage in households – questionnaire for households (SSI-10G)

Objective scope	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Household characteristics	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Expenditures on ICT and household characteristics ^a				x	x	x	x	x	x	x	x	x	x	x	x							
Access to ICT	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
ICT usage by children ^a									x			x										
Carrying out an interview	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

a A module added for national needs.
Source: own work.

Table 2. The survey on ICT usage in households – questionnaire for individuals (SSI-10I)

Objective scope	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Use of computers	x		x	x	x	x	x			x	x	x	x	x	x							
Use of computers and mobile phones		x						x	x													
Use of the Internet	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Purpose of using the Internet ^a	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Using advanced services available over the Internet or mobile phone networks				x																		
Mobile use of the Internet and ubiquitous connectivity								x														
Internet security	x					x					x				x		x					
Use of e-Government		x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Internet commerce details	x	x																				
Use of e-Commerce			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
E-Skills	x	x	x			x	x	x	x	x	x	x	x	x	x							
E-health (using the Internet in health-related issues) ^b								x			x											
Use of cloud computing										x	x	x	x	x	x	x						
Use of advanced ICT ^b										x			x									
Privacy and protection of personal identity												x				x	x		x	x	x	x
IT/digital skills														x	x	x	x	x	x	x	x	x
Trust, security and privacy														x		x						
ICT at work														x								
Digital skills														x								
Use of mobile phones ^b														x								
Supplementary data															x							
Internet of Things																x		x		x		x
Information concerning coronavirus																	x					
Remote learning																	x					
Green ICT																		x		x		x
Electronic identification																			x		x	
Artificial Intelligence																						x
Digital development club ^b																						x
Background characteristics		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Carrying out an interview	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

a In the years 2006-2018 questions from a module "Purpose of using the Internet" were included in a module "Use of the Internet". b A module added for national needs.
Source: own work.

Table 3. The survey on ICT usage in enterprises (SSI-01)

Objective scope	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
General information about ICT systems	x																					
General information about ICT systems		x	x																			
Use of computers and computer networks				x	x	x	x	x	x	x	x	x	x	x	x							
Use of the Internet		x	x																			
Use of the Internet and ensuring security	x																					
Access and use of the Internet				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Use of a fixed broadband connection to the Internet for business purposes										x	x	x	x	x	x	x	x	x	x	x	x	x
Mobile access to the Internet								x	x	x	x	x	x	x	x			x		x		
ICT skills			x						x													
E-skills and ICT specialists										x	x	x	x	x	x	x		x		x		x
Benefits of the use of ICT				x																		
E-commerce				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
E-government	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					x		
Website	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x	x
E-commerce via the Internet	x	x	x																			
E-commerce via external computer networks other than Internet		x	x																			
Barriers limiting Internet sales	x																					
Electronic invoicing							x		x	x	x	x	x	x	x		x		x			x
Automated data exchange				x	x	x	x	x		x			x									
Sharing Supply Chain Management Information electronically				x	x	x		x		x	x		x									
Sharing of information electronically within the enterprise				x	x	x		x		x	x		x						x			x
Automatic exchange of information within the enterprise, i.a. via ERP, CRM, BI				x	x	x	x	x	x	x	x		x		x		x		x		x	x
Use of Radio Frequency Identification (RFID) technologies					x		x			x			x									
Use of cloud computing services										x	x	x	x	x	x	x	x		x		x	x
Artificial Intelligence																			x	x	x	x
ICT security						x					x				x	x	x	x		x	x	x
ICT and environmental impact							x												x		x	
Use of social media									x	x	x	x	x	x	x		x		x		x	x
Big data analytics												x	x	x		x			x		x	x
ICT expenditures						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Use of 3D printing technologies															x	x	x					
Use of robotics															x	x	x		x			
Open public data															x	x	x	x	x	x	x	

Source: own work.

Table 4. The survey on the use of advanced technologies in industry (SSI-04)

Objective scope	2023	2025
General information about ICT systems	x	x
Enterprise's position in the product cycle chain	x	x
Using cloud computing	x	x
Using the Internet of Things	x	x
Using Big Data analytics	x	x
Using Artificial Intelligence	x	x
Using industrial automation	x	x
Workforce changes	x	x
Manufacturing/supplying technologies	x	x
Planning, risk and assessment of enterprise's operations	x	x

Source: own work.

Attachments

1. SSI-03 Questionnaire on ICT usage in public administration units
2. SSI-10G ICT usage in households. Questionnaire for households
3. SSI-10I ICT usage in households. Questionnaire for individuals.
4. SSI-01 Questionnaire on ICT usage in enterprises
5. SSI-04 The use of advanced technologies in industry
6. Changes in Methodological report