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European businesses statistics compilers' manual for ICT usage and e-commerce in enterprises

2023 edition

MANUALS
AND GUIDELINES

European businesses statistics compilers' manual for ICT usage and e-commerce in enterprises

2023 edition

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Abbreviations

ADSL	Asymmetric Digital Subscriber Line
AI	Artificial Intelligence
APT	Advanced Persistent Threat
ATM	Automatic Teller Machine
B2B	Business To Business
B2C	Business To Consumers
B2G	Business To Government
BSDG	Business Statistics Directors Group
CDMA	Code Division Multiple Access
CES	Conference of European Statisticians
CNC	Computer Numerical Control
COGs	Content-Oriented Guidelines
CONVAL	Content Validations
CPA	Classification Of Products By Activity
CRM	Customer Relationship Management
CSPA	Common Statistical Production Architecture
CV	Coefficient of Variation
DDoS	Distributed Denial Of Service
DPI	Deep Packet Inspection
DSD	Data Structure Definition
DSI	Data Set Identification
DSL	Digital Subscriber Line
EBS	European Business Statistics
EC	European Commission
ECB	European Central Bank
eDAMIS	electronic Dataflow Administration And Management Information System
EDI	Electronic Data Interchange
EEA	European Economic Area
EFTA	European Free Trade Association
ERP	Enterprise Resource Planning
ESMS	Euro SDMX Metadata Structure
ESQR	ESS Standard For Quality Reports
ESQRS	ESS Standard For Quality Reports Structure
ESS	European Statistical System
ESSC	European Statistical System Committee
ESS-MH	European Statistical System Metadata Handler
ESS QAF	European Statistical System Quality Assurance Framework
ESTP	European Statistical Training Programme
EU	European Union
EWP	eDAMIS Web Portal
FTE	Full-Time Equivalent
GDP	Gross Domestic Product
GIA	General Implementing Act
GSBPM	Generic Statistical Business Process Model
GSIM	Generic Statistical Information Model
HDSL	High-Bit-Rate Digital Subscriber Line
HIDS	Host-Based Intrusion Detection Systems
ICT	Information And Communication Technology
IDS	Intrusion Detection System
IEEE	Institute Of Electrical And Electronics Engineers
IFR	International Federation of Robotics
INFOSOC	Information Society
IPS	Intrusion Prevention System
ISDN	Integrated Services Digital Network
ISIC	International Standard Industrial Classification
ISO	International Organization For Standardization

IT	Information Technology
ITGS	International trade in goods statistics
KAU	Kind-of-Activity Unit
LKAU	Local Kind-of-Activity Unit
M2M	Machine To Machine
MH	Metadata Handler
MS	Member States
NACE	Statistical Classification Of Economic Activities In The European Community (Nomenclature Generale Des Activites Economiques Dans Les Communautes Europeennes)
NAT	Network- And Port-Address Translation
NGFW	Next Generation Firewall
NGIPS	Next Generation Intrusion Prevention System
NIDS	Network Intrusion Detection Systems
NSIs	National Statistical Institutes
NUTS	Nomenclature Of Territorial Units For Statistics
OECD	Organisation for Economic Co-Operation And Development
OTP	One-Time Password
PIN	Personal Identification Number
R&D	Research And Development
RIA	Robotic Industries Association
RMAR	Relative Mean Absolute Revisions
SBR	Statistical Business Register
SDC	Statistical Disclosure Control
SDMX	Statistical Data and Metadata Exchange
SDSL	Symmetric Digital Subscriber Line
SIEM	Security Information And Event Management
SIMS	Single Integrated Metadata Structure
SME	Small and Medium-Sized Enterprises
SOA	Service Oriented Architecture
SSL	Secure Sockets Layer
STRUVAL	Structural Validations
UMTS	Universal Mobile Telephone System
UNECE	United Nations Economic Commission for Europe
VAT	Value-Added Tax
VPN	Virtual Private Network
VTL	Validation and Transformation Language
WG	Working Group
Y2Y	Year to Year

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1 Introduction

1.1. What are statistics on ICT usage and e-commerce in enterprises?

Information and communications technologies (**ICT**) usage and e-commerce in enterprises statistics measure the uptake of EU technologies and the digitalisation of the EU economy. These statistics are gathered through the annual 'ICT usage and e-commerce in enterprises' survey. The 2023 survey measured enterprises' access to and use of the internet and e-commerce (i.e. sale of goods and services online), use of cloud computing services, use of artificial intelligence, invoicing and data utilisation, sharing, analytics and trading.

This exercise has been carried out since 2002 when the European Commission (**EC**) established annual 'information society' surveys to benchmark ICT-driven development in enterprises and by individuals.

Eurostat is responsible for coordinating the 'ICT usage and e-commerce in enterprises' survey which is conducted at national level. Survey questions are developed every year, in close collaboration with Member States (**MS**) and the Organisation for Economic Cooperation and Development (**OECD**), in line with the changing needs of data users and policy makers. This survey takes the form of a model questionnaire and is accompanied by methodological guidelines for its implementation.

1.2. Usage and importance of statistics on ICT usage and e-commerce in enterprises

ICT account for a significant part of EU productivity and growth and are transforming our societies and economies in a profound and unprecedented way. Official statistics are indispensable for an informed understanding of the implications of the transformations under way. Selecting appropriate indicators is a crucial step. Measuring the development of the information society with relevant statistics on society, business processes and the digital economy requires continuous revision and improvement.

The current compilers' manual refers to the model questionnaire used for collecting part of the statistical data for monitoring progress towards the Commission's vision for Europe's digital transformation by 2030 presented on 9 March 2021. This vision for the EU's Digital Decade revolves around four cardinal points: skills; digital transformation of businesses; secure and sustainable digital infrastructures; and digitalisation of public services. The model questionnaire also helps users measure the implementation of one of the six priorities of the 2019-2024 von der Leyen Commission – A Europe fit for the digital age.

1.3. What is the purpose of this compilers' manual

This compilers' manual (hereafter referred to as the '**Manual**') is meant to serve as a practical reference document for all National Statistical Institutes (**NSIs**) involved in the compilation of data on the use of ICT and e-commerce in enterprises. As such, its main objectives are:

- to help NSIs translate Eurostat model questionnaires into national languages and to ensure that the same methodology is used by all countries when conducting national surveys;
- to set out the concepts, definitions and compilation methods, guiding the compilation of data;
- to explain the validation and quality rules, and metadata reporting;
- to explain the concepts and methods of data transmission to Eurostat.

In order to do so, each chapter of this manual describes a step of the production process of statistics on ICT usage and e-commerce in enterprises.

The second chapter is on data compilation. Data compilation is carried out by the NSIs on the basis of the model questionnaire. This chapter introduces the legislative background underpinning the process and explains how to interpret the model questionnaire to ensure the comparability of data between MS.

The third chapter is on data transmission. Once the data has been collected by the NSIs, they must transmit them to Eurostat. To that effect, this chapter sets out how to transfer the data to Eurostat (codification, transmission channel, deadlines, flags, confidentiality…).

The fourth chapter is on data quality. Once the data are transmitted, Eurostat applies validation rules to assess their quality. This chapter sets out the quality framework and the validation rules used by Eurostat.

Finally, the fifth chapter is on data dissemination. Once the whole data collection process is complete, Eurostat publishes the data. This chapter describes the type of data that is published and how to access them.

Note that this edition of the Manual serves as a reference for the compilation and transmission to Eurostat of data relating to 2023 as reference year.

To keep up with technological advances in digitalisation and changes in data requirements, this Manual will be updated every year.

This Manual focuses on issues relevant to ICT and e-commerce in enterprises. It does not provide an exhaustive list of all concepts and tools underpinning European statistics. For this information, please refer to the manuals, guidelines and other references listed in Section 1.4 below. Notably, the European Business Statistics Manual, 2021 edition (**EBS Manual**) covers the concepts that are shared across the business statistics domains.

1.4. Where can I find further guidance?

Further guidance is available from the following sources:

- The Digital economy and society webpage provides a global and regularly updated overview of Digital economy and society statistics, including statistics on the use of ICT and e-commerce in enterprises.
- The European Business Statistics Manual provides an overview of business statistics while highlighting the features introduced by a new regulatory framework. The manual also describes the various statistical tools and activities supporting EBS production such as statistical units and profiling, classifications, data processing and statistical disclosure control.
- The European Statistical System handbook for quality and metadata reports sets out guidelines for the preparation of producer and user reports for the full range of statistical processes and their outputs within Member States, EFTA countries and Eurostat.
- The ESS Handbook Methodology for data validation 2.0 provides a generic reference framework and metrics for data validation.
- The Business Architecture for ESS Validation manual sets out a common understanding of how ESS validation should be conducted.
- The European Statistics Code of Practice sets out principles that aim to ensure that statistics produced within the European Statistical System are relevant, timely and accurate, and that they comply with the principles of professional independence, impartiality and objectivity.
- The Quality Assurance Framework of the European Statistical System provides a collection of methods, tools and good practices on how to implement the European Statistics Code of Practice.

2 Data compilation

Data compilation is done by the NSIs on the basis of the model questionnaire. This chapter explains the legislative background and the data requirements, and provides guidance on the interpretation of the model questionnaire.

2.1. Legislative background

Statistics on the usage of ICT and e-commerce in enterprises are based on EU legislation to ensure a harmonised approach for the production of statistics by all reporting countries. Three regulations currently form the legal basis of the survey on ICT usage and e-commerce in enterprises for the 2023 survey:

- 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 ('**EBS Regulation**');
- Commission Implementing Regulation (EU) 2020/1197 of 30 July 2020 laying down technical specifications and arrangements pursuant to Regulation (EU) 2019/2152 of the European Parliament and of the Council on European business statistics, repealing 10 legal acts in the field of business statistics ('**General Implementing Act**' or '**EBS GIA Regulation**'); and
- Commission Implementing Regulation (EU) 2022/1344 of 1 August 2022 laying down the technical specifications of data requirements for the topic 'ICT usage and e-commerce' for the reference year 2023, pursuant to Regulation (EU) 2019/2152 of the European Parliament and of the Council ('**Implementing Act**').

Regulation (EU) 2019/2152 is a framework regulation. It therefore provides flexibility to adapt the survey on 'ICT usage and e-commerce in enterprises' to the evolving needs of users and decision-makers. Annual implementing measures, such as Commission Implementing Regulation (EU) 2022/1344, are the basis for the Eurostat surveys. This ensures harmonised data for all EU-27 Member States. The annual implementing Regulation is of relevance for the European Economic Area (EEA).

2.2. Data requirements

2.2.1. Introduction

The statistical product is the clear and precise definition of the statistical information to be produced. It is distinct from the production methodology. The production methodology is the way or method of doing, while the statistical product is its direct result. Different methodologies can produce the same statistical product, being only different ways of doing the same thing. This means that as long as it is guaranteed that two figures concern the same statistical product – for instance for two different countries – they are comparable. Distinguishing between the statistical product and the statistical methodology thus helps to focus on the aspects that are more important for ensuring comparability between national statistics and for producing new ones at EU level. NSIs may choose the most appropriate statistical methodology to be applied taking into account national particularities.

Elements that make up the statistical product, at input level, are the statistical unit, the target population and

the observation variables. Elements at output level are the periodicity and the summary measures, aggregate variables and tabulation. Covering all the elements of the statistical product, the statistical concepts and the nomenclatures are the additional elements ensuring that statistics are harmonised and comparable.

This chapter provides a detailed description of data requirements on ICT usage and e-commerce in enterprises. These are based on the EBS Regulation and the Implementing Act.

2.2.2. Statistical unit

The statistical unit is the base type of the elements of a group (also called population) that we want to observe or analyse. The basic statistical operations of classification, aggregation and ordering are done on the statistical unit.

The choice of the statistical unit is a matter of both the data collection process (namely the operational restrictions associated with collecting data from each type of statistical unit) and the conceptual framework chosen to observe and analyse the phenomenon. The statistical unit is the bearer of statistical characteristics or attributes that we ultimately want to measure.

There are several types of statistical units, according to their usage. An observation unit represents an identifiable entity, about which data can be obtained. During the collection of data, this is the unit for which data are recorded. It should be noted that this may, or may not be, the same as the reporting unit. The reporting unit is the unit that reports to the survey authority. It reports information for the observation unit(s). In certain cases, it may be different from the observation unit. A reporting unit is a unit that supplies the data for a given survey instance.

The observation unit in the survey on ICT usage and e-commerce in enterprises is the enterprise, as defined in Council Regulation (EEC) No 696/93 of 15 March 1993 on the statistical units for the observation and analysis of the production system in the Community. The Regulation defines the enterprise as follows:

> *'The enterprise 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.'*

The enterprise, therefore, is an economic entity that can, 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 legal units with no employees or self-employed persons also belong 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.

However, the definition of the enterprise as the appropriate statistical unit poses some limitations. Some enterprises, especially larger ones, are composed of several local units (establishments). Because of this, a geographical breakdown of the results (although still possible using the location of the enterprise's main headquarters) is of limited use. Nevertheless, ICT usage is not easily attributable to an enterprise's various establishments, and for this reason the enterprise is the statistical unit adopted.

Implementation of the statistical unit 'enterprise' in business statistics requires specific considerations for the delineation of enterprises in business registers (profiling), the consolidation of the data on legal units, etc. Nevertheless, for surveys with qualitative variables specifically, the consolidation is more challenging.

Specific guidelines have been developed for this survey and are further developed in Section 2.2.3 below.

2.2.3. Statistical unit enterprise

2.2.3.1. The concept of enterprise in European business statistics

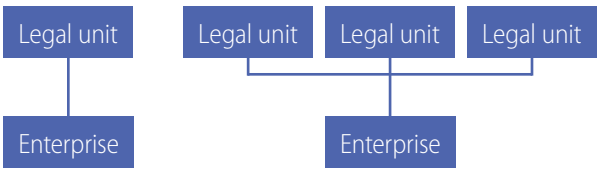
The enterprise is the most important statistical unit in European business statistics. The enterprise concept is applied in almost all domains of business statistics. It is also the core unit, given that the other statistical units, such as

the kind-of-activity unit, the local kind-of-activity unit[1] and the local unit[2], are defined in relation to the enterprise.

An enterprise may carry out one or more economic activities at one or more locations. The enterprise is thus not a homogeneous unit, neither with respect to its activity nor to its geographical location. However, in most enterprises, the principal activity accounts for quite a large share of the value added generated, and thus these enterprises come closer to the homogeneity of the economic activity. Also, most of the enterprises only have one location, which means that, for those enterprises, the regional attribution would be close to correct. Larger enterprises, however, perform various activities and have more than one location.

In business statistics, the term enterprise should always be used in the sense of a 'statistical enterprise'. This means, by definition, one aims to create a statistical unit that would allow one to compile harmonised data, irrespective of the actual organisational and legal structures of the economic agents. The criteria that a statistical enterprise should satisfy are: operating the necessary factors of production; having an organisational and managerial structure; autonomy of decision-making; and producing and selling goods and services on the market (see European business statistics methodological manual for statistical business registers, 2021 edition, Subsection 4.5.2).

The relationships between legal units and enterprises in statistical business registers may be summarised by the examples below.



1 The kind-of-activity unit is a part of an enterprise. It groups together all the offices, production facilities etc. of an enterprise that contribute to the performance of a specific economic activity defined at class level (four digits) of the European classification of economic activities (NACE Rev. 2.) For example, a kind-of-activity unit might be the combination of all parts of a metal-producing enterprise that produce copper (class 24.44 in NACE Rev. 2); within the same enterprise, there might be another kind-of-activity unit consisting of those parts that produce aluminium (class 24.42 in NACE Rev. 2).
The local part of kind of activity units is called local kind-of-activity unit; the term establishment is common as well, e.g. in SNA or ISIC (Glossary: Kind-of-activity unit and local-kind-of-activity unit - Statistics Explained (europa.eu)).

2 The local unit is an enterprise or part thereof (e.g. a workshop, factory, warehouse, office, mine or depot) situated in a geographically identified place. At or from this place, economic activity is carried out for which - save for certain exceptions - one or more persons work (even if only part-time) for one and the same enterprise (Glossary: Local unit - Statistics Explained (europa.eu)).

An enterprise consisting of more than one legal unit under the same management can be referred to as a 'complex enterprise'.

2.2.3.2. Recommendation for the correct implementation of the statistical unit enterprise in the ICT domain

In general, the share of complex enterprises or enterprises consisting of more than one legal unit is low at around 5% or even lower, depending on the country. However, complex enterprises are usually those with a high turnover or/and employment. So, an effort should be made to provide data for those enterprises in a harmonised way.

Consistency is especially encouraged with structural business statistics but also with other annual business statistics at national level.

2.2.3.2.1. Target population

In the case of complex enterprises, the attributes for the complex enterprise as a whole should be relevant for including the enterprise and its underlying legal units in the sample, even if one or more legal units are out of scope.

Therefore, the target population should comprise enterprises, including complex ones, having the main attributes (e.g. given NACE[3] code, number of employees and self-employed persons) in the scope of the ICT survey.

2.2.3.2.2. Sampling

The sample should be drawn at the level of enterprise. The attributes of the enterprise should be used as they are registered in the statistical business registers.

Unit consistency with structural business statistics and preferably also other national annual business statistics at the national level should be ensured.

If the variables 'employees and self-employed persons' and 'turnover' from existing data sources prove to be outdated, it could be considered to collect those variables from the enterprises, pre-fill them for verification by the enterprise, or check against the latest information of the statistical business registers when processing the data. It should be considered to ask for intra-enterprise flows on a voluntary basis.

3 NACE is the acronym for *Nomenclature statistique des activités économiques dans la Communauté européenne*. For more information on NACE Rev. 2: https://ec.europa.eu/eurostat/web/nace.

2.2.3.2.3. Data collection

It is up to the NSIs to collect the data either from legal units or from enterprises.

Data collection		
At enterprise level	Contact person	If an enterprise consists of more than one legal unit, the NSI should make an agreement with the enterprise as to who should be the contact person. If that is not possible, the legal unit that is best suited to reply should be chosen. If it is not known which legal unit is best suited to reply, the group head or top management should be contacted. If they cannot reply, they should forward the questionnaire for the individual modules to the person who is best suited to reply.
	Measures to ensure quality	The contact person should be given a list of legal units for which they should respond. If it turns out that the information in the statistical business registers as regards the legal units belonging to the enterprise is not correct, it should be reported back to colleagues in the responsible unit for profiling or the statistical business registers.
From legal units	Contact person	Ideally, data should be collected from all legal units belonging to the enterprise in the sample. If data cannot be collected from all legal units, the legal units that report should report for all legal units belonging to the enterprise; they should be explicitly made aware for which legal units they should provide the data.
	Measures to ensure quality	Special care should be taken to include the legal units having e-commerce in order not to underestimate the e-commerce. These would include, for example, legal units that, in previous years, reported having e-commerce or websites with functionalities to order goods or services, or legal units known from other sources to have e-commerce. For non-additive variables, e.g. variables with intra-enterprise flows, it might be better to collect them from a contact person/legal unit nominated or agreed or legally best-suited to reply for the whole enterprise, or the group head or top management. For non-additive variables, legal units should be asked to deduct the intra-enterprise flows.

2.2.3.2.4. Consolidation of variables

<table>
<tr><th colspan="4">Consolidation</th></tr>
<tr><td>Qualitative dichotomous questions (yes/no questions)</td><td colspan="3">As a general rule, if one answer is ‘yes’, the answer should be ‘yes’ for the whole enterprise.</td></tr>
<tr><td>Qualitative questions with different answer options</td><td colspan="3">In the 2023 survey, this concerns the question on internet speed, where the fastest connection in the enterprise should be chosen, and the question on the definition of the most recent review of documents on measures, practices or procedures on ICT security, where it should be the most recent update in the enterprise.</td></tr>
<tr><td rowspan="2">Quantitative variables</td><td>Additive variables</td><td colspan="2">Additive variables are those for which the simple sum of the amounts of the legal units yields the consolidated amount for the enterprise. This must be the case for all enterprises, regardless of the way in which the legal units are combined to form the enterprise.

In principle, variables such as ‘number of persons employed having access to the internet for business purposes’ and ‘number of persons employed using a portable device provided by the enterprise, that allows internet connection via mobile telephone networks’, are additive variables. However, in line with the summary note on additive and non-additive statistical business register variables, the number of persons employed are headcounts and not additive. For example, if one person (employee) is part-time employed by different legal units of the enterprise, that person should be counted once. If further information is not available, the variable should be treated as additive for practical reasons.</td></tr>
<tr><td>Non-additive variables</td><td>Non-additive variables are those that cannot be simply added up to calculate the total amount at enterprise level, if the enterprise consists of several legal units. However, a consolidation of the amounts of the variable in question (e.g. turnover) of the underlying legal units must be carried out, involving the elimination of values that are related to internal flows.

Non-additive variables in the survey on ICT usage and e-commerce in enterprises are variables with internal flows, such as e-commerce or turnover. Non-additive variables should be collected from the contact person, the legal unit best suited to reply for the whole enterprise or the group head/top management, or if the consolidation is done in the national statistical institute, an attempt should be made to deduct the intra-enterprise flows in the case of web sales or EDI-type (electronic data interchange) sales.</td><td>Data collection from enterprises

If data are collected from enterprises, they should be asked to deduct the intra-enterprise flows.

Data collection from legal units

If data are collected from legal units, information on the existence of intra-enterprise flows from the (statistical) business register should be used if available. Legal units could be asked to deduct the intra-enterprise flows.</td></tr>
</table>

Consolidation		
Percentages	**Data collection from enterprises**	If data are collected from the enterprise, the contact person, the legal unit best suited to reply for the whole enterprise or the group head/ top management in the enterprise should provide the percentage or an estimate for the whole enterprise.
	Data collection from legal units	If data are collected from legal units, the NSI should consolidate by dividing the absolute values (e.g. persons employed having access to the internet for business purposes) from all legal units by the total value for the denominator (e.g. persons employed in all legal units). If data from any legal unit is not available, it should be imputed. Information from statistical business registers can be used, if available or useful. Care should be taken if the percentages are for non-additive variables, where, for example, intra-enterprise flows should be excluded if possible.
Mutually exclusive questions	**Mutually exclusive questions** are, for example, questions about using artificial intelligence (AI), where there is a different set of questions for those who are using AI and for those who don't (such as the reasons for not using AI). In that case, the answers for such a question (e.g. reasons for not using AI) should only be counted if no legal unit in the enterprise has used the relevant technology (AI technologies). Therefore, the replies should be counted for the enterprise as whole; a 'yes' answer in at least one legal unit should be counted as a 'yes' for the whole enterprise.	

2.2.4. Statistical population

A population is a collection of objects of the same class. In statistical terms, this means a group of elements of the same statistical unit. There are two types of populations to be considered when producing statistics: the target population and the frame population.

The **target population** is the population of interest. It is identified by clearly delimiting the group of statistical elements about which information is desired. That delimitation is based on one or more attributes of the statistical unit. For example, for the enterprise, some commonly used attributes to delimit the target population are the size (e.g. number of employees and self-employed persons), the economic activity and its location. An example of a target population could be 'enterprises with 10 or more employees and self-employed persons, classified in Divisions 41–43 of NACE Rev. 2 (Construction), localised in the EU'.

The target population of the survey on ICT usage and e-commerce in enterprises is the group of enterprises delimited by the following attributes.

- **Economic activity**

NACE is the standard for the statistical classification of economic activities in the European Union. The present NACE Rev. 2, which is the new revised version of the NACE Rev. 1 and of its minor update NACE Rev. 1.1, is the outcome of a major revision of the international integrated system of economic classifications that took place between 2000 and 2007. NACE Rev. 2 reflects the technological developments and structural changes of the economy enabling the modernisation of EU statistics and contributing, through data that is more comparable and relevant, to better economic governance at both EU and national level.

NACE Rev. 2 was implemented for the first time in the 2009 survey. During that survey, both classifications NACE Rev. 1.1 and NACE Rev. 2 had been used to report the data. The results for the surveys since 2010 are reported following NACE Rev. 2 only.

Enterprises are classified in the following categories of NACE Rev. 2:

NACE Rev. 2	Description
Section C	Manufacturing
Section D, E	Electricity, gas and steam and air-conditioning supply, 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	Transportation 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
Group 95.1	Repair of computers and communication equipment

Enterprises are classified in one of these categories based on their principle economic activity. Since 2021, in accordance with the provisions of the EBS Regulation, Division 75 Veterinary activities is also included in the target population.

- **Enterprise size**

The target population consists of enterprises with 10 or more employees and self-employed persons.

Optionally, the target population can be extended to enterprises with numbers of employees and self-employed persons between 0 and 9.

With the adoption of the EBS Regulation, the variable 'persons employed' was replaced by the variable 'employees and self-employed persons'. This change of name of the variable does not imply any change in the scope. The two variables represent exactly the same concept. For the sake of user-friendliness, the term 'employees and self-employed persons' is only used in the introductory part of the model questionnaire and in Module X; in the rest of the questionnaire, the term 'persons employed' is still used.

The variable number of employees and self-employed persons is defined in Commission Implementing Regulation (EC) No 2020/1197 of 30 July 2020 (p. 92, Variable 120101: Number of employees and self-employed persons) and should not be confused with the number of employees or with full-time equivalents[4]. In what follows, from the statistical definition point of view, even though the word 'employees' is used, it always refers to 'employees and self-employed persons'.

- **Geographic scope**

Enterprises located in any part of the territory of the country.

The **frame population** is an operationalisation of the target population, consisting ideally of the complete list of the target population elements. A target population can be easily defined but, in practice, a list of all its elements is needed for its complete or partial observation (if a sample is used). This can be very difficult to obtain. The list should be complete and include each element of the target

4 A full-time equivalent (FTE) is a unit to measure employed persons or students in a way that makes them comparable although they may work or study a different number of hours per week. The unit is obtained by comparing an employee's or student's average number of hours worked to the average number of hours of a full-time worker or student. A full-time person is therefore counted as one FTE, while a part-time worker / student gets a score in proportion to the hours worked or studied. For example, a part-time worker employed for 20 hours a week where full-time work consists of 40 hours is counted as 0.5 FTE (Glossary:Full-time equivalent (FTE) - Statistics Explained (europa.eu)).

population only once. However, it will usually suffer from both under-coverage and over-coverage. Generally, files of statistical elements (registers) are maintained and updated, containing lists of statistical elements and also information on some attributes, usually used for delimiting target populations. Normally, frame populations are extracted from those registers.

2.2.5. Accuracy

The accuracy of statistical information refers to the closeness of estimates to the unknown true values. In practice, it is the degree to which the information correctly describes the phenomena it was designed to measure. The accuracy of statistical information is broken down into bias (systematic error) and variance (random error).

Sampling error is one of the quality indicators related to accuracy and, for most of the sampling surveys, is the most indicative quality information. The quality aspect is covered in Article 17 of the EBS Regulation, Articles 10 and 11 of EBS Regulation General Implementing Act, and Article 2 of the Implementing Act. The quantitative element for evaluating the data accuracy, established in agreement with Member States, has been the standard error. The maximum standard error (commonly used for evaluating quality) has been set to 2 percentage points for the whole coverage and 5 percentage points for the breakdowns, for the proportions and ratios that are calculated on the basis of the aggregate data that Member States transmit to Eurostat. It is an obligation of the NSIs, as producers of national official statistics, and of Eurostat, being the provider of official statistics on the EU, to estimate and present these statistical errors to the users.

2.2.6. Periodicity

The periodicity is annual. The data are collected and compiled once a year.

However, the content of the survey and questionnaire can be adapted to accommodate the evolving needs of data users. In practice, the content is changed every year. In addition, to minimise the burden on NSIs and respondents, some variables can be observed with a lower frequency, e.g. variables that tend to be stable over time.

The coverage of the survey is 2022-2023. Most variables of the 2023 survey are collected for the year 2023. However, the 2023 survey also collects certain variables for the year 2022. For example, questions of the 2023 survey relating to web sales of goods and services, ICT specialists and skills, ICT security incidents and background information relate to variables for the year 2022.

This periodicity is laid down in Article 6 and Annex II to the EBS Regulation.

2.2.7. Variables

Ultimately, the attributes of the statistical unit are what we want to observe; the observation variables hold the numerical measures of these attributes. Attributes and observation variables should not be confused. An attribute is some property of the statistical unit and each attribute may have one or more observation variables with qualitative or quantitative information.

For example, for the statistical unit 'enterprise', an attribute can be its size. The observation variable is then the number of employees and self-employed persons in its service.

There are many ways of classifying observation variables; the most relevant one for this survey is the distinction between qualitative and quantitative variables.

Qualitative variables concern non-numerical information. They serve merely as labels or names for identifying attributes of the statistical unit. An example is the 'use (Yes/No) of any type of fixed line connection to the internet' by the enterprise. Sometimes qualitative variables can be turned into numerical ones by coding the non-numeric values. Binary (or dichotomous) variables are an important type of qualitative variable. Binary variables assume only two different values, which are usually turned into numerical ones by attributing the values '0' and '1' in a meaningful way.

Quantitative variables contain information as to how much or how many. An example is the number of persons employed who have access to the internet.

In the survey on 'ICT usage and e-commerce', the observation variables are mainly qualitative (binary variables).

The operational version of the observation variables are the questions in the 2023 model questionnaire that can be found in Annex 1 – Model questionnaire.

The definition of the observation variables or the model questions are discussed in more detail in Section 2.3 below.

2.3. Model questionnaire

2.3.1. Development of model questionnaires

The legal background presented in Section 2.1 provides the context for developing the model questionnaires. The legal basis is output oriented, i.e. the Implementing Act defines the variables and their characteristics but does not impose a specific method for data collection.

In order to reach a higher degree of harmonisation, Eurostat - together with a task force of experts in the survey on ICT usage and e-commerce in enterprises – prepares an annual model questionnaire that is recommended to the NSIs.

The EBS Regulation limits the response burden of the annual Implementing Act for the topic of ICT usage and e-commerce to 73 variables, including background variables. On the other hand, the need for measuring digitalisation is ever increasing. To collect relevant statistics measuring the significant technological changes of the ICT landscape, but at the same time not to increase the burden on respondents, topics and/or variables are replaced or updated to collect more relevant or more in-depth information every year.

In addition to the compulsory data collection, some variables are proposed to be collected by the NSIs on a voluntary basis.

2.3.2. Modules and questions

This chapter refer to the questions in the 2023 model questionnaire ('**MQ**') (See Annex 1 – *Model questionnaire*). The structure of the chapter follows the model questionnaire, i.e. the explanatory notes are grouped by *module (title)* and *question*. It is recommended to have the model questionnaire at hand while reading this section.

2.3.2.1. General remark: 'use', 'have' or 'have another enterprise use for you'

In many of the questions and the corresponding notes, reference is made to the use of networks, systems, software etc. The term **'use'** does not refer to the ownership of such goods and infrastructure. For example, 3D printers or robots may belong to the enterprise, may be leased or may be shared with another organisation. In the case where 3D printers or robots are used by the responding enterprise, but provided or maintained by another enterprise, they should be considered as used by the responding enterprise.

Additionally, enterprises often buy ICT services or services which relate to the use of ICT in the context of the survey (like accounting). In cases where ICT services or other services which include use of ICT are provided totally by another enterprise and the responding enterprise itself is not using ICT for that function, then it should not be counted as use of ICT of the responding enterprise.

In some cases there will be a mixture of ICT usage by the responding enterprise and the ICT service provider (another enterprise). In these cases it should be made clear from the question what kind of activities will be counted as ICT usage of the responding enterprise.

Examples on the interpretation of special cases: In some questions the ICT involvement of the enterprise is not about ICT usage, but rather about whether the enterprise has or offers some digital solutions to its partners (customers or business partners). One example is the question about having a website (or websites). Here the question is about having, not using, and the subject is the solution that is offered to customers regardless of how the website(s) is technically maintained. The main issue about having a website is about control and responsibility for the contents in a separate area on the web. The enterprise's web pages can be maintained and designed by a service provider, but if the responding enterprise 'owns' the contents, it is considered to be its own website. However, not all presence in the web means that the respondent has a website. Presence in certain service catalogues 'yellow pages', address lists etc. are not counted as the enterprise's website. E-commerce systems can also be provided and maintained by service providers. Similarly to the case of the website, if it is the responding enterprise's e-commerce facility, the responding enterprise has control over the content of the site and is the one who is selling. If it is the owner of the products sold, then it is the respondent's e-commerce. Internet market places — where enterprises can sell their products — are a special case. Here the respondent does not own or control the site, but it does control the sale and own the products being sold and therefore it is their e-commerce (if e-commerce is a valid definition in the situation).

2.3.2.2. MODULE A: ACCESS AND USE OF THE INTERNET

Question A1: *How many persons employed have access to the internet for business purposes? (including fixed line, fixed wireless and mobile telephone network connection)*

If you can't provide this value,

Please indicate an estimate of the percentage of the total number of persons employed who have access to the internet for business purposes.

[Scope: all enterprises]

[Type: numerical, absolute or percentage values; filter question]

This variable refers to persons employed (employees and self-employed) who have access to the World Wide Web for business purposes from their workstation or from a computer to which they have free access. The following definition of a computer applies: *Computers include personal computers, portable computers, tablets, and other portable devices such as smartphones.*

The aim is to identify enterprises with access to the World Wide Web. The reason for applying this specific internet service is that, from the several services that can be run on the internet, the World Wide Web (as well as email) is the most common. Accessing the internet only through the email service is not considered in this variable, because email is already very common in Europe and it doesn't effectively represent the potential in terms of access to information as much as the use of the World Wide Web.

This variable can be collected in **absolute** or **percentage** values. Eurostat recommends using a combination of both, giving the respondent the opportunity to choose to answer in absolute or percentage values.

Independently of how this variable is collected, the background variable 'Average number of persons employed, during *the previous year*' (**X2**) is needed for grossing up the overall percentage of persons employed having access to the World Wide Web for business purposes.

Question A2: *Does your enterprise use any type of fixed line connection to the internet? (e.g. ADSL, SDSL, VDSL, fiber optics technology (FTTP), cable technology, fixed wireless) (add national examples)*

[Scope: enterprises with access to the internet, i.e. A1 > 0]

[Type: single answer (i.e. Tick only one); binary (Yes/No); filter question]

'Connection' means the type of the last mile connection of the enterprise (e.g. enterprise's computer-mediated network) to the network of the internet service provider (ISP). The last mile is the final segment between an ISP's infrastructure and a subscriber's location for delivering communications (connectivity) to the enterprise.

Note: From the 2020 model questionnaire onwards, the question does not explicitly mention 'broadband connection' as few countries mentioned the marginal use of 'narrowband' for the connection to the internet. Narrowband connections are not within the scope of this question (all examples mentioned refer to broadband connections). Enterprises that still use only narrowband connections to the internet should tick 'No' to this question.

Type of fixed internet connection:

- **DSL connection e.g. xDSL, ADSL, SDSL, VDSL**

xDSL digital subscriber line (DSL) is a family of technologies that provide digital data transmission over the wires of a local telephone network. DSL service is delivered simultaneously with a regular telephone service on the same telephone line as it uses a higher frequency band that is separated by filtering. A DSL line can carry both data and voice signals and the data part of the line is continuously connected.

The asymmetric digital subscriber line (ADSL), where more bandwidth is allocated to download than upload, and the high-bit-rate digital subscriber line (HDSL) are considered dominant DSL technologies. Symmetric digital subscriber line (SDSL) refers to either a DSL technology that offers symmetric bandwidth for upload and download or to a particular DSL variant where data are only supported on a single line that does not support analogue calls. Very-high-bit-rate digital subscriber line (VDSL) is a DSL technology that offers faster data transmission. VDSL

is capable of supporting high-definition television, telephone services (voice over IP) and internet access over a single connection, among others.

- **Fiber optics technology (FTTP), cable technology, etc.**

FTTP refers to 'Fiber to the Premises', also called Fiber to the Home (FTTH). It may be more correct to use FTTP: 'fiber to the premises' referring to both 'home' and 'business'.

- **Other high capacity 'speed' fixed (wired or wireless) connection includes the following types of internet connections:**
  - Cable modem 'cable TV network connection';
  - High capacity leased lines 'frame relay, ATM, digital multiplex';
  - Ethernet LAN connection;
  - Optical fibre connection;
  - Fixed wireless access (FWA) connections, e.g. satellite connection, public Wi-Fi connection, WiMax.

Cable modem uses modems attached to cable television networks (cable TV lines) for permanent fixed access to the internet. The term cable internet (or simply cable) refers to the delivery of an internet service over this infrastructure. A cable modem is a device that enables you to hook up your PC to a local cable TV line. It is considered as one of the high-capacity speed permanent fixed internet connections.

A leased line (dedicated line) is a telephone line that has been leased for private use. A leased line is usually contrasted with a switched line or dial-up line. Leased lines are usually available at speeds of 64k, 128k, 256k, 512k, 2 Mb and provided to the customer on X.21 presentation. Frame relay protocol and T-1 and T-3 (in Europe called E1 and E3) lines are used for internet connection via leased lines. Higher speeds are available on alternative interfaces.

High-capacity leased line is a permanent telephone connection between two points set up by a telecommunications common carrier. Typically, leased lines are used by businesses to connect geographically distant offices. Unlike normal dial-up connections, a leased line is always active. Because the connection doesn't carry anybody else's communications, the carrier can provide a given level of quality. For example, a T-1 channel is a type of leased line that provides a maximum transmission speed of 1 544 Mbit/s. The connection can be divided into different lines for data and voice communication or the channel can be used for one high-speed data circuit. Dividing the connection is called multiplexing.

Increasingly, leased lines are being used by enterprises, and even individuals, for internet access because they support faster data transfer rates and are cost-effective if the internet connection is heavily used.

Fixed wireless internet connection (FWA) is a technology which uses radio frequency, infrared, microwave, or other types of electromagnetic or acoustic waves in place of wires, cables, or fiber optics to transmit signals or data (provide internet access) between stationary (fixed) points. It includes for example a satellite internet connection (long-range wireless transmission) or public Wi-Fi (medium-range wireless transmission).

Wi-Fi (or Wi-fi, WiFi, Wifi, wifi), short for 'Wireless Fidelity', is a set of Ethernet standards for wireless local area networks (WLAN) currently based on the IEEE 802.11 specifications. New standards beyond the 802.11 specifications, such as 802.16 have been developed. They offer many improvements, from longer range to greater transfer speeds. Wi-Fi was intended to be used for wireless devices and LANs, but is now often used for internet access (one of the main international standards for wireless broadband internet access and networking, with widespread use in business, homes and public spaces). It is based on radio signals with a frequency of 2.4 GHz and theoretically capable of speeds of over 54 Mbit/s (at close range, some versions of Wi-Fi, running on suitable hardware, can achieve speeds of over 1 Gbit/s). It enables a person with a wireless-enabled computer or personal digital assistant to connect to the internet when close to an access point called a hotspot. Internet connection via mobile telephone networks is not included under this category.

By public Wi-Fi, essentially we are not referring to the enterprise's Wi-Fi (that may be xDSL, cable or fiber optic) but to public Wi-Fi, hotspots, hotzones that have different names in different countries. For example, in Luxembourg it is called HotCity and the coverage is very wide. National examples (i.e. WiFi or WiMax with their national brand names) would help respondents.

Note: In case the enterprises are using only a mobile internet connection, e.g. 4G technology as the only connection in the office (instead of a fixed line connection), then they should answer NO in question A2, because it is mobile broadband technology even though it is used like fixed line connection to the internet only on one address. However, it was considered that a separate question on the use of mobile internet connections was not necessary, as the information can be derived from the information provided by enterprises in questions A1 and A2.

Question A3: *What is the maximum contracted download speed of the fastest fixed line internet connection of your enterprise?*

(additional categories at national level can be added, if needed)

[Scope: enterprises with fixed line connection to the internet, i.e. A2 = Yes]

[Type: single answer (i.e. Tick only one)]

Maximum contracted download speed means the maximum theoretical speed — according to the ISP's contractual obligations — at which data can be downloaded. The five options offered are measured in Mbit/s (Mb/s or Mbps) or Gbit/s (Gb/s or Gbits). These stand for *megabits per second* or *gigabits per second* and are a measure of bandwidth (the total information flow over a given time) on a telecommunications medium. Mbps is not to be confused with MBps (megabytes per second). Often the problem is that speed tests and ISP's use 'bits per second' while download agents/programs use 'bytes per second'. Note that 1 Byte = 8 bits.

The five options offered are: a) less than 30 Mbit/s; b) at least 30 but less than 100 Mbit/s; c) at least 100 but less than 500 Mbit/s; d) at least 500 but less than 1 Gbit/s; and e) at least 1 Gbit/s.

Additional categories can be added at national level, if needed.

Note that the actual bandwidth and download speeds experienced are dependent on a combination of factors including the ISP, the equipment and the software used, the internet traffic and the destination server. Hence, it may differ from the contracted download speed which is requested in this question. Respondents are not requested to run a speed test on their equipment in order to respond to the question.

Enterprises (respondents) can obtain the information about the maximum contracted download speed of the fastest fixed line internet connection from their monthly invoices for telecommunication services (internet) or in the contract with the telecommunication services (internet) providers.

Use of website

Question A4: *Does your enterprise have a website?*

[Scope: enterprises with access to the internet, i.e. if A1 > 0; optional]

[Type: single answer (i.e. Tick only one); binary (Yes/No); filter questions]

Question **A4** is a filter question aiming to measure whether enterprises have a website. This observation variable doesn't refer specifically to the ownership of the website, but to the use of a website by the enterprise to present its business. It includes not only the existence of a website that is located on servers belonging to the enterprise or are located at one of the enterprise's sites, but also third-party websites (e.g. one of the group of enterprises to which it belongs i.e. website of the parent enterprise or holding enterprise).

Retail enterprises that have a presence on the web through the enterprise that holds the rights (royalties in the case of franchising) for the brand are counted as having a website, for example a retailer of garden tools counts as having a website if the parent enterprise has a website. The level of web presence can vary from simply an enterprise locator on a map (in particular for retailers, e.g. find your closest garden tools dealer) and indirect advertisement of the products/services to more sophisticated functionalities. As long as the presence of such enterprises on the web is through other websites for the specific products or services (not through yellow pages or telephone directories), it is considered that the enterprise has a website. However, it does not include any presence of the enterprise on the web. That would be too broad, as it would include the presence of the enterprise (e.g. its name or its contact information) in directories and online yellow pages. These cases are not included in this variable. Enterprises on e-marketplaces where they have the possibility to advertise themselves, quote prices for ad hoc services etc. are not enterprises that are considered to have a website.

Finally, this variable includes any type of website, independent of its sophistication or the services provided.

Note that an enterprise may have e-commerce web sales and still not have a website as the sales are through e-marketplaces. Note also that e-commerce marketplaces are considered different from *e-commerce platforms* e.g. Shopify, WooCommerce, Magento, Bigcommerce, that provide scalable, self-made online solutions for businesses

that would like to set up their own e-commerce website. In the light of this, an enterprise building its own e-commerce website using any e-commerce platform should be in the scope of 'enterprises having a website'.

Note that since MQ2018 enterprises having an account on specific social media (e.g. social networks such as Facebook) and providing functionalities (e.g. product lists and prices) similar to those of websites should **not** be considered as enterprises having a website. Although these enterprises would be expected to have control over the contents and in general manage their social media site, and interact with customers and/or partners, websites and social media should be considered different from various points of view such as design limitations, reporting tools, rules to follow, maintenance effort, complexity and marketing effort.

Question A5: *Does the website have any of the following?*

[Scope: enterprise with the website; i.e. A4 = Yes]

[Type: single answer (i.e. Tick only one); binary (Yes/No); multiple items may be expected]

For enterprises that have a website, this question focuses on measuring the various functionalities (facilities) of different sophistication. This information is of particular importance because the existence of a website provides the *potential* for better performance by the enterprise. The purpose of this question is to *complement* the measurement of *e-business* regarding the internet presence of the business.

a) Description of goods or services, price information

This includes lists of goods or services offered by the enterprise to its clients. It may also include the characteristics of these products and their prices. The information about the products or services may be more or less detailed. The list of goods or services offered does not have to be published completely on the website; they can be presented partly as well. The information may be static or dynamic (e.g. extracted online from a database and as such always updated).

b) Online ordering or reservation or booking, e.g. shopping cart

This item refers to a facility that allows the user to order goods or services with no additional contact offline or via email. It refers to websites that offer booking systems/functionalities (e.g. for hotel rooms or flights). Websites with links to external booking websites (e.g. Booking.com) should be excluded. It does not include a link on the website that directs the user to an email application that requires the user to send the order via email. Payment may or may not be included in the ordering facility, e.g. payment may be made on reception of the product or by other means than electronic payment.

Responses to this don't necessarily have to correspond with responses to web sales questions (B1a) due to different reference periods of both questions. Furthermore, for this item it is not mandatory to include binding reservations, while e-commerce transaction should cover only binding orders.

c) Possibility for visitors to customise or design online goods or services

This item refers to the existence of an interactive interface on the website where users can choose from several possible characteristics of goods (e.g. colour, size) or services (e.g. the size of a room) and check the price online. The interface might also include the possibility for the user to visualise online the appearance of the product with the options that were selected.

d) Tracking or status of orders placed

This facility aims to keep the customer informed on the progress of the ordering process, providing information on the expected arrival or the actual dispatch of the ordered goods, its location, date, time and the current status e.g. paid. This item doesn't cover tracking the orders placed via email exchange or offline contact.

e) Personalised content on the website for regular/recurrent visitors

This facility refers to the ability of a website to recognise registered users from previous visits (login/password) and adapt the content of the pages accordingly. This facility does not refer to the use of cookies.

f) A chat service for customer support (a chatbot, virtual agent or a person replying to customers)

This question focuses on offering a chat service to the enterprise's customers. A chat service is an internet service that allows the user to communicate **in real time** with a customer service agent by using an instant messaging application, which can be built into the enterprise's website. This includes chatbots that are developed by the enterprise as well as those that are not developed by the enterprise (e.g. WhatsApp chatbot, Messenger chatbot) and are integrated in an enterprise's website.

Chat messages are generally short in order to enable other participants to respond quickly. Thereby, a feeling similar to a spoken conversation is created, which distinguishes chatting from other text- or audio-based online communication forms, such as internet forums, emails or calls.

A chat service can be operated by a person, regardless of whether it is the enterprise's own employee (including those employed in parent or affiliate enterprises) or an external provider.

Chatbots can be scripted (sequential chatbots). This refers to chatbots that are based only on explicit predefined instructions, programmed to give a specific reply to a specific question. Given a command or question that is not in its library, such chatbot will not be able to respond.

On the other hand, **a chat service can be operated by intelligent** user interfaces such as chatbot or a virtual agent. A chatbot or virtual agent is a computer-generated, animated artificial intelligence virtual character that serves as an online customer service representative. Such programmes are often designed to convincingly simulate how a human would behave as a conversational partner. Essentially, chatbots are 'talking' robots that imitate human conversation – spoken, written or both. A chatbot may be used by enterprises in their chat service embedded on the website. Artificial intelligence (in the form of natural language processing, machine learning and deep learning) makes it possible for chatbots to 'learn' by discovering patterns in data. Without training, these chatbots can then apply the pattern to similar problems or slightly different questions. This ability gives them the 'intelligence' to perform tasks, solve problems and manage information without human intervention. Intelligent chatbots can discover new patterns and get smarter as they encounter more situations.

A chatbot's artificial intelligence has two components: machine learning and natural language processing (NLP). *Machine learning* is the ability of systems to learn from experience without human intervention and then use what they learn. With machine learning, the computer system learns by being exposed to lots of examples (rather than by being given more rules). This approach is patterned on how the brain learns and is called neural networks. *Natural language processing (NLP)* is the other component of a chatbot's intelligence and refers to its analysis and synthesis of human languages. NLP gives a chatbot the ability to learn and mimic the styles and patterns of human conversation. It helps create the illusion that the chatbot is another human, not a robot[5].

Other known names used for AI chatbots are: *talkbot, bot, IM bot, intelligent chatbot, conversation bot, AI conversation bot, talking bot, interactive agent, artificial conversation entity, or virtual talk chatbot*.

g) Advertisement of open job positions or online job application

This facility refers to providing users information on open job positions or offering them an online job application. An online job advertisement is placed on an enterprise's website, where job offers are published or online job applications are accessible. Online applications provide a way to collect résumés, cover letters and other pertinent details from applicants in electronic form. The job seeker can apply for a job online by uploading necessary documents (e.g. curriculum vitae, cover letter) and a complete set of questions, recruitment test or skills test, which can be entered into a database of applicants.

For instance, applications can be submitted via a textbox contained in the job advertisement that may be connected to the enterprise's email system, or the enterprise provides a link to the enterprise's email system. Job applications not sent via a website are not in the scope of the question.

h) Content available in at least two languages

The item refers to offering multilingual websites that feature content available (whole or partly) to customers in more than one language. This allows enterprises to connect with a significant number of new customers (multilingual audience) in different markets worldwide.

Multilingual website can be within a single domain (e.g. .com) or multiple domains of the enterprise in different languages (e.g. .es, .eu).

Multiple language options can be displayed in different ways. The most frequently used option is 'Tabs on multilingual website', where there is a small navigation option that contains the names of the languages that are available on the website. Once the customer clicks on them, the website changes the language.

Websites that offer a translation feature, such as Google Translate, are out of the scope.

5 https://www.smartsheet.com/artificial-intelligence-chatbots

Use of mobile apps

Question A6: *Does your enterprise have a mobile app for clients (e.g. for loyalty programme, e-commerce, customer support)?*

[Scope: enterprises with access to the internet, i.e. A1 > 0]

[Type: single answer (i.e. Tick only one); binary (Yes/No)]

The purpose of the question is to monitor the enterprise's offer of an interface for contacts with clients/customers using portable devices. The question focuses on having a mobile app for clients/customers to communicate with the enterprise, e.g. to sell products, to foster customer loyalty, to offer customer support. It is irrelevant if the enterprise developed the app themselves or if the app was developed for the enterprise by an external service provider.

Apps only used by employees and/or suppliers, for example in production and/or sales, are outside the scope and the app should not be the main product the enterprise is selling (e.g. gaming apps). Furthermore, common apps, i.e. apps used by several enterprises (e.g. Facebook, WhatsApp, eBay), are out of the scope.

Use of social media

Question A7: *Does your enterprise use any of the following social media?*

[Scope: enterprises with access to the internet, i.e. A1 = Yes]

[Type: single answer per item (i.e. Tick only one); binary (Yes/No); multiple items may be expected; filter question]

Enterprises that use social media are considered to be those that at least have a user profile, an account for business purposes or a user licence, depending on the requirements and the type of the social media (e.g. Facebook requires a profile, Twitter an account, Yammer a licence). It is not necessary that enterprises are active on their social media account. They may just provide basic information, e.g. location, products or services they offer.

It does not matter whether the social media is used by employees, customers or the enterprise's business partners. Furthermore, it does not matter whether the social media is fully operational or still in a pilot phase.

Enterprises exclusively paying for posting adverts (banner ads), either directly to the owner of the social media (e.g. Facebook, Twitter) or indirectly through enterprises that provide online services for automatically posting advert messages on social media (e.g. SoKule), are excluded from the scope.

Use of social media may differ by type of social media and type of enterprise. For example, enterprises in manufacturing may provide basic information on their profile, e.g. address, location, link to website. Enterprises providing services may be more active, publishing special offers, daily news and updates, etc. There may also be differences depending on the type of social media. Enterprises may be more active on social networks and less on multimedia content-sharing websites (e.g. posting a video on YouTube that is not updated for a long period). Enterprises for which employees or other persons use social media accounts other than the enterprise's own account are excluded, e.g. when enterprises pay celebrities to mention specific products in their tweets or Facebook pages.

Enterprises that **use** social media are considered those that **have a user** profile, an account or a user licence depending on the requirements and the type of the social media – enterprises may not be active users of the social media (e.g. they provided basis information years ago), but they are still considered as users of social media.

During the preparation of the national questionnaires, countries are invited to review the examples of the responses (a) to (c) according to national social medias. It is acknowledged that certain types of social media may fall into more than one response category, e.g. Yammer may be considered a social network (response a) Social network) as well as a microblog (response b) microblogs). Note that Google Talk, Skype, WhatsApp, etc. are not considered as social media because they primarily provide the means for one-to-one communication or many-to-many conferencing among predefined contacts.

a) Social networks (e.g. Facebook, LinkedIn, Xing, Viadeo, Yammer)

Social networks or websites are applications based on internet technologies that enable users to connect by creating personal information profiles, sharing interest and/or activities, sharing ideas, inviting others to have access to their profile and creating communities of people with common interests.

b) Enterprise's blog or microblogs (e.g. Twitter)

A weblog or blog is a website or a part of a website that is updated frequently, up to several times a day. A blog can be owned by individuals, interest groups of individuals, or enterprises. In the current context, it is the enterprise's blog and not other blogs to which employees contribute, even if they do so to promote the enterprise they work for. An update can have different names, sometimes specific to the website, e.g. it may be called an entry or a post. In most cases, messages consist of text only but they can also contain images (e.g. photos), audio (podcast) or videos (vlog). Readers can, sometimes anonymously, respond, share, comment or link to the entry online. Blogs can be used either within an enterprise (corporate blog) or to communicate with external parties, such as (potential) customers, business partners or other organisations.

Microblogging refers to posting very short messages (on specific microblog websites that serve this purpose) in contrast to long-form blogging, where entries usually consist of a few hundred words or more. Microblog posts usually involve a few hundred characters or less. For example, in the context of microblogging services, tweets (Twitter) are text-based posts of up to 140 characters displayed both on the user's profile page and on the timeline of the user's followers. Microblogs are often used for sharing hyperlinks to other websites, including those containing videos or images/photos.

c) Multimedia content-sharing websites or apps (e.g. YouTube, Flickr, SlideShare, Instagram, Pinterest, Snapchat, TikTok)

Multimedia content communities offer the possibility of sharing media content between users.

Photo and video services/podcasting: A podcast (or non-streamed webcast) is a series of digital media files (either audio or video in various file formats e.g. .aiff, .wav, .midi, for the former and .mov, .avi, etc. for the latter) that are released periodically. The mode of delivery differentiates podcasting from other means of accessing media files over the internet, such as direct download, or streamed webcasting.

Presentation-sharing websites offer the possibility to share presentations, documents and professional videos over the internet (share publicly or privately among colleagues, clients, intranets, networks, etc.) These websites offer the possibility to upload, update and access presentations and/or documents. Very often, presentation-sharing websites are linked to blogs and other social networking services or websites.

Question A8: *Does your enterprise use any of the above-mentioned social media to:*

Optional

[Scope: enterprises that use social media, i.e. A7 = Yes in any of the options (a) to (c)]

[Type: one single answer per item needed, i.e. Tick only one; binary (Yes/No); multiple items may be expected]

The aim of the question is to monitor for which purpose the enterprise uses any of the above-mentioned social media. The possible answer options start with option (a) presentation of the enterprise on the social media. They continue with options (b) and (c) for the use of social media platforms with customers. Option (d) covers the use of social media to interact with various business partners or other organisations. They finish with two explicit uses, option (e) for recruiting employees and option (f) using social media communication platforms internally to exchange views, opinions or knowledge.

Note that a 'Yes' in any of the responses presupposes that the enterprise has a 'Yes' in at least one of the A7 (a), (b) or (c).

a) Develop the enterprise's image or market products (e.g. advertising or launching products)

It is considered that developing the enterprise's image and marketing products cannot be distinguished as both tasks are undertaken by the same people (same business function). Response (a) implicitly refers to the enterprise's effort to monitor its reputation and presence on the World Wide Web.

b) Obtain, or respond to, customer opinions, reviews, questions

Response (b) corresponds to the use of social media for the enterprise's operational activities dealing with customer opinions, reviews or questions, in principle, implying the enterprise's effort to improve its customer service.

c) Involve customers in development or innovation of goods or services

Response (c) asks specifically for the involvement of customers in the development or the innovation activities concerning the enterprise's products. Responses (b) and (c) are considered important and should be distinct from each other as they may correspond to different business functions.

Moreover, it is common in the use of social media that enterprises address communities of customers for new innovative ideas and actively involve them in the development of new products.

d) Collaborate with business partners (e.g. suppliers) or other organisations (e.g. public authorities, non-governmental organisations)

An important purpose for using social media is the collaboration with business partners (e.g. suppliers, wholesalers, retailers, business associates) or other organisations (e.g. academic institutes, research institutes, local public authorities, non-governmental organisations) over wide communication platforms.

e) Recruit employees

Social networks for business professionals may be used in order to recruit employees, and to obtain referrals from other professionals (e.g. LinkedIn).

f) Exchange views, opinions or knowledge within the enterprise

Social media may be used to improve collaboration within an enterprise, optimise resources and develop the enterprise's network of experts (virtual teams), develop a corporate business culture and identity, share common aims and developments, exchange information and knowledge, and build collectively a knowledge base, etc. Moreover, the use of social media within an enterprise may support research activities or foster innovation through the development of new forms of collaboration.

Other use of internet

Question A9: *Does your enterprise pay to advertise on the internet? (e.g. adverts on search engines, on social media, on other websites or apps)*

[Scope: enterprises with access to the internet, i.e. A1 = Yes]

[Type: single answer per item (i.e. Tick only one); binary (Yes/No); optional question]

The question refers to enterprises using paid adverts (ads) on the internet to advertise their goods or services. For example, enterprises may pay for their ads to appear at the top of the search results of various search engines, on social media banners, etc. when relevant search terms were entered.

Question A10: *Does your enterprise pay to advertise on the internet using any of the following targeted advertising methods?*

[Scope: enterprises that pay to advertise on the internet, i.e. A9 = Yes]

[Type: single answer per item (i.e. Tick only one); binary (Yes/No); optional question]

In the following responses, we refer to targeted advertisement methods. In general, advertisement methods that are used over the internet offer enterprises more possibilities to reach their target audience. It is possible that all four responses are negative, meaning that an enterprise pays for ads (A9=Yes) without using any of the proposed targeting methods.

a) Based on content or keywords searched by internet users

Response a) refers to the use of technologies that adapt adverts to the contents of the displayed pages (contextual advertising). Internet users are presented with adverts that automated systems have selected for them according to the content of the webpage or based on keywords that users have searched on the internet. For example, enterprises may pay for having their ads at the top of results for relevant search terms of various search engines, on social media banners, etc. Adverts based on the context of the webpage may be 'push' type advertisements or 'pull' advertisements. For the former, adverts are shown regardless of the need of the user while for the latter the user was actively seeking marketing content (e.g. through keywords) and thus the advert is shown.

b) Based on the tracking of internet users' past activities or profile

Response b) refers to the use of technologies for collecting information about the online (browsing) activity of internet users (behavioural advertising, web browsing habits). Tracking cookies (files stored on internet user computers when visiting a website) are used to help determine the user interests based on the web pages that were visited, the content that users browsed and other actions that were taken online. The aim is to deliver adverts tailored to the user's interests and preferences.

c) Based on the geolocation of internet users

In the context of using the internet for ads, advertising based on the geolocation of internet users refers to

the use of technology (geo-targeting) that, regardless of the device (portable or not) and the connection to the internet (fixed including wireless or mobile), may be used in order to deliver advertisements based on the geographical location (e.g. hotels in the proximity). Determination of geolocation of the user is used by classic Google advertisements and Facebook advertisements. Geolocation is particularly used in cases of 'push' advertisements via apps on mobile devices. However, it is to be recalled that the current scope is broader than mobile advertisement that may be implied by the use of apps on mobile devices according to the terminology that is used in the questionnaire. Technically, the important issue would be the proper identification of the IP address of the connection to the internet through the closest tower antenna or router. The use of geo-targeting technologies for advertising can be combined with the use of cookies (behavioural advertising, web browsing habits) in order to specify the need of a potential customer.

d) Any other method of targeted advertising on the internet not specified above

Other methods of internet advertising refer to the use of paid ads for delivering marketing messages to consumers that are not covered by the above-mentioned dynamic methods (for example, advertisements targeting specific websites that have different demographic characteristics - e.g. general population, younger or older persons, men or women). The combined use of the above-mentioned technologies cannot be excluded.

2.3.1.1. MODULE B: E-COMMERCE SALES

This module covers e-commerce sales (received orders) which are conducted via a website or apps or as EDI (electronic data interchange)-type sales. Since the 2011 survey, the measurement of e-commerce sales is done as a split between web sales and EDI-type sales which are separate submodules and comprise mandatory reporting variables.

One important difference in this module, compared with most other variables in the questionnaire, is that systematically the reference period is the previous calendar year, instead of the current situation. Flow economic variables like turnover and purchases – the main variables to measure in e-commerce – need to be measured for a longer period instead of at just one point in time. In order to keep comparability with the main business statistics, a calendar year is taken as reference period.

Definition of e-commerce

In order to ensure the broadest international comparability of the enterprise ICT usage statistics, the OECD definition of e-commerce is used as a basis throughout this module but referring merely to sales ('Update of the OECD statistical definition of e-commerce (DSTI/ICCP/IIS(2009)5/FINAL'):

The 2009 definition of e-commerce	
OECD definition of e-commerce	**Guidelines for the Interpretation**
An **e-commerce transaction** is the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders. The goods or services are ordered by those methods, but the payment and the ultimate delivery of the goods or services do not have to be conducted online. An e-commerce transaction can be between enterprises, households, individuals, governments, and other public or private organisations.	**Include**: orders made in web pages, extranet or EDI. The type is defined by the method of making the order. **Exclude**: orders made by telephone calls, facsimile, or manually typed e-mail.

The framework for measurement	
Type	**Definition of the type of e-commerce**
Web e-commerce	Orders made at an online store (webshop) or via web forms on the Internet or extranet regardless of how the web is accessed (computer, laptop, mobile phone, etc.)
EDI e-commerce	Orders initiated with EDI. EDI (electronic data interchange) is an e-business tool for exchanging different kinds of business messages. EDI is here used as a generic term for sending or receiving business information in an agreed format which allows its automatic processing (e.g. EDIFACT, XML, etc.) and without the individual message being manually typed. "EDI e-commerce" is limited to EDI messages placing an order.

E-commerce sales may also include renewal orders (standing orders/recurrent payments/subscriptions) received in the reference period, which are associated with the initial order made via e-commerce channels before the reference year. It has been agreed that such standing orders are within the scope of the e-commerce module. However, experiences provided by statistical compilers show that measuring this would be challenging, because many enterprises cannot track the information needed to distinguish if such standing orders are linked to an initial order made via an e-commerce channel. Therefore, it has been decided not to add any explicit clarification on that matter in the questionnaire (neither model questionnaire, nor national questionnaires). If a respondent asks whether they should include such order/payments in the reference period, which are resulting from an initial order made before the reference period, they should be advised that standing orders/recurrent payments/subscriptions received in the reference period should be reported by them within the e-commerce module.

Defining e-commerce sales in the questionnaire

With the implementation of the definition in the questionnaire below the main definition of e-commerce is explained for the respondents.

> ***In e-commerce sales*** *of goods or services, the order is placed via web sites, apps or EDI-type messages by methods specifically designed for the purpose of receiving orders.*
>
> *The payment may be done online or offline.*
>
> *e-Commerce* ***does not include*** *orders written in e-mail.*

Defining web sales in the questionnaire

In the beginning of the submodule on web sales the concept of web sales is explained for the respondents.

Online store (webshop) is the most obvious and clear example of web-based e-commerce. It is a separate site in the web or a separate part of a website where products are presented and typically ordered via shopping cart functionality.

Web forms are simple forms integrated in the enterprises' website where goods and services can be ordered. In these forms you can type or click the order and send the order by "send" button on the web site.

Extranet is a closed environment for agreed partners or customers where other information between those parties can be accessed or exchanged. If there are sales done in extranet, it is counted as web sales. In extranet, the actual shopping can be done either in a webshop or via web forms, as explained above.

Bookings and binding/fulfilled reservations are considered similar to orders; for some economic sectors (e.g. NACE Rev. 2, sector 55 Accommodation), these terms are more commonly used to describe the order. The questions in this module are about sales (and generated turnover), therefore the scope is by default limited to the fulfilled sales, orders, and reservations. Reservations and orders that are not fulfilled are outside the scope of this module.

Sales via **apps for mobile devices or computers** are also counted as web sales. App is a short name for web application. There are two types: the browser-based and the client-based web applications. The former are web applications accessible over a webpage (html and JavaScript) and run within the web browser. The latter are installed on a device (e.g. smartphone), run without going through a browser but they use web protocols.

In addition to sales via enterprise own websites or apps, sales via external **e-commerce marketplace websites or apps** are also counted as enterprise web sales. E-Commerce marketplaces are external websites or apps used by several enterprises for trading (selling) their goods or services to customers.

Defining EDI-type sales in the questionnaire

In the beginning of the submodule on EDI-type sales, the concept of EDI-type sales is explained for the respondents.

EDI can be defined as the transfer of structured data, by agreed message standards, from one computer system to another without human intervention. EDI provides a technical basis for automated commercial 'conversations' between two entities, either internal or external. The term EDI encompasses the entire electronic data interchange process, including the transmission, message flow, document format, and software used to interpret the documents.

Demand-driven orders concern situations where, for example, a certain minimum level of inventory has been specified in the system of the buying enterprise; when the inventory drops below the specified minimum level, the system transmits an EDI message to the selling enterprise for more goods to be delivered.

This is an example of an advanced, but in certain activities common, way of business automation through the automated integration of systems from two trading partners.

Web sales of goods and services

Web sales covers orders, bookings and reservations placed by your customers via

- your enterprise's **websites or apps** :
  - online store (webshop)
  - web forms
  - extranet (webshop or web forms)
  - booking/reservation applications for services
  - apps for mobile devices or computers
- **e-commerce marketplace websites or apps** (used by several enterprises for trading goods or services).

Orders written in e-mail are **not** counted as web sales.

B1: *During 2022, did your enterprise have web sales of goods or services via:*

[Scope: enterprises with access to the internet, i.e. A1 > 0]

[Type: single answer per item (i.e. Tick only one); binary (Yes/No); multiple items may be expected]

a) your enterprise's websites or apps? (including extranets)

b) e-commerce marketplace websites or apps used by several enterprises for trading goods or services? (e.g. e-Bookers, Booking, hotels.com, eBay, Amazon, Amazon Business, Alibaba, Rakuten, TimoCom)

[Please add national examples of e-commerce marketplaces including government marketplaces]

Policy context: Users expressed a need to quantify the use of electronic marketplaces by enterprises (intermediary e-commerce websites or apps) for receiving orders via various web platforms in the context of enterprise web sales. The relevant policy initiatives concern market competition issues, dominant position of e-commerce players that are active in marketplaces, and investigation of (discriminatory) business models in various e-commerce marketplaces.

Methodological/explanatory notes on e-commerce marketplaces: The following working definition is proposed: The term 'e-commerce marketplace' refers to websites or apps used by several enterprises for trading products (e.g. e-Bookers, Booking, hotels.com, eBay, Amazon, Amazon Business, Alibaba, Rakuten, TimoCom, Glovo, Wolt). *Amazon Business* is a marketplace on Amazon.com that is addressed to business-to-business (B2B) commercial transactions.

TimoCom was added to the list of examples of an e-commerce marketplace in questions B1 and B3. TimoCom runs the largest transport platform in Europe (it operates in 44 European countries). Services on this platform include: transport orders (to request orders digitally and manage transport orders); freight exchange (to avoid empty runs); vehicle offers; fixed contracts (transport tenders platform); and warehousing exchange.

Amadeus is not an example of an e-commerce marketplace. It is a platform that connects travel providers and travel sellers all over the globe, offering search, pricing, booking, ticketing, transaction and servicing capabilities.

It mainly provides services designed for enterprises within the travel sector and it builds the technology that enables travel agents and websites to book airline, rail, cruise and ferry tickets, hotel rooms, car hire, tour packages and more. Travel agencies can build their services on top of Amadeus, e.g. their own platforms. Amadeus is not a marketplace, but rather an infrastructure.

Note that **e-commerce marketplaces** are different from **e-commerce platforms,** e.g. Shopify, WooCommerce, Magento, Bigcommerce, that provide scalable, self-made online solutions for business that would like to set up their own e-commerce website.

The following should **not be considered as e-commerce marketplaces**:

a) a website or app of an enterprise selling the enterprise's own products;

b) a website or app of one seller acting as a distributor, selling other enterprises' specific products;

c) a website that provides e-commerce solutions for other enterprises to install for the enterprises' own e-commerce functionality; and

d) a website that focuses on non-trading activities like collaborative design.

The issue of translating accurately the term 'e-commerce marketplaces' in other languages is important. Other alternatives might work better (e.g. internet-based trade platforms) in other languages.

B2: *What was the value of your web sales? (please refer to the provided definition of web sales)*

[Scope: enterprises which had web sales of goods or services, i.e. B1a = Yes or B1b = Yes]

[Type: numerical, absolute or percentage values]

Please answer to a) OR b)

a) What was the value of your web sales of goods or services, in 2022? (National currency, excluding VAT)

b) What percentage of total turnover was generated by web sales of goods or services, in 2022?

If you cannot provide the exact percentage, an approximation will suffice.

For turnover, the SBS definition is to be used. See background variable X3 in this document.

Collecting electronic orders in percentage values has the advantage of allowing us to obtain an estimate from respondents who don't have any records in the enterprise that can provide this value. Therefore, unless specific records of all these transactions are kept in a centralised form, it may be difficult for the enterprise to provide the value of orders received that were placed via a website or app. Another way of coping with this problem is to allow enterprises to estimate the web sales turnover in monetary terms by indicating that 'an approximation will suffice'.

For enterprises with a very small share of e-commerce in turnover, there is evidence that respondents round this significantly to around 1%. Therefore, when collected in this way as a percentage figure, a relatively large proportion of the values collected are 1%. Another challenge of this method is that, for big enterprises, a value of less than 1% can still be a significant amount in value terms. When answers from big enterprises are involved, this can bring a significant instability to the results.

In addition, larger percentage shares are often also reported rounded to multiples of 10% or 5%.

For these reasons the answer should be provided in decimals.

Due to challenges in collecting data in percentage figures, the preferred way to collect value of sales via a website or app is in absolute values. Unfortunately, for many enterprises, this value is not available. For this reason, the recommended method is to ask the enterprise to answer in precise absolute values if it has the information. Or as an alternative, if such information is not available, ask for an estimate, either in monetary terms or as a percentage of the total turnover.

Please answer to a) OR b)	
a) What was the value of your web sales of goods or services, in 2022?	(National currency, excluding VAT) _____
OR	
b) What percentage of total turnover was generated by web sales of goods or services, in 2022? *If you cannot provide the exact percentage an approximation will suffice.*	␣␣␣,␣ %

Currently some countries ask for the absolute value while others ask for the percentage value. The current formulation aims to provide an alternative in order to avoid the bias that might exist from asking only one of the two ways i.e. underestimation in the case of the absolute value and overestimation in the case of percentage values. **It may be preferable to give the option to enterprises for using the one for which they can provide the more accurate answers.**

Eurostat preferred practice is to get the grossed-up value of the percentage, i.e. the percentage of turnover resulting from orders received that were placed via a website or apps.

In a situation where an enterprise (e.g. airline) gets commissions from sales (e.g. car rental) made from another enterprise (e.g. car rental enterprise) via its (air enterprise) website or app, the commissions should be counted as e-commerce.

B3: *What was the percentage breakdown of the value of web sales in 2022 for the following: (Please refer to value of web sales you reported in B2)*

If you cannot provide the exact percentages an approximation will suffice.

[Scope: enterprises which had web sales of goods or services via own websites or apps and via e-commerce marketplaces, i.e. B1a = Yes and B1b = Yes]

[Type: numerical, percentage values that add up to 100%]

a) via your enterprise's websites or apps? *(including extranets)*

b) via e-commerce marketplace websites or apps used by several enterprises for trading goods or services? *(e.g. e-Bookers, Booking, hotels.com, eBay, Amazon, Amazon Business, Alibaba, Rakuten, TimoCom)*

[Please add national examples of e-commerce marketplaces including government marketplaces]

In the case of a web questionnaire, it is recommended that B1 serves as a 'smart filter'. **B3** should only be answered if both **B1 a) and B1 b)** have been answered with 'Yes'. If only one of the two has been answered with 'Yes', then the respective value for **B3** should be stored as **100 %** and the respondent should go to **B4**.

The sum of answer options a) and b) should always result in 100%.

B4: *What was the percentage breakdown of the value of web sales in 2022 by type of customer: (Please refer to value of web sales you reported in B2)*

If you cannot provide the exact percentages, an approximation will suffice.

a) Sales to private consumers (B2C)

b) Sales to other enterprises (B2B) and Sales to public sector (B2G)

Total: 100%

[Scope: enterprises which had web sales of goods or services, i.e. B1a = Yes or B1b = Yes]

[Type: numerical, percentage values that add up to 100%]

For respondents having received orders that were placed via a website or app, a percentage breakdown of the turnover by type of customer is requested. The two most important types of e-commerce occur in business-to-consumer (B2C) and business-to-business (B2B) markets.

a) Sales to private consumers (B2C)

The term B2C stands for business-to-consumer and refers to electronic commerce transactions between enterprises and the individuals as the end consumer. Business-to-consumer electronic commerce typically takes the form of websites or apps that offer the possibility to individuals to place orders for products.

b) Sales to other enterprises (B2B) and Sales to public sector (B2G)

The term B2B stands for business-to-business and refers to electronic commerce transactions between enterprises (different from transactions between enterprises and other groups, like consumers (individuals) and the government). B2B refers to commercial transactions between the responding enterprise and other enterprises (e.g. manufacturer and a wholesaler, a wholesaler and a retailer). Business-to-business electronic commerce typically takes the form of processes between trading partners and is performed in higher volumes than business-to-consumer applications (e.g. use of e-marketplaces or via the respondent's websites using login/password procedures). B2B e-marketplaces connect buyers and sellers through a hub where online transactions can be executed. The distinction of e-commerce between B2B and B2C is important because B2B transactions have advantages for enterprises, e.g.

reduction of product cycle times, lowering stock levels and increasing trade volumes.

B2G stands for business-to-government and includes the electronic commercial transactions between the responding enterprise and public authorities that are conducted via a website or apps.

EDI-type sales

EDI-type sales cover **orders placed** by your customers via EDI-type messages (EDI: electronic data interchange), meaning:

- in an **agreed or standard format** suitable for automated processing;
- EDI-type order message created from the **business system** of the customer;
- including orders transmitted via EDI-service provider;
- including automatic system-generated **demand-driven orders;**
- including orders received directly into your **ERP** system.

Examples of EDI: EDIFACT, XML/EDI (e.g. UBL, Rosettanet, *[please add national examples]*)

B5: *During 2022, did your enterprise have EDI-type sales of goods or services?*

[Scope: enterprises with access to the internet, i.e. A1 > 0]

[Type: single answer (i.e. Tick only one); binary (Yes/No); filter question]

B6: *What was the value of your EDI-type sales? (please refer to the provided definition of EDI-type sales)*

[Scope: enterprises which had EDI-type sales of goods or services, i.e. B5 = Yes]

[Type: numerical, absolute or percentage values]

Please answer to a) OR b)

a) What was the value of your EDI-type sales of goods or services, in 2022? (National currency, excluding VAT)

b) What percentage of total turnover was generated by EDI-type sales of goods or services, in 2022?

If you cannot provide the exact percentage, an approximation will suffice.

For turnover, the SBS definition is to be used. See background variable X3 in this document.

See definitional issues on EDI in the beginning of Chapter 1.2.3 and guidelines for some possible interpretation problems presented below.

Guidelines for some specific cases of possible interpretation problems on e-commerce, web or EDI type

1) The following example intends to clarify the distinction between EDI-type sales and web sales in a situation where both technologies are involved in the process.

Case/situation:

The responding enterprise has a website or app with sales functionalities. The customer chooses the product and the transaction is completed by pressing the Send button. The website might create an EDI-type message that is sent: to the sales department to prepare electronically the transportation documents and the goods; to the accounting department to prepare the electronic invoice; and to the department responsible for dispatching to prepare the planning of the dispatch of the goods. The same case can be replicated if the customer is not using the enterprise's website or app but the website or app of an online shop which produces the same EDI messages.

Classification/explanation:

According to the e-commerce definition[6], this is referred to as **web sales** because the order was placed via the enterprise's website or app (or a website of a third party selling on behalf of the enterprise – online store) even if the enterprise received it as an EDI-type message. The reporting enterprise should avoid double counting the sales.

2) Selling credit online via apps, e.g. on mobile phones.

In the example below, we try to clarify the issue of e-commerce in relation to apps when the reporting enterprise sells credit online. More particularly, the issue concerns enterprises that sell credit over the internet to customers that have the enterprise's app on their mobile phone, tablet or other device.

6 The type of e-commerce transaction is defined by the method of making the order. This approach should mitigate the interpretation problems where both types, EDI and web, are used in the process. An example is a situation where an order is made by the customer through a web application but the information is transmitted to the seller as an EDI-message. Here the type of selling application is, however, web; EDI is only a business application to transmit information (DSTI/ICCP/IIS (2009) 5/FINAL).

There are three distinct cases:

a) **Reporting enterprises in the specific economic activities of selling credit to be used for purchasing products from third enterprises:** For reporting enterprises whose principle economic activity is selling credit, the fact that they sell credit over the internet should be broadly considered as e-commerce. It should be considered as a commercial transaction, similar to selling vouchers (with/without specifying product) and it would be initially registered as liability towards other enterprises (e.g. retailers, wholesalers, service providers). The 'service fee' should be registered as turnover when the final client ultimately uses the credit/voucher and orders the products. It may be that, for taxation purposes, there is a 'timing issue' for registering the 'service fee' before the final client uses the credit/voucher.

b) **For enterprises that sell credit/vouchers and do not refer to any of their specific products (e.g. gift cards with a certain preloaded amount):** From the accounting perspective, selling credit over the internet is not e-commerce (no specific product is ordered), so it should be registered as advance payment and not as turnover. It should be registered as commercial transaction and turnover only when the customer orders specific products via the internet (e-commerce) or otherwise (brick-and-mortar business).

c) **For reporting enterprises that sell credit/vouchers and implicitly refer to single/specific products (e.g. set of tickets for the cinema):** In principle this should be the same as above. However, in some countries, in accordance with national tax law, it may be registered as commercial transaction and turnover because the specific product and its respective price is specified on the credit/voucher.

In the context of the survey, the most important issue is to avoid double counting (when selling credit and when receiving orders) and to enable enterprises to respond as accurately as possible, depending on how e-commerce has been implemented into their accounting system.

3) Clarification on sales over an extranet: web sales or EDI-sales

Enterprises (respondents) may receive orders placed over an extranet and these usually concern business-to-business transactions. It may not always be sufficiently clear for respondents whether the orders received over an extranet should be considered as web sales or EDI-type sales. If it is unclear, the level of automation for placing the order should be considered and clarifications may be required from the respondents. In fact, respondents should know how their customers place orders besides just EDI-type messages.

The OECD definition of e-commerce is based on **the way the order is placed**. If the order is placed via forms/web forms via extranet, it is clearly web sales, regardless of the fact that an exchange of EDI-type messages follows as explained in case 1) above. The issue to be clarified with the enterprise (respondent) should be exactly on the operation of their partner when placing the order.

Only the description of the actual operation for placing the order would provide the necessary information for web or EDI-type sales and, in certain cases, the NSI must take a decision. However, it is suggested that 'web sales' are completely excluded before declaring the sales as 'EDI-sales'.

4) Frame agreements

Goods or services that are agreed to be sold in a frame agreement, but are ordered later via web or EDI-type orders are also included in e-commerce sales. This means a situation where enterprises reach an agreement for an agreed number/amount/volume/limit of products – not necessarily online – for an agreed time frame, but the products are ordered electronically later when they are needed (it could be multiple smaller orders summing up to the frame agreement). In this case, the initial sale (frame agreement) should not be included as e-commerce, but the order of the products via web or EDI message should be (and only this turnover generated by the orders for the specific reference year).

5) The following seven cases are grouped together. Some of them raise certain issues related to the application of the e-commerce definition.

Examples on what IS e-commerce:

The first case is the usual case of an enterprise having web sales.

Case 1) An e-commerce website or app can offer the possibility to fill in a web form (online) hence the order is placed using a website or app.

The second case refers to the use of 'methods specifically designed for the purpose of receiving orders' over a website even though the selling enterprise (responding enterprise) retrieves (downloads) the order on its own initiative.

Case 2) An e-commerce website or app can offer the possibility to fill in a web form (online) hence the order

is placed using a website or app and the responding enterprise enters the website and retrieves online the order in any format.

Examples on what is NOT e-commerce:

The following cases are not considered as e-commerce web sales because the web form or the PDF order form is used as a Word document, text document or an email. The website does not provide the means to 'place the order' but in principle to 'construct the order' that is eventually placed differently (email, other electronic message via the website or post). In these cases, the orders are not made necessarily on web pages, i.e. they can be made by printing a PDF document which is then 'reintroduced' into a computer system and, because of this break, there is no e-commerce because there is a human intervention in the process, and a 'break' in the automation.

Case 1) An e-commerce website or app can offer the possibility to fill in a **web form** (online). The form is 'printed' in PDF and sent by the customer to the responding enterprise as an **email attachment**.

Case 2) An e-commerce website can offer the possibility to fill in a **web form** (online). The form is 'printed' in PDF and sent by the customer to the responding enterprise **by post**.

Case 3) An e-commerce website or app can offer the possibility to fill in a **PDF** order form (not necessarily online). The form is 'saved' in PDF, completed and sent by the customer to the responding enterprise as an **email attachment**.

Case 4) An e-commerce website or app can offer the possibility to fill in a **PDF** order form (not necessarily online). The form is 'saved' in PDF, completed and sent by the customer to the responding enterprise via the same **website as an attachment to a message**.

Case 5) An e-commerce website can offer the possibility to fill in a **PDF** order form (not necessarily online). The form is 'saved' in PDF, completed and sent by the customer to the responding enterprise **by post**.

2.3.1.2. MODULE C: DATA UTILISATION, SHARING, ANALYTICS AND TRADING

The purpose of the module is to measure the use of data by enterprises in various business processes, with the main focus on performance of data analytics. In order to bring the topic gradually closer to the respondents and to capture data utilisation in a more comprehensive way, the module structure builds on four submodules related to:

- the use of business applications or information systems for storing data, sharing information among different functional areas or for analysing data;
- sharing data with other enterprises, e.g. customers or suppliers;
- data analytics; and
- data trading.

Nowadays, most enterprises and individuals leave a digital footprint, resulting in increasingly digital, data-intensive business environments. Enterprises have to deal with immense data flows of complex structured or unstructured data, often updated in real time, most of which is demanding to structure and ultimately to analyse (e.g. images, emails, electronic documents of various formats).

In general, all activities that are carried out electronically (over the internet) produce data, the use of which is of major social and economic value. Using the available information allows enterprises to create value from the data and gain a competitive advantage.

Use of business software

C1: *Does your enterprise use the following business software?*

[Scope: enterprises with access to the internet, i.e. if A1>0]

[Type: single answer per item (i.e. Tick only one); binary (Yes/No); multiple items may be expected]

This question measures the use of software enabling the integration of some business functions within the enterprise in the context of sharing information electronically and automatically between different functions of the enterprise.

The question includes the use of one single ERP (enterprise resource planning) software application that supports different business functions of the enterprise and CRM (customer relationship management), software for managing information about customers. Furthermore, the question includes the use of BI (business intelligence) software, which allows enterprises to access and analyse data sets from internal IT systems and external sources, and to provide users with detailed insights for operational decision-making and strategic planning.

a) Enterprise resource planning (ERP) software

Software used to manage resources by sharing information among different functional areas (e.g. accounting, planning,

production, marketing). ERP software can be off-the-shelf software, customised to the needs of the enterprise or self-created software.

ERP stands for enterprise resource planning and consists of one or more sets of software applications that integrate information and processes across several business functions within an enterprise (e.g. accounting, planning, production, marketing).

The ERP is first and foremost a system for managing enterprise operations and can include various modules. It is intended to adapt to business processes, thereby facilitating and speeding up daily operations and combining data from different departments in one place (database).

The ERP software can be **either installed and operated in the enterprise's hardware capacity or operated as cloud computing services**. Typically, ERP integrates planning, procurement, sales, marketing, customer relationships, finance and human resources. Enterprises are considered as ERP software users if they are using all or only one set of software applications (modules, e.g. finance module).

ERP systems have the following characteristics:

1. ERP systems are software designed for the enterprise's ICT infrastructure, whether traditional or web/html-based server environment;
2. ERP systems integrate most business processes and functions;
3. ERP systems process a large majority of an organisation's transactions and information;
4. ERP systems use an enterprise-wide database that typically stores each piece of data once; and
5. ERP systems allow access to the data in real time.

ERP software can be off-the-shelf software, customised to the needs of the enterprise, or self-created software. However, off-the-shelf ERP software is usually built in a modular way, allowing enterprises to customise it for their specific economic activity or size, e.g. by implementing only some of the modules.

If needed, ERP software can also integrate (some) selected information of affiliates or business partners or provide them with access to (parts of) the system (preferably for web-based ERP systems).

Often respondents do not know the term ERP software because they use the brand name of an ERP software (e.g. SAP, Oracle). Mentioning examples of nationally used ERP software packages might help them to recognise the use of ERP software. Other respondents may use ERP software so regularly that it is taken as a given and they forget to report it, or they use parts of ERP software but are not aware that they use it.

This question **C1a)** is intended to measure the use of ERP software, and not of ERP as a concept of generalised integration of business processes.

The adoption of ERP software is also important because there are simple (free/open-source) ERP solutions that might be a good opportunity for enterprises to increase the internal integration of their business processes.

Among other functions, ERP is also used for marketing. A pretest showed that respondents were not sure if CRM (customer relationship management) software should be considered as ERP software or not. Indeed, basic CRM-type tools (storing contact information, information on sales, etc.) are part of many ERP systems' core modules, but CRM software for managing business interactions and communications is typically a separate software application. CRM applications can be made available by ERP software providers (and these CRM systems can be integrated with ERP). Many enterprises use stand-alone CRM software alongside ERP. Thus the decision whether CRM is part of ERP should be left to respondents. No editing/correction of data is recommended if the ERP question is answered with 'No' and CRM with 'Yes'.

However, since many ERP software applications are offered as a cloud computing service, it is recommended to verify answer option D2d) (i.e. enterprise resources planning (ERP) software applications (as cloud computing service)). If D2d is ticked 'yes', C1a 'enterprise resource planning (ERP) software' should also be ticked 'yes'. If C1a is ticked 'yes', D2d does not necessarily need to be ticked 'yes' because the ERP software may not be used as a cloud service or may be used for free.

b) Customer relationship management (CRM) software

Software for managing information about customers (e.g. relations or transactions); CRM facilitates communication with the customer and helps track customer interests and purchasing habits.

CRM (customer relationship management) refers to any software application for managing customer information, for example all customer relationships and interactions with enterprises as well as all business transactions (e.g. purchases, orders, complaints, claims, service requests), that consists of a management methodology which places

the customer at the centre of the business activity. CRM collects customer information derived from different channels, integrates it into one database, and processes and analyses information related to the customers.

CRM software facilitates communication with the customer and helps to track customer interest (e.g. a consumer may have been interested in a product in the past and wanted to wait to buy it; an enterprise has a record of that interest through consumer-monitoring software and can follow up with a phone call to get the deal) and purchasing habits.

The CRM software can be either installed and operated in the enterprise's hardware capacity or operated as cloud computing services. There are three types of CRM.

1. Operational CRM – Integration of the front office business processes that are in contact with the customer.
2. Analytical CRM – Analysis, which might employ data mining, of the information available in the enterprise on its customers. This aims to gather in-depth knowledge of the customer and how to answer to their needs.
3. Collaborative CRM – Ensure that all teams (e.g. marketing team, sales reps, customer support agents) have access to the same up-to-date customer data, no matter which department or channel they work in. Moreover, collaborative CRM facilitates interaction with the customer, such as aftersales support and means customer service where the customer and the enterprise agent communicate in real time with the aid of ICT. So web co-browsing solutions (where the agent and the customer browse together on the customer's desktop), chat, instant messaging, and various forms of application or desktop sharing can all be considered 'collaborative CRM'.

Some sources also distinguish:

- Strategic CRM – Customer-centric, based on acquiring and maintaining profitable customers.
- Communication CRM, which provides the different and best-suited interfaces for enterprise customers.

CRM also includes the creation of new business processes, like data mining on customer information and aftersales support. It is believed that the adoption of CRM software improves enterprise marketing functions by improving customer service and customer relations. Improvement comes, for instance, from providing user-friendly mechanisms for receiving complaints and helping identify potential problems before they occur. In general, it facilitates communication with the customer and helps track customer interests, purchasing habits and product use. When these technology-driven improvements lead to long-term customer satisfaction, they can ensure greater customer loyalty, lower marketing costs, higher sales revenues and increased profit margins.

Since many CRM software applications are offered as a cloud computing service, it is recommended to verify answer option D2e) (i.e. customer relationship management (CRM) software applications (as cloud computing service)). If D2e) 'customer relationship management (CRM) software applications (as cloud computing service)' is ticked 'yes', C1b) 'customer relationship management (CRM) software' should also be ticked 'yes'. If C1b) is ticked 'yes', D2e) does not necessarily need to be ticked 'yes' because the CRM software may not be used as a cloud service or may be used for free.

c) Business intelligence (BI) software

BI software accesses and analyses data (e.g. from data warehouses, data lakes) from internal IT systems and external sources and presents analytical findings in reports, summaries, dashboards, graphs, charts and maps, to provide users with detailed insights for decision-making and strategic planning.

With the help of business intelligence tools, enterprises manage to detect business trends, deviations from plans, and business strategy. BI enables every stakeholder in the enterprise and management to make daily and strategic decisions more easily, based on the information.

BI technologies can manage large amounts of structured and sometimes unstructured data, which can be obtained from enterprise IT systems or external data sources (e.g. from other enterprises). When combined, they can provide a comprehensive picture which creates an intelligence that cannot be derived from any singular set of data. Enterprises can then use that data to drive change, eliminate inefficiencies, and quickly adapt to market or supply changes.

Business intelligence focuses on what happened in the past and what is happening now.

BI software can be **either installed and operated in the enterprise's hardware capacity or operated as cloud computing services**.

Traditionally, the BI or IT team performed the data analysis for business users. Users could ask for new BI reports and dashboards. The BI team prepared the required data or, if needed, worked with IT to extract it from source systems,

to transform and to clean it, and loaded it into a data warehouse or other data store. The BI team then created queries to produce the requested analytical results and designed a dashboard or report to display the information for the business user.

Over the years, BI tools evolved from traditional BI tools to self-service BI tools. The latter allows business analysts, executives and other users to run queries themselves and to create their own data visualisations, dashboards and reports. Self-service BI enables business users to access and explore data sets even if they don't have a background in BI or data mining and statistical analysis. Self-service BI tools allow users to filter, sort, analyse and visualise data without involving the organisation's BI and IT teams.

Both the traditional and the self-service BI tools are within the scope of question **1c).**

Some examples of BI software are Microsoft Power BI, SAP BusinessObjects, SAS, and Tableau.

A positive answer to question C1c) (C1c=Yes) does not imply that it is necessary that question C3 should be ticked Yes.

Data sharing

C2: *Does your enterprise share data electronically with suppliers or customers within the supply chain (e.g. via websites or apps, EDI-systems, real-time sensors or tracking)?*

This data may be exchanged via websites, networks or other means of electronic data transfer, excluding emails not suitable for automated processing or manually typed.

Some of the examples of data exchange: information on inventory levels; progress of deliveries; progress in service provision; demand forecasts; product availability; customer requirements; e-commerce data; information regarding production or maintenance.

[Scope: enterprises with access to the internet, i.e. if A1>0]

[Type: single answer (i.e. Tick only one); binary (Yes/No)]

This question measures the integration of an enterprise's business processes with those of its suppliers and/or customers. The aim of the integration is to create a more efficient overall production line. It focuses on processes related to supply chain management (SCM). Supply chain management can be defined as the design, planning, execution, control, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging logistics, synchronising supply with demand, and measuring performance.

Sharing information electronically within the supply chain means exchanging any type of information with an enterprise's suppliers or customers about the availability, production, development and distribution of goods or services.

This information may be exchanged via websites, networks, real-time sensors or tracking, or via other means of electronic data transfer.

The real-time sensors monitor and share real-time changes/data. Sensors get information from the environment. Tracking is an activity where you can share the data with the help of other technologies, e.g. tracking of vehicles refers to the usage of sensors to know the location of vehicles, to know for example where they are. Tracking can also be done with radio frequency identification (RFID), Internet of Things (IoT) sensors, barcodes.

Examples of sharing of data within the supply chain: availability of products in web stores; and availability of rooms in accommodation facilities.

Emails not suitable for automated processing or manually typed emails are excluded from the scope of the question. However, enterprises using emails suitable for automated processing (such as automatically generated emails triggered by a step in the supply chain) should answer 'Yes' to this question. For example, a loaded truck leaving the enterprise's premises might automatically trigger an email to be sent to the customer in real time. This email might have an attachment in a fixed/agreed standard format, containing for example a list of the goods that were shipped and which should be expected to be delivered. The attachment could then be automatically imported into the customer's business applications for use in the next steps of the supply chain. Another example is a list of the stock of goods that could be automatically sent via email at the end of every day.

Data analytics

The aim of the submodule is to measure enterprise use of data for data analytics. The scope of the submodule includes data analytics performed by own employees as well as data analytics outsourced to service providers.

In this submodule, data analytics refers to the use of technologies, techniques or software tools for analysing data to extract insights, see patterns or trends, and use these to draw informed conclusions, make predictions, or support decision-making with the aim of improving performance (e.g. increase production, reduce costs in maintenance, personalise products and/or improve customer service), modelling the future or predicting a result.

Data may be extracted from enterprises' own data sources or other data sources (suppliers, customers or publicly available data from the internet, including social media or other sources).

The techniques or methods used for the data analytics may include artificial intelligence, but not necessarily. Big data analytics is also within the scope of the module.

There are four primary types of data analytics. Each type of data analytics is used for specific purposes depending on the question a data analyst is trying to answer. These types are[7]:

- **Descriptive analytics** - helps to answer questions about what happened. This type provides essential insight into past performance and requires the collection of relevant data, processing of the data, data analysis and data visualisation.
- **Diagnostic analytics -** helps to answer questions about why something happened and supplements more basic descriptive analytics. The findings from descriptive analytics are taken and analysed further to find the cause (e.g. why performance got better or worse). Usually this occurs in three steps: a) identify anomalies in the data; b) collect data that is related to these anomalies; c) use t statistical techniques to find relationships and trends that explain these anomalies.
- **Predictive analytics** - helps to answer questions about what will happen in the future, whereby historical data is used to identify trends and to determine if they are likely to recur. Predictive analytical tools provide valuable insight into what may happen in the future and its techniques include a variety of statistical and machine learning techniques, such as neural networks, decision trees, and regression.
- **Prescriptive analytics** - helps to answer questions about what should be done, namely by using insights from predictive analytics. This allows enterprises to make data-driven (informed) decisions. Prescriptive analytics techniques rely on machine learning strategies that can find patterns in large data sets. By analysing past decisions and events, the probability of different outcomes can be estimated.

A distinction has to be made between data analysis and data analytics. As shown in the picture below, the generally accepted distinction is:

- data analytics is the broad field of using data and tools to make business decisions; and
- data analysis is a subset of data analytics, referring to specific actions.

Data analytics is the process as a whole, while data analysis is one of the steps in the process, focusing on investigating and transforming data. Data analysis is usually performed on individual data sets, while data analytics as a whole may comprise several data sets (and several individual data analyses).

Steps in data analytics are: Business Case Evaluation, Data Identification, Data Collection, Data Management, Data Aggregation & Representation, Data Analysis, Data Visualisation, and Utilisation of Analysis Result (source: Data Analytics vs Data Analysis | Top 6 Amazing Differences To Learn (educba.com)). Since data analytics is the process as a whole, each step taken separately (see examples below) cannot be counted as data analytics.

7 https://www.mastersindatascience.org/learning/what-is-data-analytics/

Some examples of data analytics and non-data analytics

NOT data analytics	Data analytics
Accounting and bookkeeping *(only data collection and management)*	Using past accounting data to predict future expenditures, or to analyse the impact of potential cost-cutting actions
Managing inventories and databases *(only data collection and management)* For example, databases on customer information, inventories of equipment, inventories of stocked goods	Analyse existing inventories to highlight missing or expiring items, and possibly take action on them (request items to be replaced/ added)
Collecting information and plotting them in a graph (e.g. visualising monthly expenditures) *(only data collection and visualisation)*	Use historic data to predict future trends (e.g. future expenditures), or to analyse the impact of potential actions (e.g. savings in specific areas)
Basic calculation sheets (e.g. automatically converting purchasing prices to sale prices) *(only data aggregation and minimal manipulation)*	Extracting additional insights from calculations (e.g. highlighting most profitable items, actively monitoring changes in prices)
Compiling lists of information from multiple sources (e.g. matching customer data with their purchases) *(only data aggregation)*	Rank information and/or use the compiled lists to trigger specific actions (e.g. personalised advertising, strategic sales & marketing decisions)

C3: *Does your enterprise perform data analytics by own employees?*

Please consider internal and external data sources

[Scope: enterprises with access to the internet, i.e. if A1>0]

[Type: single answer (i.e. Tick only one); binary (Yes/No); filter question]

Question **C3** is a filter question to collect information about enterprises that perform data analytics on any data source, regardless of whether it is internal data (from enterprises' own information systems, sensors, smart meters, own websites or social media) or external data (from other enterprises, government authorities or publicly available data from websites or social media).

Question **C3** refers to cases in which an enterprise's 'own employees' (persons employed) perform data analytics. Data analytics performed by external service providers, such as other enterprises or organisations, is outside the scope of this question and is asked later in question **C5**.

C4: *Does your enterprise perform data analytics on data from the following sources?*

[Scope: enterprises that perform data analytics by own employees, i.e. C3 = Yes]

[Type: single answer per item (i.e. Tick only one); binary (Yes/No); multiple items may be expected]

The aim of this question is to provide information about which data sources enterprises use to perform data analytics. The answer options **a) to h)** may not be an exhaustive list of data sources but constitute the most prevalent sources, therefore it is valid if all items in C4 were ticked 'No'.

The responding enterprise is asked to choose among the different sources; multiple answers are allowed:

a) Data analytics on data from transaction records such as sale details, payment records (e.g. from enterprise resource planning system (ERP), own webshop)

Answer option **a)** refers to data analytics performed on transactional data generated by various applications/ systems (e.g. ERP system, own webshop), while running or supporting the business process of selling. This data is generated from all the daily transactions that take place both online and offline (e.g. invoices, payment orders, storage records, delivery receipts). The information that is captured from transactions include time of transaction, the place where it occurred, the price, and the payment method.

b) Data analytics on data about customers such as customer purchasing information, location, preferences, customer reviews, searches, etc. (e.g. from customer relationship management system (CRM) or own website)

Answer option **b)** refers to data analytics performed on data about customers generated by various applications/ systems (e.g. customer relationship management system (CRM) or online store). This data is generated from the daily transactions that take place both online and offline. The data may refer to a customer's preferences, or information about the relationship with the customer.

c) Data analytics on data from social media, including from your enterprise's own social media profiles (e.g. personal information, comments, video, audio, images)

Answer option **c)** refers to data analytics performed on data from social media interactions (location, preferences, etc.) The data comes from likes, tweets & retweets, comments, video uploads, and general media that are uploaded and shared via social media platforms. This kind of data provides invaluable insights into consumer behaviour and sentiment and can be enormously influential in marketing analytics.

In question **C4c)**, any data generated from social media is included, whether internal enterprise data from social media accounts or external data from various social media providers. In particular, it is not necessary that the enterprise has a profile on social media to perform data analytics on data generated from social media.

d) Data analytics on web data (e.g. search engine trends, web scraping data)

Answer option **d)** refers to data analytics performed on data generated on public websites (customer feedback, keywords searched on the internet, search engine trends, web scraping, etc.) Public websites are a good source for social data, and tools like Google Trends can be a good source for large amounts of data. Data from internet search engines could be used for obtaining information on consumers' behaviour by tracking keywords that internet users used when searching on the internet and consequently for personalised advertising methods.

Web scraping (or data scraping) is a technique used to collect all sorts of data types (e.g. from images to videos, text, numerical data) from the internet by using computer programmes (web scraping applications – bots), which are programmed to visit websites, grab the relevant pages and extract huge amounts of data in a very short time[8].

e) Data analytics on location data from the use of portable devices or vehicles (e.g. portable devices using mobile telephone networks, wireless connections or GPS)

Answer option **e)** refers to data analytics on data from portable devices, related to their geographical position (geolocation). Portable devices refer to 'portable computers or other portable devices such as smartphones'. Conceptually portable devices in item **e)** remain in the same framework although the concept can be extended to navigation devices that use Global Positioning System (GPS) and have additional connectivity possibilities.

In question **C4e),** the examples refer to portable devices that, depending on their capabilities, may use mobile telephone networks, wireless connections or GPS. Therefore, respondents would be expected to consider geolocation data from the use of portable devices with various connectivity capabilities.

GPS is a satellite-based radio navigation system, a specific designation for the Global Navigation Satellite System (GNSS) owned by the US government. It is one of the global networks of satellites that enable satellite navigation through GPS signals. GPS receivers can determine location, time, and velocity anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The designation of the European GNSS is Galileo. Nevertheless, since GPS is a widely spread term used and recognised in Europe, this designation is used in the wording of the question.

f) Data analytics on data from smart devices or sensors (e.g. machine-to-machine communications, sensors installed in machinery, manufacturing sensors, smart meters, radio frequency identification (RFID) tags)

Answer option **f)** refers to data analytics on machine-generated data, e.g. data from smart devices[9] or sensors. For instance data from machine-to-machine communication, sensors installed in machinery, manufacturing sensors, smart meters or radio frequency identification (RFID)[10] tags. Machine-generated data is collected by internet-enabled monitoring and reporting sensors. It is information generated by industrial equipment (logs), sensors that are installed in machinery,

8 What Is Web Scraping? ([A Complete Step-by-Step Guide] (careerfoundry.com)

9 Smart devices are electronic devices connected to other devices or networks that can operate to some extent interactively and autonomously (https://en.wikipedia.org/wiki/Smart_device).

10 A radio frequency identification tag is a device that can be applied to or incorporated into a product or an object and transmits data via radio waves.

manufacturing sensors, smart meters, and even web logs that track user behaviour.

Typically presented as structured data, machine-generated data is useful for predictive analysis, compliance and fault detection, and for improving user experience. Finance, healthcare, and manufacturing industries are among the leading users of sensor data. Sensors such as medical devices, smart meters, road cameras, satellites, games and the rapidly growing internet of things will deliver high velocity, value, volume and variety of data in the very near future.

Smart devices are electronic devices connected to other devices or networks that can operate to some extent interactively and autonomously (en.wikipedia.org/wiki/Smart-device). Sensor data may be generated by smart electric meters, car sensors and electric appliances; if relevant to the enterprise's activities, they should be included in this response. The use of machine-to-machine technologies/communications produces huge amounts of data. The use of data generated from machine-to-machine technologies/communications is included in this item.

There are numerous types of manufacturing sensors and process controls, each designed to monitor and collect data about different processes, vectors and equipment performance metrics. Sensors used in manufacturing can be installed in the machines (e.g. temperature sensors monitor the heat of the machinery, acoustic sensors for detecting anomalies based on how the machinery sounds, vibration sensors), or not (e.g. remote sensors make it possible to benefit from sensor technology without purchasing new equipment). Sensors used in manufacturing that is not installed in the machinery might be used also in other sectors. Thus, they are also within the scope of data from sensors in machines/devices used in other sectors.

g) Data analytics on government authorities' open data (e.g. enterprise public records, weather conditions, topographic conditions, transport data, housing data, buildings data)

Answer option **g)** refers to data analytics on government authorities' open data, which are created by ruling government institutions and are freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other control mechanisms. Government authorities' open data may concern records from enterprise registers, data on topographic conditions, transport, housing, buildings or weather conditions etc.

h) Data analytics on satellite data (e.g. satellite imagery, navigation signals, position signals)

Answer option **h)** refers to data analytics on data from satellites[11] (e.g. satellite imagery, navigation signals, position signals) obtained from own infrastructure or from externally provided service (e.g. AWS Ground Station). The satellite data provides opportunities for efficient mapping and monitoring of the Earth's resources, ecosystems, and events. It can be used for different purposes (e.g. for monitoring the right vegetation post-harvesting and improving soil conditions, exploiting new energy sources, developing smart cities).

Answer option **h)** refers to analysing all kinds of satellite-based data (e.g. navigation signals, positioning signals, satellite images), except for location data from the use of portable devices or vehicles using GPS, which is included in item **C4e)**.

C5: *Does an external enterprise or organisation perform data analytics for your enterprise? Please include data analytics based on data from internal and external sources.*

[Scope: enterprises with access to the internet, i.e. if A1>0]

[Type: single answer (i.e. Tick only one); binary (Yes/No)]

Enterprises may try to leverage data that they have access to, and even combine them with data from different sources. But, in order to exploit the various possibilities, enterprises may choose to hire a service provider to perform data analytics on their behalf rather than doing so themselves, instead of investing in infrastructure and software or crafting algorithms. This could be because the enterprise lacks the time, resources or skills to perform data analytics.

Specialists with more specific skills (use of data tools such as dashboards, key performance indicator data or market analysis) are essential to carry out an effective data analytics project and integrate the results of the analysis into the business processes.

Question **C5** addresses the issue of enterprises outsourcing the data analytics to an external service

11 Source: Satellite data. How to use satellite data for better decision making (iceye.com)

provider, whether another enterprise or an organisation, e.g. universities, institutes.

Question **C5** refers to data analytics of data from any source, regardless of whether the data was generated by the enterprise (and only the data analytics service was purchased) or if it was acquired from outside the enterprise.

The use of Google analytics is not within the scope of this question, i.e. it should not be interpreted as Google performing data analytics for your enterprise.

Data trading

C6: *During 2022, did your enterprise sell (access to) any of its own data? (e.g. data about your enterprise's customer preferences, data from your enterprise's smart devices or sensors)*

[Scope: enterprises with access to the internet, i.e. if A1>0]

[Type: single answer (i.e. Tick only one); binary (Yes/No); optional question]

Questions **C6** and **C7** refer to selling data, i.e. whether enterprises sold their own data (including granting access), and if enterprises purchased any data from an outside source. Among some other issues, the expressed need was for indicators on the 'extent of trading of: a) raw data between enterprises (data which have not been processed, i.e. sensor generated data); and b) aggregated data sets (data which have been processed, enriched, aggregated)'. Questions **C6** and **C7** give a general indication of the extent to which enterprises exchange data.

Enterprises may sell their own data to others even if they themselves do not analyse the data or have hired external service providers to analyse the data on their behalf. Question **C6** is about selling the enterprise's own data or selling access to the data. The policy concerns selling data either to enterprises or to government authorities. However, the scope of the question excludes data sharing when it's a legal obligation, e.g. enterprises sharing their data with public administration for tax declaration purposes.

The question mentions selling with '**access to**' data in parenthesis to make it clear that the question does not only refer to physical delivery of data, or transferring data, e.g. from one server to another. The point is that the enterprise's data becomes available to other enterprises. Finally, the question focuses on the enterprise's 'own' data (generated from their system) to be sold, which means that the sale of (access to) publicly available data and data owned by other enterprises is excluded from the scope.

From a personal data protection perspective, an enterprise cannot freely share **personal** data about its customers if another party requests these data. The enterprise can only share this data with another party if there is a legal basis for doing so under the General Data Protection Regulation (GDPR). Therefore, the example about data referring to 'customers' preferences' aims at stressing that question **C6** does not ask about enterprises selling (access to) personal information of their customers.

The difference between question **C6** and question **C2** is that in question **C6** the interest is purely in enterprises selling (access to) their data, regardless of the purpose of the data use by the entity to which the data is sold. In contrast, in question **C2** the focus is on sharing the data with other enterprises as a way of improving the enterprise's business processes along the supply chain. Moreover, question **C2** does not concern payment for the data, but rather the flow of information within the integrated processes among the enterprise and its customers and suppliers. However, the scope of question **C6** also includes selling data to the enterprise's customers or suppliers, which is unrelated to sharing the data within the supply chain management.

C7: *During 2022, did your enterprise purchase (access to) any data? (e.g. data about other enterprise's customers' preferences, data from other enterprise's smart devices or sensors)*

[Scope: enterprises with access to the internet, i.e. if A1>0]

[Type: single answer (i.e. Tick only one); binary (Yes/No); optional question]

Question **C7** refers to purchasing (access to) data from other enterprises. Similarly to question **C6**, the mention of '**access to**' data (in parenthesis) aims to clarify that the question does not merely refer to physical delivery of data, or transferring data, e.g. from one server to another. The point is that the enterprise's data becomes available to other enterprises directly from the source of the data. Since the question is not limited to any specific purpose of purchasing data, the question includes examples such as purchasing data for performing data analytics, as well

as purchasing data to train AI models when an enterprise creates AI technologies.

From a personal data protection perspective, an enterprise cannot freely share **personal** data about its customers if another party requests these data. The enterprise can only share this data with another party if there is a legal basis for doing so under the GDPR. Therefore, the example about data referring to 'customers' preferences' aims at stressing that question **C7** does not ask about enterprises purchasing (access to) personal information about their customers.

2.3.1.3. MODULE D: USE OF CLOUD COMPUTING SERVICES

Cloud computing refers to **ICT services** that are used **over the internet** to access software, computing power, storage capacity, etc.

where the services have all of the following characteristics:

- are delivered from **servers** of service providers;
- can be easily **scaled** up or down (e.g. number of users or change of storage capacity);
- can be used **on demand by the user**, at least after the initial set-up (without human interaction with the service provider);
- are **paid** for, either per user, by capacity used, or they are prepaid.

Cloud computing may include connections via virtual private networks (VPN).

Purpose: The purpose of the respective questions is to provide information on the use of a service model for the ICT provision e.g. software, computing power, storage capacity. In principle, cloud computing services should not be considered as outsourcing of business functions although to a certain extent there are similarities between the two. The business model of cloud computing relies more on economies of scale.

Introduction: For the convenience of the reader and to allow a better understanding of cloud computing, see the following information taken from NIST special publication 800-145:

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models.

Essential characteristics:

On-demand self-service. A consumer can be unilaterally provided with computing capabilities (e.g. server time, network storage, etc.) on demand and without requiring human interaction with each service's provider.

Broad network access. Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g. smartphones, tablets, laptops or workstations).

Resource pooling. The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g. country, state, or data centre). Examples of resources include storage, processing, memory, and network bandwidth.

Rapid elasticity. Capabilities can be rapidly and elastically provisioned, in some cases automatically, to scale rapidly outward or inward commensurate with demand. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time.

Measured service. Cloud systems automatically control and optimise resource use by leveraging a metering capability[12] at some level of abstraction appropriate to the type of service (e.g. storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilised service.

12 Typically, this is done on a pay-per-use or charge-per-use basis.

Service models:

Cloud software as a service (SaaS). The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure[13]. The applications are accessible from various client devices through a thin client interface such as a web browser (e.g. web-based email), or a programme interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, except for limited user-specific application configuration settings.

SaaS examples: Google Apps, Dropbox, Salesforce, GoToMeeting, Hubspot.

Cloud platform as a service (PaaS). The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or -acquired applications created using programming languages and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly application-hosting environment configurations.

PaaS examples: AWS Elastic Beanstalk, Windows Azure, Heroku, Force.com, Google App Engine, Apache Stratos, OpenShift, Magento Commerce Cloud.

Cloud infrastructure as a service (IaaS). The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. IaaS is the most flexible cloud computing model. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly limited control of select networking components (e.g. host firewalls).

IaaS examples: Amazon Web Services (AWS), Rackspace, Google Compute Engine (GCE), Digital Ocean.

Service Models	Consumer Activities	Provider Activities
SaaS	Uses application/service for business process operations.	Installs, manages, maintains, and supports the software application on a cloud infrastructure.
PaaS	Develops, tests, deploys, and manages applications hosted in a cloud system.	Provisions and manages cloud infrastructure and middleware for the platform consumers; provides development, deployment, and administration tools to platform consumers.
IaaS	Creates/installs, manages, and monitors services for IT infrastructure operations.	Provisions and manages the physical processing, storage, networking, and the hosting environment and cloud infrastructure for IaaS consumers.

13 A cloud infrastructure is the collection of hardware and software that enables the five essential characteristics of cloud computing. The cloud infrastructure can be viewed as containing both a physical layer and an abstraction layer. The physical layer consists of the hardware resources that are necessary to support the cloud services being provided, and typically includes server, storage and network components. The abstraction layer consists of the software deployed across the physical layer, which manifests the essential cloud characteristics. Conceptually the abstraction layer sits above the physical layer.

Deployment models:

Private cloud. The cloud infrastructure is provisioned for exclusive use by a single organisation comprising multiple consumers (e.g. business units). It may be owned, managed, and operated by the organisation, a third party, or some combination of them, and it may exist on or off premises.

Community cloud. The cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organisations that have shared concerns (e.g. mission, security requirements, policy, and compliance considerations). It may be owned, managed, and operated by one or more of the organisations in the community, a third party, or some combination of them, and it may exist on or off premises.

Public cloud. The cloud infrastructure is provisioned for open use by the general public. It may be owned, managed, and operated by a business, academic, or government organisation, or some combination of them. It exists on the premises of the cloud provider.

Hybrid cloud. The cloud infrastructure is a composition of two or more distinct cloud infrastructures (private, community, or public) that remain unique entities, but are bound together by standardised or proprietary technology that enables data and application portability (e.g. cloud bursting for load balancing between clouds).

Private cloud computing implies that dedicated servers are used to store data exclusively for one enterprise and, depending on the case, for the exclusive use of customised software on these servers. In addition, note that in the context of the ICT survey in enterprises, **'community cloud computing' may be considered in a wider context as 'private'**. Community cloud computing refers to servers reserved exclusively for a specific group of enterprises.

- **Enterprises in the scope:** The scope of the special topic comprises **enterprises with access to the internet**. Enterprises that are in the process of evaluating, testing or piloting the use of cloud computing services, or enterprises that are using cloud computing services free of charge, **are not considered as users of cloud computing in the context of this survey**. Note that the model questionnaire refers to all service models and deployment models of cloud computing.

D1: *Does your enterprise buy any cloud computing services used over the internet? (Please refer to the definition of cloud computing above, exclude free of charge services)*

[Scope: enterprises with access to the internet, i.e. A1 > 0]

[Type: single answer (i.e. Tick only one); binary (Yes/No); filter question]

The question aims at measuring the use of cloud computing services, including all service models (software, platform and infrastructure). Users are requested to provide information to approximate the total 'volume' of cloud computing services including all deployment models (private, community, public, hybrid).

The use of connections via secured VPN (virtual private network) means the use of secured communication over the internet; this includes enterprises using cloud computing services provided that all the other conditions (box above) are fulfilled.

In all cases, respondents should consider that all criteria of the definition should be fulfilled. In particular, the first condition - that **services are delivered from servers of service providers** - implies that third parties (enterprises) should provide cloud computing services. Enterprises exclusively using their own cloud (i.e. on-premises private cloud) should answer 'No' in question **D1.** Moreover, responding enterprises that provide cloud computing services should answer 'No' to D1.

D2: *Does your enterprise buy any of the following cloud computing services used over the internet? (Please refer to the definition of cloud computing above, exclude free of charge services)*

[Scope: enterprises using cloud computing services, i.e. D1 = Yes]

[Type: single answer per item (i.e. Tick only one); binary (Yes/No); multiple items may be expected]

Note that, for enterprises to qualify for using the following cloud computing services, the relevant conditions that are mentioned in the introduction of the module must **all be fulfilled to the extent that they are applicable**.

The answer options a) to j) are not an exhaustive list of cloud computing services but constitute the most prevalent cloud computing services used nowadays. Therefore, there can be cases when D1 could be ticked 'Yes' and D2 would be 'No'. For example, usage of paid cloud services for communication (e.g. Zoom, MS Teams, Slack) are not included in question D2. In such cases, D1 could be ticked 'Yes' and D2 would be 'No', although it is unlikely that an enterprise uses such communication tools, but no email.

a) Email (as a cloud computing service)

For example: *Gmail Enterprise, Microsoft Exchange Online/ Office 365.*

Enterprises using email as a cloud computing service must use the servers of the service providers. Adding email addresses and increasing mailbox storage capacity can easily be done, and the service is priced according to the number of email addresses and the mailbox storage capacity that is used (or prepaid for a specific number of email addresses and the respective mailbox storage capacity).

b) Office software (e.g. word processors, spreadsheets) (as a cloud computing service).

For example: *Microsoft Office Cloud, Google Workspace.*

Enterprises using office software as a cloud computing service must use the software via servers of the service providers without having the software installed on the enterprises' computers. The users can use all or part of an application's functionalities through different interfaces e.g. browser. The service is priced according to the number of users, the number of functionalities used, etc.

c) Finance or accounting software applications (as a cloud computing service)

For example: *Proactis, SAP Business ByDesign, Twinfield, SAP Concur, Netsuite, Sage, Odoo.*

Enterprises using finance or accounting software as a cloud computing service must use the software via servers of the service providers without having the software installed on the enterprises' computers. The users can use all or part of an application's functionalities through different interfaces e.g. browser. The service is priced according to the number of users, the number of functionalities used, etc.

d) Enterprise resource planning (ERP) software applications (as a cloud computing service)

For example: *ERPAG, Net Suite (Oracle), Odoo, Sage Intacct, Workday, E2 Shop System.*

Enterprises using ERP software as a cloud computing service must use the software via servers of the service providers without having the software installed on the enterprises' computers. The users can use all or part of an application's functionalities through different interfaces e.g. browser. The service is priced according to the number of users, the number of functionalities used, etc.

Cloud-based ERP software has much lower upfront costs as resources are not bought and maintained on premises but are rather leased for a predefined e.g. monthly rate. The cloud-based ERP gives flexibility to the enterprises that uses and pays only for the computing resources that it needs, allowing scalability and remote access to the enterprise resources, ensuring increased security (backup and protection from attacks) while avoiding implementation and maintenance costs.

More information on ERP is provided under question C1 (i.e. using ERP software).

If D2d) 'Enterprise resource planning (ERP) software applications (as cloud computing service)' is ticked 'yes', C1a) 'Enterprise resource planning (ERP) software' should also be ticked 'yes'. If C1a) is ticked 'yes', D2d) does not necessarily need to be ticked 'yes' because the ERP software may not be used as a cloud service or may be used for free.

e) Customer relationship management (CRM) software applications (as a cloud computing service)

For example: *salesforce.com, Oracle CRM On Demand.*

Enterprises using CRM software as a cloud computing service must use the software via servers of the service providers without having the software installed on the enterprises' computers. The users can use all or part of an application's functionalities through different interfaces e.g. browser. The service is priced according to the number of users, the number of functionalities used, etc.

More information on CRM is provided under question C1.

If D2e) 'Customer relationship management (CRM) software applications (as cloud computing service)' is ticked 'yes', C1b) 'Customer relationship management (CRM) software' should also be ticked 'yes'. If C1b) is ticked 'yes', D2e) does not necessarily need to be ticked 'yes' because the CRM software may not be used as a cloud service or may be used for free.

f) Security software applications (e.g. antivirus programme, network access control) (as a cloud computing service)

For example: *Sophos Endpoint Protection, Webroot, Symantec Endpoint Protection, Comodo, Portnox.*

Enterprises using security software applications as a cloud computing service use the software via servers of the service providers without having the software installed on the enterprises' computers. The users can use all or part of an application's functionalities through different interfaces e.g. browser. The service is priced according to the number of users, the number of functionalities used, etc.

Cloud-based antivirus software is a programmatic solution that offloads antivirus workloads to a cloud-based server, rather than installing an antivirus suite on the user's computer. While traditional security programmes rely on the processing power of a user's local computer, cloud computing solutions install only a small 'client' programme on a desktop, which in turn connects to the security provider's web service. There, data from antivirus scans is analysed, and instructions for appropriate countermeasures are sent back to the user's computer. The advantages of these cloud-based solutions are reduced processing power needed to keep a system safe, quicker update of lists of malicious files and sites, and lower costs than purchasing a full software suite.

Network access control helps enterprises implement policies for controlling devices and user access to their networks. Network access control can set policies for resources, roles, devices and location-based access, and enforce security compliance with security and patch management policies, among other controls.

g) Hosting the enterprise's database(s) (as a cloud computing service).

For example: *EnterpriseDB, Azure Cosmos DB.*

Enterprises using the hosting of databases as a cloud computing service must use the servers of the service providers for their databases. The service provider provides their infrastructure and arranges the operability of the service. The service is priced according to the capacity that is used or the number of data sets etc. This response also includes the respective database functionalities to store, search, retrieve, etc. information.

h) Storage of files (as a cloud computing service)

For example: *Dropbox, Amazon S3, Carbonite, Acronis Online, Box, OneDrive for Business.*

This response refers to the storage of any type of files that are physically stored on some media. Storage functionality is supplied as a service over the internet (e.g. documents, images, sounds, presentations). From the service point of view, this response includes storing backup files and restoring them if needed (disaster recovery). If the reporting enterprise uses a database management system only locally and uses the cloud for the backup of relevant database files, then it should answer 'yes' to **D2h)** and 'no' to **D2g)**. If the reporting enterprise uses a database management system over the cloud, then not only **D2h)** but also **D2g)** should be answered with 'yes' and backup is taken care of as an integrated service.

i) Computing power to run software used by the enterprise (as a cloud computing service)

For example: *Amazon, Microsoft Azure, Amazon EC2, Flexiscale, Joyent.*

This response essentially refers to enterprises using computing power (as a cloud computing service) for running the enterprise's software application. The service may be provided either as software as a service (SaaS) or as infrastructure (hardware/software) as a service (IaaS). For SaaS, the enterprise (end-users) uses the software application that has been developed and it is accessible and used through a browser. For IaaS, the enterprise additionally maintains control of the software environment (e.g. adds new modules for the software application, puts whatever software on the cloud). To a certain extent, this response may overlap with some of the above; however, it covers a wider scope as it concerns enterprises running their software using the computing power of the cloud. These enterprises do not have to buy or maintain servers, etc. Virtual private servers (i.e. virtual machines provided as a service over the internet) belong to this option.

j) Computing platform providing a hosted environment for application development, testing or deployment (e.g. reusable software modules, application programming interfaces) (as a cloud computing service).

For example: *AWS Elastic Beanstalk, Windows Azure, Heroku, Force.com, Google App Engine, Apache Stratos, OpenShift, Magento Commerce Cloud, IBM Bluemix, SAP Cloud Platform.*

This response essentially refers to enterprises using a computing platform that provides the software and/or hardware tools (as a cloud computing service) for developing, testing or deploying software or applications for the enterprise. PaaS platforms have many advantages:

they are accessible by multiple users; they are scalable; and they are easy to use and built on virtualisation technology.

For PaaS, cloud consumers employ the tools and execution resources provided by cloud providers for the purpose of developing, testing, deploying, and managing applications hosted in a cloud system. PaaS consumers can be: application developers who design and implement application software; application testers who run and test applications in various cloud systems; application deployers who publish applications into a cloud system; and application administrators who configure and monitor application performance on a platform. PaaS consumers can be billed by the number of consumers, the type of resources consumed by the platform, or the duration of platform usage[14].

The above list of ICT cloud computing services covers the most widely used cloud computing services but may not be exhaustive. For information, **other cloud computing services** that are not mentioned in the above list may be: *system and network management*, often called management-as-a-service MaaS (e.g. Service-Now.com, ZenDesk); paid use of *social media*; *content management* (e.g. Clickability, CrownPeak, OmniUpdate); *Personnel, Human Resources-HR, Human Capital Management-HCM or Talent Management* (e.g. Taleo, Successfactors); and *business intelligence and analytics* (e.g. IBM Smart Analytics Cloud, SAP BusinessObjects On Demand).

Therefore, it is a valid answer if filter question D1 is ticked 'yes' while all items in D2 are ticked 'no'.

Note: In cases when D1 is ticked 'yes' and all of the answer options in D2 are answered 'no', it should be considered, if feasible, to contact the enterprise and verify the response (e.g. information obtained if they actually purchase cloud computing service and what kind of service).

2.3.1.4. MODULE E: ARTIFICIAL INTELLIGENCE

[Scope: enterprises with access to the internet, i.e. A1 > 0]

Artificial intelligence refers to systems that use technologies, such as **text mining, computer vision, speech recognition, natural language generation, machine learning, and deep learning,** to gather and/or use data to predict, recommend or decide, with varying levels of autonomy, the best action to achieve specific goals.

Artificial intelligence systems **can be purely software-based**, e.g.:

- chatbots and business virtual assistants based on natural language processing;
- face recognition systems based on computer vision or speech recognition systems;
- machine translation software;
- data analysis based on machine learning;

or **embedded in devices**, e.g.:

- autonomous robots for warehouse automation or production assembly works;
- autonomous drones for production surveillance or parcel handling.

E1: *Does your enterprise use any of the following artificial intelligence technologies?*

Scope: enterprises with access to the internet, i.e. if A1>0; optional]

[Type: single answer per item (i.e. Tick only one); binary (Yes/No); multiple items may be expected; filter question]

The aim of this question is to provide information on the use of artificial intelligence technologies used by enterprises, e.g. text mining, speech recognition, natural language generation. The answer options **a) to g)** may not be an exhaustive list of artificial intelligence technologies but constitute the most prevalent AI technologies that enterprises use nowadays.

The question is about use. So if an enterprise creates AI solutions for others to use, i.e. 'for sale', then it should not answer 'Yes' to E1. However, if an enterprise creates AI solutions and uses them for their business, then it should answer 'Yes' to the relevant answer options in E1.

The responding enterprise is asked to choose among the following artificial intelligence technologies; multiple answers are allowed:

a) AI technologies performing analysis of written language (e.g. text mining)

This answer option refers to the use of artificial intelligence technologies performing analysis of written language, also referred to as text mining.

Text mining, also known as text analysis, is the process of transforming unstructured text data into meaningful and actionable information, identifying facts, relationships and

14 https://www.nist.gov/system/files/documents/itl/cloud/NIST_SP-500-291_Version-2_2013_June18_FINAL.pdf

assertions that would otherwise remain buried in the mass of unstructured or low-structured textual big data. Once extracted, this information is converted into a structured form that can be further analysed, or presented directly using clustered HTML tables, mind maps, charts, etc. Text mining employs a variety of methodologies to process the text, one of the most important of these being natural language processing (NLP).

Natural language processing – a subfield of computer science, information engineering and artificial intelligence concerned with the interactions between computers and human (natural) languages, in particular how to programme computers to process and analyse large amounts of natural language data.

Examples for the usage of technologies performing analysis of written language (text mining):

- Social media: Text mining software packages are available for analysing social media applications to monitor and analyse the online plain text from internet news, blogs, email, etc. Text mining tools help to identify and analyse the number of posts, likes and followers on the social media. This kind of analysis show people's reaction to different posts and news, and how they spread around. It shows the behaviour of people belonging to specific age groups or communities having similarity and variation in views about the same post.
- Business intelligence: Text mining plays a significant role in business intelligence that helps organisations and enterprises analyse their customers and competitors in order to take better decisions. It provides a deeper insight about business and gives information on how to improve customer satisfaction and gain competitive advantages. By bringing text mining into the equation, BI tools are able to leverage unstructured data in addition to structured data and expand the data sets that the model uses to generate business insight. Text mining tools, like IBM text analytics, Rapid miner and GATE, help take decisions about the organisation that generate alerts about good and bad performance, and market changeover; these help to take remedial actions. It also helps in telecommunication industry, business and commerce applications, and the customer chain management system[15]. BI can use AI or not. However, only BI that uses AI is within the scope.
- Risk management: No matter the industry, insufficient risk analysis is often a leading cause of failure. Adoption of risk management software based on text mining technology can dramatically increase the ability to mitigate risk. This provides enterprises with easy access to thousands of sources (and petabytes) of text documents, enabling them to link together information and access the right information at the right time.
- Knowledge management: When managing large volumes of text documents, ability to find important information quickly is essential. Text mining solutions can help enterprises locate information quickly and accurately, enabling them to unlock deeper insights and deliver products to the market faster.
- Cybercrime prevention: The anonymous nature of the internet and the many communication features operated through it contribute to the increased risk of internet-based crimes. Text mining is making cybercrime prevention easier for enterprises by establishing more context around the intelligence they are being fed. This enables them to pinpoint real threats and limit the number of false positives created by keywords taken out of context.
- Enhanced customer service: Text mining and natural language processing have proven immensely helpful for customer care teams. They are commonly adopted to improve the customer experience by leveraging valuable information sources such as surveys, trouble tickets and customer call notes to improve the quality, effectiveness and speed of problem resolution. Text analysis is also central to chatbots as it captures the information necessary to provide a rapid, automated response to the customer. As a result, enterprises can dramatically reduce their reliance on call centre operators to solve customer problems.
- Contextual advertising: Digital advertising is a relatively new and growing field of application for text analytics. Compared with the traditional cookie-based approach, contextual advertising analyses the text on a webpage to understand the content on a deeper level. For example, someone reading an article about the top new book releases may be served an ad for Kindle due to its relevance. This is not only beneficial in terms of serving more accurate and targeted advertisements, but it completely preserves user privacy.
- Spam filtering: Email is an effective, fast and reasonably cheap way to communicate, but it comes with a dark side: spam. Today, spam is a major issue for internet service providers, increasing their costs for service management and hardware software updating. For users, spam is both an entry point for viruses and a detriment to productivity. Text mining techniques can be implemented to improve the effectiveness of

15 https://www.researchgate.net/publication/311394659_Text_Mining_Techniques_Applications_and_Issues

statistical filtering methods by leveraging established prior knowledge. This not only makes for more efficient email management, but it improves the user experience considerably[16].

b) AI technologies converting spoken language into machine-readable format (speech recognition)

This answer option refers to the use of artificial intelligence technologies converting spoken language into machine-readable format, also referred to as speech recognition.

Speech recognition is an interdisciplinary subfield of computer science and computational linguistics that develops methodologies and technologies that enable the recognition and translation into text of spoken language by computers. It is also known as automatic speech recognition, computer speech recognition or speech to text. It incorporates knowledge and research in the computer science, linguistics and computer engineering fields.

Natural language processing is a subfield of computer science, information engineering and artificial intelligence concerned with the interactions between computers and human (natural) languages, in particular how to programme computers to process and analyse large amounts of natural language data.

Although the science of speech recognition dates back many decades, it has benefited substantially from artificial intelligence. AI-based speech recognition employs the latest machine learning advancements. These are high-learnability neural network algorithms and rich lexicons that enable fine recognition accuracy.

Examples for the usage of technologies converting spoken language into machine-readable format (speech recognition):

- Speech recognition is used in call centres, where it handles incoming customer calls.
- Digital assistants use speech recognition: Google Voice, Amazon Alexa, Microsoft Cortana, and Apple's Siri.

c) AI technologies generating written or spoken language (natural language generation, speech synthesis)

This answer option refers to the use of artificial intelligence technologies generating written or spoken language, also referred to as natural language generation.

Natural language generation is the ability of a computer programme to convert structured data into natural language representation. It can be used to produce long documents that summarise or explain the contents of computer databases, for example generating technical manuals, generating product descriptions for a large e-commerce site, making news reports (automated journalism) or summarising medical records. It can also be used to generate short blurbs of text in interactive conversations (a chatbot) which might even be read out loud by a text-to-speech system (artificial production of human speech).

Examples of the usage of technologies generating written or spoken language (natural language generation):

- Chatbot: A chatbot is an artificial intelligence software that can simulate a conversation (or a chat) with a user in natural language through messaging applications, websites, mobile apps or through the telephone. Formulating responses to questions in natural language is one of the most typical examples of natural language processing applied in various end-use applications of enterprises.

d) AI technologies identifying objects or persons based on images or videos (image recognition, image processing)

This answer option refers to the use of artificial intelligence technologies identifying objects based on images, also referred to as image recognition or image processing. Image processing and image recognition are examples of computer vision application.

Computer vision[17] is an interdisciplinary scientific field that deals with how computers can gain high-level understanding from digital images or videos. From the perspective of engineering, it seeks to understand and automate tasks that the human visual system can do. Computer vision tasks include methods for acquiring, processing, analysing and understanding digital images, and extraction of high-dimensional data from the real world in order to produce numerical or symbolic information, e.g. in the forms of decisions. The scientific discipline of computer vision is concerned with the theory behind artificial systems that extract information from images. The image data can take many forms, such as video sequences, views from multiple cameras, or multi-dimensional data from a 3D scanner or medical scanning device. Sub-domains of computer vision include scene

16 https://www.expert.ai/blog/10-text-mining-examples/

17 Source: https://en.wikipedia.org/wiki/Computer_vision

reconstruction, event detection, video tracking, object recognition, face recognition, motion estimation, and image restoration.

Examples of the usage of technologies identifying objects or persons based on images (image recognition, image processing):

- User identification and authentication via biometric methods implemented by the enterprise (e.g. based on fingerprints, faces).
- Drones equipped with image recognition capabilities can provide vision-based automatic monitoring, inspection and control of the assets located in remote areas.
- In manufacturing: inspecting production lines; evaluating critical points on a regular basis on the premises; monitoring the quality of final products to reduce defects; assessing the condition of workers can help manufacturing industries to have complete control of different activities in the systems. Examples of usage are: predictive maintenance; defect detection; safety (manufacturers are using computer vision to protect their employees by providing the safest working environment they can); assembling products and components (computer vision can assist in assembling products accurately and reducing the amount of time it takes to complete a product build); and reading barcodes (computer vision can read barcodes to quickly and easily track components and packages at all stages of development, through a manufacturing facility to departure and beyond; many manufacturers have begun incorporating barcode into their systems to better route products through the proper assembly lines)[18].
- Autonomous vehicles with image recognition can identify activity on the road and take necessary actions. Mini robots can help logistics industries to locate and transfer objects from one place to another. Image recognition also maintains the database of the product movement history to prevent the product from being misplaced or stolen.

e) Machine learning (e.g. deep learning) for data analysis

This answer option refers to the use of artificial intelligence technologies based on machine learning for data analysis, for instance deep learning.

Machine learning involves 'training' a computer model to better perform an automated task, e.g. data analytics. Machine learning uses algorithms whose performance improves as they are exposed to more data over time.

Deep learning is a subset of machine learning in which multilayered neural networks learn from vast amounts of data.

Neural networks (*artificial neural networks (ANN)* or *connectionism systems*) are computing systems vaguely inspired by biological neural networks. The neural network itself is not an algorithm, but rather a framework for many different machine learning algorithms to work together and process complex data inputs. Such systems 'learn' to perform tasks by considering examples, generally without being programmed with any task-specific rules.

Although neural networks are not explicitly mentioned in this answer option, they are within the scope of this item.

Examples of the usage of machine learning (e.g. deep learning) for data analysis:

- Recommender systems based on machine learning – they are utilised in a variety of areas and are most commonly recognised as playlist generators for video and music services like Netflix, YouTube and Spotify, product recommenders for services such as Amazon, or content recommenders for social media platforms such as Facebook and Twitter.
- Dynamic pricing, also referred to as surge pricing, demand pricing or time-based pricing, is a pricing strategy in which businesses set flexible prices for products or services based on current market demands. Enterprises are able to change prices based on algorithms that take into account competitor pricing, supply and demand, and other external factors in the market.
- Cyberthreat detection – machine learning has become a vital technology for cybersecurity. Machine learning pre-emptively stamps out cyberthreats and bolsters security infrastructure through pattern detection, real-time cybercrime mapping and thorough penetration testing. Microsoft uses its own cybersecurity platform, Microsoft Defender for Endpoint (MDE), previously known as Windows Defender Advanced Threat Protection (ATP), for preventative protection, breach detection, automated investigation and response. Windows Defender ATP is built into Windows 10 devices; it automatically updates and employs cloud AI, and multiple levels of machine learning algorithms, to spot threats.

18 https://blog.roboflow.com/computer-vision-use-cases-for-manufacturing/

f) AI technologies automating different workflows or assisting in decision-making (e.g. AI-based software robotic process automation)

This answer option refers to the use of artificial intelligence technologies automating different workflows or assisting in decision-making, also referred to as artificial intelligence-based software robotic process automation.

AI-based software robotic process automation is process automation based on artificial intelligence technologies. Robotic process automation (RPA) is a fast-emerging process automation approach that uses software robots to replicate human tasks. After recording a process workflow, a virtual bot mimics the actions performed by humans in the application's graphical user interface and automates their execution[19].

While process automation is not a new term and could be done without artificial intelligence, i.e. rules-based automation, this answer option refers only to the cases where artificial intelligence is used in order to boost the benefits of traditional process automation. So, as RPA gets paired with AI disciplines such as natural language processing or computer vision, the possibilities for effective automation grow considerably.

Converging AI with RPA enables businesses to automate more complex, end-to-end processes than ever before, and integrate predictive modelling and insights into these processes (which could for instance even identify new processes to automate[20]) to help humans work smarter and faster[21].

Examples of the usage of technologies automating different workflows or assisting in decision-making (AI-based software robotic process automation):

Automated bots are excellent at carrying out repetitive jobs much faster and with much more precision than human counterparts. A software bot is a programme designed to automate tasks. Typically, these tasks are simple, repetitive and routine. So, a software bot can perform them quicker and more efficiently than a human could. Software bots can take several different forms. For example, one of the most well-known types of software bot today is a chatbot. Other types of bot include web crawler bots and rule-based automation bots.

RPA that is used to work in **conjunction with people** by automating repetitive processes (attended automation) is not within the scope of the question.

g) AI technologies enabling physical movement of machines via autonomous decisions based on observation of surroundings (autonomous robots, self-driving vehicles, autonomous drones)

This answer option refers to the use of artificial intelligence technologies enabling physical movement of machines via autonomous decisions based on observation of surroundings, such as autonomous robots, self-driving vehicles, autonomous drones.

Only systems that have hardware parts (machine-like) and use artificial intelligence to learn and perform their tasks should be included in this answer option. Pure software robots or robots that automate the production process through a repetitive action without any use of artificial intelligence technologies are excluded from the scope.

Examples of the usage of technologies enabling physical movement of machines via autonomous decisions based on observation of surroundings (autonomous robots, self-driving vehicles, autonomous drones):

This answer may refer for instance to robots that use machine learning in order to learn how to better perform a task, or drones that are able to choose the best route for example for parcel delivery based on machine learning, or a self-driving vehicle that uses a combination of machine learning and computer vision for driving safely.

E2: *Does your enterprise use artificial intelligence software or systems for any of the following purposes?*

[Scope: enterprises that use artificial intelligence technologies, i.e. E1a) = yes or E1b) = yes or E1c) = yes or E1d) = yes or E1e) = yes or E1f) = yes or E1g) = yes]

[Type: single answer per item (i.e. Tick only one); binary (Yes/No); multiple items may be expected]

Question **E2** is relevant for enterprises that use one of the artificial intelligence technologies listed in question E1, i.e. enterprises that ticked yes in at least one of the answer options in question E1. The question aims at identifying the purpose of the use of artificial intelligence technologies in the enterprises. More specifically, the

19 https://www.researchgate.net/profile/Jerome_Geyer-Klingeberg/publication/326466901_Process_Mining_and_Robotic_Process_Automation_A_Perfect_Match/links/5b4f787ea6fdcc8dae2b378c/Process-Mining-and-Robotic-Process-Automation-A-Perfect-Match.pdf

20 https://www.forbes.com/sites/tomtaulli/2020/02/21/how-ai-is-supercharging-rpa-robotic-process-automation/#7172bf367769

21 https://enterprisersproject.com/article/2019/8/rpa-robotic-process-automation-vs-ai-explained

enterprises are asked to reply whether they use artificial intelligence technologies for the specific purposes by business function, namely *marketing or sales, production process, organisation of business administration processes, for management of enterprises, for logistics, for ICT security, for human resources management or recruiting.*

a. Use of AI for marketing or sales

some of the examples may be:

- **customer profiling, price optimisation, personalised marketing offers, market analysis based on machine learning**
- **chatbots based on natural language processing for customer support**
- **autonomous robots for order processing**

This answer option is related to the use of artificial intelligence technologies for marketing or sales purposes.

They may refer to chatbots that are able to analyse written language based on natural language processing and provide real-time customer support, e.g. by answering to customer questions and needs as a real person (preprogrammed chatbots that are not able to learn and only respond to specific predefined requests should be excluded from the scope). Other examples that can be included in this category are software programmes that can perform customer profiling, or recommender systems that can propose personalised marketing offers and the knowledge they have acquired about the enterprises' target market based on neural networks (e.g. through online advertisement or even phone notifications when the customer approaches a specific shop) or artificial intelligence software programmes that are able to perform market analysis in order to guide and steer the marketing decisions of the enterprises.

b) Use of AI for production or service processes

some of examples may be:

- **predictive maintenance or process optimisation based on machine learning**
- **tools to classify products or find defects in products based on computer vision**
- **autonomous drones for production surveillance, security or inspection tasks**
- **assembly works performed by autonomous robots**

This answer option is related to the use of artificial intelligence technologies for production or service purposes.

Artificial intelligence can boost the automation of the production line by integrating industrial robots into the workflow and teaching them to perform labour-intensive, dangerous or mundane tasks, thereby improving productivity while maintaining quality and safety. Examples include autonomous robots that can perform assembly works or autonomous drones that perform inspection and surveillance tasks thanks to computer vision and machine learning, or systems that are able to classify products or find defects thanks to computer vision, or to ensure predictive maintenance for assessing the state of machinery and/or prevention of equipment failure thanks to algorithms based on machine learning and neural networks.

Predictive maintenance uses condition-monitoring equipment to evaluate an asset's performance in real time. A key element in this process is the internet of things (IoT). IoT allows for different assets and systems to connect, work together, and share, analyse and action data. IoT relies on predictive maintenance sensors to capture information, make sense of it and identify any areas that need attention.

Some examples of using predictive maintenance and predictive maintenance sensors include vibration analysis, oil analysis, thermal imaging, and equipment observation.

c) Use of AI for organisation of business administration processes or management

some of the examples may be:

- **business virtual assistants based on machine learning and/or natural language processing, e.g. for document drafting**
- **data analysis or strategic decision making based on machine learning, e.g. risk assessment, based on machine learning**
- **planning or business forecasting based on machine learning**
- **human resources management based on machine learning or natural language processing, e.g. candidates pre-selection screening, employee profiling or performance analysis**

This answer option is related to the use of artificial intelligence technologies for any business administration processes or management of enterprises, including human resources management.

They may refer to business virtual assistants that are able to perform secretarial and assistance tasks based on machine learning and natural language processing and generation. They also may refer to voice-to-text conversion systems which are based on speech recognition and can produce written records (e.g. meeting minutes). Other

systems may include automated planning or scheduling based on machine learning and any other intelligent automation of workflows within the enterprises that is based on AI software-based process automation.

They may refer to business software or systems based on AI algorithms (e.g. neural networks) that are able to analyse data and help board members to take investment and other corporate decisions in the boards of enterprises. The business software or system may also be able to facilitate the distribution of information to shareholders via AI software robotic process automation or even ensure representation and voting by shareholders in general meetings of the enterprise (through natural language generation). Other examples include intelligent systems that are used for sales and/or business forecasting or risk assessment based on machine learning.

The human resources management based on machine learning or natural language processing may refer to systems that are able to do candidate preselection screening and automation of recruiting based on text mining and machine learning, or to automate the recruiting and/or onboarding process based on artificial intelligence software robotics process automation. Onboarding is the process of integrating a new employee into the organisation and its culture. Tactics used in this process include formal meetings, lectures, videos, printed materials, or computer-based orientations to introduce newcomers to their new jobs and organisations.

Enterprises may use machine learning methods to predict employee absences from work. Employees are one of the enterprise's most important resources. Their absence negatively affects productivity. Analyses may uncover reasons of absences that can be addressed by the enterprise e.g. improve the mental health of staff, invest in safety practices to prevent accidents at work, and improve workplace morale.

Other examples include personalised training offers (online course and digital classroom, best time frame for new courses and schedules to fit personal preferences) based on AI-powered staff profiling or human resources virtual assistants (HR bots), and electronic employee helpdesks that are able to handle staff requests based on natural language processing and generation. Moreover, they can use machine learning for employee performance analysis, and computer vision for sentiment and group analysis.

d) Use of AI for logistics

some of the examples may be:

- **autonomous robots for pick-and-pack solutions in warehouses for parcel shipping, tracing, distribution and sorting**
- **route optimisation based on machine learning**

This answer option is related to the use of artificial intelligence technologies for logistics.

Logistics is the process of planning and executing the efficient transportation and storage of goods from the point of origin to the point of consumption. The goal of logistics is to meet customer requirements in a timely, cost-effective manner.

Examples of usage include AI that refers to autonomous robots for pick-and-pack solutions in warehouses, or for parcel handling (shipping, tracing, distribution and sorting), or parcel delivery and route optimisation that increase safety and efficiency, based on computer vision and machine learning. Other examples may include computer vision inventory management and execution. AI-powered technology is already able to extract characteristics of products such as price tags, shelf condition, and brand to provide real-time warehouse inventory management.

Visual inspection powered by artificial intelligence is identifying damage, classifying the damage type, and determining the appropriate corrective action faster than ever before.

Robotic process automation – the combination of robotic process automation and AI can automate and streamline routine business tasks to cut corners significantly (collecting and processing data files; shipment scheduling and tracking; order processing and sending confirmation emails; capturing, researching, and closing out loads)[22].

e) Use of AI for ICT security

some of the examples may be:

- **face recognition based on computer vision for authentication of ICT users**
- **detection and prevention of cyberattacks based on machine learning**

This answer option is related to the use of artificial intelligence technologies for the enterprise's ICT security.

22 https://artificialintelligence.oodles.io/blogs/artificial-intelligence-in-logistics/

They may refer to biometric authentication systems (fingerprints, face, iris, voice) based on computer vision and/or natural language processing. Other examples may include intelligent AI-powered antivirus software, spam filter applications (SpamAssassin), fraud detection, botnet detection, hacking incident forecasting or cyberattack detection and prevention systems (network intrusion detection and prevention) that protect the enterprise networks and systems from intrusion and other ICT security incidents.

Ordinary antivirus or spam filter applications that do not use any artificial intelligence technologies are out of the scope of this question.

f) Use of AI for accounting, controlling or finance management

some of the examples may be:

- **machine learning to analyse data that helps to make financial decisions**
- **invoice processing based on machine learning**
- **machine learning or natural language processing for bookkeeping documents**

This answer option is related to the use of artificial intelligence technologies for accounting, controlling or finance management.

They may refer to intelligent systems that are used for accounting and bookkeeping services (e.g. for validation transaction activities, automatic suggestions or completion of accounting codes), and for invoice processing (e.g. to read invoices, extract the needed data, code the invoices, track outstanding invoices and automate the follow-up collection process). They may also refer to machine learning algorithms that analyse data to identify potential fraud issues and flag them for review to avoid loss of revenue. Another example may be analysis of large volumes of transactions to detect hidden errors or trends. In procurement, invoicing or billings, the AI can detect potential issues with future purchases, such as late payments and/or deliveries. AI-enabled systems can support auditing, and compliance with corporate, state, and federal regulations, by monitoring the pertinent documents and raising alerts where necessary.

Machine learning or natural language processing for bookkeeping documents refers to the usage of AI to automate and simplify bookkeeping tasks, e.g. AI can quickly and accurately record transactions in ledgers, and automate processes by extracting data from invoices, receipts, and other documents using optical character recognition. The example can also be translated as usage of machine learning or natural language processing for bookkeeping tasks.

g) Use of AI for research and development (R&D) or innovation activity (excluding research on AI)

some of the examples may be:

analysis of data for conducting research, solving research problems, developing a new or significantly improved product/service based on machine learning

This answer option is related to the use of artificial intelligence technologies for research and development (R&D) or innovation activity. AI technologies that are not used for the R&D and innovation activity, but which are used to be embedded in the enterprise's new or improved product or service, are not within the scope of this answer option, nor is R&D activity on AI.

They may refer to machine learning to analyse data to obtain useful insights, categorise, predict, and make evidence-based decisions for solving research problems or developing new or significantly improved products/services. AI might be used in the planning or implementation.

Research and development (R&D)[23] activity is creative and systematic work undertaken in order to increase the stock of knowledge - including knowledge of humankind, culture and society - and to devise new applications of available knowledge. For an activity to be an R&D activity, it must satisfy five core criteria (at least in principle), namely the activity must be novel, creative, uncertain, systematic and transferable. The term R&D covers three types of activity: basic research, applied research and experimental development.

An **innovation**[24] is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and which has been made available to potential users (product) or brought into use by the unit (process).

The minimum requirement for an innovation to occur is that the product or process (marketing or organisational)

23 OECD (2015), Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris, https://doi.org/10.1787/9789264239012-en.

24 OECD/Eurostat (2018), Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris/Eurostat, Luxembourg, https://doi.org/10.1787/9789264304604-en.

method must be new or significantly improved in the enterprise. This includes not only products, processes and methods that enterprises are the first to develop but also those that have been adopted from other enterprises or organisations.

E3: *How did your enterprise acquire the artificial intelligence software or systems that it uses?*

[Scope: enterprises that use artificial intelligence technologies, i.e. E1a) = yes or E1b) = yes or E1c) = yes or E1d) = yes or E1e) = yes or E1f) = yes or E1g) = yes; optional]

[Type: single answer per item (i.e. Tick only one); binary (Yes/No); multiple items may be expected]

Question **E3** is optional and should be answered by enterprises that use one of the artificial intelligence technologies listed in question E1, i.e. enterprises that ticked 'yes' in at least one of the answer options in question E1. The question aims at identifying how the enterprises acquired the artificial intelligence technologies that they are using. Five ways of acquisition, with varying levels of involvement on the part of the enterprise, have been identified; namely the artificial intelligence technologies were developed by own employees (including those employed in the parent or affiliate enterprises); commercial software or systems were modified by own employees (including those employed in the parent or affiliate enterprises); open-source software or systems were modified by own employees (including those employed in the parent or affiliate enterprises); commercial software or systems ready to use were purchased (including examples where it was already incorporated in a purchased item or system); and external providers were contracted to develop or modify artificial intelligence technologies.

a) They were developed by own employees (including those employed in the parent or affiliate enterprise)

This answer option covers the cases where the enterprise uses artificial intelligence software or a system, as listed in question E1, that was fully developed by its own employees (including those employed in parent or affiliate enterprises as affiliates and parent enterprises are not considered as external suppliers according to the current practices in global value chain statistics).

For instance, the enterprise's employees developed from scratch a machine learning algorithm that makes sales or business forecasting.

b) Commercial software or systems were modified by own employees (including those employed in parent or affiliate enterprise)

This answer option covers the cases where the enterprise purchased a commercial artificial intelligence software or system as listed in question E1. The commercial software or system was then modified by its own employees (including those employed in parent or affiliate enterprises) before being used by the enterprise (e.g. the software was adapted to the enterprise's need).

For instance, the enterprise bought a commercial artificial intelligence software that does customer profiling and the enterprise's employees further developed and customised the software for their own market needs and/or adapted it to better integrate into their own systems.

c) Open-source software or systems were modified by own employees (including those employed in parent or affiliate enterprise)

This answer option covers the cases where the enterprise acquired an open-source artificial intelligence software or system as listed in question E1. The open-source software or system was modified by its own employees (including those employed in parent or affiliate enterprises) before being used by the enterprise (e.g. the software was adapted to the enterprise's need).

For instance, the enterprise acquired an open-source artificial intelligence software that does customer profiling and the enterprise's employees further developed and customised the software for their own market needs and/or adapted it to better integrate into their own systems.

d) Commercial software or systems ready to use were purchased (including examples where it was already incorporated in a purchased item or system)

This answer option covers the cases where the enterprise purchased a commercial artificial intelligence software or system as listed in question E1. The commercial software or system was used directly by the enterprise without any further development. This answer option includes cases where the artificial intelligence technology is only part of a bigger system.

For instance, the respondent enterprise bought a ready-to-use software for detection and prevention of cyberattacks based on machine learning. The software was directly installed on the enterprise's network without any further customisation.

e) External providers were contracted to develop or modify them

This answer option covers the cases where the enterprise contracted external service providers to develop for the respondent enterprise a customised artificial intelligence software or system as listed in question E1.

For instance, the respondent enterprise contracted an external provider to provide them with a chatbot based on natural language processing specially developed for their customer support. The external provider may have developed the chatbot entirely from scratch or modified an already existing chatbot to meet the customer enterprise's needs. The ready-made systems that are not customised are outside the scope of this answer option and fall under answer options d).

Note that 'external supplier' refers to any other enterprise that developed the artificial intelligence software or system. Affiliates and parent enterprises are not considered as external suppliers and are therefore covered under answer option a). This complies with the current practices in global value chain statistics.

According to the definitions in the international sourcing survey, there are four types of sourcing based on 'location' and 'control'. Accordingly, outsourcing (i.e. external suppliers) includes sourcing to an enterprise that is not affiliated, otherwise it is considered as insourcing (i.e. own staff), hence the proposed clarification would be consistent with global value chains.

Note: If one of the questions in E1 was ticked 'yes', then the enterprise had to acquire or purchase artificial intelligence software or systems from somewhere. In cases where one of the E1 questions is ticked 'yes' and all of the questions in E3 are ticked 'no', it should be considered, if feasible, to contact the enterprise and verify their response (e.g. information obtained, and from whom they obtained or purchased the software or system).

E4: *Has your enterprise ever considered using any of the artificial intelligence technologies listed in question E1?*

[Scope: enterprises that had not used any of the artificial intelligence technologies listed in question E1, i.e. E1a) = no or E1b) = no or E1c) = no or E1d) = no or E1e) = no or E1f) = no or E1g) = no; optional]

[Type: single answer (i.e. Tick only one); binary (Yes/ No)]

Question **E4** is asked to those enterprises that have not used any of the artificial intelligence technologies listed in question E1, answer options a) to g).

The question is aiming to filter out those enterprises that have considered using artificial intelligence technologies but have not yet used them. This question is a filter for the following question **E5**.

E5: *What are the reasons for your enterprise not to use any of the Artificial Intelligence technologies listed in question E1?*

[Scope: enterprises that had not used any of the Artificial Intelligence technologies listed in question E1, but have considered using them, i.e. E4 = Yes; optional]

[Type: single answer per item (i.e. Tick only one); binary (Yes/ No); multiple items may be expected]

Question **E5** is aiming to collect information on the possible reasons (e.g. associated costs, lack of expertise, ethical concerns) why an enterprise has not used any of the artificial intelligence technologies listed in question E1, although they have considered it (they have replied yes to question E4).

Multiple reasons for not using artificial intelligence technologies may be valid for one enterprise.

a) The costs seemed too high

This answer option includes cases where the enterprise estimated that the costs related to using the artificial intelligence technologies listed in question E1 were higher than the expected benefits. Therefore, the enterprise decided finally not to use them. The costs related to artificial intelligence technologies use may include: costs of acquiring the artificial intelligence systems; staff costs (costs of hiring a specialist, training, etc.); hardware/ software costs due to incompatibility with existing equipment/software/systems; costs for purchasing training data for the artificial intelligence systems; or other unexpected costs due to uncertainty factors e.g. due to legal consequences or violation of data privacy.

b) There is a lack of relevant expertise in the enterprise

This item covers cases where enterprises have decided not to use any artificial intelligence because they did not have enough relevant expertise in the enterprise, namely sufficient human resources, knowledge or skills,

e.g. the required specialists are insufficiently available within the enterprise, or it is difficult to hire them. Artificial intelligence is an advanced and complex ICT technology that may require specialised knowledge to be managed and maintained even when acquired as a ready-to-use system. Therefore, some enterprises may be reluctant to use any artificial intelligence systems because they do not have, or find it difficult to employ, specialised personnel with the required expertise.

c) Incompatibility with existing equipment, software or systems

This item covers cases where enterprises have decided not to use any artificial intelligence technologies because of incompatibility with existing equipment, software or systems. The introduction of artificial intelligence technologies in the enterprise may not necessarily be compatible with the existing systems in use in the enterprise. It may therefore bring a certain uncertainty and require a resource investment in terms of the integration of the new system into the existing systems. An enterprise might therefore choose not to use artificial intelligence technology because this might require a complete change in the technical infrastructure that the enterprise is already using, which could bring about additional acquisition costs, need for specialised personnel, need for additional training for the enterprise's employees, or even the introduction of a new system for customers or suppliers of the enterprise.

d) Difficulties with availability or quality of the necessary data

This answer option covers cases where the responding enterprise has not used any artificial intelligence technologies due to difficulties with the availability or quality of the necessary data from within or from outside the responding enterprise. Data are essential for artificial intelligence systems to be trained and operate efficiently. Difficulties with the availability or quality of the necessary data refers to cases where there is no available data within the enterprise or it is difficult and costly to access them from external sources, or the available data is not detailed enough or do not include the necessary information to enable the training of the artificial intelligence systems for the specific purpose of the enterprise (e.g. the enterprise may not be able to gain access to data regarding consumer behaviour in their customer segment for training an artificial intelligence software for marketing or sales).

e) Concerns regarding violation of data protection and privacy

This answer option refers to cases where the respondent enterprise has not used any artificial intelligence technologies due to concerns regarding violation of data protection and privacy.

One of the key elements of trustworthy artificial intelligence technologies is the privacy and data governance, along with other requirements such as technical robustness, transparency, and diversity. Artificial intelligence systems must guarantee privacy and data protection throughout a system's entire life cycle. This includes the information initially provided by the user, as well as the information generated about the user over the course of their interaction with the system (e.g. outputs that the AI system generated for specific users or how users responded to particular recommendations). Digital records of human behaviour may allow AI systems to infer not only individual preferences, but also their sexual orientation, age, gender, and religious or political views. To allow individuals to trust the data gathering process, it must be ensured that data collected about them will not be used to unlawfully or unfairly discriminate against them[25].

f) Lack of clarity regarding the legal consequences (e.g. liability in the case of damage caused by the use of artificial intelligence)

This answer option refers to cases where the respondent enterprise has not used any artificial intelligence technologies due to lack of clarity regarding the legal consequences.

Lawful artificial intelligence is particularly important for the European Commission in the context of trustworthy artificial intelligence[26]. AI systems do not operate in a lawless world. Several of the legally binding rules at European, national and international level already apply or are relevant to the development, deployment and use of AI systems today. Legal sources include, but are not limited to: EU primary law (the Treaties of the European Union and its Charter of Fundamental Rights); EU secondary law (such as the General Data Protection Regulation, the Product Liability Directive, the Regulation on the Free Flow of Non-Personal Data, anti-discrimination Directives, consumer law, and Safety and Health at Work Directives);

25 https://www.europarl.europa.eu/cmsdata/196377/AI%20HLEG_Ethics%20Guidelines%20for%20Trustworthy%20AI.pdf

26 See footnote 25.

the UN Human Rights treaties and the Council of Europe conventions (such as the European Convention on Human Rights); and numerous EU Member State laws. Besides generally applicable rules, various domain-specific rules exist that apply to particular AI applications (such as the Medical Device Regulation in the healthcare sector).

The law provides both positive and negative obligations, which means that it should not only be interpreted with reference to what cannot be done, but also with reference to what should be done and what may be done. The law not only prohibits certain actions but also enables others. In this regard, it can be noted that the EU Charter contains articles on the 'freedom to conduct a business' and the 'freedom of the arts and sciences', alongside articles addressing areas with which we are more familiar when looking to ensure AI's trustworthiness, such as for instance data protection and non-discrimination.

g) Ethical considerations

This answer option refers to cases where the respondent enterprise has not used any artificial intelligence technologies because of ethical considerations. This is a particularly important topic for the EU (as well as internationally), as it tries to regulate the use of artificial intelligence in order to tackle the associated risks. The EU is considered a front runner with regard to establishing a framework on ethical rules for AI. In this context, the European Commission has issued ethical guidelines[27] for trustworthy AI that includes the ethical dimension, i.e. ensuring adherence to ethical principles and values of respect for human autonomy, prevention of harm, fairness and explicability. Trustworthy AI should be: (i) lawful - respecting all applicable laws and regulations; (ii) ethical - respecting ethical principles and values; and (iii) robust - both from a technical and social perspective since, even with good intentions, AI systems can cause unintentional harm[28].

Achieving trustworthy AI requires not only compliance with the law, which is but one of its three components. Laws are not always up to speed with technological developments, can at times be out of step with ethical norms, or may simply not be well suited to addressing certain issues. For AI systems to be trustworthy, they should therefore also be ethical, ensuring alignment with ethical norms.

h) Artificial intelligence technologies are not useful for the enterprise

This answer option refers to enterprises that have not used any artificial intelligence technologies because they were not considered useful for the enterprise, for instance not needed because of the activity of the enterprise.

2.3.1.5. MODULE F: INVOICING

There are invoices in **paper form** and **electronic form**. Invoices in electronic form are of two types:

- **E-invoices** in a standard structure **suitable for automated processing**, excluding the transmission of PDF files. They are exchanged either directly or via service operators or via an electronic banking system.
- **Invoices** in electronic form **not suitable for automated processing**, including the transmission of PDF files.

The purpose of this module is to provide quantitative information on the use of invoices by type of invoice. An invoice (in any format, paper or electronic) is a commercial transaction document that contains billing information.

The questions refer to invoices sent to all customers: other enterprise (B2B); public authorities (B2G); or individuals (B2C). Therefore, **it is important to adjust the translation of the term 'invoice' to include all of the above-mentioned customers (B2B/B2G/B2C)**.

Types of invoices:

a) E-invoices in electronic form in a standard structure suitable for automated processing

'True' e-invoicing fully automates the invoice capture and receipt process without the need to perform any data entry; invoice information flows directly from the supplier to the buyer's back-office system, requiring no manual intervention by the buyer. The buyer receives invoices from its suppliers using formats that have been agreed in advance. The invoices may include mechanisms, such as digital signatures and EDI, that ensure their authenticity and integrity. They will arrive at the buyer in a format that can be integrated into their ERP and then archived for the legally required period, without being altered in any way.

The condition for automated processing is that the e-invoice is sent in a standard or at least agreed format. This can be EDI (electronic data exchange) or the more modern UBL (universal business language). In the case of UBL, the messages are encoded in XML (extensible

27 See footnote 25.

28 See footnote 25.

markup language). There are XML implementations for EDI, too. EDI-invoices are often sent via service operators.

b) Invoices in electronic form not suitable for automated processing

Invoices can be in electronic form and not suitable for automated processing, e.g. emails, email attachments as PDF, TIF, JPEG or other formats.

Issuing a PDF invoice by email removes paper from the process but it can create new problems. The customer's Accounts payable department still has to capture the data from the PDF, and this can only be achieved by separate optical character recognition (OCR) software (sometimes printing the PDF invoice) or by keying the data directly from the PDF image. PDF invoices can be a first step to true e-invoicing. They do not provide the end-to-end integration.

The scanning of paper-based invoices isn't considered e-invoicing, although it is the first step for many enterprises. Using OCR software, the data can be moved from a paper-based format to a digital format that can be entered in the Accounts payable system.

Optical character recognition is not an error-free solution and legibility issues with the original invoice will necessitate manual data entry to resolve any issues. In most cases, some manual data entry will be required. Once an OCR initiative is implemented, enterprises can benefit from some time and cost savings in the routing, approval and payment of invoices.

There is confusion between different types of invoice automation under the term e-invoicing. Invoice automation via scanning and optical character recognition (OCR) is the digitisation of paper-based invoices upon receipt. Issuing PDF invoices via email is also a form of automation, but it does not provide full integration. Both of these methods are often referred to as e-invoicing, but are not to be considered as e-invoices in this survey.

c) Invoices in paper form

Invoices that are sent in paper format and scanned (by the recipient) should be considered as sent in paper and received as paper invoices. The scanned version may be a PDF, or an image or any kind of electronic invoice, but it is not relevant since the supplier originally sent it as paper.

Note: The definition of e-invoice is in line with the definition of electronic invoice as 'an invoice that has been issued, transmitted and received in a structured electronic format which allows for its automatic and electronic processing' provided by Directive 2014/55/EU[29] of the European Parliament and of the Council of 16 April 2014 on electronic invoicing in public procurement. The term 'invoices in electronic form' used in the model questionnaire is not to be confused with the term 'electronic invoices' used in the Directive.

F1: *In 2022, did your enterprise send any of the following types of invoices:*

Include also invoices sent via intermediaries, e.g. accountants, e-invoice service providers.

[Scope: enterprises with access to the internet, i.e. A1 > 0]

[Type: single answer per item (i.e. Tick only one); binary (Yes/No); filter question; multiple items may be expected]

a) Invoices in electronic form, in a standard structure **suitable for automated processing** (e-invoices)?

(EDI (e.g. EDIFACT), XML (e.g. UBL)), [please add national examples])

Excluding the transmission of PDF files

b) Invoices in electronic form **not suitable for automated processing?**

(e.g. emails, TIF, JPEG or other format)

Including the transmission of PDF files

c) Paper invoices?

Two distinct types of electronic invoices are proposed i.e. 'e-invoices in a standard structure suitable for automated processing' and 'invoices in electronic form not suitable for automated processing'. The core difference between the two types of electronic invoices – requiring or not requiring manual intervention – is essential to the commercial case for improving efficiency, increasing productivity and reducing costs through the dematerialisation of financial processes.

The scope of question F1a) on e-invoicing is on:

- *e-invoices in a standard structure suitable for automated processing*. They can be treated in an automated way (in an agreed structure) without the need to use other software (OCR) to be treated in an automated way. Electronic invoices not suitable for automatic processing

29 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014L0055

e.g. emails, email attachment in PDF format, should not be treated as e-invoice as defined in Directive 2014/55/EU of the European Parliament and of the Council of 16 April 2014 on electronic invoicing in public procurement.

- *e-invoices sent*. Invoices issued, for example when purchasing grocery in stores, are not within the scope of the questions. E-invoices sent via intermediaries, e.g. accountants, service providers, are within the scope of the questions.
- *e-invoices sent to all customers*; private persons (B2C), other enterprises (B2B) or public authorities (B2G). In recent years, more enterprises have been providing the opportunity to private persons to receive their invoices for services provided in a standard structure suitable for automatic processing, either directly to their bank account or to their email from where the e-invoice can easily be transferred into their e-bank. When translating the questions into national languages, the word for invoice should be translated in a way that includes invoices or bills issued to all customers of an enterprise.

Possible methodological issues in the survey

- **E-invoices** may be converted automatically into a payment by the client but the definition would exclude direct debiting or bank transfer from the client to the vendor without any exchange of invoice.
- An enterprise may send an electronic invoice not suitable for automated processing (e.g. PDF attached to an email) and also send a printed version of the invoice on paper along with the product. In these cases, the invoice should be reported as one invoice (not as two separate invoices), sent in electronic form not suitable for automated processing F1b). It should not be included as invoices only in paper form F1c).
- An enterprise may send an electronic invoice suitable for automated processing and also send an electronic invoice not suitable for automated processing (e.g. PDF attached to an email). In these cases, the invoice should be reported as one invoice (not as two separate invoices), sent in electronic form suitable for automated processing F1a). It should not be included as an electronic invoice not suitable for automated processing in F1b).
- An enterprise may send via email a PDF invoice that is not suitable for automated processing. In this case, the invoice should be reported as an electronic invoice not suitable for automated processing (F1b)).

An enterprise may send an invoice via fax machines. In this case, the invoice should be reported as a paper invoice (F1c)).

F2: *Concerning e-Invoices: In 2022, out of all invoices your enterprise sent (in electronic or paper form) to private customers, other enterprises or public authorities, how many were e-invoices in a standard structure suitable for automated processing? (Tick only one)*

(optional)

[Scope: enterprises that sent invoices in electronic form, in a standard structure suitable for automated processing, i.e. F1a) = Yes; optional]

[Type: single answer (i.e. Tick only one)]

a) Less than 10%

b) At least 10% but less than 25%

c) At least 25% but less than 50%

d) At least 50% but less than 75%

e) At least 75%

F2.bis: *Concerning e-invoices: In 2022, out of all invoices your enterprise sent (in electronic or paper form) to private customers, other enterprises or public authorities, what percentage were e-invoices in a standard structure suitable for automated processing?*

If you cannot provide the exact percentage, an approximation will suffice.

(optional)

[Scope: enterprises that sent invoices in electronic form, in a standard structure suitable for automated processing i.e. F1a) = Yes; optional]

[Type: numerical, percentage values]

Note that NSIs can choose the alternative (F2 or F2bis) that would best suit their national data collection. Data would be reported according to ranges. To help respondents in supplying the quantitative information, it is indicated that the percentages could be indicated with a degree of approximation. If option F2.bis was chosen, data could be underestimated/overestimated if the percentage of invoices sent in a standard structure suitable for automated processing was below 1%.

2.3.1.6. MODULE X: BACKGROUND INFORMATION

The background variables have several purposes. Firstly, they are used for breakdowns. That is the case for the 'Main economic activity of the enterprise' and 'Average number of employees and self-employed persons (persons employed)'.

Secondly, they are needed to weight the percentages of turnover from e-commerce. The background variable 'Total turnover' is used for that purpose. The variable 'Average number of employees and self-employed persons (persons employed)' is similarly used to weight the percentage of persons employed using computers, the percentage of persons employed using computers with access to the internet, etc. The number of employees and self-employed persons (persons employed) is also used to weight the qualitative variables.

Thirdly, the background variables are used in the sampling design. Namely, 'Main economic activity' and 'Average number of employees and self-employed persons (persons employed)' are used to stratify the sample.

The background variables described so far may be collected through the ICT survey questionnaire or obtained from alternative sources. The alternative sources are mainly the registers and one main business survey, usually used to produce the structural business statistics. It is very important that the background information is at least consistent with the structural business statistics.

X1: *Main economic activity of the enterprise*

[Scope: all enterprises]

[Type: categorical]

The main (or principal) economic activity is identified as the activity that contributes most to the total value added of the enterprise. The principal activity so identified does not necessarily account for 50% or more of the enterprise's total value added. The classification of principal activity is determined by reference to NACE, first at the highest level of classification and then at more detailed levels ('top-down' method).

The nomenclature NACE Rev. 2 is available on: https://ec.europa.eu/eurostat/web/nace

The main economic activity of the enterprise should be classified by NACE Rev. 2 at its highest level of detail (4 digits). Nevertheless, only the following level of detail which is used in the breakdown is strictly necessary.

Please note that with the entry into force of Regulation (EU) 2019/2152 of the European Parliament and of the Council of 17 December 2019 on European business statistics[30] (*OJ L 327*), the NACE breakdown requested for ICT usage and e-commerce in the enterprises survey has changed both for national and European aggregates, from survey year 2021 onwards.

30 https://eur-lex.europa.eu/legal-content/EN/TXT/?toc=OJ%3AL%3A2019%3A327%3ATOC&uri=uriserv%3AOJ.L_.2019.327.01.0001.01.ENG

NACE Rev. 2 groupings		
Aggregates for calculation of **national** NACE Rev. 2 aggregates		
1	10 - 33 + 35 - 39 + 41 - 43 + 45 - 47 + 49 - 53 + 55 - 56 + 58 - 63 + 68 - 75 + 77 - 82 + 95.1	
2	10 - 33	Manufacturing
3	10 - 18	Manufacture of products based on food, beverages, tobacco, textile, leather, wood, pulp and paper; publishing and printing
4	19 - 23	Manufacture of coke, refined petroleum products, chemical products, basic pharmaceutical products, rubber and plastics, other non-metallic mineral products
5	24 - 25	Manufacture of basic metals and fabricated metal products excluding machines and equipment
6	26 - 33	Manufacture of computers, electric and optical products, electrical equipment, machinery and equipment n.e.c., motor vehicles, other transport equipment, furniture, other manufacturing, repair and installation of machinery and equipment
7	35 - 39	Production and distribution of electricity, gas, steam and air conditioning; water supply, sewerage, waste management and remediation activities
8	41 - 43	Construction
9	45 - 47	Wholesale and retail trade; repair of motor vehicles and motorcycles
10	47	Retail trade
11	49 - 53	Transport and storage
12	55	Accommodation
13	55 - 56	Accommodation and food service activities
14	58 - 63	Information and communication
15	68	Real estate activities
16	69 - 75	Professional, scientific and technical activities
17	77 - 82	Administrative and support service activities
	26.1 - 26.4 + 26.8 + 46.5 + 58.2 + 61 + 62.01 + 62.02 + 62.03 + 62.09 + 63.1 + 95.1	Manufacture of electronic components and boards, consumer electronics, magnetic and optical media; wholesale of information and communication equipment; software publishing; telecommunications; computer programming, consultancy and facilities management activities, other information technology and computer service activities; data processing, hosting and related activities, web portals; repair of computers and communication equipment or ICT sector

Aggregates for calculation of **European** NACE Rev. 2 aggregates		
3a	10 - 12	Manufacture of beverages, food and tobacco products
3b	13 - 15	Manufacture of textiles, wearing apparel, leather and related products
3c	16 - 18	Manufacture of wood and products of wood and cork, except furniture; articles of straw and plaiting materials; paper and paper products; printing and reproduction of recorded media
4a	19	Manufacture of coke and refined petroleum products
4b	20	Manufacture of chemicals and chemical products
4c	21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
4d	22 - 23	Manufacture of rubber and plastic products; other non-metallic mineral products
6a	26	Manufacture of computer, electronic and optical products
6b	27	Manufacture of electrical equipment, machinery and equipment n.e.c.
6c	28	Manufacture of machinery and equipment n.e.c.
6d	29 - 30	Manufacture of motor vehicles, trailers and semi-trailers; other transport equipment
6e	31 - 33	Manufacture of furniture; other manufacturing; repair and installation of machinery and equipment
7a	35	Electricity, gas, steam and air conditioning supply
7b	36 - 39	Water collection, treatment and supply; sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services
9a	45	Wholesale and retail trade and repair of motor vehicles and motorcycles
9b	46	Wholesale trade, except of motor vehicles and motorcycles
14a	58 - 60	Publishing activities; motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities
14b	61	Telecommunications
14c	62 - 63	Computer programming, consultancy and related activities; information service activities
16a	69 - 71	Legal and accounting activities; activities of head offices; management consultancy activities; architectural and engineering activities; technical testing and analysis
16b	72	Scientific research and development
16c	73 - 75	Advertising and market research; other professional, scientific and technical activities; veterinary activities
17a	77 - 78 + 80-82	Activities for: rental and leasing; employment; security and investigation; services to buildings and landscape; office administrative, office support and other business support
17b	79	Travel agency, tour operator and other reservation service and related activities
18a	95.1	Repair of computers and communication equipment

The NACE Rev. 2 categories are grouped together for dissemination purposes into several aggregates organised in five hierarchal levels. At the first level, there are two categories distinguishing 'Manufacturing, Energy and Construction' and 'Non-financial services'. At the second level, activities are grouped at the Section level of NACE, making 11 categories. The content of these groupings is described above.

X2: *Average number of employees and self-employed persons (persons employed), during 2022*

[Scope: all enterprises]

[Type: numerical]

With the introduction of the Framework Regulation on European Business Statistics, the variable 'persons employed' is replaced by the variable 'employees and self-employed persons'. This change in the denomination of the variable does not imply any change in the scope. The two variables represent exactly the same concept. For the sake of user friendliness, the term 'employees and self-employed persons' is only used in the introductory part of the questionnaire and in Module X; in the rest of the questionnaire, the term 'persons employed' is used.

For the purpose of general harmonisation of enterprise ICT usage statistics and the more general field of business statistics, the concept of employees and self-employed persons used here is taken from Regulation (EU) 2020/1197 of 30 July 2020 implementing Regulation 2020/2152 on European Business Statistics (p. 92, Variable 120101: Number of employees and self-employed persons).

The **number of employees and self-employed persons** is the sum of the **number of employees** and **number of self-employed persons.**

The **number of employees** represents the average number of persons who were, at some time during the reference period, employees of the statistical unit.

Explanatory note:

While the employment relationship, which qualifies the parties (into employee and employer), is defined in specific legislation or contracts, the term 'employee' usually means a person hired by the statistical unit to provide services to it on a regular basis, in exchange for benefits, and where the services provided are not part of an independent business. For the sake of clarity, apprentices, if hired under such conditions, are considered employees.

The average should be calculated as the arithmetic mean of the number of employees over the shortest time periods of equal length fitting into the reference period, for which regular observations are practicable (e.g. daily, weekly, monthly, quarterly).

The **number of self-employed persons** is the average number of persons who were at some time during the reference period the sole owners or joint owners of the statistical unit in which they work. Family workers and outworkers whose income is a function of the value of the outputs of the statistical unit are also included.

Note: In order to check the comparability of data, it is necessary to indicate whether voluntary workers have been included under this heading or not.

The number of employees and self-employed persons should be measured as the yearly average during the previous calendar year. For comparability reasons, the number of employees and self-employed persons should not be confused with the number of employees (that excludes unpaid workers) or the number of employees in full-time equivalent units.

The average number of employees and self-employed persons is coded into five size categories, of which three are compulsory and the other two are optional.

Size categories (according to the number of employees and self-employed persons)		
Compulsory		
1	10 to 49	Small enterprises
2	50 to 249	Medium enterprises
3	250 or more	Large enterprises
Optional		
4	Less than 2	Small micro-enterprises
5	2 to 9	Big micro-enterprises

X3: *Total turnover (in value terms, excluding VAT), for 2022*

[Scope: all enterprises]

[Type: numerical]

This background variable is needed to weight the percentage of turnover resulting from orders received via computer networks (value of web sales and value of EDI-type sales in Module B: e-Commerce sales).

For the purpose of general harmonisation of enterprise ICT usage statistics and the more general field of business statistics, the concept of employees and self-employed persons used here is taken from Regulation (EU) 2020/1197 of 30 July 2020 (p. 104, Variable 140301: Net turnover) implementing Regulation 2019/2152 (European Business Statistics):

For all activities except for NACE 64, 65 and some activities of NACE 66 net turnover consists of all income arising during the reference period in the course of ordinary activities of the statistical unit, and is presented net of all price reductions, discounts and rebates granted by it.

Income is defined as increases in economic benefits during the reference period in the form of inflows or enhancements of assets or decreases of liabilities that result in increases in equity, other than those relating to contributions from equity participants.

The inflows referred to are arising from contracts with customers and are realised through the satisfaction by the statistical unit of performance obligations as provided for in said contracts. Usually, a performance obligation is represented by the sale (transfer) of goods or the rendering of services, however, the gross inflows can also contain revenues obtained as a yield on the use by others of the statistical unit's assets.

Excluded from net turnover are:

- *all taxes, duties or levies linked directly to revenue;*
- *any amounts collected on behalf of any principal, if the statistical unit is acting as an agent in its relationship with said principal;*
- *all income not arising in the course of ordinary activities of the statistical unit. Usually, these types of income are classified as 'Other (operating) income', 'Financial income', 'Extra-ordinary income' or under a similar heading, depending on the respective set of generally accepted accounting standards used to prepare the financial statements.*

Infra-annual statistics may not be able to take into account aspects such as annual price reductions, subsidies, rebates and discounts.

3 Data transmission

Once the data have been collected by the NSIs, they must be transmitted to Eurostat. This chapter provides guidance on how to compute aggregates and transmit the data.

3.1. General description

Data files on ICT usage and e-commerce in enterprises transmitted to Eurostat include statistical data elements laid down in the Implementing Act. The Implementing Act lists 70 mandatory variables and 28 optional variables.

Metadata and quality reports complement those data.

3.2. Codification, indicators and breakdown aggregates

NSIs have to codify microdata, compute aggregates and break them down into different combinations depending on the enterprises' activity, sector and size (number of employees and self-employed persons). Those steps are necessary prerequisites for transmitting data to Eurostat.

3.2.1. Codification of microdata

The following table provides guidance on how NSIs can codify microdata gathered using the model questionnaire in order to develop the indicators that need to be sent to Eurostat.

The use of the following codification is not mandatory but recommended as the scope of the indicators to be transmitted to Eurostat are based on that codification.

Variable name	Code	Description	Filter/Remarks (Standard codification)
		Module A: Access and use of the internet	
		Access to the Internet	
		A1: How many persons employed have access to the internet for business purposes?	All enterprises
		(including fixed line, fixed wireless and mobile telephone network connection)	
EMPIUSEVAL	Nnnnn	Absolute number	
	Blank	No answer	
EMPIUSEPCT	Nnn	Percentage (0-100, round to the nearest integer)	
	Blank	No answer	
		Derived value	
EMPIUSE	Nnnnn	Reconstructed absolute number:	
	Blank	IF EMPIUSEVAL<> Blank THEN EMPIUSEVAL	
		ELSEIF EMPIUSEPCT<>Blank AND EMP <> Blank	
		THEN EMPIUSEPCT * EMP / 100	
		ELSE Blank	
		Use of a fixed connection to the internet for business purposes	
		A2: Does your enterprise use any type of fixed connection to the internet? (e.g. ADSL, SDSL, VDSL, fiber optics technology (FTTP), cable technology, fixed wireless)	Enterprises where EMPIUSE > 0
FIXBB	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
		A3: What is the maximum contracted download speed of the fastest fixed internet connection of your enterprise?	Enterprises where FIXBB=1
ISPDF1	1	a) less than 30 Mbit/s	
	2	b) at least 30 but less than 100 Mbit/s	
	3	c) at least 100 but less than 500 Mbit/s	
	4	d) at least 500 but less than 1 Gbit/s	
	5	e) at least 1 Gbit/s	
	Blank	No answer	
	9	Not applicable (FIXBB=Blank or FIXBB<>1)	
		Use of a website	
		A4: Does your enterprise have a website?	Enterprises where EMPIUSE > 0
WEB	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
		A5: Does the website have any of the following?	Enterprises where WEB=1
WEBACC		a) Description of goods or services, price information	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (WEB=Blank or WEB<>1)	
WEBORD		b) Online ordering or reservation or booking, e.g. shopping cart	
	1	Yes	
	0	No	

Variable name	Code	Description	Filter/Remarks (Standard codification)
	Blank	No answer or option not included	
	9	Not applicable (WEB=Blank or WEB<>1)	
WEBCTM		c) Possibility for visitors to customise or design online goods or services	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (WEB=Blank or WEB<>1)	
WEBOT		d) Tracking or status of orders placed	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (WEB=Blank or WEB<>1)	
WEBPER		e) Personalised content on the website for regular/recurrent visitors	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (WEB=Blank or WEB<>1)	
WEBCHT		f) A chat service for customer support (a chatbot, virtual agent or a person replying to customers)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (WEB=Blank or WEB<>1)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
WEBVAC		g) Advertisement of open job positions or online job application	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (WEB=Blank or WEB<>1)	
WEBLANG		h) Content available in at least two languages	
		Please, consider a multilingual website within a single domain (e.g. ".com") or multiple domains of your enterprise in different languages (e.g. ".es", ".uk").	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (WEB=Blank or WEB<>1)	
		Use of mobile apps	
		A6: Does your enterprise have a mobile app for clients (e.g. for loyalty program, e-commerce, customer support)?	Enterprises where EMPIUSE > 0
MOBAPP	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
		Use of social media	
		A7: Does your enterprise use any of the following social media? *(add national examples; replace existing examples if necessary)*	Enterprises where EMPIUSE > 0
SM1_SNET		a) Social networks (e.g. Facebook, LinkedIn, Xing, Viadeo, Yammer)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
SM1_BLOG		b) Enterprise's blog or microblogs (e.g. Twitter)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
SM1_CNTSHR		c) Multimedia content sharing websites or apps (e.g. YouTube, Flickr, SlideShare, Instagram, Pinterest, Snapchat)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
(Optional)		**A8: Does your enterprise use any of the above mentioned social media to:**	Enterprises where SM1_SNET=1 or SM1_BLOG=1 or SM1_CNTSHR=1
SM_PADVERT		a) Develop the enterprise's image or market products (e.g. advertising or launching products)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable ((SM1_SNET=Blank or SM1_SNET<>1) and (SM1_BLOG=Blank or SM1_BLOG<>1) and (SM1_CNTSHR=Blank or SM1_CNTSHR<>1))	

Variable name	Code	Description	Filter/Remarks (Standard codification)
SM_PCUQOR		b) Obtain or respond to customer opinions, reviews, questions	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable ((SM1_SNET=Blank or SM1_SNET<>1) and (SM1_BLOG=Blank or SM1_BLOG<>1) and (SM1_CNTSHR=Blank or SM1_CNTSHR<>1))	
SM_PCUDEV		c) Involve customers in development or innovation of goods or services	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable ((SM1_SNET=Blank or SM1_SNET<>1) and (SM1_BLOG=Blank or SM1_BLOG<>1) and (SM1_CNTSHR=Blank or SM1_CNTSHR<>1))	
SM_PBPCOLL		d) Collaborate with business partners (e.g. suppliers) or other organisations (e.g. public authorities, non-governmental organisations)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable ((SM1_SNET=Blank or SM1_SNET<>1) and (SM1_BLOG=Blank or SM1_BLOG<>1) and (SM1_CNTSHR=Blank or SM1_CNTSHR<>1))	
SM_PRCR		e) Recruit employees	
	1	Yes	
	0	No	

Variable name	Code	Description	Filter/Remarks (Standard codification)
	Blank	No answer	
	9	Not applicable ((SM1_SNET=Blank or SM1_SNET<>1) and (SM1_BLOG=Blank or SM1_BLOG<>1) and (SM1_CNTSHR=Blank or SM1_CNTSHR<>1))	
SM_PEXCHVOK		f) Exchange views, opinions or knowledge within the enterprise	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable ((SM1_SNET=Blank or SM1_SNET<>1) and (SM1_BLOG=Blank or SM1_BLOG<>1) and (SM1_CNTSHR=Blank or SM1_CNTSHR<>1))	
(Optional)		***Other use of the internet***	
ADS		**A9: Does your enterprise pay to advertise on the internet?**	Enterprises where EMPIUSE > 0
		(e.g. adverts on search engines, on social media, on other websites or apps)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
(Optional)		**A10: Does your enterprise pay to advertise on the internet using any of the following targeted advertising methods?**	Enterprises where ADS=1
ADS_KW		a) Based on content or keywords searched by internet users	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (ADS=Blank or ADS<>1)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
ADS_TRK		b) Based on the tracking of internet users' past activities or profile	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (ADS=Blank or ADS<>1)	
ADS_LOC		c) Based on the geolocation of internet users	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (ADS=Blank or ADS<>1)	
ADS_OTH		d) Any other method of targeted advertising on the internet not specified above	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (ADS=Blank or ADS<>1)	
		Module B: e-Commerce sales	
		Web sales of goods or services	
		B1: During 2022, did your enterprise have web sales of goods or services via:	Enterprises where EMPIUSE > 0
AWS_COWN		a) your enterprise's websites or apps? (including extranets)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
AWS_CMP		b) e-commerce marketplace websites or apps used by several enterprises for trading goods or services? (e.g. e-Bookers, Booking, hotels.com, eBay, Amazon, Amazon Business, Alibaba, Rakuten, TimoCom etc.)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
		B2: What was the value of your web sales?	
AWSVALVAL	Nnnnn	a) What was the value of your web sales of goods or services, in 2022? (National currency, excluding VAT)	Enterprises where AWS_COWN=1 or AWS_CMP=1
	Blank	No answer	
	-1	Not applicable ((AWS_COWN=Blank or AWS_COWN<>1) and (AWS_CMP=Blank or AWS_CMP<>1))	
AWSVALPCT	Nnn	b) What percentage of the turnover was generated by web sales of goods or services, in 2022? (0-100, please provide at least one decimal)	
	Blank	No answer	
	-1	Not applicable ((AWS_COWN=Blank or AWS_COWN<>1) and (AWS_CMP=Blank or AWS_CMP<>1))	
		Derived values	
AWSVAL	Nnnnn	Reconstructed absolute number:	
	Blank	IF (AWS_COWN=Blank or AWS_COWN<>1) and (AWS_CMP=Blank or AWS_CMP<>1) THEN -1	

Variable name	Code	Description	Filter/Remarks (Standard codification)
	-1	ELSEIF AWSVALVAL <> Blank THEN AWSVALVAL	
		ELSEIF AWSVALPCT <>Blank AND TOVT <> Blank	
		THEN AWSVALPCT * TOVT / 100	
		ELSE Blank	
		B3: What was the percentage breakdown of the value of the web sales in 2022 for the following:	
AWS_COWNPCT		a) via your enterprise's websites or apps? (including extranets)	Enterprises where AWS_COWN=1 and AWS_CMP=1
	Nnn	Percentage (0-100)	
	Blank	No answer	
	-1	Not applicable ((AWS_COWN=Blank or AWS_COWN<>1) or (AWS_CMP=Blank or AWS_CMP<>1))	
AWS_CMPPCT		b) via e-commerce marketplace websites or apps used by several enterprises for trading goods or services? (e.g. e-Bookers, Booking, hotels.com, eBay, Amazon, Amazon Business, Alibaba, Rakuten, TimoCom etc.)	
	Nnn	Percentage (0-100)	
	Blank	No answer	
	-1	Not applicable ((AWS_COWN=Blank or AWS_COWN<>1) or (AWS_CMP=Blank or AWS_CMP<>1))	
		Derived values	
		The following two variables reconstruct the turnover resulting from the orders received via a website or apps (in monetary terms, excluding VAT) in 2022, via the respective channels (enterprise's website or e-commerce marketplace), based on the replies to questions B1 and B3. The formulae below indicate how they could be calculated:	Enterprises where AWS_COWN=1 or AWS_CMP=1

Variable name	Code	Description	Filter/Remarks (Standard codification)
AWSVAL_COWN	Nnnnn	Reconstructed absolute number:	
	Blank	IF AWS_COWN=1 THEN	
	-1	IF AWS_CMP=Blank or AWS_CMP=0	
		THEN AWSVAL	
		ELSE	
		IF AWS_COWNPCT=Blank	
		THEN Blank	
		ELSE AWSVAL * AWS_COWNPCT / 100	
		ELSEIF AWS_COWN=0 THEN 0	
		ELSEIF AWS_COWN=Blank THEN Blank	
		ELSE -1	
AWSVAL_CMP	Nnnnn	Reconstructed absolute number:	
	Blank	IF AWS_CMP=1 THEN	
	-1	IF AWS_COWN=Blank or AWS_COWN=0	
		THEN AWSVAL	
		ELSE	
		IF AWS_CMPPCT=Blank	
		THEN Blank	
		ELSE AWSVAL * AWS_CMPPCT / 100	
		ELSEIF AWS_CMP=0 THEN 0	
		ELSEIF AWS_CMP=Blank THEN Blank	
		ELSE -1	
		B4: What was the percentage breakdown of the value of the web sales in 2022 by type of customer:	Enterprises where AWS_COWN=1 or AWS_CMP=1
AWSVALCPCT		a) Sales to private consumers (B2C)	
	Nnn	Percentage (0-100)	
	Blank	No answer	
	-1	Not applicable ((AWS_COWN=Blank or AWS_COWN<>1) and (AWS_CMP=Blank or AWS_CMP<>1))	

Variable name	Code	Description	Filter/Remarks (Standard codification)
		b) Sales to other enterprises (B2B) and Sales to public sector (B2G)	
AWSVALBGPCT	Nnn	Percentage (0-100)	
	Blank	No answer	
	-1	Not applicable ((AWS_COWN=Blank or AWS_COWN<>1) and (AWS_CMP=Blank or AWS_CMP<>1))	
		Derived values	
AWSVALC	Nnnnn	Reconstructed absolute number:	
	Blank	IF (AWS_COWN=Blank or AWS_COWN<>1) and (AWS_CMP=Blank or AWS_CMP<>1) THEN -1	
	-1	ELSEIF AWSVALCPCT<>Blank AND AWSVAL <> Blank	
		THEN AWSVALCPCT * AWSVAL / 100	
		ELSE Blank	
AWSVALBG	Nnnnn	Reconstructed absolute number:	
	Blank	IF (AWS_COWN=Blank or AWS_COWN<>1) and (AWS_CMP=Blank or AWS_CMP<>1) THEN -1	
	-1	ELSEIF AWSVALBGPCT<>Blank AND AWSVAL <> Blank	
		THEN AWSVALBGPCT * AWSVAL / 100	
		ELSE Blank	

Variable name	Code	Description	Filter/Remarks (Standard codification)
		EDI-type sales	
		B5: During 2022, did your enterprise have EDI-type sales of goods or services?	Enterprises where EMPIUSE > 0
AXSELL	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
		B6: What was the value of your EDI-type sales?	Enterprises where AXSELL=1
AXSVALVAL	Nnnnn	a) What was the value of your EDI-type sales of goods or services, in 2022? (National currency, excluding VAT)	
	Blank	No answer	
	-1	Not applicable (AXSELL=Blank or AXSELL<>1)	
AXSVALPCT	Nnn	b) What percentage of total turnover was generated by EDI-type sales of goods or services, in 2022?	
	Blank	No answer	
	-1	Not applicable (AXSELL=Blank or AXSELL<>1)	
		Derived value	
AXSVAL	Nnnnn	Reconstructed absolute number:	
	Blank	IF AXSELL<>1 THEN -1	
	-1	ELSEIF AXSVALVAL <> Blank THEN AXSVALVAL	
		ELSEIF AXSVALPCT <>Blank AND TOVT <> Blank	
		THEN AXSVALPCT * TOVT / 100	
		ELSE Blank	

Variable name	Code	Description	Filter/Remarks (Standard codification)
		Module C: Data utilisation, sharing, analytics and trading	
		(Scope: enterprises with access to the internet, i.e. if A1>0)	
		Use of business software	
		C1: Does your enterprise use the following business software?	Enterprises where EMPIUSE > 0
ITERP1		a) Enterprise Resource Planning (ERP) software	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
CRM1		b) Customer Relationship Management (CRM) software	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
ITBI		c) Business Intelligence (BI) software	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
		Data sharing	
SISC		**C2: Does your enterprise share data electronically with suppliers or customers within the supply chain (e.g. via websites or apps, EDI-systems, real-time sensors or tracking)?**	Enterprises where EMPIUSE > 0
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
		Data analytics	
DAOWN		**C3: Does your enterprise perform data analytics by own employees?**	Enterprises where EMPIUSE > 0
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
		C4: Does your enterprise perform data analytics on data from the following sources?	Enterprises where DAOWN=1
DASERP		a) Data analytics on data from transaction records such as sale details, payments records (e.g. from Enterprise Resource Planning system (ERP), own webshop)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (DAOWN=Blank or DAOWN<>1)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
DASCRM		b) Data analytics on data about customers such as customer purchasing information, location, preferences, customer reviews, searches (e.g. from Customer Relationship Management system (CRM) or own website)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (DAOWN=Blank or DAOWN<>1)	
DASSM		c) Data analytics on data from social media, incl. from your enterprise's own social media profiles (e.g. personal information, comments, video, audio, images)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (DAOWN=Blank or DAOWN<>1)	
DASWEB		d) Data analytics on web data (e.g. search engine trends, web scraping* data)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (DAOWN=Blank or DAOWN<>1)	
DASLOC		e) Data analytics on location data from the use of portable devices or vehicles (e.g. portable devices using mobile telephone networks, wireless connections or GPS)	
	1	Yes	
	0	No	

Variable name	Code	Description	Filter/Remarks (Standard codification)
	Blank	No answer	
	9	Not applicable (DAOWN=Blank or DAOWN<>1)	
DASSDS		f) Data analytics on data from smart devices or sensors (e.g. Machine to Machine (M2M) communications, sensors installed in machinery, manufacturing sensors, smart meters, Radio frequency identification (RFID) tags)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (DAOWN=Blank or DAOWN<>1)	
DASGOV		g) Data analytics on government authorities' open data (e.g. enterprise public records, weather conditions, topographic conditions, transport data, housing data, buildings data)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (DAOWN=Blank or DAOWN<>1)	
DASSAT		h) Data analytics on satellite data (e.g. satellite imagery, navigation signals, position signals)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (DAOWN=Blank or DAOWN<>1)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
DAEXT		**C5: Does an external enterprise or organisation perform data analytics for your enterprise?**	Enterprises where EMPIUSE > 0
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
		Data trading	
(optional)		**C6: During 2022, did your enterprise sell (access to) any of its own data?**	Enterprises where EMPIUSE > 0
DSELL	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
(optional)		**C7: During 2022, did your enterprise purchase (access to) any data?**	Enterprises where EMPIUSE > 0
DBUY	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
		Module D: Use of cloud computing services	
CC		**D1: Does your enterprise buy any cloud computing services used over the internet?**	Enterprises where EMPIUSE > 0
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
		D2: Does your enterprise buy any of the following cloud computing services used over the internet?	Enterprises where CC=1
CC_PEM		a) E-mail (as a cloud computing service)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (CC=Blank or CC<>1)	
CC_PSOFT		b) Office software (e.g. word processors, spreadsheets) (as a cloud computing service)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (CC=Blank or CC<>1)	
CC_PFACC		c) Finance or accounting software applications (as a cloud computing service)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (CC=Blank or CC<>1)	
CC_PERP		d) Enterprise Resource Planning (ERP) software applications (as a cloud computing service)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (CC=Blank or CC<>1)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
CC_PCRM		e) Customer Relationship Management (CRM) software applications (as a cloud computing service)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (CC=Blank or CC<>1)	
CC_PSEC		f) Security software applications (e.g. antivirus program, network access control) (as a cloud computing service)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (CC=Blank or CC<>1)	
CC_PDB		g) Hosting the enterprise's database(s) (as a cloud computing service)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (CC=Blank or CC<>1)	
CC_PFIL		h) Storage of files (as a cloud computing service)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (CC=Blank or CC<>1)	
CC_PCPU		i) Computing power to run the enterprise's own software (as a cloud computing service)	
	1	Yes	

Variable name	Code	Description	Filter/Remarks (Standard codification)
	0	No	
	Blank	No answer	
	9	Not applicable (CC=Blank or CC<>1)	
CC_PDEV		j) Computing platform providing a hosted environment for application development, testing or deployment (e.g. reusable software modules, application programming interfaces (APIs)) (as a cloud computing service)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (CC=Blank or CC<>1)	
		Module E: Artificial Intelligence	
		E1: Does your enterprise use any of the following Artificial Intelligence (AI) technologies?	Enterprises where EMPIUSE > 0
AI_TTM		a) AI technologies performing analysis of written language (e.g. text mining)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
AI_TSR		b) AI Technologies converting spoken language into machine-readable format (speech recognition)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
AI_TNLG		c) AI Technologies generating written or spoken language (natural language generation, speech synthesis)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
AI_TIR		d) AI Technologies identifying objects or persons based on images or videos (image recognition, image processing)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
AI_TML		e) Machine learning (e.g. deep learning) for data analysis	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
AI_TPA		f) AI Technologies automating different workflows or assisting in decision making (e.g. AI based software robotic process automation)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
AI_TAR		g) AI Technologies enabling physical movement of machines via autonomous decisions based on observation of surroundings (autonomous robots, self-driving vehicles, autonomous drones)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
		E2: Does your enterprise use Artificial Intelligence software or systems for any of the following purposes?	Enterprises where AI_TTM=1 or AI_TSR=1 or AI_TNLG=1 or AI_TIR=1 or AI_TML=1 or AI_TPA=1 or AI_TAR=1
AI_PMS		a) Use of AI for marketing or sales	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable ((AI_TTM=Blank or AI_TTM<>1) and (AI_TSR=Blank or AI_TSR<>1) and (AI_TNLG=Blank or AI_TNLG<>1) and (AI_TIR=Blank or AI_TIR<>1) and (AI_TML=Blank or AI_TML<>1) and (AI_TPA=Blank or AI_TPA<>1) and (AI_TAR=Blank or AI_TAR<>1))	
AI_PPP		b) Use of AI for production or service processes	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable ((AI_TTM=Blank or AI_TTM<>1) and (AI_TSR=Blank or AI_TSR<>1) and (AI_TNLG=Blank or AI_TNLG<>1) and (AI_TIR=Blank or AI_TIR<>1) and (AI_TML=Blank or AI_TML<>1) and (AI_TPA=Blank or AI_TPA<>1) and (AI_TAR=Blank or AI_TAR<>1))	

Variable name	Code	Description	Filter/Remarks (Standard codification)
AI_PBAM		c) Use of AI for organisation of business administration processes or management	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable ((AI_TTM=Blank or AI_TTM<>1) and (AI_TSR=Blank or AI_TSR<>1) and (AI_TNLG=Blank or AI_TNLG<>1) and (AI_TIR=Blank or AI_TIR<>1) and (AI_TML=Blank or AI_TML<>1) and (AI_TPA=Blank or AI_TPA<>1) and (AI_TAR=Blank or AI_TAR<>1))	
AI_PLOG		d) Use of AI for logistics	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable ((AI_TTM=Blank or AI_TTM<>1) and (AI_TSR=Blank or AI_TSR<>1) and (AI_TNLG=Blank or AI_TNLG<>1) and (AI_TIR=Blank or AI_TIR<>1) and (AI_TML=Blank or AI_TML<>1) and (AI_TPA=Blank or AI_TPA<>1) and (AI_TAR=Blank or AI_TAR<>1))	
AI_PITS		e) Use of AI for ICT security	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable ((AI_TTM=Blank or AI_TTM<>1) and (AI_TSR=Blank or AI_TSR<>1) and (AI_TNLG=Blank or AI_TNLG<>1) and (AI_TIR=Blank or AI_TIR<>1) and (AI_TML=Blank or AI_TML<>1) and (AI_TPA=Blank or AI_TPA<>1) and (AI_TAR=Blank or AI_TAR<>1))	

Variable name	Code	Description	Filter/Remarks (Standard codification)
AI_PFIN		f) Use of AI for accounting, controlling or finance management	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable ((AI_TTM=Blank or AI_TTM<>1) and (AI_TSR=Blank or AI_TSR<>1) and (AI_TNLG=Blank or AI_TNLG<>1) and (AI_TIR=Blank or AI_TIR<>1) and (AI_TML=Blank or AI_TML<>1) and (AI_TPA=Blank or AI_TPA<>1) and (AI_TAR=Blank or AI_TAR<>1))	
AI_PRDI		g) Use of AI for research and development (R&D) or innovation activity (excluding research on AI)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable ((AI_TTM=Blank or AI_TTM<>1) and (AI_TSR=Blank or AI_TSR<>1) and (AI_TNLG=Blank or AI_TNLG<>1) and (AI_TIR=Blank or AI_TIR<>1) and (AI_TML=Blank or AI_TML<>1) and (AI_TPA=Blank or AI_TPA<>1) and (AI_TAR=Blank or AI_TAR<>1))	
(Optional)		**E3: How did your enterprise acquire the Artificial Intelligence software or systems that it uses?**	Enterprises where AI_TTM=1 or AI_TSR=1 or AI_TNLG=1 or AI_TIR=1 or AI_TML=1 or AI_TPA=1 or AI_TAR=1
AI_ADOWN		a) They were developed by own employees (including those employed in parent or affiliate enterprise)	
	1	Yes	
	0	No	
	Blank	No answer or option not included	

Variable name	Code	Description	Filter/Remarks (Standard codification)
	9	Not applicable ((AI_TTM=Blank or AI_TTM<>1) and (AI_TSR=Blank or AI_TSR<>1) and (AI_TNLG=Blank or AI_TNLG<>1) and (AI_TIR=Blank or AI_TIR<>1) and (AI_TML=Blank or AI_TML<>1) and (AI_TPA=Blank or AI_TPA<>1) and (AI_TAR=Blank or AI_TAR<>1))	
AI_AMOWN		b) Commercial software or systems were modified by own employees (including those employed in parent or affiliate enterprise)	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable ((AI_TTM=Blank or AI_TTM<>1) and (AI_TSR=Blank or AI_TSR<>1) and (AI_TNLG=Blank or AI_TNLG<>1) and (AI_TIR=Blank or AI_TIR<>1) and (AI_TML=Blank or AI_TML<>1) and (AI_TPA=Blank or AI_TPA<>1) and (AI_TAR=Blank or AI_TAR<>1))	
AI_AOS		c) Open-source software or systems were modified by own employees (including those employed in parent or affiliate enterprise)	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable ((AI_TTM=Blank or AI_TTM<>1) and (AI_TSR=Blank or AI_TSR<>1) and (AI_TNLG=Blank or AI_TNLG<>1) and (AI_TIR=Blank or AI_TIR<>1) and (AI_TML=Blank or AI_TML<>1) and (AI_TPA=Blank or AI_TPA<>1) and (AI_TAR=Blank or AI_TAR<>1))	
AI_ARDY		d) Commercial software or systems ready to use were purchased (including examples where it was already incorporated in a purchased item or system)	
	1	Yes	

Variable name	Code	Description	Filter/Remarks (Standard codification)
	0	No	
	Blank	No answer or option not included	
	9	Not applicable ((AI_TTM=Blank or AI_TTM<>1) and (AI_TSR=Blank or AI_TSR<>1) and (AI_TNLG=Blank or AI_TNLG<>1) and (AI_TIR=Blank or AI_TIR<>1) and (AI_TML=Blank or AI_TML<>1) and (AI_TPA=Blank or AI_TPA<>1) and (AI_TAR=Blank or AI_TAR<>1))	
AI_AEXT		e) External providers were contracted to develop or modify them	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable ((AI_TTM=Blank or AI_TTM<>1) and (AI_TSR=Blank or AI_TSR<>1) and (AI_TNLG=Blank or AI_TNLG<>1) and (AI_TIR=Blank or AI_TIR<>1) and (AI_TML=Blank or AI_TML<>1) and (AI_TPA=Blank or AI_TPA<>1) and (AI_TAR=Blank or AI_TAR<>1))	
AI_EC		**E4: Has your enterprise ever considered using any of the Artificial Intelligence technologies listed in question E1?**	Enterprises where (AI_TTM=Blank or AI_TTM=0) and (AI_TSR=Blank or AI_TSR=0) and (AI_TNLG=Blank or AI_TNLG=0) and (AI_TIR=Blank or AI_TIR=0) and (AI_TML=Blank or AI_TML=0) and (AI_TPA=Blank or AI_TPA=0) and (AI_TAR=Blank or AI_TAR=0)

Variable name	Code	Description	Filter/Remarks (Standard codification)
(Optional)	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (AI_TTM<>0 or AI_TSR<>0 or AI_TNLG<>0 or AI_TIR<>0 or AI_TML<>0 or AI_TPA<>0 or AI_TAR<>0)	
(Optional)		**E5: What are the reasons for your enterprise not to use any of the Artificial Intelligence technologies listed in question E1?**	Enterprises where AI_EC=1
AI_BCST		a) The costs seem too high	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (AI_EC=Blank or AI_EC<>1)	
AI_BLE		b) There is a lack of relevant expertise in the enterprise	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (AI_EC=Blank or AI_EC<>1)	
AI_BINC		c) Incompatibility with existing equipment, software or systems	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (AI_EC=Blank or AI_EC<>1)	
AI_BDDT		d) Difficulties with availability or quality of the necessary data	
	1	Yes	

Variable name	Code	Description	Filter/Remarks (Standard codification)
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (AI_EC=Blank or AI_EC<>1)	
AI_BCDP		e) Concerns regarding violation of data protection and privacy	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (AI_EC=Blank or AI_EC<>1)	
AI_BLEG		f) Lack of clarity about the legal consequences (e.g. liability in case of damage caused by the use of Artificial Intelligence)	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (AI_EC=Blank or AI_EC<>1)	
AI_BEC		g) Ethical considerations	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (AI_EC=Blank or AI_EC<>1)	
AI_BNU		h) Artificial Intelligence technologies are not useful for the enterprise	
	1	Yes	
	0	No	
	Blank	No answer or option not included	
	9	Not applicable (AI_EC=Blank or AI_EC<>1)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
		Module F: Invoicing	
		F1: In 2022, did your enterprise send any of the following types of invoices: ***Include also invoices sent via intermediaries, e.g. accountants, e-invoice service providers***	Enterprises where EMPIUSE > 0
INV4S_AP		a) Invoices in electronic form, in a standard structure **suitable for automated processing** (e-invoices)? (EDI (e.g. EDIFACT), XML (e.g. UBL) [please add national examples])	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
INV4S_EMP		b) Invoices in electronic form **not suitable for automated processing**? (e.g. emails, JPEG or other format)	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	
INV4S_PMP		c) Paper invoices?	
	1	Yes	
	0	No	
	Blank	No answer	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	

Variable name	Code	Description	Filter/Remarks (Standard codification)
(optional)		**F2: Concerning e-invoices: In 2022, out of all invoices your enterprise sent (in electronic or paper form) to private customers, other enterprises or public authorities, how many were e-invoices in a standard structure suitable for automated processing?**	Enterprises where INV4S_AP=1
INV4S_AP_P	1	a) Less than 10%	
	2	b) At least 10% but less than 25%	
	3	c) At least 25% but less than 50%	
	4	d) At least 50% but less than 75%	
	5	e) At least 75%	
	Blank	No answer	
	9	Not applicable (INV4S_AP=Blank or INV4S_AP<>1)	
		Alternative	
(optional)		**F2.bis Concerning e-invoices: In 2022, out of all invoices your enterprise sent (in electronic or paper form) to private customers, other enterprises or public authorities, what percentage were e-invoices in a standard structure suitable for automated processing?**	
		If this alternate question is used, then INV4S_AP_P needs to be reconstructed from the answer to the alternate question	
		Module X: Background Information	
		X1: Main economic activity of the enterprise, during 2022 (NACE Rev 2.0)	All enterprises
NACE2	xx.xx	NACE code of the enterprise, 4 digits	
		X2: Average number of employees and self-employed persons (persons employed), during 2022	All enterprises

Variable name	Code	Description	Filter/Remarks (Standard codification)
EMPL	Nnnnnn	Number of employed persons (use as many digits as necessary)	
		X3: Total turnover (in monetary terms, excluding VAT), for 2022	All enterprises
TOVT	Nnnnnn	Total turnover (use as many digits as necessary)	
		Y1: Enterprise ID	All enterprises
ENT_ID	XxNnnnnnn	Unique id of the enterprise (2 letters for country code, then 7 digits)	
		Y2: Enterprise Weight	All enterprises
ENT_WGHT	Nnnnnn.nnnnnn	Grossing up factor of the enterprise (6 digits, decimal point, 6 digits)	
DI3_INDEX	0-12	Derived value: Digital Intensity index, v3	
		Give one point for each of the following 12 conditions, if true:	
		EMPIUSE<>Blank and EMP<>Blank and EMPIUSE > 0.50 * EMP	
		AI_TTM=1 or AI_TSR=1 or AI_TNLG=1 or AI_TIR=1 or AI_TML=1 or AI_TPA=1 or AI_TAR=1	
		ISPDF1=2 or ISPDF1=3 or ISPDF1=4 or ISPDF1=5	
		DAOWN=1 or DAEXT=1	
		CC=1	
		CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1	
		(SM1_SNET=1 or SM1_BLOG=1 or SM1_CNTSHR=1)	
		ITERP1=1	
		CRM1=1	

Variable name	Code	Description	Filter/Remarks (Standard codification)
		(SM1_SNET+SM1_BLOG+SM1_CNTSHR between 2 and 3)	
		(AWSVAL<>Blank and AWSVAL>=TOVT*1%) or (AXSVAL<>Blank and AXSVAL>=TOVT*1%) or (AWSVAL<>Blank and AWSVAL<>-1 and AXSVAL<>Blank and AXSVAL<>-1 and (AWSVAL+AXSVAL)>=TOVT*1%)	
		TOVT<>Blank and AWSVAL<>Blank and AWSVALC<>Blank AND AWSVALC>0 AND (AWSVAL>0.01 * TOVT) and AWSVALC>0.1 * AWSVAL	
AI_CNT	0-7	Derived value: Artificial intelligence technologies counter Give one point for each of the following 7 conditions, if true:	
		AI_TTM=1	
		AI_TSR=1	
		AI_TNLG=1	
		AI_TIR=1	
		AI_TML=1	
		AI_TPA=1	
		AI_TAR=1	
	9	Not applicable (EMPIUSE = Blank or EMPIUSE = 0)	

3.2.2. Digital intensity index

The last variable of the table above is the digital intensity index (codified as DI3_INDEX). It measures the use of different digital technologies at enterprise level. The digital intensity index score of an enterprise is determined by how many of the selected digital technologies it uses and is between 0 and 12.

The index is used to calculate certain aggregates such as the number of enterprises that use ICT security measures according to their digital intensity index.

The table below provides guidance on how to calculate it.

DI3_INDEX	0-12	Derived value: Digital Intensity index	Description (references to MQ 2023 see section 3)
		Give one point for each of the following 12 conditions, if true:	
		EMPIUSE<>Blank and EMP<>Blank and EMPIUSE > 0.50 * EMP	Enterprises where more than 50% of the persons employed had access to the internet for business purposes
		AI_TTM=1 or AI_TSR=1 or AI_TNLG=1 or AI_TIR=1 or AI_TML=1 or AI_TPA=1 or AI_TAR=1	Use any AI technology
		ISPDF1=2 or ISPDF1=3 or ISPDF1=4 or ISPDF1=5	The maximum contracted download speed of the fastest fixed line internet connection is at least 30 Mb/s
		DAOWN=1 or DAEXT=1	Data analytics for the enterprise is performed by the enterprise's own employees or by an external provider
		CC=1	Buy CC services used over the internet
		CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1	Buy sophisticated or intermediate CC services
		(SM1_SNET=1 or SM1_BLOG=1 or SM1_CNTSHR=1)	Use any social media
		ITERP1=1	Have ERP software package to share information between different functional areas
		CRM1=1	Have CRM (2023)
		(SM1_SNET+SM1_BLOG+SM1_CNTSHR between 2 and 3)	Use two or more social media
		(AWSVAL<>Blank and AWSVAL>=TOVT*1%) or (AXSVAL<>Blank and AXSVAL>=TOVT*1%) or (AWSVAL<>Blank and AWSVAL<>-1 and AXSVAL<>Blank and AXSVAL<>-1 and (AWSVAL+AXSVAL)>=TOVT*1%)	Used any computer networks for sales (at least 1%)
		TOVT<>Blank and AWSVAL<>Blank and AWSVALC<>Blank AND AWSVALC>0 AND (AWSVAL>0.01 * TOVT) and AWSVALC>0.1 * AWSVAL	Enterprises where web sales are more than 1% of the total turnover and B2C web sales more than 10% of the web sales

3.2.3. Indicator coding and scope

Indicators have to be computed by NSIs using the microdata gathered. The indicators are aggregates of microdata. The table below presents, among other indicators (column Variable codes), their description and the questions of the model questionnaire they are derived from. The indicators' scope can be computed using the codification of microdata presented above in Section 3.2.1.

Some indicators computed by Eurostat are also presented in the table for information.

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
back	ENT_SAMPLE	Number of enterprises in final (net) sample - non-raised figures	Count (ENT_ID) unraised	FALSE	2022
back	ENT	Number of enterprises in population (surveyed size and industry groups corresponding to raised figures)	Count (ENT_ID)	FALSE	2022
back	EMPL	Average number of employed persons in population (surveyed size and industry groups corresponding to raised figures)	∑ (EMPL)	FALSE	2022
back	TOVT	Total turnover in population, in value terms, excluding VAT (surveyed size and industry groups corresponding to raised figures)	∑ (TOVT)	FALSE	2022
Derived from A1	E_IUSE	Enterprises where persons employed have access to the internet for business purposes	Count (ENT_ ID) where EMPIUSE<>Blank and EMPIUSE>0	FALSE	2022

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from A1	E_IUSE_GT10	Enterprises where more than 10% of the persons employed have access to the internet for business purposes	Count (ENT_ ID) where EMPIUSE<>Blank and EMPL<>Blank and EMPIUSE > 0.10 * EMPL	FALSE	2022
Derived from A1	E_IUSE_GT50	Enterprises where more than 50% of the persons employed have access to the internet for business purposes	Count (ENT_ ID) where EMPIUSE<>Blank and EMPL<>Blank and EMPIUSE > 0.50 * EMPL	FALSE	2022
Derived from A1	E_IUSE_GE10A	Enterprises where at least 10 persons employed have access to the internet for business purposes	Count (ENT_ ID) where EMPIUSE<>Blank and EMPIUSE >= 10	FALSE	2022
A2	E_FIXBB	Use any type of fixed connection to the internet	Count (ENT_ID) where FIXBB=1	FALSE	2022
A2	E_FIXBBX	Don't use any type of fixed connection to the internet	Count (ENT_ID) where FIXBB=0	FALSE	2022
A2	E_FIXBBZ	Don't know if they use any type of fixed connection to the internet	Count (ENT_ID) where FIXBB=Blank	TRUE	2022
A3a	E_ISPDF_LT30	The maximum contracted download speed of the fastest fixed internet connection is less than 30 Mb/s	Count (ENT_ID) where ISPDF1=1	FALSE	2022
A3b	E_ISPDF1_30_100	The maximum contracted download speed of the fastest fixed internet connection is at least 30 Mb/s but less than 100 Mb/s	Count (ENT_ID) where ISPDF1=2	FALSE	2022

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
A3c	E_ISPDF_100_500	The maximum contracted download speed of the fastest fixed internet connection is at least 100 Mb/s but less than 500 Mb/s	Count (ENT_ID) where ISPDF1=3	FALSE	2022
A3d	E_ISPDF_500_1G	The maximum contracted download speed of the fastest fixed internet connection is at least 500 Mb/s but less than 1 Gb/s	Count (ENT_ID) where ISPDF1=4	FALSE	2022
A3e	E_ISPDF_GE1G	The maximum contracted download speed of the fastest fixed internet connection is at least 1 Gb/s	Count (ENT_ID) where ISPDF1=5	FALSE	2022
Derived from A3b to A3e	E_ISPDF1_GE30	The maximum contracted download speed of the fastest fixed internet connection is at least 30 Mb/s	Count (ENT_ID) where ISPDF1=2 or ISPDF1=3 or ISPDF1=4 or ISPDF1=5	FALSE	2022
Derived from A3c to A3e	E_ISPDF1_GE100	The maximum contracted download speed of the fastest fixed internet connection is at least 100 Mb/s	Count (ENT_ID) where ISPDF1=3 or ISPDF1=4 or ISPDF1=5	FALSE	2022
A4	E_WEB	Have a website	Count (ENT_ID) where WEB=1	FALSE	2021
A4	E_WEBX	Don't have a website	Count (ENT_ID) where WEB=0	FALSE	2021
A4	E_WEBZ	Don't know if they have a website	Count (ENT_ID) where WEB=Blank	TRUE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
A5a	E_WEBACC	Website has description of goods or services, price information	Count (ENT_ID) where WEBACC=1	FALSE	2021
A5a	E_WEBACCX	Website has no description of goods or services, price information	Count (ENT_ID) where WEBACC=0	FALSE	2021
A5b	E_WEBORD	Website has online ordering, reservation or booking, e.g. shopping cart	Count (ENT_ID) where WEBORD=1	FALSE	2021
A5b	E_WEBORDX	Website has no online ordering, reservation or booking, e.g. shopping cart	Count (ENT_ID) where WEBORD=0	FALSE	2021
A5c	E_WEBCTM	Website has possibility for visitors to customise or design online goods or services	Count (ENT_ID) where WEBCTM=1	FALSE	2021
A5c	E_WEBCTMX	Website has no possibility for visitors to customise or design online goods or services	Count (ENT_ID) where WEBCTM=0	FALSE	2021
A5d	E_WEBOT	Website has tracking or status of orders placed	Count (ENT_ID) where WEBOT=1	FALSE	2021
A5d	E_WEBOTX	Website has no tracking or status of orders placed	Count (ENT_ID) where WEBOT=0	FALSE	2021
A5e	E_WEBPER	Website has personalised content in the website for regular/recurrent visitors	Count (ENT_ID) where WEBPER=1	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
A5e	E_WEBPERX	Website has no personalised content in the website for regular/recurrent visitors	Count (ENT_ID) where WEBPER=0	FALSE	2021
A5f	E_WEBCHT	Website has a chat service for customer support (a chatbot, virtual agent or a person replying to customers)	Count (ENT_ID) where WEBCHT=1	FALSE	NEW
A5f	E_WEBCHTX	Website has no chat service for customer support (a chatbot, virtual agent or a person replying to customers)	Count (ENT_ID) where WEBCHT=0	FALSE	NEW
A5g	E_WEBVAC	Website has advertisement of open job positions or online job applications	Count (ENT_ID) where WEBVAC=1	FALSE	2016
A5g	E_WEBVACX	Website has no advertisement of open job positions or online job applications	Count (ENT_ID) where WEBVAC=0	FALSE	2016
A5h	E_WEBLANG	Website has content available in at least two languages	Count (ENT_ID) where WEBLANG=1	FALSE	NEW
A5h	E_WEBLANGX	Website has no content available in at least two languages	Count (ENT_ID) where WEBLANG=0	FALSE	NEW
Derived from A5a, c, d, e	E_WEBF2	Website has at least one of : webacc, webctm, webot or webper	Count (ENT_ID) where WEBACC=1 or WEBOT=1 or WEBCTM=1 or WEBPER=1	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from A5a to A5e	E_WEBF3	Website has online ordering, reservation or booking, e.g. shopping cart and at least one of : webacc, webctm, webot or webper	Count (ENT_ID) where WEBORD=1 and (WEBACC=1 or WEBOT=1 or WEBCTM=1 or WEBPER=1)	FALSE	2021
Derived from A5a to A5h	E_WEB1_GE1	Website has at least one of: webacc, webord, webctm, webot, webper, webcht, webvac or weblang	Count (ENT_ID) where at least one of (WEBACC, WEBORD, WEBCTM, WEBOT, WEBPER, WEBCHT, WEBVAC, WEBLANG) are 1	FALSE	NEW derived variable
Derived from A5a to A5h	E_WEB1_GE2	Website has at least two of: webacc, webord, webctm, webot, webper, webcht, webvac or weblang	Count (ENT_ID) where at least two of (WEBACC, WEBORD, WEBCTM, WEBOT, WEBPER, WEBCHT, WEBVAC, WEBLANG) are 1	FALSE	NEW derived variable
Derived from A5a to A5h	E_WEB1_GE3	Website has at least three of: webacc, webord, webctm, webot, webper, webcht, webvac or weblang	Count (ENT_ID) where at least three of (WEBACC, WEBORD, WEBCTM, WEBOT, WEBPER, WEBCHT, WEBVAC, WEBLANG) are 1	FALSE	NEW derived variable
A6	E_MOBAPP	The enterprise has a mobile app for clients (e.g. for loyalty program, e-commerce, customer support)	Count (ENT_ID) where MOBAPP=1	FALSE	NEW
A6	E_MOBAPPX	The enterprise has not a mobile app for clients (e.g. for loyalty program, e-commerce, customer support)	Count (ENT_ID) where MOBAPP=0	FALSE	NEW

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from A4 and A6	E_WEB_MOBAPP	The enterprise has a website and a mobile app for clients	Count (ENT_ID) where WEB=1 and MOBAPP=1	FALSE	NEW derived variable
A7a	E_SM1_SNET	Use social networks (e.g. Facebook, LinkedIn, Xing, Viadeo, Yammer)	Count (ENT_ID) where SM1_SNET=1	FALSE	2021
A7a	E_SM1_SNETX	Don't use social networks (e.g. Facebook, LinkedIn, Xing, Viadeo, Yammer)	Count (ENT_ID) where SM1_SNET=0	FALSE	2021
A7b	E_SM1_BLOG	Use enterprise blog or microblogs (e.g. Twitter, Present.ly)	Count (ENT_ID) where SM1_ BLOG=1	FALSE	2021
A7b	E_SM1_BLOGX	Don't use enterprise blog or microblogs (e.g. Twitter, Present. ly)	Count (ENT_ID) where SM1_ BLOG=0	FALSE	2021
A7c	E_SM1_CNTSHR	Use multimedia content sharing websites (e.g. Instagram, YouTube, Flickr, SlideShare)	Count (ENT_ID) where SM1_ CNTSHR=1	FALSE	2021
A7c	E_SM1_CNTSHRX	Don't use multimedia content sharing websites (e.g. Instagram, YouTube, Flickr, SlideShare)	Count (ENT_ID) where SM1_ CNTSHR=0	FALSE	2021
Derived from A7a to A7c	E_SM1_ANY	Use any social media	Count (ENT_ID) where (SM1_ SNET=1 or SM1_BLOG=1 or SM1_CNTSHR=1)	FALSE	2021
Derived from A7a to A7c	E_SM1_1	Use only one type of social media	Count (ENT_ID) where (SM1_ SNET+SM1_ BLOG+SM1_ CNTSHR = 1)	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from A7a to A7c	E_SM1_2	Use two types of social media	Count (ENT_ID) where (SM1_ SNET+SM1_ BLOG+SM1_ CNTSHR = 2)	FALSE	NEW derived variable
Derived from A7a to A7c	E_SM1_GE2	Use two or more social media	Count (ENT_ID) where (SM1_ SNET+SM1_ BLOG+SM1_ CNTSHR) between 2 and 3	FALSE	2021
Derived from A7a to A7c	E_SM1_3	Use three types of social media	Count (ENT_ID) where (SM1_ SNET+SM1_ BLOG+SM1_ CNTSHR = 3)	FALSE	NEW derived variable
Derived from A4 and A7a to A7c	E_WEB_SM1_ ANY	Have a web site and use any social media	Count (ENT_ID) where WEB=1 and (SM1_SNET=1 or SM1_BLOG=1 or SM1_CNTSHR=1)	FALSE	2021
Derived from A4, A6 and A7	E_WEB_MA_ SM1_ANY	Have a web site, a mobile app and use any social media	Count (ENT_ID) where WEB=1 and MOBAPP=1 and (SM1_SNET=1 or SM1_BLOG=1 or SM1_CNTSHR=1)	FALSE	NEW derived variable
A8a	E_SM_PADVERT	Use social media to develop the enterprise's image or market products (e.g. advertising or launching products)	Count (ENT_ID) where SM_ PADVERT=1	TRUE	2019
A8a	E_SM_PADVERTX	Do not use social media to develop the enterprise's image or market products (e.g. advertising or launching products)	Count (ENT_ID) where SM_ PADVERT=0	TRUE	2019

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
A8b	E_SM_PCUQOR	Use social media to obtain or respond to customer opinions, reviews questions	Count (ENT_ID) where SM_ PCUQOR=1	TRUE	2019
A8b	E_SM_PCUQORX	Do not use social media to obtain or respond to customer opinions, reviews questions	Count (ENT_ID) where SM_ PCUQOR=0	TRUE	2019
A8c	E_SM_PCUDEV	Use social media to involve customers in development or innovation of goods or services	Count (ENT_ID) where SM_ PCUDEV=1	TRUE	2019
A8c	E_SM_PCUDEVX	Do not use social media to involve customers in development or innovation of goods or services	Count (ENT_ID) where SM_ PCUDEV=0	TRUE	2019
A8d	E_SM_PBPCOLL	Use social media to collaborate with business partners (e.g. suppliers, etc.) or other organisations (e.g. public authorities, non governmental organisations)	Count (ENT_ID) where SM_ PBPCOLL=1	TRUE	2019
A8d	E_SM_PBPCOLLX	Do not use social media to collaborate with business partners (e.g. suppliers, etc.) or other organisations (e.g. public authorities, non governmental organisations)	Count (ENT_ID) where SM_ PBPCOLL=0	TRUE	2019
A8e	E_SM_PRCR	Use social media to recruit employees	Count (ENT_ID) where SM_PRCR=1	TRUE	2019

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
A8e	E_SM_PRCRX	Do not use social media to recruit employees	Count (ENT_ID) where SM_PRCR=0	TRUE	2019
A8f	E_SM_PEXCHVOK	Use social media to exchange views, opinions or knowledge within the enterprise	Count (ENT_ID) where SM_ PEXCHVOK=1	TRUE	2019
A8f	E_SM_ PEXCHVOKX	Do not use social media to exchange views, opinions or knowledge within the enterprise	Count (ENT_ID) where SM_ PEXCHVOK=0	TRUE	2019
Derived from A8a to A8f	E_SM_PANY	Use social media for any purpose	Count (ENT_ID) where SM_ PADVERT=1 or SM_PCUQOR=1 or SM_PCUDEV=1 or SM_PBPCOLL=1 or SM_PRCR=1 or SM_PEXCHVOK=1	TRUE	2019
Derived from A8a to A8c	E_SM_PCU	Use social media with customers	Count (ENT_ID) where SM_ PADVERT=1 or SM_PCUQOR=1 or SM_PCUDEV=1	TRUE	2019
Derived from A8a to A8d	E_SM_PBPCU	Use social media with business partners and customers	Count (ENT_ID) where (SM_ PADVERT=1 or SM_ PCUQOR=1 or SM_ PCUDEV=1) and SM_PBPCOLL=1	TRUE	2019

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from A8a to A8d	E_SM_PBPNCU	Use social media with business partners, but not with customers	Count (ENT_ID) where (SM_ PADVERT=0 or SM_ PADVERT=Blank) and (SM_ PCUQOR=0 or SM_ PCUQOR=Blank) and (SM_ PCUDEV=0 or SM_ PCUDEV=Blank) and SM_PBPCOLL=1	TRUE	2019
Derived from A8a to A8f	E_SM_PCUQ_ PNDEV	Use social media only with customers (excluding development and innovation)	Count (ENT_ID) where (SM_ PADVERT=1 or SM_PCUQOR=1) and (SM_ PCUDEV=0 or SM_ PCUDEV=Blank) and (SM_ PBPCOLL=0 or SM_ PBPCOLL=Blank) and (SM_PRCR=0 or SM_PRCR=Blank) and (SM_ PEXCHVOK=0 or SM_ PEXCHVOK=Blank)	TRUE	2019
Derived from A8a to A8f	E_SM_ PEXCHVOKQ	Use social media only to exchange views, opinions or knowledge within the enterprise	Count (ENT_ID) where (SM_ PADVERT=0 or SM_ PADVERT=Blank) and (SM_ PCUQOR=0 or SM_ PCUQOR=Blank) and (SM_ PCUDEV=0 or SM_ PCUDEV=Blank) and (SM_ PBPCOLL=0 or SM_ PBPCOLL=Blank) and (SM_PRCR=0 or SM_PRCR=Blank) and SM_ PEXCHVOK=1	TRUE	2019

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
A9	E_ADS	Pay to advertise on the Internet	Count (ENT_ID) where ADS=1	TRUE	2018
A9	E_ADSX	Don't pay to advertise on the Internet	Count (ENT_ID) where ADS=0	TRUE	2018
Derived from A4 and A9	E_ADS_WEB	Have a Website and pay to advertise on the Internet	Count (ENT_ID) where WEB=1 and ADS=1	TRUE	2018
A10a	E_ADS_KW	Pay to advertise on the internet, based on content or keywords searched by internet users	Count (ENT_ID) where ADS_KW=1	TRUE	2018
A10a	E_ADS_KWX	Pay to advertise on the internet, but not based on content or keywords searched by internet users	Count (ENT_ID) where ADS_KW=0	TRUE	2018
A10b	E_ADS_TRK	Pay to advertise on the internet, based on the tracking of internet users' past activities or profile	Count (ENT_ID) where ADS_TRK=1	TRUE	2018
A10b	E_ADS_TRKX	Pay to advertise on the internet, but not based on the tracking of internet users' past activities or profile	Count (ENT_ID) where ADS_TRK=0	TRUE	2018
A10c	E_ADS_LOC	Pay to advertise on the internet, based on the geolocation of internet users	Count (ENT_ID) where ADS_LOC=1	TRUE	2018
A10c	E_ADS_LOCX	Pay to advertise on the internet, but not based on the geolocation of internet users	Count (ENT_ID) where ADS_LOC=0	TRUE	2018
A10d	E_ADS_OTH	Pay to advertise on the internet, based on any other method of target advertising	Count (ENT_ID) where ADS_OTH=1	TRUE	2018

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
A10d	E_ADS_OTHX	Pay to advertise on the internet, but not based on any other method of target advertising	Count (ENT_ID) where ADS_OTH=0	TRUE	2018
A10a to A10c	E_ADS3	Pay to advertise on the internet, based on content, keywords, internet users' past activities or profile or the geolocation	Count (ENT_ID) where ADS_KW=1 or ADS_TRK=1 or ADS_LOC=1	TRUE	2018
B1a	E_AWS_COWN	Enterprises which sold via their own websites or apps	Count (ENT_ID) where AWS_ COWN=1	FALSE	2022
B1a	E_AWS_COWNX	Enterprises which did not sell via their own websites or apps	Count (ENT_ID) where AWS_ COWN=0	FALSE	2022
B1b	E_AWS_CMP	Enterprises which sold via an e-commerce marketplace	Count (ENT_ID) where AWS_CMP=1	FALSE	2022
B1b	E_AWS_CMPX	Enterprises which did not sell via an e-commerce marketplace	Count (ENT_ID) where AWS_CMP=0	FALSE	2022
Derived from B1a and B1b	E_AWS_CBOTH	Enterprises which sold via their own websites or apps and via an e-commerce marketplace	Count (ENT_ID) where AWS_ COWN=1 and AWS_CMP=1	FALSE	2022
Derived from B1a and B1b	E_AWSELL	Have received orders via websites or apps (web sales)	Count (ENT_ID) where (AWS_ COWN=1 or AWS_ CMP=1)	FALSE	2022
Derived from B1a and B1b	E_AWSELLX	Have not received orders via websites or apps	Count (ENT_ID) where (AWS_ COWN=0 and AWS_CMP=0)	FALSE	2022

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
B2	E_AWSVALS	Sales via websites or apps, excluding VAT (<1% of turnover)	∑ (AWSVAL) where AWSVAL <> Blank and AWSVAL <> -1 and AWSVAL < TOVT * 1%	FALSE	2022
B2	E_AWSVALB	Sales via websites or apps, excluding VAT (>= 1% of turnover)	∑ (AWSVAL) where AWSVAL <> Blank and AWSVAL <> -1 and AWSVAL >= TOVT * 1%	FALSE	2022
B2	E_AWSVAL	Total sales via websites or apps, excluding VAT	∑ (AWSVAL) where AWSVAL <> Blank and AWSVAL <> -1	FALSE	2022
B2	E_WSEL0	Total sales via websites or apps equal to or above 0	Count (ENT_ID) where AWSVAL <> Blank and AWSVAL <> -1 and AWSVAL>=0	FALSE	2022
B2	E_WSEL1	Total sales via websites or apps equal to or above 1% of turnover	Count (ENT_ID) where AWSVAL <> Blank and AWSVAL <> -1 and AWSVAL>=TOVT * 1%	FALSE	2022
B2	E_WSEL2	Total sales via websites or apps equal to or above 2% of turnover	Count (ENT_ID) where AWSVAL <> Blank and AWSVAL <> -1 and AWSVAL>=TOVT * 2%	FALSE	2022
B2	E_WSEL5	Total sales via websites or apps equal to or above 5% of turnover	Count (ENT_ID) where AWSVAL <> Blank and AWSVAL <> -1 and AWSVAL>=TOVT * 5%	FALSE	2022

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
B2	E_WSEL10	Total sales via websites or apps equal to or above 10% of turnover	Count (ENT_ID) where AWSVAL <> Blank and AWSVAL <> -1 and AWSVAL>=TOVT * 10%	FALSE	2022
B2	E_WSEL25	Total sales via websites or apps equal to or above 25% of turnover	Count (ENT_ID) where AWSVAL <> Blank and AWSVAL <> -1 and AWSVAL>=TOVT * 25%	FALSE	2022
B2	E_WSEL50	Total sales via websites or apps equal to or above 50% of turnover	Count (ENT_ID) where AWSVAL <> Blank and AWSVAL <> -1 and AWSVAL>=TOVT * 50%	FALSE	2022
B2	E_WSELZ	Don't know the % of sales via websites or apps	Count (ENT_ID) where AWSVAL=Blank	TRUE	2022
B3a	E_AWSVAL_COWN	Sales via their own websites or apps	∑(AWSVAL_COWN) where AWSVAL_COWN <> Blank and AWSVAL_COWN <> -1	FALSE	2022
B3b	E_AWSVAL_CMP	Sales via an e-commerce marketplace	∑(AWSVAL_CMP) where AWSVAL_CMP <> Blank and AWSVAL_CMP <> -1	FALSE	2022
Derived from B1b, B2 and B3b	E_AWS_CMP_GE20	Enterprises which sold via an e-commerce marketplace for at least 20% of the web sales	Count (ENT_ID) where AWS_CMP=1 and (AWSVAL_CMP >= AWSVAL * 0.20)	FALSE	2022

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from B1b, B2 and B3b	E_AWS_CMP_GE50	Enterprises which sold via an e-commerce marketplace for at least 50% of the web sales	Count (ENT_ID) where AWS_CMP=1 and (AWSVAL_CMP >= AWSVAL * 0.50)	FALSE	2022
Derived from B1b, B2 and B3b	T_AWS_CMP_GE20	Turnover of the enterprises where web sales via an e-commerce marketplace were at least 20% of the web sales	∑ (TOVT) where AWS_CMP=1 and (AWSVAL_CMP >= AWSVAL * 0.20)	FALSE	2022
Derived from B1b, B2 and B3b	T_AWS_CMP_GE50	Turnover of the enterprises where web sales via an e-commerce marketplace were at least 50% of the web sales	∑ (TOVT) where AWS_CMP=1 and (AWSVAL_CMP >= AWSVAL * 0.50)	FALSE	2022
B4a	E_AWSVAL_B2C	Sales via websites or apps (B2C)	∑ (AWSVALC) where AWSVALC<>Blank and AWSVALC<>-1	FALSE	2022
B4b	E_AWSVAL_B2BG	Sales via websites or apps (B2B) and (B2G)	∑ (AWSVALBG) where AWSVALBG<>Blank and AWSVALBG<>-1	FALSE	2022
Derived from B4a	E_AWS_B2C	Enterprises which sold via websites or apps - B2C	Count (ENT_ID) where AWSVALC<>Blank and AWSVALC>0	FALSE	2022
Derived from B4b	E_AWS_B2BG	Enterprises which sold via websites or apps - B2B and B2G	Count (ENT_ID) where AWSVALBG<>Blank and AWSVALBG>0	FALSE	2022
Derived from B1b and B4a	E_AWS_B2C_CMP	Enterprises which sold via websites or apps - B2C and via an e-commerce marketplace	Count (ENT_ID) where (AWSVALC<>Blank and AWSVALC>0) and AWS_CMP=1	FALSE	2022

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from B2 and B4a	E_AWSVAL_B2C_GE10WS	Enterprises where B2C sales via websites or apps were 10% or more of the total web sales	Count (ENT_ID) where AWSVALC<>Blank AND AWSVALC>0 and AWSVAL<>Blank and AWSVAL<>-1 and AWSVALC>=0.1 * AWSVAL	FALSE	2022
Derived from B2 and B4a	E_AWSVAL_B2C_GE5WS	Enterprises where B2C sales via websites or apps were 5% or more of the total web sales	Count (ENT_ID) where AWSVALC<>Blank AND AWSVALC>0 and AWSVAL<>Blank and AWSVAL<>-1 and AWSVALC>=0.05 * AWSVAL	FALSE	2022
Derived from B2 and B4a	E_AWS_B2C_GT1WS	Enterprises where B2C sales via websites or apps were more than 1% of the total web sales	Count (ENT_ID) where AWSVALC<>Blank AND AWSVALC>0 and AWSVAL<>Blank and AWSVAL<>-1 and AWSVALC>0.01 * AWSVAL	FALSE	2022
Derived from B2 and B4a	E_AWSVAL_GT1_B2C_GT10WS	B2C web sales of enterprises where web sales > 1% of total turnover and B2C web sales > 10% of the web sales	∑ (AWSVALC) where TOVT<>Blank and AWSVAL<>Blank and AWSVALC<>Blank AND (AWSVAL>0.01 * TOVT) and AWSVALC>0.1 * AWSVAL	FALSE	2022

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from B2 and B4a	E_AWS_GT1_ B2C_GT10WS	Enterprises where web sales were more than 1% of the total turnover and B2C web sales more than 10% of the web sales	Count (ENT_ ID) where TOVT<>Blank and AWSVAL<>Blank and AWSVALC<>Blank AND AWSVALC>0 AND (AWSVAL>0.01 * TOVT) and AWSVALC>0.1 * AWSVAL	FALSE	2022
Derived from B2 and B4a	T_AWS_GT1_ B2C_GT10WS	Turnover of the enterprises where web sales were more than 1% of the total turnover and B2C web sales more than 10% of the web sales	∑ (TOVT) where TOVT<>Blank and AWSVAL<>Blank and AWSVALC<>Blank AND AWSVALC>0 AND (AWSVAL>0.01 * TOVT) and AWSVALC>0.1 * AWSVAL	FALSE	2022
Derived from B1b, B2 and B4a	E_AWSVAL_B2C_ GE10WS_CMP	Enterprises where B2C sales via websites or apps were 10% or more of the total web sales and which sold via an e-commerce marketplace	Count (ENT_ ID) where AWSVALC<>Blank AND AWSVALC>0 and AWSVAL<>Blank and AWSVAL<>-1 and AWSVALC>=0.1 * AWSVAL and AWS_CMP=1	FALSE	2022
B5	E_AXSELL	Have received orders via EDI-type messages	Count (ENT_ID) where AXSELL=1	FALSE	2022
B5	E_AXSELLX	Have not received orders via EDI-type messages	Count (ENT_ID) where AXSELL=0	FALSE	2022
B5	E_AXSELLZ	Do not know if have received orders via EDI-type messages	Count (ENT_ ID) where AXSELL=Blank	TRUE	2022

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from B1 and B5	E_AESELL	Have received orders via computer networks	Count (ENT_ID) where (AWS_ COWN=1 or AWS_CMP=1) or AXSELL=1	FALSE	2022
Derived from B2 and B5	E_WSEL1Q	Enterprises with web sales via websites or apps equal to or above 1% of turnover, and no orders received via EDI-type messages	Count (ENT_ID) where AWSVAL <> Blank and AWSVAL <> -1 and AWSVAL>=TOVT * 1% and (AXSELL=0 or AXSELL=Blank)	FALSE	2022
B6	E_AXSVALS	Total sales via EDI type messages, excluding VAT(<1% of turnover)	∑ (AXSVAL) where AXSVAL <> Blank and AXSVAL <> -1 and AXSVAL<TOVT * 1%	FALSE	2022
B6	E_AXSVALB	Total sales via EDI type messages, excluding VAT(>=1% of turnover)	∑ (AXSVAL) where AXSVAL <> Blank and AXSVAL <> -1 and AXSVAL>=TOVT * 1%	FALSE	2022
B6	E_AXSVAL	Total sales via EDI type messages, excluding VAT	∑ (AXSVAL]) where AXSVAL <> Blank and AXSVAL <> -1	FALSE	2022
B6	E_XSEL0	Enterprises with sales via EDI-type messages equal to or above 0	Count (ENT_ID) where AXSVAL <> Blank and AXSVAL <> -1 and AXSVAL>=0	FALSE	2022
B6	E_XSEL1	Enterprises with sales via EDI-type messages equal to or above 1% of turnover	Count (ENT_ID) where AXSVAL <> Blank and AXSVAL <> -1 and AXSVAL>=TOVT * 1%	FALSE	2022

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
B6	E_XSEL2	Enterprises with sales via EDI-type messages equal to or above 2% of turnover	Count (ENT_ID) where AXSVAL <> Blank and AXSVAL <> -1 and AXSVAL>=TOVT * 2%	FALSE	2022
B6	E_XSEL5	Enterprises with sales via EDI-type messages equal to or above 5% of turnover	Count (ENT_ID) where AXSVAL <> Blank and AXSVAL <> -1 and AXSVAL>=TOVT * 5%	FALSE	2022
B6	E_XSEL10	Enterprises with sales via EDI-type messages equal to or above 10% of turnover	Count (ENT_ID) where AXSVAL <> Blank and AXSVAL <> -1 and AXSVAL>=TOVT * 10%	FALSE	2022
B6	E_XSEL25	Enterprises with sales via EDI-type messages equal to or above 25% of turnover	Count (ENT_ID) where AXSVAL <> Blank and AXSVAL <> -1 and AXSVAL>=TOVT * 25%	FALSE	2022
B6	E_XSEL50	Enterprises with sales via EDI-type messages equal to or above 50% of turnover	Count (ENT_ID) where AXSVAL <> Blank and AXSVAL <> -1 and AXSVAL>=TOVT * 50%	FALSE	2022
B6	E_XSELZ	Don't know the % of sales via EDI-type messages	Count (ENT_ ID) where AXSVAL=Blank	TRUE	2022

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from B2 and B6	E_ESELL	Enterprises which used any computer networks for sales (at least 1%) – continuation with previous years	Count (ENT_ ID) where (AWSVAL<>Blank and AWSVAL>= TOVT*1%) or (AXSVAL<>Blank and AXSVAL>=TOVT*1%) or (AWSVAL<>Blank and AWSVAL<>-1 and AXSVAL<>Blank and AXSVAL<>-1 and (AWSVAL+AXSVAL) >=TOVT*1%)	FALSE	2022
Derived from B2 and B6	E_ETURN	Total electronic sales, excluding VAT	∑ (AWSVAL) where AWSVAL <> Blank and AWSVAL <> -1 + ∑ (AXSVAL) where AXSVAL <> Blank and AXSVAL <> -1	FALSE	2022
Derived from B2, B4a and B6	E_AWSVAL_B2C_ GE10EC	Enterprises where B2C sales via websites or apps were 10% or more of the e-commerce turnover	Count (ENT_ ID) where AWSVALC<>Blank AND AWSVALC>0 and AWSVAL<>Blank and AXSVAL<>Blank and ((AXSVAL = -1 and AWSVALC>=0.1 * AWSVAL) or (AXSVAL <> -1 and AWSVALC>=0.1 * (AWSVAL+AXSVAL)))	FALSE	2022
C1a	E_ERP1	Enterprises use Enterprise Resource Planning (ERP) software	Count (ENT_ID) where ITERP1=1	FALSE	2021
C1a	E_ERP1X	Enterprises don't use Enterprise Resource Planning (ERP) software	Count (ENT_ID) where ITERP1=0	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
C1b	E_CRM1	Enterprises use Customer Relationship Management (CRM) software	Count (ENT_ID) where CRM1=1	FALSE	NEW
C1b	E_CRM1X	Enterprises don't use Customer Relationship Management (CRM) software	Count (ENT_ID) where CRM1=0	FALSE	NEW
C1c	E_ITBI	Enterprises use Business Intelligence (BI) software	Count (ENT_ID) where ITBI=1	FALSE	NEW
C1c	E_ITBIX	Enterprises don't use Business Intelligence (BI) software	Count (ENT_ID) where ITBI=0	FALSE	NEW
Derived from C1a, C1b, C1c	E_BSANY	Enterprises use any business software	Count (ENT_ID) where ITERP1=1 or CRM1=1 or ITBI=1	FALSE	NEW derived variable
Derived from A7a to A7c and C1a	E_ERP1_SM1_ ANY	Enterprises use Enterprise Resource Planning (ERP) software and use any social media	Count (ENT_ID) where ITERP1=1 and (SM1_SNET=1 or SM1_BLOG=1 or SM1_CNTSHR=1)	FALSE	2021
C2	E_SISC	Enterprises share supply chain management information electronically with suppliers or customers	Count(ENT_ID) where SISC=1	FALSE	2017
C2	E_SISCX	Enterprises don't share supply chain management information electronically with suppliers or customers	Count(ENT_ID) where SISC=0	FALSE	2017

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from C1a, C1b and C2	E_SI1	Enterprises use ERP or CRM, or share supply chain management information electronically with suppliers or customers	Count(ENT_ID) where ITERP1=1 OR CRM1=1 OR SISC=1	FALSE	NEW derived variable
Derived from C1a, C1b, C1c and C2	E_ERP_CRM_BI_SISC	Enterprises use ERP or CRM or BI software, or share supply chain management information electronically with suppliers or customers	Count(ENT_ID) where ITERP1=1 OR CRM1=1 OR ITBI=1 OR SISC=1	FALSE	NEW derived variable
C3	E_DAOWN	Enterprises perform data analytics by own employees	Count(ENT_ID) where DAOWN=1	FALSE	NEW
C3	E_DAOWNX	Enterprises do not perform data analytics by own employees	Count(ENT_ID) where DAOWN=0	FALSE	NEW
C4a	E_DASERP	Perform data analytics on data from transaction records such as sale details, payments records	Count(ENT_ID) where DASERP=1	FALSE	NEW
C4a	E_DASERPX	Don't perform data analytics on data from transaction records such as sale details, payments records	Count(ENT_ID) where DASERP=0	FALSE	NEW

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
C4b	E_DASCRM	Perform data analytics on data about customers, e.g. purchasing information, location, preferences, customer reviews, searches	Count(ENT_ID) where DASCRM=1	FALSE	NEW
C4b	E_DASCRMX	Don't perform data analytics on data about customers, e.g. purchasing information, location, preferences, customer reviews, searches	Count(ENT_ID) where DASCRM=0	FALSE	NEW
C4c	E_DASSM	Perform data analytics on data from social media incl. from enterprises' own social media profiles	Count(ENT_ID) where DASSM=1	FALSE	NEW
C4c	E_DASSMX	Don't perform data analytics on data from social media incl. from enterprises' own social media profiles	Count(ENT_ID) where DASSM=0	FALSE	NEW
C4d	E_DASWEB	Perform data analytics on web data	Count(ENT_ID) where DASWEB=1	FALSE	NEW
C4d	E_DASWEBX	Don't perform data analytics on web data	Count(ENT_ID) where DASWEB=0	FALSE	NEW
C4e	E_DASLOC	Perform data analytics on location data from the use of portable devices or vehicles	Count(ENT_ID) where DASLOC=1	FALSE	NEW

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
C4e	E_DASLOCX	Don't perform data analytics on location data from the use of portable devices or vehicles	Count(ENT_ID) where DASLOC=0	FALSE	NEW
C4f	E_DASSDS	Perform data analytics on data from smart devices or sensors	Count(ENT_ID) where DASSDS=1	FALSE	NEW
C4f	E_DASSDSX	Don't perform data analytics on data from smart devices or sensors	Count(ENT_ID) where DASSDS=0	FALSE	NEW
C4g	E_DASGOV	Perform data analytics on government authorities' open data	Count(ENT_ID) where DASGOV=1	FALSE	NEW
C4g	E_DASGOVX	Don't perform data analytics on government authorities' open data	Count(ENT_ID) where DASGOV=0	FALSE	NEW
C4h	E_DASSAT	Perform data analytics on satellite data	Count(ENT_ID) where DASSAT=1	FALSE	NEW
C4h	E_DASSATX	Don't perform data analytics on satellite data	Count(ENT_ID) where DASSAT=0	FALSE	NEW
Derived from C4	E_DASANY	Enterprises perform data analytics on data from any source	Count(ENT_ID) where DASERP=1 or DASCRM=1 or DASSM=1 or DASWEB=1 or DASLOC=1 or DASSDS=1 or DASGOV=1 or DASSAT=1	FALSE	NEW derived variable

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from C4	E_DASGE3	Enterprises perform data analytics on data from at least three sources	Count(ENT_ID) where (DASERP+DASCRM+ DASSM+DASWEB+ DASLOC+DASSDS+ DASGOV+DASSAT) between 3 and 8	FALSE	NEW derived variable
Derived from C4 d), e), f), g), h)	E_DASANY2	Enterprises perform data analytics on data from any source among e_dasweb, e_dasloc, e_dassds, e_dasgov and e_ dassat	Count(ENT_ID) where DASWEB=1 or DASLOC=1 or DASSDS=1 or DASGOV=1 or DASSAT=1	FALSE	NEW derived variable
Derived from C4 and A9	E_DASANY_ADS	Enterprises perform data analytics on data from any source, and pay to advertise on the internet	Count(ENT_ID) where (DASERP=1 or DASCRM=1 or DASSM=1 or DASWEB=1 or DASLOC=1 or DASSDS=1 or DASGOV=1 or DASSAT=1) and ADS=1	TRUE	NEW derived variable
C5	E_DAEXT	External enterprise or organisation perform data analytics for the enterprise	Count(ENT_ID) where DAEXT=1	FALSE	NEW
C5	E_DAEXTX	No external enterprise or organisation perform data analytics for the enterprise	Count(ENT_ID) where DAEXT=0	FALSE	NEW
Derived from C3 and C5	E_DA	Data analytics for the enterprise is performed by the enterprise's own employees or by an external provider	Count(ENT_ID) where DAOWN=1 or DAEXT=1	FALSE	NEW derived variable

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
C6	E_DSELL	Enterprises sell (access to) any of its own data	Count(ENT_ID) where DSELL=1	TRUE	NEW
C6	E_DSELLX	Enterprises don't sell (access to) any of its own data	Count(ENT_ID) where DSELL=0	TRUE	NEW
Derived from C4f and C6	E_DASSDS_SELL	Perform data analytics on data from smart devices or sensors and sell (access to) its own data	Count(ENT_ID) where DASSDS=1 and DSELL=1	TRUE	NEW derived variable
Derived from C4e and C6	E_DASLOC_SELL	Perform data analytics on location data from the use of portable devices, and sell (access to) its own data	Count(ENT_ID) where DASLOC=1 and DSELL=1	TRUE	NEW derived variable
Derived from C4c and C6	E_DASSM_SELL	Perform data analytics on data from social media, and sell (access to) its own data	Count(ENT_ID) where DASSM=1 and DSELL=1	TRUE	NEW derived variable
Derived from C4d and C6	E_DASWEB_SELL	Perform data analytics on web data, and sell (access to) its own data	Count(ENT_ID) where DASWEB=1 and DSELL=1	TRUE	NEW derived variable
C7	E_DBUY	Enterprises purchased (access to) any data	Count(ENT_ID) where DBUY=1	TRUE	NEW
C7	E_DBUYX	Enterprises didn't purchase (access to) any data	Count(ENT_ID) where DBUY=0	TRUE	NEW
Derived from C4f and C7	E_DASSDS_BUY	Perform data analytics on data from smart devices or sensors, and purchased (access to) any data	Count(ENT_ID) where DASSDS=1 and DBUY=1	TRUE	NEW derived variable

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from C4e and C7	E_DASLOC_BUY	Perform data analytics on location data from the use of portable devices, and purchased (access to) any data	Count(ENT_ID) where DASLOC=1 and DBUY=1	TRUE	NEW derived variable
Derived from C4c and C7	E_DASSM_BUY	Perform data analytics on data from social media, and purchased (access to) any data	Count(ENT_ID) where DASSM=1 and DBUY=1	TRUE	NEW derived variable
Derived from C4d and C7	E_DASWEB_BUY	Perform data analytics on web data, and purchased (access to) any data	Count(ENT_ID) where DASWEB=1 and DBUY=1	TRUE	NEW derived variable
D1	E_CC	Buy cloud computing services (CC) used over the internet	Count(ENT_ID) where CC=1	FALSE	2021
D1	E_CCX	Don't buy cloud computing services (CC) used over the internet	Count(ENT_ID) where CC=0	FALSE	2021
Derived from D1 and C3, C5	E_CC_DA	Enterprises buy cloud computing services used over the internet and perform data analytics	Count(ENT_ID) where CC=1 and (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable
D2a	E_CC_PEM	Buy e-mail (as a CC service)	Count(ENT_ID) where CC_PEM=1	FALSE	2021
D2a	E_CC_PEMX	Don't buy e-mail (as a CC service)	Count(ENT_ID) where CC_PEM=0	FALSE	2021
D2b	E_CC_PSOFT	Buy office software (e.g. word processors, spreadsheets, etc.) (as a CC service)	Count(ENT_ID) where CC_PSOFT=1	FALSE	2021
D2b	E_CC_PSOFTX	Don't buy office software (e.g. word processors, spreadsheets, etc.) (as a CC service)	Count(ENT_ID) where CC_PSOFT=0	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
D2c	E_CC_PFACC	Buy finance or accounting software applications (as a CC service)	Count(ENT_ID) where CC_PFACC=1	FALSE	2021
D2c	E_CC_PFACCX	Don't buy finance or accounting software applications (as a CC service)	Count(ENT_ID) where CC_PFACC=0	FALSE	2021
D2d	E_CC_PERP	Buy ERP software applications (as a CC service)	Count(ENT_ID) where CC_PERP=1	FALSE	2021
D2d	E_CC_PERPX	Don't buy ERP software applications (as a CC service)	Count(ENT_ID) where CC_PERP=0	FALSE	2021
D2e	E_CC_PCRM	Buy Customer Relationship Management software (as a CC service)	Count(ENT_ID) where CC_PCRM=1	FALSE	2021
D2e	E_CC_PCRMX	Don't buy Customer Relationship Management software (as a CC service)	Count(ENT_ID) where CC_PCRM=0	FALSE	2021
D2f	E_CC_PSEC	Buy security software applications (as a CC service)	Count(ENT_ID) where CC_PSEC=1	FALSE	2021
D2f	E_CC_PSECX	Don't buy security software applications (as a CC service)	Count(ENT_ID) where CC_PSEC=0	FALSE	2021
D2g	E_CC_PDB	Buy hosting for the enterprise's database(s) (as a CC service)	Count(ENT_ID) where CC_PDB=1	FALSE	2021
D2g	E_CC_PDBX	Don't buy hosting for the enterprise's database(s) (as a CC service)	Count(ENT_ID) where CC_PDB=0	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
D2h	E_CC_PFIL	Buy storage of files (as a CC service)	Count(ENT_ID) where CC_PFIL=1	FALSE	2021
D2h	E_CC_PFILX	Don't buy storage of files (as a CC service)	Count(ENT_ID) where CC_PFIL=0	FALSE	2021
D2i	E_CC_PCPU	Buy computing power to run software used by the enterprise (as a CC service)	Count(ENT_ID) where CC_PCPU=1	FALSE	2021
D2i	E_CC_PCPUX	Don't buy computing power to run software used by the enterprise (as a CC service)	Count(ENT_ID) where CC_PCPU=0	FALSE	2021
D2j	E_CC_PDEV	Buy computing platform providing a hosted environment for application development, testing or deployment (as a CC service)	Count(ENT_ID) where CC_PDEV=1	FALSE	2021
D2j	E_CC_PDEVX	Don't buy computing platform providing a hosted environment for application development, testing or deployment (as a CC service)	Count(ENT_ID) where CC_PDEV=0	FALSE	2021
Derived from D2g and D2h	E_CC_PDBFIL	Buy hosting for the enterprise's database(s) or storage of files	Count(ENT_ID) where CC_PDB=1 or CC_PFIL=1	FALSE	2021
Derived from D2g, D2h and D2i	E_CC_PHW	Buy hosting for the enterprise's database(s) or storage of files or computing power	Count(ENT_ID) where CC_PDB=1 or CC_PFIL=1 or CC_PCPU=1	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from D2a to D2j	E_CC1_PANY	Buy at least one of the listed CC services	Count(ENT_ID) where CC_PEM=1 or CC_PSOFT=1 or CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PFIL=1 or CC_PCPU=1 or CC_PDEV=1	FALSE	2021
Derived from D2a to D2j	E_CC1_PNONE	Don't buy any of the listed CC services	Count(ENT_ID) where CC_PEM=0 and CC_PSOFT=0 and CC_PFACC=0 and CC_PERP=0 and CC_PCRM=0 and CC_PSEC=0 and CC_PDB=0 and CC_PFIL=0 and CC_PCPU=0 and CC_PDEV=0	FALSE	2021
Derived from D2j	E_CC1_PS	Buy platform CC service	Count(ENT_ID) where CC_PDEV=1	FALSE	2021
Derived from D2a to D2j	E_CC1_B	Buy basic CC services	Count(ENT_ID) where (CC_PEM=1 or CC_PSOFT=1 or CC_PFIL=1 or CC_PCPU=1) and CC_PFACC=0 and CC_PERP=0 and CC_PCRM=0 and CC_PSEC=0 and CC_PDB=0 and CC_PDEV=0	FALSE	2021
Derived from D2c, d, e, f, g, j	E_CC1_I	Buy intermediate CC services	Count(ENT_ID) where (CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1) and CC_PSEC=0 and CC_PDB=0 and CC_PDEV=0	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from D2f, g, j	E_CC1_S	Buy sophisticated CC services	Count(ENT_ID) where CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1	FALSE	2021
Derived from D2a to D2j	E_CC1_BI	Buy basic or intermediate CC services	Count(ENT_ID) where (CC_PEM=1 or CC_PSOFT=1 or CC_PFIL=1 or CC_PCPU=1 or CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1) and CC_PSEC=0 and CC_PDB=0 and CC_PDEV=0	FALSE	2021
Derived from D2c, d, e, f, g, j	E_CC1_SI	Buy sophisticated or intermediate CC services	Count(ENT_ID) where CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1	FALSE	2021
Derived from D2a, b, c, d, e, f	E_CC1_SS_GE1	Buy at least 1 CC software service	Count(ENT_ID) where CC_PEM=1 or CC_PSOFT=1 or CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1	FALSE	2021
Derived from D2a, b, c, d, e, f	E_CC1_SS_GE2	Buy at least 2 CC software services	Count(ENT_ID) where at least two of (CC_PEM, CC_PSOFT, CC_PFACC, CC_PERP, CC_PCRM, CC_PSEC) are 1	FALSE	2021
Derived from D2a, b, c, d, e, f	E_CC1_SS_GE3	Buy at least 3 CC software services	Count(ENT_ID) where at least three of (CC_PEM, CC_PSOFT, CC_PFACC, CC_PERP, CC_PCRM, CC_PSEC) are 1	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from D2a, b, c, d, e, f	E_CC1_SS_6	Buy all 6 CC software services	Count(ENT_ID) where CC_PEM=1 and CC_PSOFT=1 and CC_PFACC=1 and CC_PERP=1 and CC_PCRM=1 and CC_PSEC=1	FALSE	2021
Derived from D2g, h, i	E_CC1_IS_GE1	Buy at least 1 CC infrastructure service	Count(ENT_ID) where CC_PDB=1 or CC_PFIL=1 or CC_PCPU=1	FALSE	2021
Derived from D2g, h, i	E_CC1_IS_GE2	Buy at least 2 CC infrastructure services	Count(ENT_ID) where at least two of (CC_PDB, CC_PFIL, CC_PCPU) are 1	FALSE	2021
Derived from D2g, h, i	E_CC1_IS_3	Buy all 3 CC infrastructure service	Count(ENT_ID) where CC_PDB=1 and CC_PFIL=1 and CC_PCPU=1	FALSE	2021
Derived from D2a to D2j	E_CC1_SS1IS1PS	Buy 1 CC software service, 1 CC infrastructure service and platform CC service	Count(ENT_ID) where (one of (CC_PEM, CC_PSOFT, CC_PFACC, CC_PERP, CC_PCRM, CC_PSEC) is 1) and (one of (CC_PDB, CC_PFIL, CC_PCPU) is 1) and CC_PDEV=1	FALSE	2021
Derived from D2a to D2i	E_CC1_SS1IS1	Buy 1 CC software service and 1 CC infrastructure service	Count(ENT_ID) where (one of (CC_PEM, CC_PSOFT, CC_PFACC, CC_PERP, CC_PCRM, CC_PSEC) is 1) and (one of (CC_PDB, CC_PFIL, CC_PCPU) is 1)	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from D2a to D2f and D2j	E_CC1_SS1PS	Buy 1 CC software service and platform CC service	Count(ENT_ID) where (one of (CC_PEM, CC_PSOFT, CC_PFACC, CC_PERP, CC_PCRM, CC_PSEC) is 1) and CC_PDEV=1	FALSE	2021
Derived from D2g to D2j	E_CC1_IS1PS	Buy 1 CC infrastructure service and platform CC service	Count(ENT_ID) where (one of (CC_PDB, CC_PFIL, CC_PCPU) is 1) and CC_PDEV=1	FALSE	2021
Derived from D2a to D2i	E_CC1_SS2IS1	Buy 2 CC software services and 1 CC infrastructure service	Count(ENT_ID) where (two of (CC_PEM, CC_PSOFT, CC_PFACC, CC_PERP, CC_PCRM, CC_PSEC) are 1) and (one of (CC_PDB, CC_PFIL, CC_PCPU) is 1)	FALSE	2021
Derived from D2a to D2i	E_CC1_SS2IS2	Buy 2 CC software services and 2 CC infrastructure services	Count(ENT_ID) where (two of (CC_PEM, CC_PSOFT, CC_PFACC, CC_PERP, CC_PCRM, CC_PSEC) are 1) and (two of (CC_PDB, CC_PFIL, CC_PCPU) are 1)	FALSE	2021
Derived from D2a to D2i	E_CC1_SS3IS1	Buy 3 CC software services and 1 CC infrastructure service	Count(ENT_ID) where (three of (CC_PEM, CC_PSOFT, CC_PFACC, CC_PERP, CC_PCRM, CC_PSEC) are 1) and (one of (CC_PDB, CC_PFIL, CC_PCPU) is 1)	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from D2a to D2i	E_CC1_SS3IS2	Buy 3 CC software services and 2 CC infrastructure services	Count(ENT_ID) where (three of (CC_PEM, CC_PSOFT, CC_PFACC, CC_PERP, CC_PCRM, CC_PSEC) are 1) and (two of (CC_PDB, CC_PFIL, CC_PCPU) are 1)	FALSE	2021
Derived from D2a to D2i	E_CC1_SS3IS3	Buy 3 CC software services and all 3 CC infrastructure services	Count(ENT_ID) where (three of (CC_PEM, CC_PSOFT, CC_PFACC, CC_PERP, CC_PCRM, CC_PSEC) are 1) and CC_PDB=1 and CC_PFIL=1 and CC_PCPU=1	FALSE	2021
Derived from D2a to D2i	E_CC1_SS6IS3	Buy all 6 CC software services and all 3 CC infrastructure services	Count(ENT_ID) where CC_PEM=1 and CC_PSOFT=1 and CC_PFACC=1 and CC_PERP=1 and CC_PCRM=1 and CC_PSEC=1 and CC_PDB=1 and CC_PFIL=1 and CC_PCPU=1	FALSE	2021
Derived from D2a to D2j	E_CC1_SS6IS3PS	Buy all 6 CC software services and all 3 CC infrastructure services and platform CC service	Count(ENT_ID) where CC_PEM=1 and CC_PSOFT=1 and CC_PFACC=1 and CC_PERP=1 and CC_PCRM=1 and CC_PSEC=1 and CC_PDB=1 and CC_PFIL=1 and CC_PCPU=1 and CC_PDEV=1	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
E1a	E_AI_TTM	Enterprises use AI technologies performing analysis of written language	Count(ENT_ID) where AI_TTM=1	FALSE	2021
E1a	E_AI_TTMX	Enterprises do not use AI technologies performing analysis of written language	Count(ENT_ID) where AI_TTM=0	FALSE	2021
E1b	E_AI_TSR	Enterprises use AI technologies converting spoken language into machine-readable format	Count(ENT_ID) where AI_TSR=1	FALSE	2021
E1b	E_AI_TSRX	Enterprises do not use AI technologies converting spoken language into machine-readable format	Count(ENT_ID) where AI_TSR=0	FALSE	2021
E1c	E_AI_TNLG	Enterprises use AI technologies generating written or spoken language	Count(ENT_ID) where AI_TNLG=1	FALSE	2021
E1c	E_AI_TNLGX	Enterprises do not use AI technologies generating written or spoken language	Count(ENT_ID) where AI_TNLG=0	FALSE	2021
E1d	E_AI_TIR	Enterprises use AI technologies identifying objects or persons based on images	Count(ENT_ID) where AI_TIR=1	FALSE	2021
E1d	E_AI_TIRX	Enterprises do not use AI technologies identifying objects or persons based on images	Count(ENT_ID) where AI_TIR=0	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
E1e	E_AI_TML	Enterprises use machine learning (e.g. deep learning) for data analysis	Count(ENT_ID) where AI_TML=1	FALSE	2021
E1e	E_AI_TMLX	Enterprises do not use machine learning (e.g. deep learning) for data analysis	Count(ENT_ID) where AI_TML=0	FALSE	2021
E1f	E_AI_TPA	Enterprises use AI technologies automating different workflows or assisting in decision making	Count(ENT_ID) where AI_TPA=1	FALSE	2021
E1f	E_AI_TPAX	Enterprises do not use AI technologies automating different workflows or assisting in decision making	Count(ENT_ID) where AI_TPA=0	FALSE	2021
E1g	E_AI_TAR	Enterprises use AI technologies enabling physical movement of machines via autonomous decisions based on observation of surroundings	Count(ENT_ID) where AI_TAR=1	FALSE	2021
E1g	E_AI_TARX	Enterprises do not use AI technologies enabling physical movement of machines via autonomous decisions based on observation of surroundings	Count(ENT_ID) where AI_TAR=0	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from E1	E_AI_TANY	Enterprises use at least 1 of the listed artificial intelligence technologies: (AI_TTM, AI_TSR, AI_TNLG, AI_TIR, AI_TML, AI_TPA, AI_TAR)	Count (ENT_ID) where (AI_TTM+AI_TSR+AI_TNLG+AI_TIR+AI_TML+AI_TPA+AI_TAR) between 1 and 7	FALSE	2021
Derived from E1	E_AI_TX	Enterprises doesn't use artificial intelligence technologies.	Count (ENT_ID) where AI_TTM=0 and AI_TSR=0 and AI_TNLG=0 and AI_TIR=0 and AI_TML=0 and AI_TPA=0 and AI_TAR=0	FALSE	2021
Derived from E1	E_AI_TGE2	Enterprises use at least 2 of the listed artificial intelligence technologies: (AI_TTM, AI_TSR, AI_TNLG, AI_TIR, AI_TML, AI_TPA, AI_TAR)	Count (ENT_ID) where (AI_TTM+AI_TSR+AI_TNLG+AI_TIR+AI_TML+AI_TPA+AI_TAR) between 2 and 7	FALSE	2021
Derived from E1	E_AI_TGE3	Enterprises use at least 3 of the listed artificial intelligence technologies: (AI_TTM, AI_TSR, AI_TNLG, AI_TIR, AI_TML, AI_TPA, AI_TAR)	Count (ENT_ID) where (AI_TTM+AI_TSR+AI_TNLG+AI_TIR+AI_TML+AI_TPA+AI_TAR) between 3 and 7	FALSE	2021
Derived from E1 and C3, C5	E_AI_DA	Enterprises use at least 1 of the listed artificial intelligence technologies and perform data analytics	Count (ENT_ID) where ((AI_TTM+AI_TSR+AI_TNLG+AI_TIR+AI_TML+AI_TPA+AI_TAR) between 1 and 7) and (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from E1 and D1	E_AI_CC	Enterprises use at least 1 of the listed artificial intelligence technologies and buy any cloud computing services used over the internet	Count (ENT_ ID) where ((AI_TTM+AI_ TSR+AI_TNLG+AI_ TIR+AI_TML+AI_ TPA+AI_TAR) between 1 and 7) and CC=1	FALSE	NEW derived variable
Derived from C4, D2c), d), e), f), g), j) and E1	E_AI_CC1SI_ DASANY	Enterprises use AI technologies or buy sophisticated or intermediate cloud computing services or perform data analytics on data from any source	Count(ENT_ID) where (AI_CNT between 1 and 7) or (CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1) or (DASERP=1 or DASCRM=1 or DASSM=1 or DASWEB=1 or DASLOC=1 or DASSDS=1 or DASGOV=1 or DASSAT=1)	FALSE	NEW derived variable
Derived from C4, D2c), d), e), f), g), j) and E1	E_AI_CC1SI_ DASGE3	Enterprises use AI technologies or buy sophisticated or intermediate cloud computing services or perform data analytics on data from at least three sources	Count(ENT_ID) where (AI_CNT between 1 and 7) or (CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1) or ((DASERP+DASCRM+ DASSM+DASWEB+ DASLOC+DASSDS+ DASGOV+DASSAT) between 3 and 8)	FALSE	NEW derived variable

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from C4 d), e), f), g), h); D2c), d), e), f), g), j) and E1	E_AI_CC1SI_ DASANY2	Enterprises use AI technologies or buy sophisticated or intermediate cloud computing services or perform data analytics on data from any source among e_dasweb, e_dasloc, e_dassds, e_dasgov and e_ dassat	Count(ENT_ID) where (AI_CNT between 1 and 7) or (CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1) or (DASWEB=1 or DASLOC=1 or DASSDS=1 or DASGOV=1 or DASSAT=1)	FALSE	NEW derived variable
Derived from C3, C5, D2c), d), e), f), g), j) and E1	E_AI_CC1SI_DA_ ANY	Enterprises use AI technologies, or buy sophisticated or intermediate cloud computing services, or perform data analytics	Count(ENT_ID) where (AI_CNT between 1 and 7) or (CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1) or (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable
Derived from C3, C5, D2c), d), e), f), g), j) and E1	E_AI_CC1SI_DA	Enterprises use AI technologies, and buy sophisticated or intermediate cloud computing services, and perform data analytics	Count(ENT_ID) where (AI_CNT between 1 and 7) and (CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1) and (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from C3, C5, D2c), d), e), f), g), j) and E1	E_AIX_CC1SI_DA	Enterprises buy sophisticated or intermediate cloud computing services and perform data analytics, but don't use AI technologies	Count(ENT_ID) where AI_CNT=0 and (CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1) and (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable
Derived from C3, C5, D2c), d), e), f), g), j) and E1	E_AI_CC1SIX_DA	Enterprises use AI technologies and perform data analytics, but don't buy sophisticated or intermediate cloud computing services	Count(ENT_ID) where (AI_CNT between 1 and 7) and not (CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1) and (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable
Derived from C3, C5, D2c), d), e), f), g), j) and E1	E_AI_CC1SI_DAX	Enterprises use AI technologies and buy sophisticated or intermediate cloud computing services, but don't perform data analytics	Count(ENT_ID) where (AI_CNT between 1 and 7) and (CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1) and not (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived from C3, C5, D2c), d), e), f), g), j) and E1	E_AIX_CC1SIX_DA	Enterprises perform data analytics, but don't use AI technologies and don't buy sophisticated or intermediate cloud computing services	Count(ENT_ID) where AI_CNT=0 and not (CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1) and (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable
Derived from C3, C5, D2c), d), e), f), g), j) and E1	E_AIX_CC1SI_DAX	Enterprises buy sophisticated or intermediate cloud computing services, but don't use AI technologies, and don't perform data analytics	Count(ENT_ID) where AI_CNT=0 and (CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1) and not (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable
Derived from C3, C5, D2c), d), e), f), g), j) and E1	E_AI_CC1SIX_DAX	Enterprises use AI technologies, but don't buy sophisticated or intermediate cloud computing services and don't perform data analytics	Count(ENT_ID) where (AI_CNT between 1 and 7) and not (CC_PFACC=1 or CC_PERP=1 or CC_PCRM=1 or CC_PSEC=1 or CC_PDB=1 or CC_PDEV=1) and not (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable
E2a	E_AI_PMS	Enterprises use AI technologies for marketing or sales	Count(ENT_ID) where AI_PMS=1	FALSE	2021
E2a	E_AI_PMSX	Enterprises do not use AI technologies for marketing or sales	Count(ENT_ID) where AI_PMS=0	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
E2b	E_AI_PPP	Enterprises use AI technologies for production or service processes	Count(ENT_ID) where AI_PPP=1	FALSE	2021
E2b	E_AI_PPPX	Enterprises do not use AI technologies for production or service processes	Count(ENT_ID) where AI_PPP=0	FALSE	2021
E2c	E_AI_PBAM	Enterprises use AI technologies for organisation of business administration processes or management	Count(ENT_ID) where AI_PBAM=1	FALSE	NEW
E2c	E_AI_PBAMX	Enterprises do not use AI technologies for organisation of business administration processes or management	Count(ENT_ID) where AI_PBAM=0	FALSE	NEW
E2d	E_AI_PLOG	Enterprises use AI technologies for logistics	Count(ENT_ID) where AI_PLOG=1	FALSE	2021
E2d	E_AI_PLOGX	Enterprises do not use AI technologies for logistics	Count(ENT_ID) where AI_PLOG=0	FALSE	2021
E2e	E_AI_PITS	Enterprises use AI technologies for ICT security	Count(ENT_ID) where AI_PITS=1	FALSE	2021
E2e	E_AI_PITSX	Enterprises do not use AI technologies for ICT security	Count(ENT_ID) where AI_PITS=0	FALSE	2021
E2f	E_AI_PFIN	Enterprises use AI technologies for accounting, controlling or finance management	Count(ENT_ID) where AI_PFIN=1	FALSE	NEW

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
E2f	E_AI_PFINX	Enterprises do not use AI technologies for accounting, controlling or finance management	Count(ENT_ID) where AI_PFIN=0	FALSE	NEW
E2g	E_AI_PRDI	Enterprises use AI technologies for research and development (R&D) or innovation activity	Count(ENT_ID) where AI_PRDI=1	FALSE	NEW
E2g	E_AI_PRDIX	Enterprises do not use AI technologies for research and development (R&D) or innovation activity	Count(ENT_ID) where AI_PRDI=0	FALSE	NEW
Derived from E2	E_AI_P1ANY	Enterprises use artificial intelligence for at least 1 of the listed purposes: (AI_PMS, AI_PPP, AI_PBAM, AI_PLOG, AI_PITS, AI_PFIN, AI_PRDI)	Count (ENT_ID) where (AI_PMS+AI_PPP+AI_PBAM+AI_PLOG+AI_PITS+AI_PFIN+AI_PRDI) between 1 and 7	FALSE	NEW derived variable
Derived from E2	E_AI_P1GE2	Enterprises use artificial intelligence for at least 2 of the listed purposes: (AI_PMS, AI_PPP, AI_PBAM, AI_PLOG, AI_PITS, AI_PFIN, AI_PRDI)	Count (ENT_ID) where (AI_PMS+AI_PPP+AI_PBAM+AI_PLOG+AI_PITS+AI_PFIN+AI_PRDI) between 2 and 7	FALSE	NEW derived variable
Derived from E2	E_AI_P1GE3	Enterprises use artificial intelligence for at least 3 of the listed purposes: (AI_PMS, AI_PPP, AI_PBAM, AI_PLOG, AI_PITS, AI_PFIN, AI_PRDI)	Count (ENT_ID) where (AI_PMS+AI_PPP+AI_PBAM+AI_PLOG+AI_PITS+AI_PFIN+AI_PRDI) between 3 and 7	FALSE	NEW derived variable

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
E3a	E_AI_ADOWN	The enterprises' AI technologies were developed by own employees	Count(ENT_ID) where AI_ ADOWN=1	TRUE	2021
E3a	E_AI_ADOWNX	The enterprises' AI technologies were not developed by own employees	Count(ENT_ID) where AI_ ADOWN=0	TRUE	2021
E3b	E_AI_AMOWN	The enterprises' AI technologies were commercial software or systems modified by own employees	Count(ENT_ID) where AI_ AMOWN=1	TRUE	2021
E3b	E_AI_AMOWNX	The enterprises' AI technologies were not commercial software or systems modified by own employees	Count(ENT_ID) where AI_ AMOWN=0	TRUE	2021
E3c	E_AI_AOS	The enterprises' AI technologies were open-source software or systems modified by own employees	Count(ENT_ID) where AI_AOS=1	TRUE	2021
E3c	E_AI_AOSX	The enterprises' AI technologies were not open-source software or systems modified by own employees	Count(ENT_ID) where AI_AOS=0	TRUE	2021
E3d	E_AI_ARDY	The enterprises' AI technologies were purchased commercial software or systems ready to use	Count(ENT_ID) where AI_ARDY=1	TRUE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
E3d	E_AI_ARDYX	The enterprises' AI technologies were not purchased commercial software or systems ready to use	Count(ENT_ID) where AI_ARDY=0	TRUE	2021
E3e	E_AI_AEXT	The enterprises' AI technologies were developed or modified them by external providers	Count(ENT_ID) where AI_AEXT=1	TRUE	2021
E3e	E_AI_AEXTX	The enterprises' AI technologies were not developed or modified them by external providers	Count(ENT_ID) where AI_AEXT=0	TRUE	2021
E4	E_AI_EC	Enterprises have ever considered to use AI technologies	Count(ENT_ID) where AI_EC=1	TRUE	2021
E4	E_AI_ECX	Enterprises have never considered to use AI technologies	Count(ENT_ID) where AI_EC=0	TRUE	2021
E5a	E_AI_BCST	Enterprises do not use AI technologies, because the costs seem too high	Count(ENT_ID) where AI_BCST=1	TRUE	2021
E5a	E_AI_BCSTX	Enterprises do not use AI technologies, but not because the costs seem too high	Count(ENT_ID) where AI_BCST=0	TRUE	2021
E5b	E_AI_BLE	Enterprises do not use AI technologies, because of a lack of relevant expertise	Count(ENT_ID) where AI_BLE=1	TRUE	2021
E5b	E_AI_BLEX	Enterprises do not use AI technologies, but not because of a lack of relevant expertise	Count(ENT_ID) where AI_BLE=0	TRUE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
E5c	E_AI_BINC	Enterprises do not use AI technologies, because of incompatibility with existing equipment, software or systems	Count(ENT_ID) where AI_BINC=1	TRUE	2021
E5c	E_AI_BINCX	Enterprises do not use AI technologies, but not because of incompatibility with existing equipment, software or systems	Count(ENT_ID) where AI_BINC=0	TRUE	2021
E5d	E_AI_BDDT	Enterprises do not use AI technologies, because of difficulties with availability or quality of the necessary data	Count(ENT_ID) where AI_BDDT=1	TRUE	2021
E5d	E_AI_BDDTX	Enterprises do not use AI technologies, but not because of difficulties with availability or quality of the necessary data	Count(ENT_ID) where AI_BDDT=0	TRUE	2021
E5e	E_AI_BCDP	Enterprises do not use AI technologies, because od concerns regarding violation of data protection and privacy	Count(ENT_ID) where AI_BCDP=1	TRUE	2021
E5e	E_AI_BCDPX	Enterprises do not use AI technologies, but not because od concerns regarding violation of data protection and privacy	Count(ENT_ID) where AI_BCDP=0	TRUE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
E5f	E_AI_BLEG	Enterprises do not use AI technologies, because of a lack of clarity about the legal consequences	Count(ENT_ID) where AI_BLEG=1	TRUE	2021
E5f	E_AI_BLEGX	Enterprises do not use AI technologies, but not because of a lack of clarity about the legal consequences	Count(ENT_ID) where AI_BLEG=0	TRUE	2021
E5g	E_AI_BEC	Enterprises do not use AI technologies, because of ethical considerations	Count(ENT_ID) where AI_BEC=1	TRUE	2021
E5g	E_AI_BECX	Enterprises do not use AI technologies, but not because of ethical considerations	Count(ENT_ID) where AI_BEC=0	TRUE	2021
E5h	E_AI_BNU	Enterprises do not use AI technologies, because artificial Intelligence technologies are not useful for the enterprise	Count(ENT_ID) where AI_BNU=1	TRUE	2021
E5h	E_AI_BNUX	Enterprises do not use AI technologies, but not because artificial Intelligence technologies are not useful for the enterprise	Count(ENT_ID) where AI_BNU=0	TRUE	2021
F1a	E_INV4S_AP	eInvoices sent, suitable for automated processing	Count (ENT_ID) where INV4S_AP=1	FALSE	2020
F1a	E_INV4S_APX	Did not send eInvoices, suitable for automated processing	Count (ENT_ID) where INV4S_AP=0	FALSE	2020

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
F1b	E_INV4S_EMP	eInvoices sent, not suitable for automated processing	Count (ENT_ID) where INV4S_EMP=1	FALSE	2020
F1b	E_INV4S_EMPX	Did not send eInvoices, not suitable for automated processing	Count (ENT_ID) where INV4S_EMP=0	FALSE	2020
F1c	E_INV4S_PMP	Paper invoices sent	Count (ENT_ID) where INV4S_PMP=1	FALSE	2020
F1c	E_INV4S_PMPX	Did not send paper invoices	Count (ENT_ID) where INV4S_PMP=0	FALSE	2020
F2a	E_INV4S_AP_LT10	eInvoices sent, suitable for automated processing - less than 10% of all invoices	Count (ENT_ID) where INV4S_AP_P=1	TRUE	2020
F2b	E_INV4S_AP_10_24	eInvoices sent, suitable for automated processing - at least 10% but less than 25% of all invoices	Count (ENT_ID) where INV4S_AP_P=2	TRUE	2020
F2c	E_INV4S_AP_25_49	eInvoices sent, suitable for automated processing - at least 25% but less than 50% of all invoices	Count (ENT_ID) where INV4S_AP_P=3	TRUE	2020
F2d	E_INV4S_AP_50_74	eInvoices sent, suitable for automated processing - at least 50% but less than 75% of all invoices	Count (ENT_ID) where INV4S_AP_P=4	TRUE	2020

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
F2e	E_INV4S_AP_GE75	eInvoices sent, suitable for automated processing - at least 75% of all invoices	Count (ENT_ID) where INV4S_AP_P=5	TRUE	2020
A1	P_IUSE	Persons employed have access to the internet for business purposes	∑ (EMPIUSE) where EMPIUSE<>Blank and EMPIUSE<>-1	FALSE	2022
Derived from A1 (Eurostat computed)1	P_IUSEX	Persons employed who do not have access to the internet for business purposes	∑ (EMPL) - ∑ (EMPIUSE) where EMPIUSE<>Blank and EMPIUSE<>-1	FALSE	2022
Derived from B1	P_AWSELL	Persons employed by enterprises which have received orders via websites or apps	∑ (EMPL) where (AWS_COWN=1 or AWS_CMP=1)	FALSE	2022
Derived from B5	P_AXSELL	Persons employed by enterprises which have received orders via EDI-type messages	∑ (EMPL) where AXSELL=1	FALSE	2022
Derived from B1 and B5	P_AESELL	Persons employed by enterprises which have received orders via computer networks	∑ (EMPL) where (AWS_COWN=1 or AWS_CMP=1) or AXSELL=1	FALSE	2022
Derived	E_DI3_VLO	Enterprises with very low digital intensity index	Count (ENT_ID) where DI3_INDEX>=0 and DI3_INDEX<=3	FALSE	2021
Derived	E_DI3_LO	Enterprises with low digital intensity index	Count (ENT_ID) where DI3_INDEX>=4 and DI3_INDEX<=6	FALSE	2021
Derived	E_DI3_HI	Enterprises with high digital intensity index	Count (ENT_ID) where DI3_INDEX>=7 and DI3_INDEX<=9	FALSE	2021

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived	E_DI3_VHI	Enterprises with very high digital intensity index	Count (ENT_ID) where DI3_ INDEX>=10 and DI3_INDEX<=12	FALSE	2021
Derived	E_DI3_GELO	Enterprises with at least low (basic) digital intensity index	[Count(ENT_ID) where DI3_ INDEX>=4 and DI3_INDEX<=6] + [Count (ENT_ID) where DI3_ INDEX>=7 and DI3_INDEX<=9] + [Count (ENT_ID) where DI3_ INDEX>=10 and DI3_INDEX<=12]	FALSE	Eurostat computed. The indicator has to be "Not available" when any of the 3 components is "not available".
Derived	E_DI3_VLO_ BSANY	Enterprises with very low digital intensity index and use any business software	Count (ENT_ID) where DI3_ INDEX>=0 and DI3_INDEX<=3 and (ITERP1=1 OR CRM1=1 OR ITBI=1)	FALSE	NEW derived variable
Derived	E_DI3_LO_ BSANY	Enterprises with low digital intensity index and use any business software	Count (ENT_ID) where DI3_ INDEX>=4 and DI3_INDEX<=6 and (ITERP1=1 OR CRM1=1 OR ITBI=1)	FALSE	NEW derived variable
Derived	E_DI3_HI_BSANY	Enterprises with high digital intensity index and use any business software	Count (ENT_ID) where DI3_ INDEX>=7 and DI3_INDEX<=9 and (ITERP1=1 OR CRM1=1 OR ITBI=1)	FALSE	NEW derived variable
Derived	E_DI3_VHI_ BSANY	Enterprises with very high digital intensity index and use any business software	Count (ENT_ID) where DI3_ INDEX>=10 and DI3_INDEX<=12 and (ITERP1=1 OR CRM1=1 OR ITBI=1)	FALSE	NEW derived variable

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived	E_DI3_VLO_SISC	Enterprises with very low digital intensity index and share supply chain management information electronically with suppliers or customers	Count (ENT_ID) where DI3_ INDEX>=0 and DI3_INDEX<=3 and SISC=1	FALSE	NEW derived variable
Derived	E_DI3_LO_SISC	Enterprises with low digital intensity index and share supply chain management information electronically with suppliers or customers	Count (ENT_ID) where DI3_ INDEX>=4 and DI3_INDEX<=6 and SISC=1	FALSE	NEW derived variable
Derived	E_DI3_HI_SISC	Enterprises with high digital intensity index and share supply chain management information electronically with suppliers or customers	Count (ENT_ID) where DI3_ INDEX>=7 and DI3_INDEX<=9 and SISC=1	FALSE	NEW derived variable
Derived	E_DI3_VHI_SISC	Enterprises with very high digital intensity index and share supply chain management information electronically with suppliers or customers	Count (ENT_ID) where DI3_ INDEX>=10 and DI3_INDEX<=12 and SISC=1	FALSE	NEW derived variable

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived	E_DI3_VLO_ DASANY	Enterprises with very low digital intensity index and perform data analytics on data from any source	Count (ENT_ID) where DI3_ INDEX>=0 and DI3_INDEX<=3 and (DASERP=1 or DASCRM=1 or DASSM=1 or DASWEB=1 or DASLOC=1 or DASSDS=1 or DASGOV=1 or DASSAT=1)	FALSE	NEW derived variable
Derived	E_DI3_LO_ DASANY	Enterprises with low digital intensity index and perform data analytics on data from any source	Count (ENT_ID) where DI3_ INDEX>=4 and DI3_INDEX<=6 and (DASERP=1 or DASCRM=1 or DASSM=1 or DASWEB=1 or DASLOC=1 or DASSDS=1 or DASGOV=1 or DASSAT=1)	FALSE	NEW derived variable
Derived	E_DI3_HI_ DASANY	Enterprises with high digital intensity index and perform data analytics on data from any source	Count (ENT_ID) where DI3_ INDEX>=7 and DI3_INDEX<=9 and (DASERP=1 or DASCRM=1 or DASSM=1 or DASWEB=1 or DASLOC=1 or DASSDS=1 or DASGOV=1 or DASSAT=1)	FALSE	NEW derived variable

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived	E_DI3_VHI_DASANY	Enterprises with very high digital intensity index and perform data analytics on data from any source	Count (ENT_ID) where DI3_INDEX>=10 and DI3_INDEX<=12 and (DASERP=1 or DASCRM=1 or DASSM=1 or DASWEB=1 or DASLOC=1 or DASSDS=1 or DASGOV=1 or DASSAT=1)	FALSE	NEW derived variable
Derived	E_DI3_VLO_DA	Enterprises with very low digital intensity index and perform data analytics	Count (ENT_ID) where DI3_INDEX>=0 and DI3_INDEX<=3 and (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable
Derived	E_DI3_LO_DA	Enterprises with low digital intensity index and perform data analytics	Count (ENT_ID) where DI3_INDEX>=4 and DI3_INDEX<=6 and (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable
Derived	E_DI3_HI_DA	Enterprises with high digital intensity index and perform data analytics	Count (ENT_ID) where DI3_INDEX>=7 and DI3_INDEX<=9 and (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable
Derived	E_DI3_VHI_DA	Enterprises with very high digital intensity index and perform data analytics	Count (ENT_ID) where DI3_INDEX>=10 and DI3_INDEX<=12 and (DAOWN=1 or DAEXT=1)	FALSE	NEW derived variable

Model questionnaire 2023	Variable codes (CAPITAL LETTERS)	Description	Scope	Optional	Notes / Source (if not previous year)
Derived	E_DI3_VLO_AI_TANY	Enterprises with very low digital intensity index and use any artificial intelligence technology	Count (ENT_ID) where DI3_INDEX>=0 and DI3_INDEX<=3 and (AI_TTM=1 or AI_TSR=1 or AI_TNLG=1 or AI_TIR=1 or AI_TML=1 or AI_TPA=1 or AI_TAR=1)	FALSE	NEW derived variable
Derived	E_DI3_LO_AI_TANY	Enterprises with low digital intensity index and use any artificial intelligence technology	Count (ENT_ID) where DI3_INDEX>=4 and DI3_INDEX<=6 and (AI_TTM=1 or AI_TSR=1 or AI_TNLG=1 or AI_TIR=1 or AI_TML=1 or AI_TPA=1 or AI_TAR=1)	FALSE	NEW derived variable
Derived	E_DI3_HI_AI_TANY	Enterprises with high digital intensity index and use any artificial intelligence technology	Count (ENT_ID) where DI3_INDEX>=7 and DI3_INDEX<=9 and (AI_TTM=1 or AI_TSR=1 or AI_TNLG=1 or AI_TIR=1 or AI_TML=1 or AI_TPA=1 or AI_TAR=1)	FALSE	NEW derived variable
Derived	E_DI3_VHI_AI_TANY	Enterprises with very high digital intensity index that use any artificial intelligence technology	Count (ENT_ID) where DI3_INDEX>=10 and DI3_INDEX<=12 and (AI_TTM=1 or AI_TSR=1 or AI_TNLG=1 or AI_TIR=1 or AI_TML=1 or AI_TPA=1 or AI_TAR=1)	FALSE	NEW derived variable

3.2.4. Activity and employee number codes

Once the indicators have been computed, they must be broken down by economic activity, sector and size using the codes below.

It is mandatory to transmit the data according to the breakdowns in Sections 3.2.4.1 to 3.2.4.5. However, the breakdowns in Sections 3.2.4.6 to 3.2.4.8 are optional.

Some breakdowns computed by Eurostat are also presented in the tables below for information.

3.2.4.1. Economic activity breakdown

The economic activities to be covered are the following:

Rev. 2 NACE category	Description
Section C	Manufacturing
Section D, E	Electricity, gas and steam, water supply, sewerage and waste management
Section F	Construction
Section G	Wholesale and retail trade; repair of motor vehicles and motorcycles
Section H	Transportation 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 activities
Group 95.1	Repair of computers and communication equipment

The following activity and number_employees codes should be applied to all indicators.

For the possible calculation of **national** aggregates the economic activities are to be subdivided into the following sections using the given codes for **enterprises with 10 or more employees and self-employed persons**:

ACTIVITY	NUMBER_ EMPLOYEES	Explanation
C10T18	EGE10	10 or more employees and self-employed persons in NACE section C10T18
C19T23	EGE10	10 or more employees and self-employed persons in NACE section C19T23
C24_25	EGE10	10 or more employees and self-employed persons in NACE section C24_25
C26T33	EGE10	10 or more employees and self-employed persons in NACE section C26T33
C10T33	EGE10	[C10T18]+[C19T23]+[C24_25]+[C26T33]
D35TE39	EGE10	10 or more employees and self-employed persons in NACE section D35_E39
C10TE39 *Eurostat computed*	EGE10	[C10T18]+[C19T23]+[C24_25]+[C26T33]+[D35TE39]

ACTIVITY	NUMBER_ EMPLOYEES	Explanation
F41T43	EGE10	10 or more employees and self-employed persons in NACE section F41T43
G45T47	EGE10	10 or more employees and self-employed persons in NACE section G45T47
G47	EGE10	10 or more employees and self-employed persons in NACE section G47
H49T53	EGE10	10 or more employees and self-employed persons in NACE section H49T53
I55	EGE10	10 or more employees and self-employed persons in NACE section I55
I55_56	EGE10	10 or more employees and self-employed persons in NACE section I55_56
J58T63	EGE10	10 or more employees and self-employed persons in NACE section J58T63
L68	EGE10	10 or more employees and self-employed persons in NACE section L68
M69T75	EGE10	10 or more employees and self-employed persons in NACE section M69T75
N77T82	EGE10	10 or more employees and self-employed persons in NACE section N77T82 (including N79)
ICT_T	EGE10	10 or more employees and self-employed persons in NACE groups 26.1-26.4, 26.8, 46.5, 58.2, 61, 62, 63.1, 95.1

For the possible calculation of **European** aggregates the economic activities are to be subdivided into the following sections using the given codes for **enterprises with 10 or more employees and self-employed persons**:

ACTIVITY	NUMBER_ EMPLOYEES	Explanation
C10T12	EGE10	10 or more employees and self-employed persons in NACE section C10T12
C13T15	EGE10	10 or more employees and self-employed persons in NACE section C13T15
C16T18	EGE10	10 or more employees and self-employed persons in NACE section C16T18
C19	EGE10	10 or more employees and self-employed persons in NACE section C19
C20	EGE10	10 or more employees and self-employed persons in NACE section C20
C21	EGE10	10 or more employees and self-employed persons in NACE section C21
C22_23	EGE10	10 or more employees and self-employed persons in NACE section C22_23
C26	EGE10	10 or more employees and self-employed persons in NACE section C26
C27	EGE10	10 or more employees and self-employed persons in NACE section C27
C28	EGE10	10 or more employees and self-employed persons in NACE section C28

ACTIVITY	NUMBER_ EMPLOYEES	Explanation
C27_28 *Eurostat computed*	EGE10	10 or more employees and self-employed persons in NACE section C27_28
C29_30	EGE10	10 or more employees and self-employed persons in NACE section C29_30
C31T33	EGE10	10 or more employees and self-employed persons in NACE section C31T33
D35	EGE10	10 or more employees and self-employed persons in NACE section D35
E36T39	EGE10	10 or more employees and self-employed persons in NACE section E36T39
G45	EGE10	10 or more employees and self-employed persons in NACE section G45
G46	EGE10	10 or more employees and self-employed persons in NACE section G46
J58T60	EGE10	10 or more employees and self-employed persons in NACE section J58T60
J61	EGE10	10 or more employees and self-employed persons in NACE section J61
J62_63	EGE10	10 or more employees and self-employed persons in NACE section J62_63
M69T71	EGE10	10 or more employees and self-employed persons in NACE section M69T71
M72	EGE10	10 or more employees and self-employed persons in NACE section M72
M73T75	EGE10	10 or more employees and self-employed persons in NACE section M73T75
N77T82X79	EGE10	10 or more employees and self-employed persons in NACE section N77T82_X79
N79	EGE10	10 or more employees and self-employed persons in NACE section N79
S951	EGE10	10 or more employees and self-employed persons in NACE group S951

3.2.4.2. Enterprise size class

These activity and number_employees codes should be applied to all variables.

ACTIVITY	NUMBER_ EMPLOYEES	Explanation
C10TS951XK	EGE10	10 or more employees and self-employed persons in NACE sections [C10TE39]+[F41T43]+[G45T47]+[H49T53]+[I55_56]+ [J58T63]+[L68]+ [M69T75]+[N77T82]+[S951]
C10TS951XK	E10T49	10-49 employees and self-employed persons (small enterprises) in given NACE sections
C10TS951XK	E50T249	50-249 employees and self-employed persons (medium enterprises) in given NACE sections
C10TS951XK	EGE250	250 or more employees and self-employed persons (large enterprises) in given NACE sections
C10TS951XK *Eurostat computed*	E10T249	C10TS951XK [E10T49] + C10TS951XK [E50T249]

3.2.4.3. Sector enterprise size class

These activities and number_employees codes should be applied to all variables.

ACTIVITY	NUMBER_ EMPLOYEES	Explanation
C10TF43	EGE10	10 or more employees and self-employed persons in NACE sections C to F
G45TS951XK	EGE10	10 or more employees and self-employed persons in NACE sections G to N, S951, except K
C10TF43	E10T49	10-49 employees and self-employed persons (small enterprises) in NACE sections C to F
G45TS951XK	E10T49	10-49 employees and self-employed persons (small enterprises) in NACE sections G to N, S951, except K
C10TF43	E50T249	50-249 employees and self-employed persons (medium enterprises) in NACE sections C to F
G45TS951XK	E50T249	50-249 employees and self-employed persons (medium enterprises) in NACE sections G to N, S951, except K
C10TF43	EGE250	250 or more employees and self-employed persons (large enterprises) in NACE sections C to F
G45TS951XK	EGE250	250 or more employees and self-employed persons (large enterprises) in NACE sections G to N, S951, except K
C10TF43 *Eurostat computed*	E10T249	C10TF43 [E10T49] + C10TF43 [E50T249]
G45TS951XK *Eurostat computed*	E10T249	G45TS951XK [E10T49]+ G45TS951XK [E50T249]

3.2.4.4. Economic activity breakdowns for micro-enterprises

The results of the statistics compiled for microenterprises are to be broken down in accordance with the NACE Rev. 2. sections, divisions and group for the following size class breakdowns: 0-9 employees and self-employed persons, 2-9 and 0-1 employees and self-employed persons, or only 2-9 employees and self-employed persons.

The economic activities are to be subdivided into the following sections using the codes for enterprises with 0-9 employees and self-employed persons.

These activities and number_employees codes should be used for all variables.

ACTIVITY	NUMBER_ EMPLOYEES	Explanation
C10TS951XK	*E0T9*	*0-9 employees and self-employed persons in NACE sections 10-33, 35-39, 41-43, 45-47, 49-53, 55-56, 58-63, 68-75, 77-82, 95.1*
C10T18	*E0T9*	*0-9 employees and self-employed persons in NACE section C10T18*
C19T23	*E0T9*	*0-9 employees and self-employed persons in NACE section C19T23*
C24_25	*E0T9*	*0-9 employees and self-employed persons in NACE section C24_25*
C26T33	*E0T9*	*0-9 employees and self-employed persons in NACE section C26T33*
C10T33	*E0T9*	*[C10T18]+[C19T23]+[C24_25]+[C26T33]*
D35TE39	*E0T9*	*0-9 employees and self-employed persons in NACE section D35TE39*
C10TE39 Eurostat computed	*E0T9*	*[C10T18]+[C19T23]+[C24_25]+[C26T33]+[D35TE39]*
F41T43	*E0T9*	*0-9 employees and self-employed persons in NACE section F41T43*
G45T47	*E0T9*	*0-9 employees and self-employed persons in NACE section G45T47*
G47	*E0T9*	*0-9 employees and self-employed persons in NACE section G47*
H49T53	*E0T9*	*0-9 employees and self-employed persons in NACE section H49T53*
I55	*E0T9*	*0-9 employees and self-employed persons in NACE section I55*
I55_56	*E0T9*	*0-9 employees and self-employed persons in NACE section I55_56*
J58T63	*E0T9*	*0-9 employees and self-employed persons in NACE section J58T63*
L68	*E0T9*	*0-9 employees and self-employed persons in NACE section L68*
L68TM75	*E0T9*	*0-9 employees and self-employed persons in NACE section L68TM75*
M69T75	*E0T9*	*0-9 employees and self-employed persons in NACE section M69T75*
N77T82	*E0T9*	*0-9 employees and self-employed persons in NACE section N77T82 (including N79)*

ACTIVITY	NUMBER_ EMPLOYEES	Explanation
S951	*E0T9*	*0-9 employees and self-employed persons in NACE group S951*
ICT_T	*E0T9*	*0-9 employees and self-employed persons in NACE 26.1-26.4, 26.8, 46.5, 58.2, 61, 62, 63.1, 95.1*

3.2.4.5. Sector enterprise size classes for enterprises with 0-9 employees and self-employed persons

These activities and number_employees codes should be used for all variables.

The breakdowns for enterprises with 0-9 employees and self-employed persons are for NSIs providing the breakdown.

ACTIVITY	NUMBER_ EMPLOYEES	Explanation
C10TF43	*E0T9*	*0-9 employees and self-employed persons (very small enterprises) in NACE sections C to F*
G45TS951XK	*E0T9*	*0-9 employees and self-employed persons (very small enterprises) in NACE sections G to N, S951, except K*

3.2.4.6. Optional sector breakdowns by size class for enterprises with 0-1 and 2-9 employees and self-employed persons

These activity and number_employees codes should be used for all variables.

The breakdowns for enterprises with 0-1 and 2-9 employees and self-employed persons are for NSIs providing the breakdown.

ACTIVITY	NUMBER_ EMPLOYEES	Explanation
C10TS951XK	*E0T1*	*0-1 employees and self-employed persons (micro-enterprises) in given NACE sections*
C10TS951XK	*E2T9*	*2-9 employees and self-employed persons (mini-enterprises) in given NACE sections*
C10TF43	*E0T1*	*0-1 employees and self-employed persons (micro-enterprises) in NACE sections C to F*
C10TF43	*E2T9*	*2-9 employees and self-employed persons (mini-enterprises) in NACE sections C to F*
G45TS951XK	*E0T1*	*0-1 employees and self-employed persons (micro-enterprises) in NACE sections G to N, S951, except K*
G45TS951XK	*E2T9*	*2-9 employees and self-employed persons (mini-enterprises) in NACE sections G to N, S951, except K*

3.2.4.7. Optional breakdowns by economic activity for enterprises with 0-1 employees and self-employed persons

These activity and number_employees codes should be used for all variables.

The breakdowns for enterprises with 0-1 employees and self-employed persons are for NSIs providing the breakdown.

ACTIVITY	NUMBER_ EMPLOYEES	Explanation
C10TS951XK	*E0T1*	*0-1 employees and self-employed persons in NACE sections 10-33, 35-39, 41-43, 45-47, 49-53, 55-56, 58-63, 68-75, 77-82, 95.1*
C10T18	*E0T1*	*0-1 employees and self-employed persons in NACE section C10T18*
C19T23	*E0T1*	*0-1 employees and self-employed persons in NACE section C19T23*
C24_25	*E0T1*	*0-1 employees and self-employed persons in NACE section C24_25*
C26T33	*E0T1*	*0-1 employees and self-employed persons in NACE section C26T33*
C10T33	*E0T1*	*[C10T18]+[C19T23]+[C24_25]+[C26T33]*
D35TE39	*E0T1*	*0-1 employees and self-employed persons in NACE section D35TE39*
C10TE39 Eurostat computed	*E0T1*	*[C10T18]+[C19T23]+[C24_25]+[C26T33]+[D35TE39]*
F41T43	*E0T1*	*0-1 employees and self-employed persons in NACE section F41T43*
G45T47	*E0T1*	*0-1 employees and self-employed persons in NACE section G45T47*
G47	*E0T1*	*0-1 employees and self-employed persons in NACE section G47*
H49T53	*E0T1*	*0-1 employees and self-employed persons in NACE section H49T53*
I55	*E0T1*	*0-1 employees and self-employed persons in NACE section I55*
I55_56	*E0T1*	*0-1 employees and self-employed persons in NACE section I55_56*
J58T63	*E0T1*	*0-1 employees and self-employed persons in NACE section J58T63*
L68	*E0T1*	*0-1 employees and self-employed persons in NACE section L68*
L68TM75	*E0T1*	*0-1 employees and self-employed persons in NACE section L68TM75*
M69T75	*E0T1*	*0-1 employees and self-employed persons in NACE section M69T75*
N77T82	*E0T1*	*0-1 employees and self-employed persons in NACE section N77T82 (including N79)*
S951	*E0T1*	*0-1 employees and self-employed persons in NACE group S951*
ICT_T	*E0T1*	*0-1 employees and self-employed persons in NACE 26.1-26.4, 26.8, 46.5, 58.2, 61, 62, 63.1, 95.1*

3.2.4.8. Optional breakdowns by economic activity for enterprises with 2-9 employees and self-employed persons

These activity and number_employees codes should be used for all variables.

The breakdowns for enterprises with 2-9 employees and self-employed persons are for NSIs providing the breakdown.

ACTIVITY	NUMBER_ EMPLOYEES	Explanation
C10TS951XK	*E2T9*	*2-9 employees and self-employed persons in NACE sections 10-33, 35-39, 41-43, 45-47, 49-53, 55-56, 58-63, 68-75, 77-82, 95.1*
C10T18	*E2T9*	*2-9 employees and self-employed persons in NACE section C10T18*
C19T23	*E2T9*	*2-9 employees and self-employed persons in NACE section C19T23*
C24_25	*E2T9*	*2-9 employees and self-employed persons in NACE section C24_25*
C26T33	*E2T9*	*2-9 employees and self-employed persons in NACE section C26T33*
C10T33	*E2T9*	*[C10T18]+[C19T23]+[C24_25]+[C26T33]*
D35TE39	*E2T9*	*2-9 employees and self-employed persons in NACE section D35TE39*
C10TE39 Eurostat computed	*E2T9*	*[C10T18]+[C19T23]+[C24_25]+[C26T33]+[D35TE39]*
F41T43	*E2T9*	*2-9 employees and self-employed persons in NACE section F41T43*
G45T47	*E2T9*	*2-9 employees and self-employed persons in NACE section G45T47*
G47	*E2T9*	*2-9 employees and self-employed persons in NACE section G47*
H49T53	*E2T9*	*2-9 employees and self-employed persons in NACE section H49T53*
I55	*E2T9*	*2-9 employees and self-employed persons in NACE section I55*
I55_56	*E2T9*	*2-9 employees and self-employed persons in NACE section I55_56*
J58T63	*E2T9*	*2-9 employees and self-employed persons in NACE section J58T63*
L68	*E2T9*	*2-9 employees and self-employed persons in NACE section L68*
L68TM75	*E2T9*	*2-9 employees and self-employed persons in NACE section L68TM75*
M69T75	*E2T9*	*2-9 employees and self-employed persons in NACE section M69T75*
N77T82	*E2T9*	*2-9 employees and self-employed persons in NACE section N77T82 (including N79)*
S951	*E2T9*	*2-9 employees and self-employed persons in NACE group S951*
ICT_T	*E2T9*	*2-9 employees and self-employed persons in NACE 26.1-26.4, 26.8, 46.5, 58.2, 61, 62, 63.1, 95.1*

3.2.5. Regional Data

Regional data is collected for a selection of indicators and activities. The data should refer to enterprises with 10+ employees.

Indicators for regional data

The indicators which should be provided relate to questions A1, A3, B2, D1, F1 (first priority) as well as C1, C3 and E1 (second priority).

Enterprise size and Economic activities for regional data

The economic activities to be covered are the following:

NACE category	Description
Section C	Manufacturing
Section D, E	Electricity, gas and steam, water supply, sewerage and waste management
Section F	Construction
Section G	Wholesale and retail trade; repair of motor vehicles and motorcycles
Section H	Transportation and storage
Section I	Accommodation and food service activities
Section J	Information and communication
Section L	Real estate activities
Section M, N	Professional, scientific, technical, administrative and support activities

The following activity and number_employees codes should be used:

ACTIVITY	NUMBER_ EMPLOYEES	Explanation
C10T33	EGE10	10 or more employees and self-employed persons in NACE section C10T33
D35TE39	EGE10	10 or more employees and self-employed persons in NACE section D35TE39
C10TE39 *Eurostat computed*	EGE10	[C10T33]+[D35TE39]
F41T43	EGE10	10 or more employees and self-employed persons in NACE section F41T43
G45T47	EGE10	10 or more employees and self-employed persons in NACE section G45T47
H49T53	EGE10	10 or more employees and self-employed persons in NACE section H49T53

I55_56	EGE10	10 or more employees and self-employed persons in NACE section I55_56
J58T63	EGE10	10 or more employees and self-employed persons in NACE section J58T63
L68TM75	EGE10	10 or more employees and self-employed persons in NACE section L68TM75
N77T82	EGE10	10 or more employees and self-employed persons in NACE section N77T82 (including N79)
C10TS951XK	EGE10	10 or more employees and self-employed persons in NACE sections [C10TE39]+[F41T43]+[G45T47]+[H49T53]+[I55_56]+ [J58T63]+[L68]+ [M69T75]+[N77T82]+[S951]
C10TF43	EGE10	10 or more employees and self-employed persons in NACE sections C to F
G45TS951XK	EGE10	10 or more employees and self-employed persons in NACE sections G to N, S951, except K

For **regional data**, the column REGIONAL in the data file in SDMX format should not contain _Z, but the respective NUTS 1 and NUTS 2 region codes (see 12).

For countries providing regional data, where only one NUTS 1 region representing the national total exists, the variables and breakdowns requested for regional data should be included twice in the data set: first with _Z in the column REGIONAL and a second time with the respective NUTS 1 code in the column REGIONAL.

Region codes

Region	Region Name
AT1	Ostösterreich
AT11	Burgenland (AT)
AT12	Niederösterreich
AT13	Wien
AT2	Südösterreich
AT21	Kärnten
AT22	Steiermark
AT3	Westösterreich
AT31	Oberösterreich
AT32	Salzburg
AT33	Tirol
AT34	Vorarlberg
BE1	Région de Bruxelles-Capitale/Brussels Hoofdstedelijk Gewest
BE10	Région de Bruxelles-Capitale/Brussels Hoofdstedelijk Gewest
BE2	Vlaams Gewest
BE21	Prov. Antwerpen
BE22	Prov. Limburg (BE)
BE23	Prov. Oost-Vlaanderen
BE24	Prov. Vlaams-Brabant
BE25	Prov. West-Vlaanderen
BE3	Région wallonne
BE31	Prov. Brabant wallon
BE32	Prov. Hainaut
BE33	Prov. Liège
BE34	Prov. Luxembourg (BE)
BE35	Prov. Namur
BG3	Severna i yugoiztochna Bulgaria
BG31	Severozapaden
BG32	Severen tsentralen
BG33	Severoiztochen
BG34	Yugoiztochen
BG4	Yugozapadna i yuzhna tsentralna Bulgaria
BG41	Yugozapaden
BG42	Yuzhen tsentralen
CY0	Kypros
CY00	Kypros
CZ0	Cesko
CZ01	Praha
CZ02	Strední Cechy
CZ03	Jihozápad
CZ04	Severozápad
CZ05	Severovýchod
CZ06	Jihovýchod
CZ07	Strední Morava
CZ08	Moravskoslezsko
DE1	Baden-Württemberg
DE11	Stuttgart
DE12	Karlsruhe
DE13	Freiburg
DE14	Tübingen
DE2	Bayern
DE21	Oberbayern
DE22	Niederbayern
DE23	Oberpfalz
DE24	Oberfranken
DE25	Mittelfranken
DE26	Unterfranken
DE27	Schwaben
DE3	Berlin
DE30	Berlin
DE4	Brandenburg

Region	Region Name
DE40	Brandenburg
DE5	Bremen
DE50	Bremen
DE6	Hamburg
DE60	Hamburg
DE7	Hessen
DE71	Darmstadt
DE72	Gießen
DE73	Kassel
DE8	Mecklenburg-Vorpommern
DE80	Mecklenburg-Vorpommern
DE9	Niedersachsen
DE91	Braunschweig
DE92	Hannover
DE93	Lüneburg
DE94	Weser-Ems
DEA	Nordrhein-Westfalen
DEA1	Düsseldorf
DEA2	Köln
DEA3	Münster
DEA4	Detmold
DEA5	Arnsberg
DEB	Rheinland-Pfalz
DEB1	Koblenz
DEB2	Trier
DEB3	Rheinhessen-Pfalz
DEC	Saarland
DEC0	Saarland
DED	Sachsen
DED2	Dresden
DED4	Chemnitz
DED5	Leipzig

Region	Region Name
DEE	Sachsen-Anhalt
DEE0	Sachsen-Anhalt
DEF	Schleswig-Holstein
DEF0	Schleswig-Holstein
DEG	Thüringen
DEG0	Thüringen
DK0	Danmark
DK01	Hovedstaden
DK02	Sjælland
DK03	Syddanmark
DK04	Midtjylland
DK05	Nordjylland
EE0	Eesti
EE00	Eesti
EL3	Attiki
EL30	Attiki
EL4	Nisia Aigaiou, Kriti
EL41	Voreio Aigaio
EL42	Notio Aigaio
EL43	Kriti
EL5	Voreia Ellada
EL51	Anatoliki Makedonia, Thraki
EL52	Kentriki Makedonia
EL53	Dytiki Makedonia
EL54	Ipeiros
EL6	Kentriki Ellada
EL61	Thessalia
EL62	Ionia Nisia
EL63	Dytiki Ellada
EL64	Sterea Ellada
EL65	Peloponnisos
ES1	Noroeste (ES)

Region	Region Name
ES11	Galicia
ES12	Principado de Asturias
ES13	Cantabria
ES2	Noreste (ES)
ES21	País Vasco
ES22	Comunidad Foral de Navarra
ES23	La Rioja
ES24	Aragón
ES3	Comunidad de Madrid
ES30	Comunidad de Madrid
ES4	Centro (ES)
ES41	Castilla y León
ES42	Castilla-la Mancha
ES43	Extremadura
ES5	Este (ES)
ES51	Cataluña
ES52	Comunitat Valenciana
ES53	Illes Balears
ES6	Sur (ES)
ES61	Andalucía
ES62	Región de Murcia
ES63	Ciudad de Ceuta
ES64	Ciudad de Melilla
ES7	Canarias
ES70	Canarias
FI1	Manner-Suomi
FI19	Länsi-Suomi
FI1B	Helsinki-Uusimaa
FI1C	Etelä-Suomi
FI1D	Pohjois- ja Itä-Suomi
FI2	Åland
FI20	Åland

Region	Region Name
FR1	Île de France
FR10	Île de France
FRB	Centre - Val de Loire
FRB0	Centre - Val de Loire
FRC	Bourgogne - Franche-Comté
FRC1	Bourgogne
FRC2	Franche-Comté
FRD	Normandie
FRD1	Basse-Normandie
FRD2	Haute-Normandie
FRE	Hauts-de-France
FRE1	Nord-Pas-de-Calais
FRE2	Picardie
FRF	Grand Est
FRF1	Alsace
FRF2	Champagne-Ardenne
FRF3	Lorraine
FRG	Pays-de-la-Loire
FRG0	Pays-de-la-Loire
FRH	Bretagne
FRH0	Bretagne
FRI	Nouvelle-Aquitaine
FRI1	Aquitaine
FRI2	Limousin
FRI3	Poitou-Charentes
FRJ	Occitanie
FRJ1	Languedoc-Roussillon
FRJ2	Midi-Pyrénées
FRK	Auvergne - Rhône-Alpes
FRK1	Auvergne
FRK2	Rhône-Alpes
FRL	Provence-Alpes-Côte d'Azur

Region	Region Name
FRL0	Provence-Alpes-Côte d'Azur
FRM	Corse
FRM0	Corse
FRY	RUP FR - Régions ultrapériphériques françaises
FRY1	Guadeloupe
FRY2	Martinique
FRY3	Guyane
FRY4	La Réunion
FRY5	Mayotte
HR0	Hrvatska
HR02	Panonska Hrvatska
HR03	Jadranska Hrvatska
HR05	Grad Zagreb
HR06	Sjeverna Hrvatska
HU1	Közép-Magyarország
HU11	Budapest
HU12	Pest
HU2	Dunántúl
HU21	Közép-Dunántúl
HU22	Nyugat-Dunántúl
HU23	Dél-Dunántúl
HU3	Alföld és Észak
HU31	Észak-Magyarország
HU32	Észak-Alföld
HU33	Dél-Alföld
IE0	Éire/Ireland
IE04	Northern and Western
IE05	Southern
IE06	Eastern and Midland
IS0	Ísland
IS00	Ísland

Region	Region Name
ITC	Nord-Ovest
ITC1	Piemonte
ITC2	Valle d'Aosta/Vallée d'Aoste
ITC3	Liguria
ITC4	Lombardia
ITF	Sud
ITF1	Abruzzo
ITF2	Molise
ITF3	Campania
ITF4	Puglia
ITF5	Basilicata
ITF6	Calabria
ITG	Isole
ITG1	Sicilia
ITG2	Sardegna
ITH	Nord-Est
ITH1	Provincia Autonoma di Bolzano/Bozen
ITH2	Provincia Autonoma di Trento
ITH3	Veneto
ITH4	Friuli-Venezia Giulia
ITH5	Emilia-Romagna
ITI	Centro (IT)
ITI1	Toscana
ITI2	Umbria
ITI3	Marche
ITI4	Lazio
LT0	Lietuva
LT01	Sostines regionas
LT02	Vidurio ir vakaru Lietuvos regionas
LU0	Luxembourg
LU00	Luxembourg
LV0	Latvija

Region	Region Name
LV00	Latvija
MT0	Malta
MT00	Malta
NL1	Noord-Nederland
NL11	Groningen
NL12	Friesland (NL)
NL13	Drenthe
NL2	Oost-Nederland
NL21	Overijssel
NL22	Gelderland
NL23	Flevoland
NL3	West-Nederland
NL31	Utrecht
NL32	Noord-Holland
NL33	Zuid-Holland
NL34	Zeeland
NL4	Zuid-Nederland
NL41	Noord-Brabant
NL42	Limburg (NL)
NO0	Norge
NO02	Innlandet
NO06	Trøndelag
NO07	Nord-Norge
NO08	Oslo og Viken
NO09	Agder og Sør-Østlandet
NO0A	Vestlandet
NO0B	Jan Mayen and Svalbard
PL2	Makroregion Poludniowy
PL21	Malopolskie
PL22	Slaskie
PL4	Makroregion Pólnocno-Zachodni
PL41	Wielkopolskie

Region	Region Name
PL42	Zachodniopomorskie
PL43	Lubuskie
PL5	Makroregion Poludniowo-Zachodni
PL51	Dolnoslaskie
PL52	Opolskie
PL6	Makroregion Pólnocny
PL61	Kujawsko-Pomorskie
PL62	Warminsko-Mazurskie
PL63	Pomorskie
PL7	Makroregion Centralny
PL71	Lódzkie
PL72	Swietokrzyskie
PL8	Makroregion Wschodni
PL81	Lubelskie
PL82	Podkarpackie
PL84	Podlaskie
PL9	Makroregion Województwo Mazowieckie
PL91	Warszawski stoleczny
PL92	Mazowiecki regionalny
PT1	Continente
PT11	Norte
PT15	Algarve
PT16	Centro (PT)
PT17	Área Metropolitana de Lisboa
PT18	Alentejo
PT2	Região Autónoma dos Açores (PT)
PT20	Região Autónoma dos Açores (PT)
PT3	Região Autónoma da Madeira (PT)
PT30	Região Autónoma da Madeira (PT)
RO1	Macroregiunea unu
RO11	Nord-Vest
RO12	Centru

Region	Region Name
RO2	Macroregiunea doi
RO21	Nord-Est
RO22	Sud-Est
RO3	Macroregiunea trei
RO31	Sud - Muntenia
RO32	Bucuresti - Ilfov
RO4	Macroregiunea patru
RO41	Sud-Vest Oltenia
RO42	Vest
SE1	Östra Sverige
SE11	Stockholm
SE12	Östra Mellansverige
SE2	Södra Sverige
SE21	Småland med öarna
SE22	Sydsverige
SE23	Västsverige
SE3	Norra Sverige
SE31	Norra Mellansverige
SE32	Mellersta Norrland
SE33	Övre Norrland
SI0	Slovenija
SI03	Vzhodna Slovenija
SI04	Zahodna Slovenija
SK0	Slovensko
SK01	Bratislavský kraj
SK02	Západné Slovensko
SK03	Stredné Slovensko
SK04	Východné Slovensko

3.3. Transmission format for the ICT usage and e-commerce in enterprises survey

Once microdata have been collected and aggregates computed, the data can be transmitted to Eurostat.

The purpose of this section is to describe how the ICT enterprise survey data should be compiled and sent to Eurostat.

The 2023 results must be transmitted to Eurostat as a single txt (tab-delimited) file following the Statistical Data and Metadata eXchange (**SDMX**) CSV format.

Each data transmission is assumed to be **a full transmission**. New transmissions will **replace** previous transmissions.

For the content validation tool and Eurostat to be able to process the data, they must be transmitted in the format described below. Extra columns or codes will not be recognised. Comments fields should be used to indicate clearly any deviations Eurostat should be aware of – this is critical for ensuring the fullest comparability of the data for Eurostat's users. **Non-comparable data will not be published.**

The examples given in this section are laid out as they are for ease of reading only.

3.3.1. SDMX

SDMX is an international initiative aimed at standardising and modernising ('industrialising') the mechanisms and processes for exchanging statistical data and metadata among international organisations and their member countries.

SDMX is sponsored by seven international organisations including the Bank for International Settlements (BIS), the European Central Bank (ECB), Eurostat (Statistical Office of the European Union), the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD), the United Nations Statistical Division (UNSD), and the World Bank.

SDMX has three key components.

- A model — the information model — to describe data and metadata

The SDMX information model describes statistics in a standard way. It identifies objects and their relationships. A description is necessary to represent data, in order to

make them meaningful. The descriptors are modelled according to whether they are dimensions (identifying and describing data), attributes (providing additional information about the data) or measures (representing the phenomenon to be measured). The structural descriptors are brought together in the Data Structure Definition (DSD). This identifies the dimensions, attributes and measures of a data set, associating them with common code lists and concepts. The DSD provides all the information necessary to fully describe the data transmitted[31].

- A standard for automated communication called Content-oriented Guidelines

The Content-oriented Guidelines (COGs) are a set of recommendations within the scope of the SDMX standard that are designed to maximise interoperability. They are intended to be applicable to all statistical domains.

The COGs focus on harmonising specific concepts and terminology that are common to a large number of statistical domains. Such harmonisation helps achieve an even more efficient exchange of comparable data and metadata, and builds on existing experience from implementation.

The COGs cover cross-domain concepts, code lists, subject-matter domains, a glossary, and implementation-specific guidelines[32].

- An IT architecture and set of tools for data and metadata exchange

To support more automated and efficient data and metadata exchange, standard tools and an IT architecture are required. In practice, this means that SDMX promotes the use of standard SDMX-compliant formats. It provides the necessary tools to support the Model, create SDMX-compliant files, store SDMX-related artefacts, map and transcode from existing databases, and validate the structure (and in future the content) of data files. It also provides the necessary architecture to connect IT systems to the SDMX world, enabling data to be shared more easily[33].

The SDMX standard thus provides essential support for statisticians, in that it: maximises the amount of information made available to users; enables the process to be automated; and allows web-service queries.

31 More details on the SDMX information model can be found in the Technical specifications.

32 For more information see the recommended practices offered by the SDMX Content-Oriented Guidelines.

33 For more information see IT architecture and set of tools - SDMX InfoSpace - Eurostat (europa.eu).

3.3.2. SDMX format for the ICT usage and e-commerce in enterprises survey

The first line contain the column headers. They must be in uppercase characters, and separated by a tab.

Column 1 - DATAFLOW

The dataflow column should contain ESTAT:INFOSOC_ENT_A(1.0). This value should be repeated for each line of the file.

Column 2 - FREQ

The freq column should contain A, as our survey is annual.

Column 3 – TIME_PERIOD

Put the reference year of the survey, with four digits, e.g. 2023.

Column 4 – REF_AREA

Put here your country code. This code should follow the two alpha ISO code.

Codes to be used for the Member States, Candidate Countries and other participating countries are as follows: BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, ME, MK, AL, RS, TR, BA.

Column 5 – TABLE_IDENTIFIER

Please use the following code

ENT2 – Enterprise/ecommerce ICT survey

Column 6 – EMBARGO_TIME

YYYY-MM-DD - example: 2023-10-31. This would mean that data must not be published before the 31st October 2023. Please leave empty if there is no embargo date. This value should be repeated for each line of the file.

Column 7 – INDICATOR – The variables, their codes and descriptions

Variable codes are the codes, which Eurostat uses for its database and publications. Data should be delivered to Eurostat using these codes in upper case. There is no given order necessary for the variables. If a variable is not collected, it should be removed from the dataset or the value entry should be left blank. In this case, please add a note of explanation in a separate file.

Scope of the observation variables by module

This shows the observation variables. Their exact scope has been defined based on section 3 "Codification of microdata" where the filters to be applied are given.

Column 8 – UNIT_MEASURE and column 18 – UNIT_MULT

Please use the following codes

UNIT_MEASURE	UNIT_MULT	Explanation
PS	0	Persons – use these codes when referring to employed persons (employees or self-employed)
PN	0	Pure Number – use these codes when referring to enterprises
EUR	6	Million Euros – use these codes to report amounts, in million euros. Use these codes if your country belongs to the Eurozone.
XDC	6	Million National Currency – use these codes to report amounts, in million national currency. Use these codes if your country does not belong to the Eurozone.

Column 9 – ACTIVITY

Please use the following codes

C10T12	Manufacture of beverages, food and tobacco products
C10T18	Manufacture of products based on: food, beverages, tobacco, textile, leather, wood, pulp and paper; publishing and printing
C10T33	Manufacturing
C10TE39	Manufacturing, electricity, gas, steam and air conditioning; water supply, sewerage, waste management and remediation activities
C10TF43	Manufacturing, electricity, gas, steam and air conditioning supply; water supply and construction
C10TS951XK	All enterprises, without financial sector
C13T15	Manufacture of textiles, wearing apparel, leather and related products
C16T18	Manufacture of wood & products of wood & cork, except furniture; articles of straw & plaiting materials; paper & paper products; printing & reproduction of recorded media
C19	Manufacture of coke and refined petroleum products
C19T23	Manufacture of coke, refined petroleum, chemical & basic pharmaceutical products, rubber & plastics, other non-metallic mineral products
C20	Manufacture of chemicals and chemical products
C21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
C22_23	Manufacture of rubber and plastics products, and other non-metallic mineral products
C24_25	Manufacture of basic metals & fabricated metal products excluding machines & equipment
C26	Manufacture of computer, electronic and optical products

C26T33	Manufacture of computers, electric & optical products, electrical equipment, machinery & equipment n.e.c., motor vehicles, oth. transport equipment, furniture, oth. manufacturing, repair & installation of machinery & equipment
C27	Manufacture of electrical equipment
C27_28	Manufacture of electrical equipment, machinery and equipment n.e.c.
C28	Manufacture of machinery and equipment n.e.c.
C29_30	Manufacture of motor vehicles, trailers and semi-trailers, other transport equipment
C31T33	Manufacture of furniture and other manufacturing; repair and installation of machinery and equipment
D35	Electricity, gas, steam and air conditioning supply
D35TE39	Electricity, gas, steam and air conditioning; water supply, sewerage, waste management and remediation activities
E36T39	Water supply, sewerage, waste management and remediation
F41T43	Construction
G45	Trade of motor vehicles and motorcycles
G45T47	Wholesale and retail trade; repair of motor vehicles and motorcycles
G45TS951XK	Services, without financial sector
G46	Wholesale trade, except of motor vehicles and motorcycles
G47	Retail trade, except of motor vehicles and motorcycles
H49T53	Transport and storage
I55	Accommodation
I55_56	Accommodation and food service activities
ICT_T	NACE 26.1-26.4, 26.8, 46.5, 58.2, 61, 62, 63.1, 95.1
J58T60	Publishing activities; motion picture, video & television programme production, sound recording & music publishing; programming & broadcasting
J58T63	Information and communication
J61	Telecommunications
J62_63	Computer programming, consultancy and related activities, information service activities
L68	Real estate activities
L68TM75	Real estate; professional, scientific and technical service activities (**only for micro-enterprises and regional data: Eurostat computed for national totals**)
M69T71	Legal, accounting, management, architecture, engineering, technical testing and analysis activities
M69T75	Professional, scientific and technical service activities
M72	Scientific research and development
M73T75	Other professional, scientific and technical activities

N77T82	Administrative and support service activities
N77T82X79	Activities for rental and leasing, employment, security & investigation , services to buildings &landscape, office administrative, office support & other business support
N79	Travel agency; tour operator reservation service and related activities
S951	Repair of computers and communication equipment

Column 10 – NUMBER_EMPLOYEES

Please use the following codes

NUMBER_EMPLOYEES	Explanations
E0T1	From 0 to 1
E0T9	From 0 to 9
E10T249	From 10 to 249
E10T49	From 10 to 49
E2T9	From 2 to 9
E50T249	From 50 to 249
EGE10	10 or more
EGE250	250 or more

Annex 2 provides an overview of the requested activity and number_employees codes combinations.

Column 11 - REGIONAL

The regional column should contain _Z for national totals.

For regional data the column should contain the respective region code.

Column 12 – CUST_BREAKDOWN

The cust_breakdown column should contain _T

Column 13 – OBS_VALUE

All variables should be grossed up to the enterprise population, EXCEPT for

variables starting with P_ which should be **grossed up** to the population of employees and self-employed persons

currency or monetary variables: **grossed up** to turnover (sales variables)

sample values (remain **non-raised** figures)

For the values in this txt file **a dot (".") should be used as decimal point**. Thousand separators should not be used. In order to avoid small differences which occur in the crosschecking phase, values must not be rounded to integer figures but decimal figures should be reported instead. **The value can have maximum of 10 digits for the whole part and maximum of 7 decimal digits.**

Any non-numerical cell entry will be interpreted as a missing value. If a variable is not collected and is not removed from the dataset, the value entry should be left blank and an explanation provided in a separate file.

Column 14 – OBS_STATUS and column 15 – OBS_STATUS_1

These columns allow you to flag the data. Each column can contain only one flag. Put the first flag, if any, in OBS_STATUS. Then put the second flag, if any, in OBS_STATUS_1. The codes to be used are as follows:

OBS_STATUS	Explanations
A	Normal value (no flag)
B	Break in series
U	Low reliability

Column 16 – CONF_STATUS

These columns allow you to define the confidentiality status. The codes to be used are as follows:

CONF_STATUS	Explanations
F	Free for publication
C	Confidential

Column 17 – COMMENT_OBS

This column allows you to put a footnote. Actually, it may contain several footnotes, separated by a '@' character. A footnote that applies to many cells must be repeated for each cell. Right now, the maximum length of the combined footnotes is 255 characters. After the testing period is over, we will decide if we keep that limit length, or if we increase it a bit. Anyway, only short footnotes can be put here. Longer comments should be put in a separate file.

Column 18 – UNIT_MULT

This column is a unit multiplier. Use 0 if the UNIT is PS or PN. Use 6 if the unit is EUR or XDC.

Column 19 – DECIMALS

This column is foreseen to allow you to indicate how many of the OBS_VALUE decimals are significant. Right now, this column is not used. It should be set to 0.

3.3.3. Example

This is an example of a file that could be sent. The data is made up.

DATAFLOW	FREQ	TIME_ PERIOD	REF_ AREA	TABLE_ IDENTIFIER	EMBARGO_ TIME
ESTAT:INFOSOC_ENT_A(1.0)	A	2023	XY	ENT2	2023-10-11
ESTAT:INFOSOC_ENT_A(1.0)	A	2023	XY	ENT2	2023-10-11
ESTAT:INFOSOC_ENT_A(1.0)	A	2023	XY	ENT2	2023-10-11

INDICATOR	UNIT_MEASURE	ACTIVITY	NUMBER_EMPLOYEES	REGIONAL	CUST_BREAKDOWN
EMPL	PS	C10T12	EGE10	_Z	_T
EMPL	PS	C10T18	EGE10	_Z	_T
EMPL	PS	C10T33	EGE10	_Z	_T

OBS_ VALUE	OBS_ STATUS	OBS_ STATUS_1	CONF_ STATUS	COMMENT_ OBS	UNIT_ MULT	DECIMALS
1	U	A	F	Note 1	0	0
2	B	A	C	Note 1@Note 2	0	0
3	U	B	F	Note 2	0	0

3.4. Data confidentiality

Confidentiality is a fundamental principle of European statistics, as defined by Regulation (EC) 223/2009, Commission Regulation (EU) No 557/2013 and the European Statistics Code of Practice (ESCoP).

Recital 24 of Regulation (EC) 223/2009 on European statistics makes provision for the establishment of common principles and guidelines ensuring the confidentiality of data used for the production of European statistics and access to those confidential data, taking due account of technical developments and the requirements of users in a democratic society.

For that purpose, Article 20(4) of Regulation (EC) 223/2009 requires the following.

> *'Within their respective spheres of competence, the NSIs and other national authorities and the Commission (Eurostat) shall take all necessary regulatory, administrative, technical and organisational measures to ensure the physical and logical protection of confidential data (statistical disclosure control).'*

'Confidential data' means:

> *'data which allow statistical units to be identified, either directly or indirectly, thereby disclosing individual information. Confidentiality aims at protecting data from unauthorised disclosure that could be prejudicial or harmful to the interest of the source or other relevant parties. To determine whether a statistical unit is identifiable, account shall be taken of all relevant means that might reasonably be used by a third party to identify the statistical unit' (Article 3(4) of Regulation (EC) 223/2009).*

In practice, for Eurostat not to publish confidential data, compilers need to indicate during data transmission which data are confidential, using the c-flag.

It is recommended to use flags wisely and sparingly. Most cells should not be flagged.

Depending on the status of national confidentiality, there are several implications for how European aggregates are to be published.

Data used for the production of statistics by national and EU authorities are considered confidential if statistical units can be identified, directly or indirectly, and if information about individuals or businesses can be disclosed as a result.

- Direct identification means identification of the respondent (statistical unit) from their formal identifiers (e.g. name, address, identification number).
- Indirect identification means inferring a respondent's identity through a combination of variables or characteristics (e.g. age, gender, education).

Statistical disclosure control can be ensured through physical protection and statistical disclosure control (SDC). For further details, refer to the Eurostat website.

Confidentiality rules are based on the number of enterprises. Two criteria, relevant for confidential disclosure, are proposed at national level:

- criterion A – data refer to less than three statistical units;
- criterion B – one or a few enterprises contribute to over 85 % of the total volume of aggregated data.

Data compilers should explain the national confidentiality rules in the metadata and quality reports.

3.5. Transmission deadlines

The Implementing Act states that:

- the annual metadata report for survey year 2023 must be transmitted to Eurostat by 31 May 2023.
- the transmission deadline for the data relating to ICT usage and e-commerce in enterprises survey is 5 October of the survey year, i.e. 5 October 2023 for survey year 2023.
- the annual quality report for survey year 2023 must be transmitted to Eurostat by 5 November 2023.

3.6. Transmission channels

The transmission and delivery of data sets is managed by EDAMIS (Electronic Data Files Administration and Management Information System), adopted as the unique entry point for the transmission of data to Eurostat.

The EDAMIS portal is accessible via the following link: https://webgate.ec.europa.eu/edamis4

EDAMIS is made available through different networks: the internet and secure European networks like TESTA (Trans European Services for Telematics between Administrations) and CCN (Common Communication Network).

Information on networks, comparison between the different transmission methods and step-by-step instructions for submitting files are provided in EDAMIS short and extensive user guides developed by Eurostat.

3.7. Data revisions

Revisions are broadly defined as any change to the value of a statistic released to the public. They can occur when new observations (one additional month or quarter) become available and some past values are modified or when the current and/or some past values are modified. Data are generally revised to incorporate new, improved information. Revisions are therefore inevitable whenever statistics are produced that report promptly on economic developments despite the fact that some relevant information is still missing.

Further guidance on data revision principles can be found in the European Statistics Code of Practice.

3.8. Support for data providers

Specific support is available here: ESTAT-ICT-SURVEYS@ec.europa.eu.

4

Data quality

Assessing data quality is a crucial step in providing users with high-quality statistics.

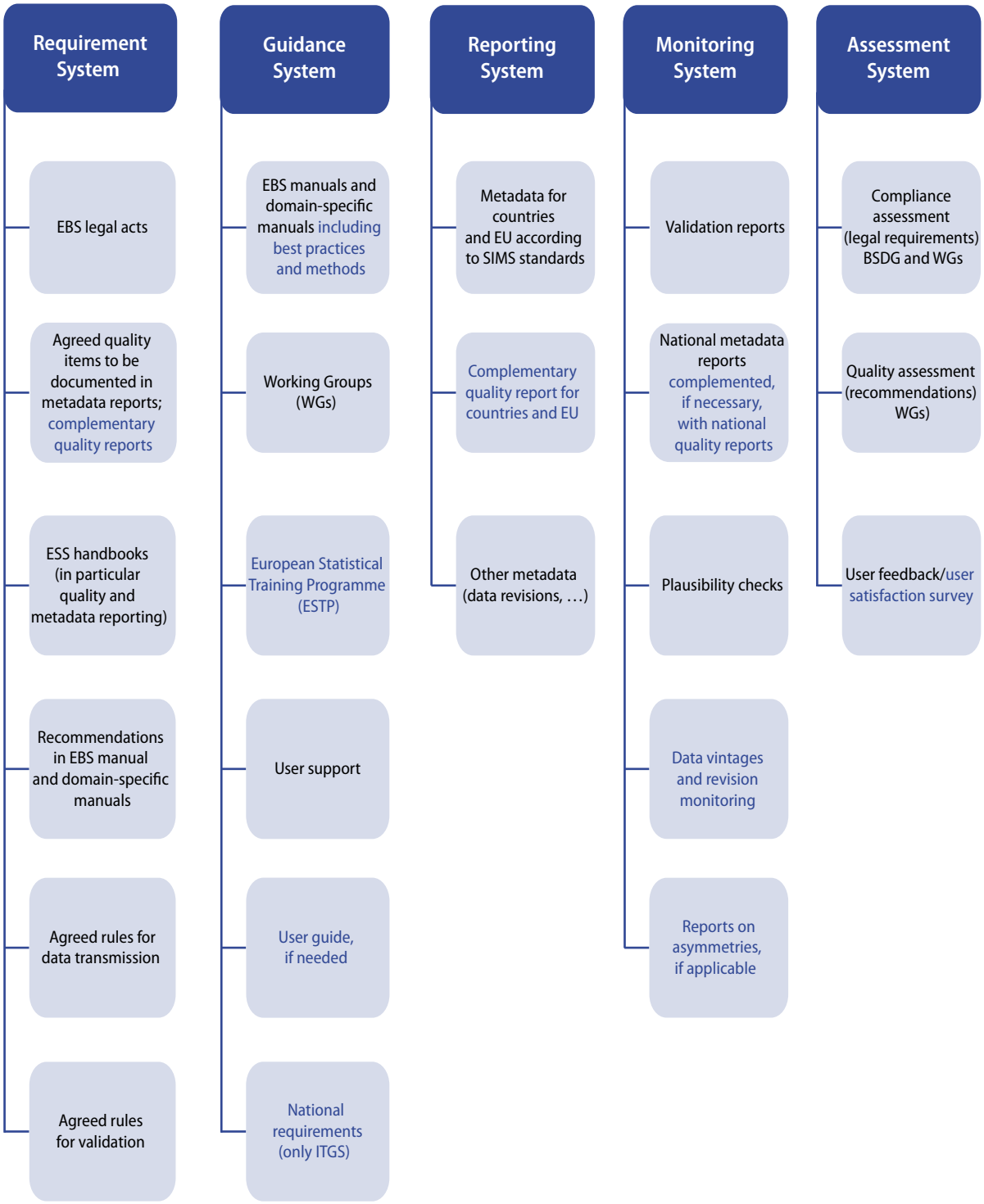
Consequently, Eurostat has a quality framework in place to assess data on ICT usage and e-commerce in enterprises. It carries out a number of checks on the data submitted to Eurostat based on validation rules. National statistical institutes (NSIs) are required to send quality and metadata reports to assess the overall quality of their data.

4.1. Quality framework

4.1.1. European business statistics quality framework

Efforts were made to standardise the quality framework for business and trade statistics under the European Business Statistics (EBS) Regulation. As shown below, the core EBS quality framework involves different measures that ensure high-quality statistics and allow users to understand the quality issues for the statistics concerned.

The core set of measures are written in black and ensure the quality of business and trade statistics. These should eventually be in place for all business and trade statistics. Measures written in blue are considered optional depending on the needs of the individual domains.


Requirement System
EBS legal acts
Agreed quality items to be documented in metadata reports; complementary quality reports
ESS handbooks (in particular quality and metadata reporting)
Recommendations in EBS manual and domain-specific manuals
Agreed rules for data transmission
Agreed rules for validation
Guidance System
EBS manuals and domain-specific manuals including best practices and methods
Working Groups (WGs)
European Statistical Training Programme (ESTP)
User support
User guide, if needed
National requirements (only ITGS)
Reporting System
Metadata for countries and EU according to SIMS standards
Complementary quality report for countries and EU
Other metadata (data revisions, …)
Monitoring System
Validation reports
National metadata reports complemented, if necessary, with national quality reports
Plausibility checks
Data vintages and revision monitoring
Reports on asymmetries, if applicable
Assessment System
Compliance assessment (legal requirements) BSDG and WGs
Quality assessment (recommendations) WGs)
User feedback/user satisfaction survey

4.1.2. Implementing the framework for data on ICT usage and e-commerce in enterprises

The table below explains how the EBS quality framework is applied when collecting data on ICT usage and e-commerce in enterprises.

REQUIREMENT SYSTEM **The requirements system comprises all legal requirements, standards and rules agreed at working-group level.**	
European business statistics legal acts	See Section 2.1 – Legislative background
Quality items to be documented in metadata reports	12.3.1. Data completeness – rate (*rates are not requested but deviation from question / item in model questionnaire have to be provided*) 14.2.1. Punctuality – delivery (*Number of days between the delivery date of data and the target date on which they were scheduled for delivery*)
European statistical system handbooks, particularly the handbook quality and metadata reporting	European statistical system handbook for quality and metadata reports
Recommendations	See Chapter 2 – Data compilation
Rules for submitting data	See Chapter 3 – Data transmission
Rules for validating data	See Annex 2 – Validation rules
GUIDANCE SYSTEM **The guidance system provides further advice to help compilers improve and ensure the quality of data.**	
European business statistics manuals and domain-specific manuals, including best practices and methods	European business statistics manual
Expert groups	Information Society Statistics Task Force Information Society Statistics Working Group
European statistical training programme courses	Not applicable
User support	Questions to be addressed to ESTAT-ICT-SURVEYS@ec.europa.eu.
REPORTING SYSTEM **The reporting system is used by data providers to report on the quality of the European business and trade statistics sent to Eurostat.**	
Metadata for countries and EU according to the single integrated metadata structure reporting standards	Metadata are available via the following link: ESS Metadata Handler EU metadata are available via the following link: Eurostat metadata

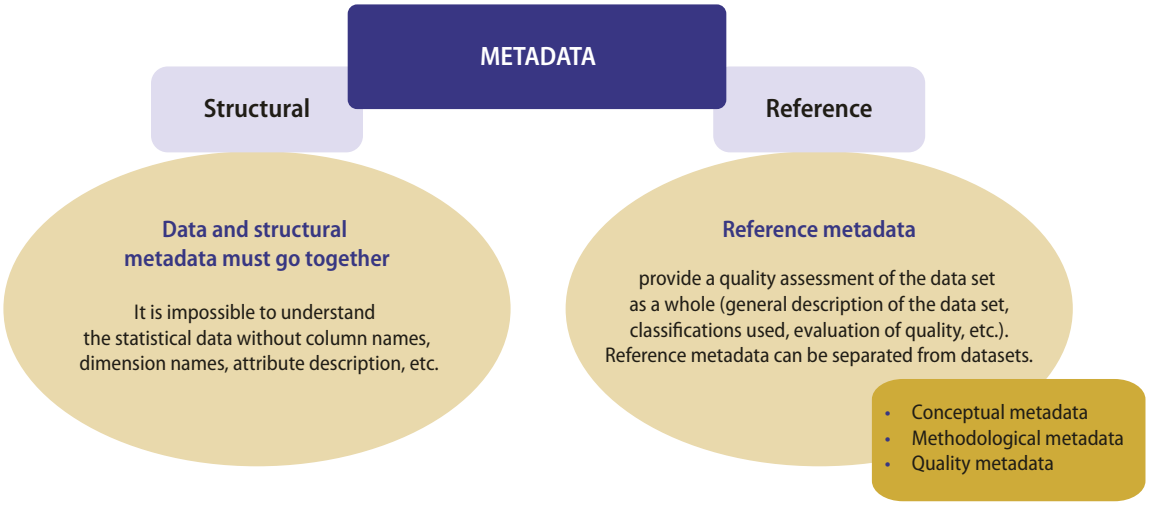
MONITORING SYSTEM **The monitoring system comprises all measures Eurostat uses to keep track of the quality of European business and trade statistics.**	
Validation reports	Countries contacted in case of issues.
National metadata reports complemented with national quality reports if necessary	Metadata collected according to the single integrated metadata structure.
Plausibility checks	Checks for consistency within data sets, cross-country data and time series analyses.
ASSESSMENT SYSTEM **The assessment system describes measurements Eurostat uses to analyse how European statistical system countries comply with legal requirements. It also analyses the quality of national data submitted to Eurostat.**	
Compliance assessment (legal requirements)	Annual compliance assessment.
Quality assessment	Annual quality reviews before publication, recommendations issued in this manual, experience of NSIs taken into account when preparing the model questionnaire.
User feedback / user satisfaction surveys	Feedback collected from regular users and via questions sent out by user support

4.2. Metadata and quality reports

Metadata, also described as «data about data», provide information about data and are essential for their understanding. They allow users to make comparisons between data and assess the quality of data. Metadata can be expressed as text (for example descriptions), values (for example percentage rates) and codes (from controlled vocabularies such as code lists).

There are two types of metadata: structural metadata and reference metadata.

Structural metadata cover the information that is used to identify and describe the data. Some examples of types of structural metadata are: variable names; variable codes; classifications used; technical descriptions of a data set (e.g. data formats, time dimensions, etc.); and data set locations. Structural metadata need to be linked with data so that they can be searched for and identified.



Reference metadata describe the contents and quality of statistical data. According to the latest version of the *European statistical system handbook for quality and metadata reports*, metadata are subdivided into:

- conceptual metadata – these explain the concepts used;
- methodological metadata – these refer to methods used in preparing the statistical data;
- quality metadata – these refer to and explain quality dimensions of the statistical outputs.

Several tools have been developed to produce high-quality and standardised metadata within the European statistical system (**ESS**). The single integrated metadata structure (**SIMS**) was created to support quality reporting on European statistics. It provides a standard, integrated and comprehensible framework for metadata and quality reporting in the ESS. It was formed by integrating and standardising two reporting structures. In particular, the Euro-SDMX metadata structure and the ESS standard for quality reports structure[34]. It is a template for the ESS reference metadata report structure and quality report, which contain information about quality concepts at different levels of detail.

4.2.1. Metadata and quality report on ICT usage and e-commerce in enterprises

For the ICT usage and e-commerce survey, the EBS Regulation asks reporting countries to submit quality and metadata reports to Eurostat each year. The information needed for data treatment should be included in the metadata report and all remaining information should be included in the quality report. The content of those reports is then combined into one national reference metadata report for each country.

The deadlines to submit the quality and metadata reports are laid down in the Implementing Act. The deadline to send Eurostat the metadata report is before the quality report.

The current structure of the reference metadata report is the following:

Contact: information about the organisation, contact name and details (address, email, telephone number) of the person in charge in the organisation.

Metadata update: dates when the metadata have been certified, posted and updated.

Statistical presentation: description of the data and classifications used (e.g. NACE Rev. 2); statistical concepts and definitions; coverage of the statistical domain; statistical population and statistical units data refer to; time coverage and reference area.

Unit of measure: for the survey on ICT usage and e-commerce in enterprises, the percentage of enterprises, of turnover, and of employees and self-employed persons is used.

Reference period: the reference period is usually the survey year, but for certain variables it is the year before the survey year.

Institutional mandate: information about complementary national legislation constituting the legal basis for the survey.

Confidentiality: this includes confidentiality policy – provisions concerning confidentiality in legal acts; and data treatment – rules applied to keep confidential data undisclosed.

Release policy: this covers the data release schedule/calendar and where this calendar can be found. The release policy refers to several principles as laid down in the Regulation on European statistics and in the European statistics code of practice. For example, objectivity, impartiality, confidentiality and accessibility.

Frequency of dissemination: data on ICT usage and e-commerce in enterprises are disseminated annually.

Accessibility and clarity: this refers to various formats used in the dissemination data on ICT usage and e-commerce in enterprises at national level. For example, news releases, publications and online databases.

Quality management: quality assurance and quality assessment describe the systems and frameworks in place to manage the quality of surveys and processes on ICT usage and e-commerce in enterprises.

Relevance: the main national users and their needs are taken into account when developing the survey on ICT usage and e-commerce in enterprises. User satisfaction is also taken into account either through a survey or other methods.

Accuracy: accuracy of data is the closeness of computations or estimates to the exact or true values that the statistics were intended to measure. It is assessed based on overall comments on accuracy and the amount

34 More information and a visualisation of this structure is available in the European Statistical System (ESS) handbook for quality and metadata reports — 2020 edition, p 238-241.

of sampling and non-sampling errors. These include: coverage errors; measurement errors; non-response errors; processing errors; and model assumption errors.

Timeliness and punctuality: Timeliness refers to the time elapsed between the event or phenomenon the data describe taking place and the time at which the data becomes available. Punctuality refers to the time lag between the actual delivery of the data and the target date that they should have been delivered. For example, 5 October 2023.

Coherence and comparability: European statistics should be coherent, maintaining internal consistency over time. It should also be possible to compare statistics between regions and countries, as well as combine and make joint use of related data from different sources. Information on geographical and intertemporal comparability, and cross-domain coherence are provided in the metadata report.

Cost and burden: provides information on the cost of collecting and producing data on ICT usage and e-commerce in enterprises, and the burden on respondents.

Data revision: data revision is any change in a value of a statistic released to the public. This includes data revision policy applicable to data output and how it can be implemented practically.

Statistical processing: information about: data on ICT usage and e-commerce in enterprises source data (e.g. frame population and sampling); data collection frequency; type of data collection (e.g. paper, web, electronic); data validation; and data compilation.

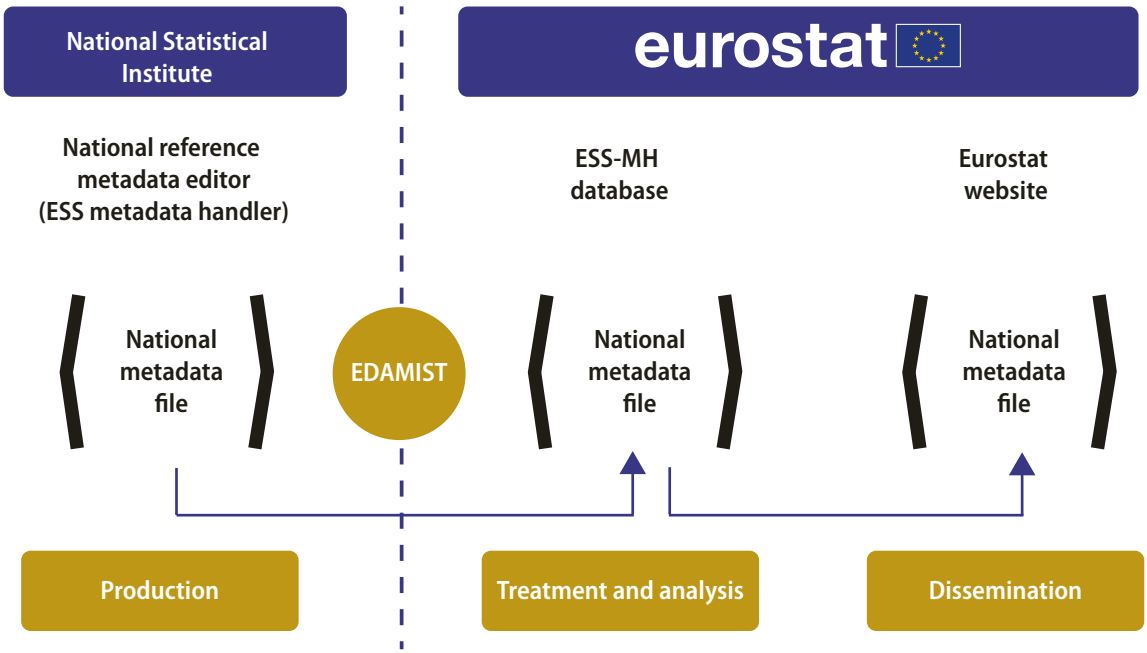
Comments: contains problems encountered, lessons learnt, any other comments, and the list of annexes.

Related metadata: not applicable for this survey.

Annexes: links to annexes.

4.2.2. European Statistical System metadata handler

Reporting countries should deliver the metadata and quality report using the metadata handler. The ESS Metadata Handler (ESS-MH) is a web-based application that supports the production, exchange and dissemination of reference metadata in the ESS. This metadata handler accommodates SDMX-compliant files based on SIMS. It supports standardising reference metadata and quality reports in the ESS. The diagram below presents the high-level business process to report SDMX-compliant reference metadata. It also presents use of the metadata handler.



Eurostat and NSIs use this application to produce metadata files. The application is accessible through a password system[35].

Information about the metadata file on ICT usage and e-commerce in enterprises is provided below:

File name: INFOSOC_ETNSI_ A_CC_YEAR_0000

Domain: INFOSOC

Metadata flow: INFOSOC_ETNSI_ A

Typology: simsie - Sims structure for INFOSOC enterprises

Country: CC (country code)

Organisation – provider: name of the organisation providing the metadata file

Reference year: YEAR

Period: A0

Status: Draft; Ready for validation; Validated; Ready for publication, Published

Modified on: dd/mm/yyyy hh:mm:ss

By: username

Published on: dd/mm/yyyy hh:mm:ss

Owner: username

The main application features of the metadata file for users are:

copy an existing file to create a new one;

recall the file to make changes;

download;

view history;

preview;

print.

After the changes have been made, the file is sent to the domain manager at Eurostat for validation. The domain manager will approve the file if all information is clear. If not, they can ask for clarifications. Reporting countries are asked to correct or add missing information. The file is then submitted again for approval.

The template of the national reference metadata report is provided in Annex 3 – metadata reporting template.

35 For any issues, contact: ESTAT-DATA-METADATA-SERVICES@ec.europa.eu

4.3. Data validation by Eurostat

Although reporting countries are responsible for the quality of the data provided, Eurostat carries out a series of checks to ensure the accuracy of data submission format and the absence of errors. The validation process is currently structured according to the validation levels classification established by the ESS.

Validation level 0: consistency with expected IT structural requirements;

Validation level 1: consistency within the data set;

Validation level 2: consistency with other data sets within the same domain and the same data source;

Validation level 3: consistency within the same domain between different data sources;

Validation level 4: consistency between separate domains in the same data provider;

Validation level 5: consistency with data of other data providers;

Only levels 0 to 3 are currently used to validate data on ICT usage and e-commerce in enterprises. Checks with the highest priority include: format checks; checks on the completeness of the file and uniqueness of records (level 0); and checks on data consistency (level 1). Failure to pass these levels will result in the file being rejected. The other checks may result in a list of warnings for which the reporting country is asked either to send revised data or to confirm the data correctness according to the type of warning spotted. A description of the different data checks is provided below. The rules applied are included in Annex 2 – validation rules.

Validation level 0: consistency with expected IT structural requirements

The first step is to check whether the file complies with the structure and format required by the submission format presented in Section 3.3.2. The checks performed at this stage refer to the:

validity of format: data are expected to be sent in the sole SDMX-TXT format as defined in Chapter 3. The number of columns in the file should be in line with the submission format presented in Section 3.3.2.

validity of codes: these checks are performed on each dimension and attribute at record level. Their aim is to make sure that each reported code belongs to the code list related to that particular dimension or attribute.

Complying with the submission format is the highest priority. Failing to pass checks at this level will result in the file being rejected.

Validation level 1: consistency within the data set

The next step in the validation process is to analyse the content of the file. The checks are divided into the three categories below:

- **completeness of the file**: this check verifies that the number of records in the file is equal to the total number expected for this data set.
- **inter-record consistency checks**: these verify the consistency between the observation value of two or more records. These records can be linked by an equality or an inequality. The link is described in a consistency rule. Typically, the consistency of the total with the sum of details will be verified through these types of checks.
- **consistency checks on ratios**: ICT data are shared on the Eurostat website as percentages. Checks are run on these percentages to assess their plausibility by comparing them with a configurable range defined for every unit.

Validation level 2: consistency with other data sets within the same domain and the same data source

In this step, two series of checks are performed:

- **variation over previous reference years**: data provided for a new reference year are compared with those from previous years. The variation should fall within a pre-defined range.
- **consistency checks on reference data and flags** are carried out and compared with the information in the quality report provided by the NSIs.

If the variation of the data falls outside the pre-defined range when compared with previous reference years, Eurostat will contact the country concerned and ask them to clarify and confirm the accuracy of the data. Eurostat will also contact countries if there is a discrepancy in the reference data.

Validation level 3: consistency within the same domain and a different data source

Data on ICT usage and e-commerce in enterprises are compared with similar data reported by other countries. The comparison is carried out at the level of main indicators, enterprise sizes and NACE activities, and is based on the most recent detailed data submitted to Eurostat.

If there is significant inconsistency between the two sources, Eurostat will contact the reporting countries to ask them to provide clarifications and possible corrections.

5 Data dissemination

Once Eurostat has received and validated the data transferred by the NSIs, the European aggregates are calculated and the complete database with the results from the surveys is published online.

5.1. Data description

Eurostat publishes the 'ICT usage and e-commerce in enterprises' data gathered by the NSIs on the basis of the model questionnaire along with EU metadata. The results of the surveys are published as ratios (e.g. the percentage of companies with e-commerce sales that represent at least 1% of turnover).

A ratio is the result of the division of a numerator and a denominator. Numerators and denominators are aggregated variables.

For example, we compute a ratio by dividing the aggregated variable E_IUSE (enterprises where persons employed have access to the internet) by the aggregated variable ENT (total enterprises), and the result is E_IUSE with unit PC_ENT (percentage of all enterprises).

Similarly, we compute EU ratios by dividing the sum (over all Member States) of the aggregated variable E_IUSE by the sum of the aggregated variable ENT.

Given that data published in this domain are based on model questionnaires that change every year, Eurostat provides, on a dedicated webpage, a table that lists the available ratios, enterprise sizes and activities (NACE Rev.2) per year.

In addition, Eurostat publishes country-specific notes that provide a snapshot of the metadata provided by each NSI.

5.2. Confidentiality and flags

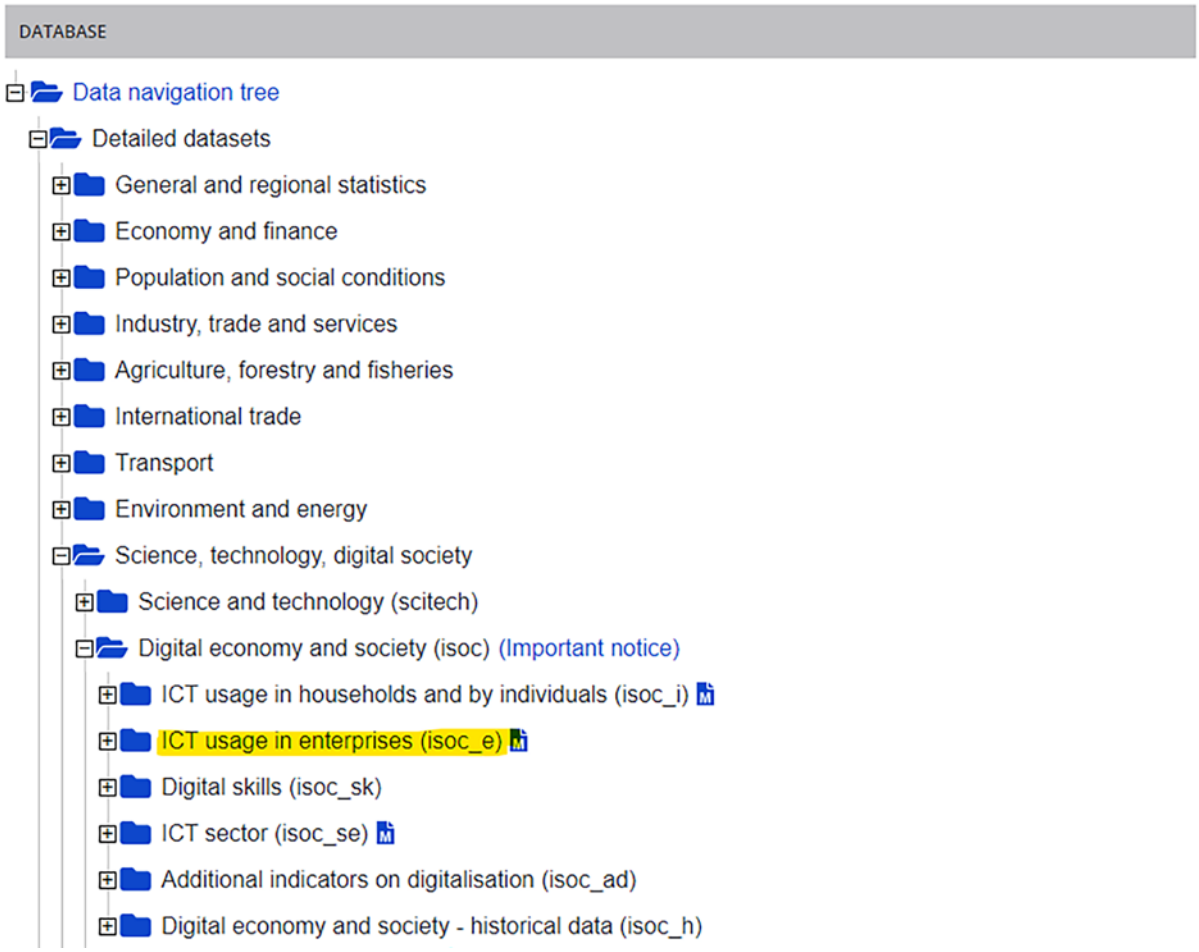
The aggregated data received from the NSIs also contain some flags to indicate confidentiality, statistical reliability, and break in series. Then, the ratios are computed and they inherit the flags. Data flagged as unreliable are not published at national level, but are taken into account for calculating the EU aggregates. Data flagged as confidential are neither published at national level nor taken into account for EU aggregates.

5.3. Dissemination channels

ICT usage and e-commerce in enterprises data are accessible on Eurostat's website through different paths: the data navigation tree, the 'Statistics Explained' articles, the news items and the dedicated webpage.

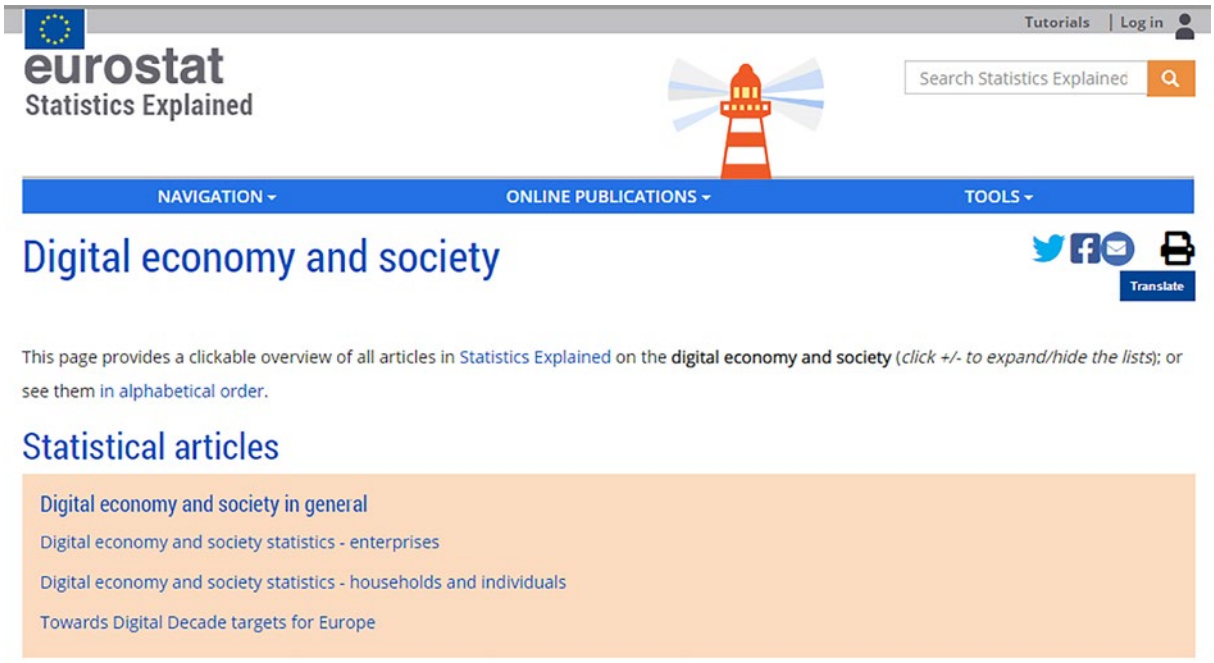
Eurostat navigation tree

ICT usage and e-commerce in enterprises data are published on Eurostat's website under the 'ICT usage in enterprises' sub-branch of the 'science, technology, digital society' heading.



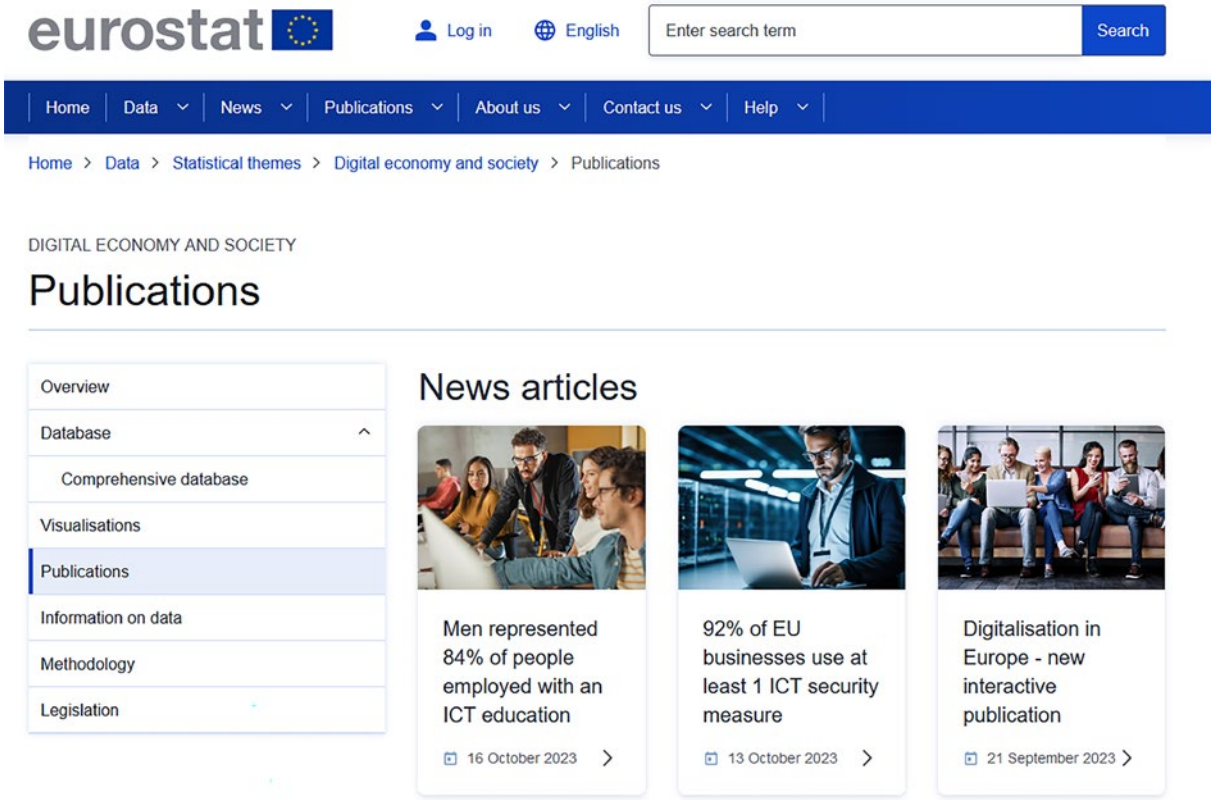
Statistics Explained

'Statistics Explained' is an official Eurostat website presenting statistical topics in an easily understandable way. The Digital economy and society page contains the links to the main statistical articles related to ICT data for enterprises, household and individuals.



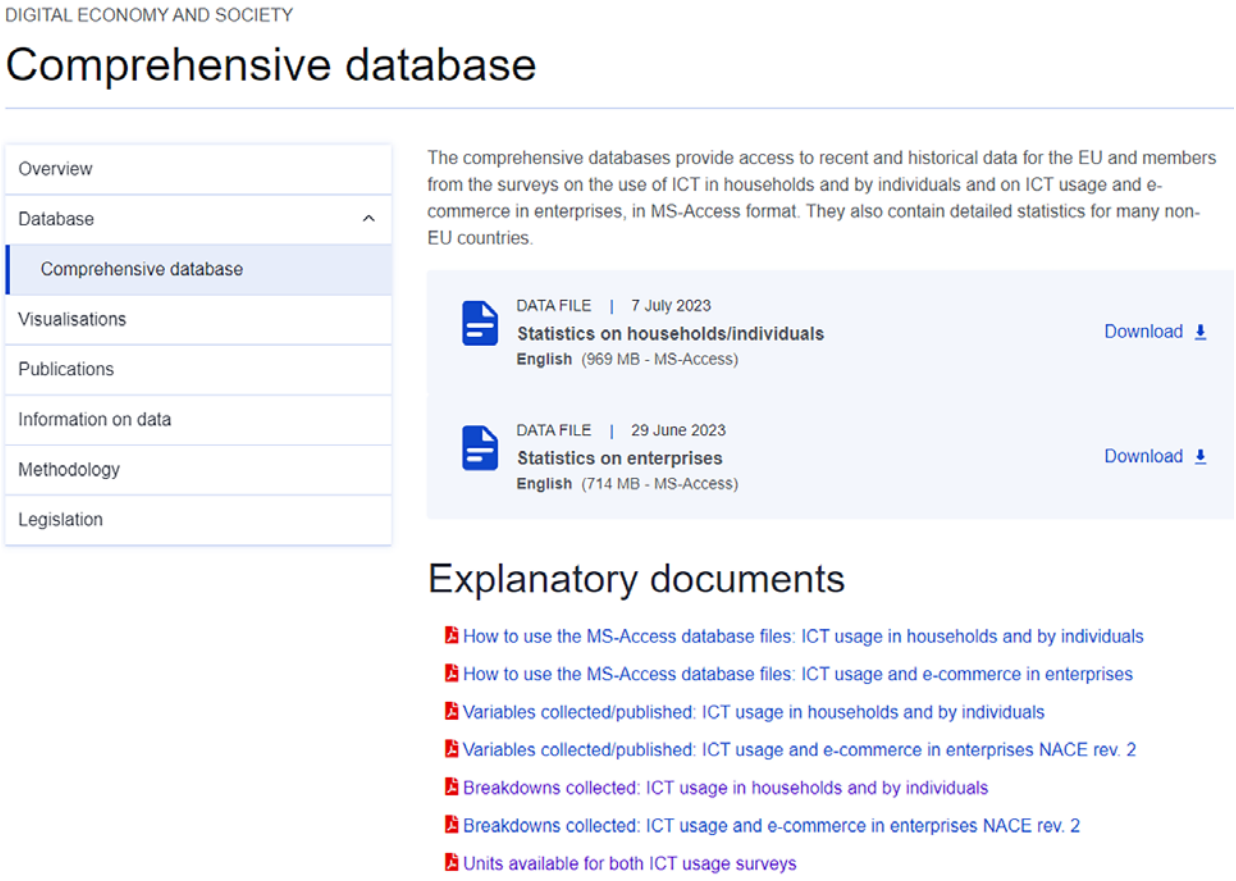
News Items

News items are displayed in reverse chronological order on the News page (accessible by clicking on 'News' in the drop-down menu anywhere in the Eurostat portal and then on News articles). They provide short texts and visuals on our data, including first data releases. From the menu on the right, the theme of interest can be selected and articles on ICT in enterprises (among other things) can be viewed.



Dedicated webpage

In addition, the complete Eurostat working database is available online along with information on the variables and breakdowns collected over time, a description of how to use the database, model questionnaires, country-specific notes, and other related information.



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Contacts EDAMIS Help Centre: (https://webgate.ec.europa.eu/edamis/helpcenter/website/index.htm).

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Eurostat Data Transmission Helpdesk: ESTAT-SUPPORT-EDAMIS@ec.europa.eu

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Validation and Transformation Language (VTL) on the SDMX website) (https://sdmx.org).

Annexes

Annex 1 - Model questionnaire

Annex 2 - Validations rules

Annex 3 - Metadata reporting template

Annex 1 - Model questionnaire

Community Survey on ICT Usage and e-commerce in Enterprises

2023

General outline of the survey

Sampling unit:	Enterprise
Scope / Target Population:	**Economic activity:** Enterprises classified in the following categories of NACE Rev. 2: - Section C – *"Manufacturing"*; - Section D, E – *"Electricity, gas, steam and air conditioning supply"* **"***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 – *"Transportation 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"*; - Group 95.1 – **"***Repair of computers and communication equipment***"** **Enterprise size:** Enterprises with 10 or more employees and self-employed persons[36]. Optional: enterprises with number of employees and self-employed persons between 0 and 9. **Geographic scope:** Enterprises located in any part of the territory of the country.
Reference period:	Where not specified respondents should consider as reference their current situation (survey period in 2023). Year 2022 for the value or % of sales data and where specified.
Recommended survey period:	First quarter 2023.

36 With the introduction of the Framework Regulation on European Business Statistics the variable "persons employed" is replaced by the variable "employees and self-employed persons". This change in the denomination of the variable does not imply any change in the scope. The two variables represent exactly the same concept. For the sake of user friendliness, the term "employees and self-employed persons" is only used in the introductory part of the questionnaire and in Module X, while in the rest of the questionnaire the term "persons employed" is used.

Sampling unit:	Enterprise
Questionnaire:	The layout of the national questionnaire should be defined by the country. However, countries should follow the order of the list of variables enclosed, if possible. The background information (Module X) should be placed at the end of the questionnaire. This information can be obtained in 3 different ways: from national registers, from Structural Business Statistics or collected directly with the ICT usage survey. Every effort should be made to obtain them from the most recent SBS survey. Countries can include additional questions.
Target respondent:	A decision maker with major responsibility for ICT-related issues in the enterprise (the ICT manager or a senior professional in the ICT department). In smaller enterprises, the respondent should be someone at the level of managing director or the owner. In any case the respondent should not be someone with responsibilities only in accounting.
Sample size, stratification:	The sampling design and the resulting sample size should be appropriate for obtaining accurate, reliable and representative results on the variables and items in the model questionnaire. This objective should be achieved for the overall proportions as well as for the proportions for the different breakdowns of the population defined below: NACE and size class. NACE breakdown and enterprise size class breakdown are not required to be cross-tabulated. This requirement aims at ensuring the collection of a complete dataset – without empty, confidential or unreliable cells – for these indicators – with an exception for those broken down by economic activity for the calculation of **European** NACE aggregates.
NACE breakdown:	**(To be applied to: all variables; enterprises with 10 or more employees and self-employed persons; whole territory of the country.)** Data should be broken down by the following NACE Rev. 2 aggregates for possible calculation of **national** NACE Rev. 2 aggregates: 1 10-33, 35-39, 41-43, 45-47, 49-53, 55-56, 58-63, 68-75, 77-82, 95.1 2 10 - 33 3 10 - 18 4 19 - 23 5 24 - 25 6 26 - 33 7 35 - 39 8 41 - 43 9 45 - 47 10 47 11 49 - 53 12 55 13 55 - 56 14 58 - 63

Sampling unit:	Enterprise
NACE breakdown:	15 68 16 69 - 75 17 77 - 82 18 26.1 - 26.4, 26.8, 46.5, 58.2, 61, 62, 63.1, 95.1 Breakdowns for which national data should be provided with the purpose of possible calculation of **European** NACE aggregates. The production and transmission of these aggregates with an accuracy that allows the release at national level is optional. The production and transmission of these aggregates with an accuracy that may not allow the release at national level (use of flag u: unreliable) but are accurate enough to be combined with other countries' aggregates to be released at European level is mandatory.) 3a 10 - 12 3b 13 - 15 3c 16 - 18 4a 19 4b 20 4c 21 4d 22 - 23 6a 26 6b 27 6c 28 6d 29 - 30 6e 31 - 33 7a 35 7b 36 - 39 9a 45 9b 46 14a 58 - 60 14b 61 14c 62 - 63 16a 69 - 71 16b 72 16c 73 - 75 17a 77 - 78 + 80 - 82 17b 79 18a 95.1

Sampling unit:	Enterprise
Size class breakdown:	**(To be applied to: all variables; aggregate of all mandatory NACE aggregates [1 to 18 defined above]; whole territory of the country.)** Data should be broken down by the following size classes according to the number of employees and self-employed persons: 1 10 or more 2 10 - 49 (small enterprises) 3 50 - 249 (medium enterprises) 4 250 or more (large enterprises) **Optional:** 5 0 - 9 6 0 - 1 7 2 - 9
Weighting of results:	Results should in general be weighted by number of enterprises. Turnover weighting should be used for sales related questions. Quantitative variables in the e-Commerce module related to sales should be weighted by total turnover. Weighting by the number of employees and self-employed persons should be applied for variables related to questions A1, A4, and for other variables e.g. % sending orders via a website or EDI-type messages, as specified in the transmission format document.
Treatment of non-response/'Do not know':	**Unit non-response:** The non-respondent units should be assumed to resemble those who have responded to the survey and be treated as non-selected units. For this, the weighting or the grossing up factors should be adjusted: the design weight N_h / n_h is replaced by N_h / m_h where N_h is the size of stratum h, n_h is the sample size in stratum h and m_h is the number of respondents in stratum h. **Item non-response:** Logical corrections should be made, when information can be deduced from other variables, and priority given to further contacts with enterprises to collect the missing information. For the categorical variables (e.g. the YES/NO questions), respondents with item non response or 'do not know' should not be imputed with values from respondents who answered the question. Numerical variables shouldn't be imputed (see also Methodological Manual).
Tabulation of results:	For the categorical variables, estimates should be made for the total number of enterprises for each response category, tabulated using the breakdowns specified above. For the quantitative variables (turnover, sales and number of employees and self-employed persons), when collected in absolute or percentage terms (and not in percentage classes), estimates should be made for the total values in absolute terms, tabulated using breakdowns as specified in the transmission format document.
Data transmission:	Results are to be sent to Eurostat following the transmission format described in a forthcoming Eurostat document.

Disclaimer: References to third-party brands, products and trademarks are for the sake of clarification and are not intended to promote the use of such products.

ICT-Ent 2023 - Model Questionnaire V 1.2 – Response burden and numbering

Module	Description	Mandatory questions	Optional questions
A	**Access and use of the internet**	**16**	**11**
	Access to the internet	*1*	*0*
	Use of a fixed connection to the internet for business purposes	*2*	*0*
	Use of a website and mobile apps	*10*	*0*
	Use of social media	*3*	*6*
	Other use of the internet	*0*	*5*
B	**e-Commerce sales**	**9**	**0**
	Web sales of goods or services	*7*	*0*
	EDI-type sales	*2*	*0*
C	**Data utilisation, sharing, analytics and trading**	**14**	**2**
	Use of business software	3	0
	Data sharing	1	0
	Data analytics	10	0
	Data trading	0	2
D	**Use of cloud computing services**	**11**	**0**
E	**Artificial Intelligence**	**14**	**14**
F	**Invoicing**	**3**	**1**
	Total number of questions/responses	**67**	**28**
X	**Background characteristics**	**3**	**0**
	Total number of questions/responses with background characteristics	**70**	**28**

COMMUNITY SURVEY ON ICT USAGE AND E-COMMERCE IN ENTERPRISES

2023

MODEL QUESTIONNAIRE VERSION 1.2

	Module A: Access and use of the internet **(Scope: all enterprises)**	
A1	**How many persons employed have access to the internet for business purposes?** (including fixed line, fixed wireless and mobile telephone network connection) (Filter question) If you can't provide this value, **please indicate an estimate of the percentage of the total number of persons employed who have access to the internet for business purposes**	*(Number)* ␣ ␣ ␣ ␣ , ␣ % If the value=0, go to **X1**
	Use of a fixed connection to the internet for business purposes	
A2.	**Does your enterprise use any type of fixed connection to the internet?** (e.g. ADSL, SDSL, VDSL, fiber optics technology (FTTP), cable technology, fixed wireless) *(Add national examples)* (Filter question)	Yes □ No □ ->go to **A4**
A3.	**What is the maximum contracted download speed of the fastest fixed internet connection of your enterprise?** ***(additional categories at national level can be added, if needed)*** *(Tick only one)*	
	a) less than 30 Mbit/s	□
	b) at least 30 but less than 100 Mbit/s	□
	c) at least 100 Mbit/s but less than 500 Mbit/s	□
	d) at least 500 Mbit/s but less than 1 Gbit/s	□
	e) at least 1 Gbit/s	□

Web presence

Use of a website

A4.	**Does your enterprise have a website?** (Filter question)	Yes □	No □ ->go to **A6**

A5.	**Does the website have any of the following?**	Yes	No
	a) Description of goods or services, price information	□	□
	b) Online ordering or reservation or booking, e.g. shopping cart	□	□
	c) Possibility for visitors to customise or design online goods or services	□	□
	d) Tracking or status of orders placed	□	□
	e) Personalised content on the website for regular/recurrent visitors	□	□
	f) A chat service for customer support (a chatbot, virtual agent or a person replying to customers)	□	□
	g) Advertisement of open job positions or online job application	□	□
	h) Content available in at least two languages Please, consider a multilingual website within a single domain (e.g. ".com") or multiple domains of your enterprise in different languages (e.g. ".es", ".uk").	□	□

Use of mobile apps

A6.	**Does your enterprise have a mobile app for clients (e.g. for loyalty program, e-commerce, customer support)?**	Yes □	No □

Use of social media

Enterprises **using** social media are considered those that have a user profile, an account or a user licence depending on the requirements and the type of the social media.

A7.	**Does your enterprise use any of the following social media?** *(add national examples; replace existing examples if necessary)*	Yes	No
	a) Social networks (e.g. Facebook, LinkedIn, Xing, Viadeo, Yammer)	□	□
	b) Enterprise's blog or microblogs (e.g. Twitter)	□	□
	c) Multimedia content sharing websites or apps (e.g. YouTube, Flickr, SlideShare, Instagram, Pinterest, Snapchat)	□	□

The following question (A8) should only be answered if any of the above social media is used (i.e. A7 has at least one "Yes"), otherwise go to A9.

A8.	**Does your enterprise use any of the above mentioned social media to:** - **optional**	Yes	No
	a) Develop the enterprise's image or market products (e.g. advertising or launching products)	☐	☐
	b) Obtain or respond to customer opinions, reviews, questions	☐	☐
	c) Involve customers in development or innovation of goods or services	☐	☐
	d) Collaborate with business partners (e.g. suppliers) or other organisations (e.g. public authorities, non-governmental organisations)	☐	☐
	e) Recruit employees	☐	☐
	f) Exchange views, opinions or knowledge within the enterprise	☐	☐

Other use of the internet

- **optional**

A9.	**Does your enterprise pay to advertise on the internet?** (e.g. adverts on search engines, on social media, on other websites or apps) (Filter question)	Yes ☐	No ☐ ->go to **B1**
A10.	**Does your enterprise pay to advertise on the internet using any of the following targeted advertising methods?**	Yes	No
	a) Based on content or keywords searched by internet users	☐	☐
	b) Based on the tracking of internet users' past activities or profile	☐	☐
	c) Based on the geolocation of internet users	☐	☐
	d) Any other method of targeted advertising on the internet not specified above	☐	☐

Module B: e-Commerce sales

(Scope: enterprises with access to the internet, i.e. if A1>0)

In e-commerce sales of goods or services, the order is placed via web sites, apps or EDI-type messages (EDI: Electronic Data interchange) by methods specifically designed for the purpose of receiving orders.

The payment may be done online or offline.

e-Commerce **does not include** orders written in e-mail.

Please report **web and EDI-type sales separately**. They are defined by the method of placing the order**:**

- WEB sales: the **customer** places the order on a website or through an app;
- EDI type sales: **an EDI-type order message is created from the business system of the customer.**

Web sales of goods or services

Web sales cover orders, bookings and reservations placed by your customers via

- your enterprise's **websites or apps:**
  - online store (webshop);
  - web forms;
  - extranet (webshop or web forms) ;
  - booking/reservation applications for services;
  - apps for mobile devices or computers;
- **e-commerce marketplace websites or apps** (used by several enterprises for trading goods or services).

Orders written in e-mail are **not** counted as web sales.

		Yes	No
B1.	**During 2022, did your enterprise have web sales of goods or services via:**		
	a) your enterprise's websites or apps? (including extranets)	☐	☐
	b) e-commerce marketplace websites or apps used by several enterprises for trading goods or services? (e.g. e-Bookers, Booking, hotels.com, eBay, Amazon, Amazon Business, Alibaba, Rakuten, TimoCom etc.)	☐	☐
	[Please add national examples of e-commerce marketplaces incl. government marketplaces]		

If both B1 a) and B1 b) = "No" then go to B5

B2. **What was the value of your web sales?**

(please refer to the provided definition of web sales)

Please answer to a) OR b)

a) What was the value of your web sales of goods or services, in 2022?	(National currency, excluding VAT) _____
OR	
b) What percentage of total turnover was generated by web sales of goods or services, in 2022?	␣ ␣ ␣ , ␣ %
If you cannot provide the exact percentage an approximation will suffice.	

	Question B3 should be answered only if both B1 a) and B1 b) = "Yes"	
B3.	**What was the percentage breakdown of the value of web sales in 2022 for the following:** (Please refer to value of web sales you reported in B2) *If you cannot provide the exact percentages an approximation will suffice.*	
	a) via your enterprise's websites or apps? (including extranets)	␣ ␣ ␣ %
	b) via e-commerce marketplace websites or apps used by several enterprises for trading goods or services? (e.g. e-Bookers, Booking, hotels.com, eBay, Amazon, Amazon Business, Alibaba, Rakuten, TimoCom etc.) *[Please add national examples of e-commerce marketplaces incl. government marketplaces]*	␣ ␣ ␣ %
	TOTAL	**100** %

B4.	**What was the percentage breakdown of the value of web sales in 2022 by type of customer:** (Please refer to value of web sales you reported in B2) *If you cannot provide the exact percentages an approximation will suffice.*	
	a) Sales to private consumers (**B2C**)	␣ ␣ ␣ %
	b) Sales to other enterprises (**B2B**) and Sales to public sector (**B2G**)	␣ ␣ ␣ %
	TOTAL	**100** %

EDI-type sales

EDI-type sales cover **orders placed** by customers via EDI-type messages (EDI: Electronic Data interchange) meaning:

- in an **agreed or standard format** suitable for automated processing;
- EDI-type order message created from the **business system** of the customer;
- including orders transmitted via EDI-service provider;
- including automatic system generated **demand driven orders**;
- including orders received directly into your **ERP** system.

Examples of EDI: EDIFACT, XML/EDI (e.g. UBL, Rosettanet, *[please add national examples]*).

B5.	**During 2022, did your enterprise have EDI-type sales of goods or services?** (Filter question)	Yes □	No □ -> go to **C1**

B6.	**What was the value of your EDI-type sales?** (please refer to the provided definition of EDI-type sales) Please answer to a) OR b)	
	a) What was the value of your EDI-type sales of goods or services, in 2022?	(National currency, excluding VAT) _____
	OR	
	b) What percentage of total turnover was generated by EDI-type sales of goods or services, in 2022? *If you cannot provide the exact percentage an approximation will suffice.*	␣ ␣ ␣ , ␣ %

Module C: Data utilisation, sharing, analytics and trading (Scope: enterprises with access to the internet, i.e. if A1>0)

Use of business software

C1.	**Does your enterprise use the following business software?**	**Yes**	**No**
	a) Enterprise Resource Planning (ERP) software Software used to manage resources by sharing information among different functional areas (e.g. accounting, planning, production, marketing,). ERP software can be off-the-shelf software, customised to the needs of the enterprise or self-created software.	□	□
	b) Customer Relationship Management (CRM) software Software for managing information about customers (e.g. relations or transactions), CRM facilitates communication with the customer and helps track customer interests, purchasing habits.	□	□
	c) Business Intelligence (BI) software BI software accesses and analyses data (e.g. from data warehouses, data lakes) from internal IT systems and external sources and presents analytical findings in reports, summaries, dashboards, graphs, charts and maps, to provide users with detailed insights for decision-making and strategic planning.	□	□

Data sharing

C2. Does your enterprise share data electronically with suppliers or customers within the supply chain (e.g. via websites or apps, EDI-systems, real-time sensors or tracking)?

This data may be exchanged via websites, networks or other means of electronic data transfer, excluding e-mails not suitable for automated processing or manually typed.

Yes □ No □

Some of the examples of data exchange: information on inventory levels, progress of deliveries, progress in service provision, demand forecasts, products availability, customer requirements, e-commerce data, information regarding production or maintenance.

Data analytics

Data analytics refers to the use of technologies, techniques or software tools for analysing data to extract patterns, trends and insights to make conclusions, predictions and better decision-making with the aim of improving performance (e.g. increase production, reduce costs). Data may be extracted from your own enterprise' data source or from external sources (e.g. suppliers, customers, government).

C3. Does your enterprise perform data analytics by own employees?

Please, consider internal and external data sources.

Yes □ No □

If Yes to question C3, then go to question C4, otherwise go to question C5.

C4.	**Does your enterprise perform data analytics on data from the following sources?**	**Yes**	**No**
	a) Data analytics on data from transaction records such as sale details, payments records (e.g. from Enterprise Resource Planning system (ERP), own webshop)	□	□
	b) Data analytics on data about customers such as customer purchasing information, location, preferences, customer reviews, searches (e.g. from Customer Relationship Management system (CRM) or own website)	□	□
	c) Data analytics on data from social media, incl. from your enterprise's own social media profiles (e.g. personal information, comments, video, audio, images)	□	□
	d) Data analytics on web data (e.g. search engine trends, web scraping* data) * use of computer program for extracting data from websites	□	□
	e) Data analytics on location data from the use of portable devices or vehicles (e.g. portable devices using mobile telephone networks, wireless connections or GPS)	□	□

	f) Data analytics on data from smart devices or sensors (e.g. Machine to Machine (M2M) communications, sensors installed in machinery, manufacturing sensors, smart meters, Radio frequency identification (RFID[37]) tags)	□	□
	g) Data analytics on government authorities' open data (e.g. enterprise public records, weather conditions, topographic conditions, transport data, housing data, buildings data)	□	□
	h) Data analytics on satellite data (e.g. satellite imagery, navigation signals, position signals) Please, include data acquired from enterprise's own infrastructure or from externally provided service (e.g. AWS Ground Station) and exclude location data from the use of portable devices or vehicles using GPS.	□	□

C5.	***Does an external enterprise or organisation perform data analytics for your enterprise?*** *Please include data analytics based on data from internal and external sources.*	Yes □	No □

	Data trading

C6.	**During 2022, did your enterprise sell (access to) any of its own data?** **- *Optional*** *e.g. data about your enterprise's customers' preferences, data from your enterprise's smart devices or sensors*	Yes □	No □
C7.	**During 2022, did your enterprise purchase (access to) any data?** **- *Optional*** *e.g. data about other enterprise's customers' preferences, data from other enterprise's smart devices or sensors*	Yes □	No □

37 A **Radio Frequency identification-RFID** tag is a device that can be applied to or incorporated into a product or an object and transmits data via radio waves.

	Module D: Use of cloud computing services (Scope: enterprises with access to the internet, i.e. if A1>0)		
	Cloud computing refers to **ICT services** that are used **over the internet** to access software, computing power, storage capacity etc.; **where the services have all of the following characteristics:** • are delivered from **servers** of service providers; • can be easily **scaled** up or down (e.g. number of users or change of storage capacity) ; • can be used **on-demand by the user,** at least after the initial set up (without human interaction with the service provider) ; • are **paid** for, either per user, by capacity used, or they are pre-paid. Cloud computing may include connections via Virtual Private Networks (VPN).		
D1.	**Does your enterprise buy any cloud computing services used over the internet?** (Please refer to the definition of cloud computing above, exclude free of charge services.) (Filter question)	Yes □	No □ -> go to **E1**
D2.	**Does your enterprise buy any of the following cloud computing services used over the internet?** (Please refer to the definition of cloud computing above, exclude free of charge services.)	**Yes**	No
	a) E-mail (as a cloud computing service)	□	□
	b) Office software (e.g. word processors, spreadsheets) (as a cloud computing service)	□	□
	c) Finance or accounting software applications (as a cloud computing service)	□	□
	d) Enterprise Resource Planning (ERP) software applications (as a cloud computing service)	□	□
	e) Customer Relationship Management (CRM) software applications (as a cloud computing service)	□	□
	f) Security software applications (e.g. antivirus program, network access control) (as a cloud computing service)	□	□
	g) Hosting the enterprise's database(s) (as a cloud computing service)	□	□
	h) Storage of files (as a cloud computing service)	□	□
	i) Computing power to run the enterprise's own software (as a cloud computing service)	□	□
	j) Computing platform providing a hosted environment for application development, testing or deployment (e.g. reusable software modules, application programming interfaces (APIs)) (as a cloud computing service)	□	□

Module E: Artificial Intelligence

(Scope: enterprises with access to the internet, i.e. if A1>0)

Artificial intelligence refers to systems that use technologies such as: **text mining, computer vision, speech recognition, natural language generation, machine learning, deep learning** to gather and/or use data to predict, recommend or decide, with varying levels of autonomy, the best action to achieve specific goals.

Artificial intelligence systems **can be purely software based**, e.g.:

- chatbots and business virtual assistants based on natural language processing;
- face recognition systems based on computer vision or speech recognition systems;
- machine translation software;
- data analysis based on machine learning, etc.;

or **embedded in devices**, e.g.:

- autonomous robots for warehouse automation or production assembly works;
- autonomous drones for production surveillance or parcel handling, etc.

E1.	**Does your enterprise use any of the following Artificial Intelligence (AI) technologies?**	**Yes**	**No**
	a) AI technologies performing analysis of written language (e.g. text mining)	☐	☐
	b) AI Technologies converting spoken language into machine-readable format (speech recognition)	☐	☐
	c) AI Technologies generating written or spoken language (natural language generation, speech synthesis)	☐	☐
	d) AI Technologies identifying objects or persons based on images or videos (image recognition, image processing)	☐	☐
	e) Machine learning (e.g. deep learning) for data analysis	☐	☐
	f) AI Technologies automating different workflows or assisting in decision making (e.g. **AI based** software robotic process automation)	☐	☐
	g) AI Technologies enabling physical movement of machines via autonomous decisions based on observation of surroundings (autonomous robots, self-driving vehicles, autonomous drones)	☐	☐

If E1 a) to g) = "No" then go to E4 (if optional included) else go to F1

E2.	**Does your enterprise use Artificial Intelligence software or systems for any of the following purposes?**	**Yes**	**No**
	a) **Use of AI for marketing or sales** some of the examples may be: • customer profiling, price optimisation, personalised marketing offers, market analysis based on machine learning • chatbots based on natural language processing for customer support • autonomous robots for orders processing	☐	☐

b) **Use of AI for production or service processes** some of the examples may be: • predictive maintenance or process optimization based on machine learning • tools to classify products or find defects in products based on computer vision • autonomous drones for production surveillance, security or inspection tasks • assembly works performed by autonomous robots	☐	☐
c) Use of **AI for organisation of business administration processes or management** some of the examples may be: • business virtual assistants based on machine learning and/or natural language processing, e.g. for document drafting • data analysis or strategic decision making based on machine learning, e.g. risk assessment, based on machine learning • planning or business forecasting based on machine learning • human resources management based on machine learning or natural language processing, e.g. candidates pre-selection screening, employee profiling or performance analysis	☐	☐
d) Use of **AI for logistics** some of the examples may be: • autonomous robots for pick-and-pack solutions in warehouses for parcel shipping, tracing, distribution or sorting • route optimization based on machine learning	☐	☐
e) Use of **AI for ICT security** some of the examples may be: • face recognition based on computer vision for authentication of ICT users • detection and prevention of cyber-attacks based on machine learning	☐	☐
f) Use of **AI for accounting, controlling or finance management** some of the examples may be: • machine learning to analyse data that helps to make financial decisions • invoice processing based on machine learning • machine learning or natural language processing for bookkeeping documents	☐	☐
g) Use of **AI for research and development (R&D) or innovation activity** (excluding research on AI) some of the examples may be: • analysis of data for conducting research, solving research problems, developing a new or significantly improved product/service based on machine learning	☐	☐

E3.	**How did you enterprise acquire the Artificial Intelligence software or systems that it uses?** **- *Optional***	**Yes**	**No**
	a) They were developed by own employees (including those employed in parent or affiliate enterprise)	□	□
	b) Commercial software or systems were modified by own employees (including those employed in parent or affiliate enterprise)	□	□
	c) Open-source software or systems were modified by own employees (including those employed in parent or affiliate enterprise)	□	□
	d) Commercial software or systems ready to use were purchased (including examples where it was already incorporated in a purchased item or system)	□	□
	e) External providers were contracted to develop or modify them	□	□

Questions E4 is presented only to respondents who answered 'No' to E1a)-g) i.e. enterprises that did not use any of the Artificial Intelligence technologies listed in question E1.

E4.	**Has your enterprise ever considered using any of the Artificial Intelligence technologies listed in question E1? – *Optional*** *(Filter question)*	Yes □	Yes □ -> go to **F1**

E5.	**What are the reasons for your enterprise not to use any of the Artificial Intelligence technologies listed in question E1? – *Optional***	**Yes**	**No**
	a) The costs seem too high	□	□
	b) There is a lack of relevant expertise in the enterprise	□	□
	c) Incompatibility with existing equipment, software or systems	□	□
	d) Difficulties with availability or quality of the necessary data	□	□
	e) Concerns regarding violation of data protection and privacy	□	□
	f) Lack of clarity about the legal consequences (e.g. liability in case of damage caused by the use of Artificial Intelligence)	□	□
	g) Ethical considerations	□	□
	h) Artificial Intelligence technologies are not useful for the enterprise	□	□

Module F: Invoicing

(Scope: enterprises with access to the internet, i.e. if A1>0)

There are invoices in **paper form** and **electronic form.** Invoices in **electronic form** are of two types:

- **E-invoices** in a standard structure **suitable for automated processing,** excluding the transmission of PDF files. They are exchanged either directly or via service operators or via an electronic banking system.
- **Invoices** in electronic form **not suitable for automated processing,** including the transmission of PDF files

F1.	**In 2022, did your enterprise send any of the following types of invoices:** *Include also invoices sent via intermediaries, e.g. accountants, e-invoice service providers* (Filter question)	**Yes**	**No**
	a) Invoices in electronic form, in a standard structure **suitable for automated processing** (e-invoices)? (EDI (e.g. EDIFACT), XML (e.g. UBL) [please add national examples]) Excluding the transmission of PDF files	☐	☐
	b) Invoices in electronic form **not suitable for automated processing?** (e.g. emails, JPEG or other format) Including the transmission of PDF files	☐	☐
	c) Paper invoices?	☐	☐

Filter – if F1a) answered with 'Yes', go to F2, otherwise go to X1.

F2.	**Concerning e-invoices: In 2022, out of all invoices your enterprise sent (in electronic or paper form) to private customers, other enterprises or public authorities, how many were e-invoices in a standard structure suitable for automated processing?** (Tick only one) ***- Optional***	
	a) Less than 10%	☐
	b) At least 10% but less than 25%	☐
	c) At least 25% but less than 50%	☐
	d) At least 50% but less than 75%	☐
	e) At least 75%	☐

Alternative

F2.bis	**Concerning e-invoices: In 2022, out of all invoices your enterprise sent (in electronic or paper form) to private customers, other enterprises or public authorities, what percentage were e-invoices in a standard structure suitable for automated processing?** (*If you cannot provide the exact percentage an approximation will suffice.*) ***- Optional***	␣ ␣ ␣ %

	Module X: Background information **(X1-X3) available in some countries from SBS, the business register or administrative data and thus not to be included; latest available information should be provided**	
X1.	**Main economic activity of the enterprise, during 2022**	. . .
X2.	**Average number of employees and self-employed persons (persons employed), during 2022**	. . .
X3.	**Total turnover (in monetary terms, excluding VAT), for 2022**	. . .

Community Survey on ICT Usage and e-Commerce in Enterprises

Glossary

App(s)	A mobile app, short for mobile application or just app, is application software designed for a specific purpose (e.g. entertainment, shopping, etc.), downloaded and used on computers depending on their operating system (e.g. portable devices such as tablets, Smartphones, etc.) Further information: http://en.wikipedia.org/wiki/Mobile_app; http://www.techopedia.com/definition/2953/mobile-application-mobile-app
Authentication methods	Authentication is a way to ascertain that a user is who they claim to be. This is usually performed by presenting one or more challenges to the user. There are three broad categories of challenges: 1) Something the user knows. The user is asked for a secret, known only to her. Typical examples are passwords and PINs, but can also take the form of security questions. 2) Something the user has. The user is in possession of a unique token, like a key. In the case of computer tokens, this can take the form of an NFC tag, or a device. 3) Something the user is. Aka biometrics. The user is asked to present a part of her body that forms unique and repeatable patterns, like fingerprints, voice, or face recognition. Source: https://www.enisa.europa.eu/topics/csirts-in-europe/glossary/authentication-methods
Business process	A business process or business method is a collection of related, structured activities or tasks that produce a specific service or product (serve a particular goal) for a particular customer or customers. Business processes can be of three types: *Management processes* (e.g. corporate governance, strategic management), *Operational processes* (e.g. purchasing, manufacturing, marketing and sales etc) and *Supporting processes* (e.g. accounting, recruitment, technical support etc). Source: http://en.wikipedia.org/wiki/Business_process
Chatbots or Virtual agent	A chatbot or virtual agent is a computer generated, animated, artificial intelligence virtual character that serves as an online customer service representative.
Computer Vision	Computer vision tasks include methods for acquiring, processing, analysing and understanding digital images, and extraction of high-dimensional data from the real world in order to produce numerical or symbolic information, e.g. in the forms of decisions. Source: https://en.wikipedia.org/wiki/Computer_vision
Cloud computing	Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. There are three service models of cloud computing services: Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). Source: https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

CRM	Customer Relationship Management (CRM) is a management methodology which places the customer at the centre of the business activity, based in an intensive use of information technologies to collect, integrate, process and analyse information related to the customers. One can distinguish between: 1. Operational CRM – Integration of the front office business processes that are in contact with the customer. 2. Analytical CRM – Analysis, through data mining, of the information available in the enterprise on its customers. This aims to gather in depth knowledge of the customer and how to answer to its needs.
DSL	Digital Subscriber Line (DSL) is a family of technologies that provides digital data transmission over the wires of a local telephone network. DSL is widely understood to mean Asymmetric Digital Subscriber Line (ADSL), the most commonly installed technical varieties of DSL. DSL service is delivered simultaneously with regular telephone on the same telephone line as it uses a higher frequency band that is separated by filtering. Source: http://en.wikipedia.org/wiki/DSL
EDI, EDI-type	Electronic Data Interchange (EDI) refers to the structured transmission of data or documents between organizations or enterprises by electronic means. It also refers specifically to a family of standards (EDI-type) and EDI-type messages suitable for automated processing. Source: http://en.wikipedia.org/wiki/Electronic_Data_Interchange
EDI e-commerce	Orders initiated with EDI-type messages. EDI (electronic data interchange) is an e-business tool for exchanging different kinds of business messages. EDI is here used as a generic term for sending or receiving business information in an agreed format suitable for automated processing (e.g. EDIFACT, XML, etc.) and without the individual message being manually typed. "EDI e-commerce" is limited to EDI messages placing an order. Source: OECD, DSTI/ICCP/IIS(2009)5/FINAL
Electronic commerce (e-Commerce)	An e-commerce transaction is the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders. The goods or services are ordered by those methods, but the payment and the ultimate delivery of the goods or services do not have to be conducted online. An e-commerce transaction can be between enterprises, households, individuals, governments, and other public or private organisations. e-Commerce comprises orders made in Web pages or apps, extranet or EDI and excludes orders made by telephone calls, facsimile, or manually typed e-mail. The type is defined by the method of making the order. Source: OECD, DSTI/ICCP/IIS(2009)5/FINAL
E-mail	Electronic transmission of messages, including text and attachments, from one computer to another located within or outside of the organisation. This includes electronic mail by internet or other computer networks.

ERP	Enterprise Resource Planning (ERP) consists of one or of a set of software applications that integrate information and processes across the several business functions of the enterprise. Typically ERP integrates planning, procurement, sales, marketing, customer relationship, finance and human resources. ERP software can be customised or package software. These latter are single-vendor, enterprise wide, software packages, but they are built in a modular way allowing enterprises to customise the system to their specific activity implementing only some of those modules. ERP systems typically have the following characteristics: 1. are designed for client server environment (traditional or web-based); 2. integrate the majority of a business's processes; 3. process a large majority of an organization's transactions; 4. use enterprise-wide database that stores each piece of data only once; 5. allow access to the data in real time.
Extranet	A closed network that uses internet protocols to securely share enterprise's information with suppliers, vendors, customers or other businesses partners. It can take the form of a secure extension of an Intranet that allows external users to access some parts of the enterprise's Intranet. It can also be a private part of the enterprise's website, where business partners can navigate after being authenticated in a login page.
GPS	The Global Positioning System (GPS) is a satellite-based radionavigation system. Is one of the global network of satellites that enable satellite navigation through GPS signals. GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites can determine location, time, and velocity using this information. Source: https://en.wikipedia.org/wiki/Global_Positioning_System, https://en.wikipedia.org/wiki/GPS_signals
Internet	The internet is a global system of interconnected computer networks that use the standard internet Protocol Suite (TCP/IP) to serve billions of users worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks of local to global scope that are linked by a broad array of electronic and optical networking technologies. The internet carries a vast array of information resources and services, most notably the inter-linked hypertext documents of the World Wide Web (WWW) and the infrastructure to support electronic mail. Source: http://en.wikipedia.org/wiki/internet Relates to internet Protocol based networks: www, Extranet over the internet, EDI over the internet, internet-enabled mobile phones.
Marketplace(s) **(e-Commerce marketplaces)**	The term "e-commerce marketplaces" refers to websites or apps used by several enterprises for trading products e.g. Booking, eBay, Amazon, Amazon Business, Alibaba, Rakuten, etc.). e-Commerce marketplaces are different from e-commerce platforms. The latter provide scalable, self-made online solutions for business that would like to set up their own e-commerce website.

Machine learning (incl. deep learning)	Machine learning (e.g. deep learning) involves 'training' a computer model to better perform an automated task, e.g. pattern recognition.
Natural language generation (NLG)	Natural language generation is the ability for a computer program to convert data into natural language representation.
Natural language processing (NLP)	Natural language processing is the ability for a computer program to understand human language as it is spoken.
Office (automation) software	Office (automation) software is a generic type of software comprising (grouped together) usually a word processing package, a spreadsheet, presentations' software etc.
Online payment	An online payment is an integrated ordering-payment transaction.
Robots -Robotics	According to their intended application, robots may be industrial or service robots. An industrial robot is an automatically controlled, reprogrammable, multipurpose manipulator programmable in three or more axes, which may be either fixed in place or mobile for use in industrial automation applications. A service robot is a machine that has a degree of autonomy and is able to operate in complex and dynamic environment that may require interaction with persons, objects or other devices, excluding its use in industrial automation applications.
Robotic process automation (Artificial Intelligence based)	Artificial Intelligence based robotic process automation refers to software that automates business processes (e.g. workflows automation) based on Artificial Intelligence technologies.
Sales via website (web sales)	Web sales are sales made via an online store (webshop), via web forms on a website or extranet, or apps. Web sales are distinguished from EDI sales. In particular, the type of e-commerce transaction is defined by the method of making the order. This approach should mitigate the interpretation problems where both types, EDI and Web, are used in the process. An example is a situation where an order is made by the customer through a web application but the information is transmitted to the seller as an EDI-type message. Here the type of selling application is however web; EDI is only a business application to transmit information about the sale. Web sales can be done by mobile phones using an internet browser. Source: OECD, DSTI/ICCP/IIS(2009)5/FINAL

Social media	In the context of the ICT usage survey, the central point of the social media is to establish and maintain social relationships within and around the enterprise. From that aspect we refer to the use of social media (as applications based on internet technology or communication platforms) and the use of Web 2.0 technologies and tools for connecting, conversing and creating content online, with customers, suppliers, or other partners, or within the enterprise. It is not simply the use of Web 2.0 platform (although it is the enabling technology) but the use of social media implies the development of new forms of collaboration and information management within the enterprises as well as helping employees, customers and suppliers to collaborate, to innovate, to share, and to organize knowledge and experiences. The following are the main social media communication platforms and tools for enterprises: Social networks or websites are applications based on internet technologies that enable users to connect by creating personal information profiles, share interest and/or activities, share ideas, invite others to have access to their profile and create communities of people with common interests. **Blogs**: A blog is a website or a part of a website, that is updated frequently, either owned by individuals, interest groups of individuals or corporate (in the current context it is the blog of the enterprise and not other blogs to which employees contribute). An update (called an entry or a post) is usually quite short and readers can respond, share, comment or link to the entry online. Blogs can be used either within an enterprise (corporate blog) or for communicating with customers, business partners or other organisations. **Content communities** offer the possibility of sharing media content between users. Photo and video services / Podcasting: A podcast (or non-streamed webcast) is a series of digital media files (either audio or video in various file format e.g. .aiff, .wav, .midi etc for the former and .mov, .avi etc for the latter) that are released episodically. The mode of delivery differentiates podcasting from other means of accessing media files over the internet, such as direct download, or streamed webcasting. Presentation sharing websites offer the possibility to share presentations, documents and professional videos over the internet (share publicly or privately among colleagues, clients, intranets, networks etc). These websites offer the possibility to upload, update and access presentations and/or documents. Very often, presentation sharing websites are linked to blogs and other social networking services or websites. **Microblogging** refers to the posting of very short updates about oneself. It is in contrast to long-form blogging, where there are usually at least a few hundred words. Microblog posts usually involve a few hundred characters or less. For example, in the context of microblogging services Tweets (Twitter) are text-based posts of up to 140 characters displayed on the user's profile page.
Speech recognition	Speech recognition is the ability of a machine or program to identify words and phrases in spoken language and convert them to a machine-readable format.
Text mining	Text mining refers to the use of advanced techniques for automated detection of patterns in (large) texts.

VPN	A virtual private network (VPN) extends a private network across a public network, and enables users to send and receive data across shared or public networks as if their computing devices were directly connected to the private network. Applications running on a computing device, e.g., a laptop, desktop, smartphone, across a VPN may therefore benefit from the functionality, security, and management of the private network. Encryption is a common, though not an inherent, part of a VPN connection. Source: https://en.wikipedia.org/wiki/Virtual_private_network
Web e-commerce	Web (e-commerce) sales are sales made via an online store (webshop), via web forms on a website or extranet, or apps regardless of how the web is accessed (computer, laptop, mobile phone etc.) Source: OECD, DSTI/ICCP/IIS(2009)5/FINAL
Website	Location on the World Wide Web identified by a Web address (e.g.: http://www.). Collection of Web pages on a particular subject that includes a home page which normally allows the access to the other web pages. Information is encoded with specific languages (e.g. Hypertext mark-up language (HTML), XML, Java) readable with a Web browser, like e.g. Microsoft Edge, Internet Explorer, Google Chrome, Mozilla Firefox, Safari. All publicly accessible websites collectively constitute the World Wide Web. There are also private websites that can only be accessed on a private network, such as a company's internal website for its employees. An own website, created by the enterprise, allows this enterprise to customize the content, design and features of the website. It is irrelevant whether this website is made available via the enterprise's own or a third party's IT infrastructure.
Wi-Fi	Wi-Fi (or Wi-fi, WiFi, Wifi, wifi), short for 'Wireless Fidelity', is a set of ethernet standards for wireless local area networks (WLAN) currently based on the IEEE 802.11 specifications. New standards beyond the 802.11 specifications, such as 802.16 have been developed. Wi-Fi was intended to be used for wireless devices and LANs, but is now often used for internet access (one of the main international standards for wireless broadband internet access and networking, with widespread use in business, homes and public spaces). It is based on radio signals with a frequency of 2.4 GHz and theoretically capable of speeds of over 54 Mbit/s. It enables a person with a wireless-enabled computer or personal digital assistant to connect to the internet when close to an access point called a hotspot.
xDSL	Digital Subscriber Line. DSL technologies are designed to increase bandwidth available over standard copper telephone wires. Includes IDSL, HDSL, SDSL, ADSL, RADSL, VDSL, DSL-Lite.
XML	The Extensible Markup Language is a markup language for documents containing structured information. Structured information contains both content (words, pictures, etc.) and some indication of what role that content plays (for example, content in a section heading has a different meaning from content in a footnote, which means something different than content in a figure caption or content in a database table, etc.). Almost all documents have some structure. A markup language is a mechanism to identify structures in a document. The XML specification defines a standard way to add markup to documents. Source: http://www.xml.com/

Annex 2 - Validations rules

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	ACTIVITY	byNaceEU	C10T12 <= C10T18
Sdmxe	*	ACTIVITY	byNaceEU	C10T12 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	C10T12 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	C13T15 <= C10T18
Sdmxe	*	ACTIVITY	byNaceEU	C13T15 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	C13T15 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	C16T18 <= C10T18
Sdmxe	*	ACTIVITY	byNaceEU	C16T18 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	C16T18 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	C19 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	C19 <= C19T23
Sdmxe	*	ACTIVITY	byNaceEU	C19 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	C19T23 = C19 + C20 + C21 + C22_23
Sdmxe	*	ACTIVITY	byNaceEU	C20 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	C20 <= C19T23
Sdmxe	*	ACTIVITY	byNaceEU	C20 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	C21 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	C21 <= C19T23
Sdmxe	*	ACTIVITY	byNaceEU	C21 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	C22_23 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	C22_23 <= C19T23
Sdmxe	*	ACTIVITY	byNaceEU	C22_23 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	C26 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	C26 <= C26T33
Sdmxe	*	ACTIVITY	byNaceEU	C26 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	C27 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	C27 <= C27_28
Sdmxe	*	ACTIVITY	byNaceEU	C27 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	C27_28 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	C27_28 <= C26T33

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	ACTIVITY	byNaceEU	C27_28 = C27 + C28
Sdmxe	*	ACTIVITY	byNaceEU	C27_28 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	C28 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	C28 <= C27_28
Sdmxe	*	ACTIVITY	byNaceEU	C28 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	C29_30 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	C29_30 <= C26T33
Sdmxe	*	ACTIVITY	byNaceEU	C29_30 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	C31T33 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	C31T33 <= C26T33
Sdmxe	*	ACTIVITY	byNaceEU	C31T33 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	D35 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	D35 <= D35TE39
Sdmxe	*	ACTIVITY	byNaceEU	D35 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	D35TE39 = D35 + E36T39
Sdmxe	*	ACTIVITY	byNaceEU	E36T39 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	E36T39 <= D35TE39
Sdmxe	*	ACTIVITY	byNaceEU	E36T39 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	G45 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	G45 <= G45T47
Sdmxe	*	ACTIVITY	byNaceEU	G45 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	G46 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	G46 <= G45T47
Sdmxe	*	ACTIVITY	byNaceEU	G46 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	G47 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	G47 <= G45T47
Sdmxe	*	ACTIVITY	byNaceEU	G47 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	J58T60 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	J58T60 <= J58T63
Sdmxe	*	ACTIVITY	byNaceEU	J58T60 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	J61 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	J61 <= J58T63

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	ACTIVITY	byNaceEU	J61 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	J62_63 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	J62_63 <= J58T63
Sdmxe	*	ACTIVITY	byNaceEU	J62_63 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	M69T71 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	M69T71 <= M69T75
Sdmxe	*	ACTIVITY	byNaceEU	M69T71 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	M69T75 = M69T71 + M72 + M73T75
Sdmxe	*	ACTIVITY	byNaceEU	M72 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	M72 <= M69T75
Sdmxe	*	ACTIVITY	byNaceEU	M72 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	M73T75 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	M73T75 <= M69T75
Sdmxe	*	ACTIVITY	byNaceEU	M73T75 >= 0
Sdmxe	*	ACTIVITY	byNaceEU	N77T82X79 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceEU	N77T82X79 <= N77T82
Sdmxe	*	ACTIVITY	byNaceEU	N77T82X79 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	C10T18 <= C10T33
Sdmxe	*	ACTIVITY	byNaceNat	C10T18 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	C10T18 = C10T12 + C13T15 + C16T18
Sdmxe	*	ACTIVITY	byNaceNat	C10T18 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	C10T33 <= C10TF43
Sdmxe	*	ACTIVITY	byNaceNat	C10T33 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	C10T33 = C10T18 + C19T23 + C24_25 + C26T33
Sdmxe	*	ACTIVITY	byNaceNat	C10T33 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	C10TE39 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	C10TE39 = C10T33 + D35TE39
Sdmxe	*	ACTIVITY	byNaceNat	C10TE39 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	C10TF43 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	C10TF43 = C10T33 + D35TE39 + F41T43
Sdmxe	*	ACTIVITY	byNaceNat	C10TF43 >= 0

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	ACTIVITY	byNaceNat	C10TS951XK >= 0
Sdmxe	*	ACTIVITY	byNaceNat	C19T23 <= C10T33
Sdmxe	*	ACTIVITY	byNaceNat	C19T23 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	C19T23 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	C24_25 <= C10T33
Sdmxe	*	ACTIVITY	byNaceNat	C24_25 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	C24_25 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	C26T33 <= C10T33
Sdmxe	*	ACTIVITY	byNaceNat	C26T33 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	C26T33 = C26 + C27_28 + C29_30 + C31T33
Sdmxe	*	ACTIVITY	byNaceNat	C26T33 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	D35TE39 <= C10TF43
Sdmxe	*	ACTIVITY	byNaceNat	D35TE39 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	D35TE39 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	F41T43 <= C10TF43
Sdmxe	*	ACTIVITY	byNaceNat	F41T43 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	F41T43 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	G45T47 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	G45T47 <= G45TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	G45T47 = G45 + G46 + G47
Sdmxe	*	ACTIVITY	byNaceNat	G45T47 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	H49T53 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	H49T53 <= G45TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	H49T53 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	I55 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	I55 <= G45TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	I55 <= I55_56
Sdmxe	*	ACTIVITY	byNaceNat	I55 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	I55_56 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	I55_56 <= G45TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	I55_56 >= 0

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	ACTIVITY	byNaceNat	ICT_T <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	ICT_T <= C26T33 + G45T47 + J58T63 + S951
Sdmxe	*	ACTIVITY	byNaceNat	ICT_T >= 0
Sdmxe	*	ACTIVITY	byNaceNat	J58T63 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	J58T63 <= G45TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	J58T63 = J58T60 + J61 + J62_63
Sdmxe	*	ACTIVITY	byNaceNat	J58T63 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	L68 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	L68 <= G45TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	L68 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	L68TM75 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	L68TM75 <= G45TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	L68TM75 = L68 + M69T75
Sdmxe	*	ACTIVITY	byNaceNat	L68TM75 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	M69T75 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	M69T75 <= G45TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	M69T75 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	N77T82 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	N77T82 <= G45TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	N77T82 = N77T82X79 + N79
Sdmxe	*	ACTIVITY	byNaceNat	N77T82 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	N79 <= N77T82
Sdmxe	*	ACTIVITY	byNaceNat	N79 >= 0
Sdmxe	*	ACTIVITY	byNaceNat	S951 <= C10TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	S951 <= G45TS951XK
Sdmxe	*	ACTIVITY	byNaceNat	S951 >= 0
Sdmxe	*	ACTIVITY	Total	C10TS951XK = C10T18 + C19T23 + C24_25 + C26T33 + D35TE39 + F41T43 + G45T47 + H49T53 + I55_56 + J58T63 + L68 + M69T75 + N77T82 + S951
Sdmxe	*	ACTIVITY	Total	C10TS951XK = C10TF43 + G45TS951XK

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	ACTIVITY	Total	G45TS951XK = G45T47 + H49T53 + I55_56 + J58T63 + L68 + M69T75 + N77T82 + S951
Sdmxe	*	ACTIVITY	Total	G45TS951XK >= 0
Sdmxe	*	INDICATOR	back	empl <= 25000000
Sdmxe	*	INDICATOR	back	ent <= 5000000
Sdmxe	*	INDICATOR	back	ent_sample <= ent
Sdmxe	*	INDICATOR	back	tovt <= 10000000
Sdmxe	*	INDICATOR	a01	e_iuse <= ent
Sdmxe	*	INDICATOR	a01	e_iuse_ge10a <= e_iuse
Sdmxe	*	INDICATOR	a01	e_iuse_gt10 <= e_iuse
Sdmxe	*	INDICATOR	a01	e_iuse_gt50 <= e_iuse_gt10
Sdmxe	*	INDICATOR	a02	e_fixbb <= e_iuse
Sdmxe	*	INDICATOR	a02	e_fixbbx <= e_iuse
Sdmxe	*	INDICATOR	a02	e_fixbbz <= e_iuse
Sdmxe	*	INDICATOR	a02	e_iuse = e_fixbb + e_fixbbx + e_fixbbz
Sdmxe	*	INDICATOR	a02	e_iuse >= e_fixbb + e_fixbbx + e_fixbbz
Sdmxe	*	INDICATOR	a03	e_fixbb = e_ispdf_lt30 + e_ispdf1_30_100 + e_ispdf_100_500 + e_ispdf_500_1G + e_ispdf_ge1G
Sdmxe	*	INDICATOR	a03	e_fixbb >= e_ispdf_lt30 + e_ispdf1_30_100 + e_ispdf_100_500 + e_ispdf_500_1G + e_ispdf_ge1G
Sdmxe	*	INDICATOR	a03	e_ispdf_100_500 <= e_fixbb
Sdmxe	*	INDICATOR	a03	e_ispdf_500_1G <= e_fixbb
Sdmxe	*	INDICATOR	a03	e_ispdf_ge1G <= e_fixbb
Sdmxe	*	INDICATOR	a03	e_ispdf_lt30 <= e_fixbb
Sdmxe	*	INDICATOR	a03	e_ispdf1_30_100 <= e_fixbb
Sdmxe	*	INDICATOR	a03	e_ispdf1_ge100 <= e_fixbb
Sdmxe	*	INDICATOR	a03	e_ispdf1_ge100 = e_ispdf_100_500 + e_ispdf_500_1G + e_ispdf_ge1G
Sdmxe	*	INDICATOR	a03	e_ispdf1_ge30 <= e_fixbb

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	a03	e_ispdf1_ge30 = e_ispdf1_30_100 + e_ispdf_100_500 + e_ispdf_500_1G + e_ispdf_ge1G
Sdmxe	*	INDICATOR	a04	e_iuse = e_web + e_webx
Sdmxe	*	INDICATOR	a04	e_iuse >= e_web + e_webx
Sdmxe	*	INDICATOR	a04	e_web <= e_iuse
Sdmxe	*	INDICATOR	a04	e_webx <= e_iuse
Sdmxe	*	INDICATOR	a04	e_webz <= e_iuse
Sdmxe	*	INDICATOR	a05	e_web = e_webacc + e_webaccx
Sdmxe	*	INDICATOR	a05	e_web = e_webcht + e_webchtx
Sdmxe	*	INDICATOR	a05	e_web = e_webctm + e_webctmx
Sdmxe	*	INDICATOR	a05	e_web = e_weblang + e_weblangx
Sdmxe	*	INDICATOR	a05	e_web = e_webord + e_webordx
Sdmxe	*	INDICATOR	a05	e_web = e_webot + e_webotx
Sdmxe	*	INDICATOR	a05	e_web = e_webper + e_webperx
Sdmxe	*	INDICATOR	a05	e_web = e_webvac + e_webvacx
Sdmxe	*	INDICATOR	a05	e_web >= e_webacc + e_webaccx
Sdmxe	*	INDICATOR	a05	e_web >= e_webcht + e_webchtx
Sdmxe	*	INDICATOR	a05	e_web >= e_webctm + e_webctmx
Sdmxe	*	INDICATOR	a05	e_web >= e_weblang + e_weblangx
Sdmxe	*	INDICATOR	a05	e_web >= e_webord + e_webordx
Sdmxe	*	INDICATOR	a05	e_web >= e_webot + e_webotx
Sdmxe	*	INDICATOR	a05	e_web >= e_webper + e_webperx
Sdmxe	*	INDICATOR	a05	e_web >= e_webvac + e_webvacx
Sdmxe	*	INDICATOR	a05	e_web1_ge1 <= e_web
Sdmxe	*	INDICATOR	a05	e_web1_ge1 <= e_webacc + e_webord + e_webctm + e_webot + e_webper + e_webcht + e_webvac + e_weblang
Sdmxe	*	INDICATOR	a05	e_web1_ge2 <= e_web
Sdmxe	*	INDICATOR	a05	e_web1_ge2 <= e_web1_ge1
Sdmxe	*	INDICATOR	a05	e_web1_ge3 <= e_web
Sdmxe	*	INDICATOR	a05	e_web1_ge3 <= e_web1_ge2
Sdmxe	*	INDICATOR	a05	e_webacc <= e_web

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	a05	e_webacc <= e_web1_ge1
Sdmxe	*	INDICATOR	a05	e_webacc <= e_webf2
Sdmxe	*	INDICATOR	a05	e_webaccx <= e_web
Sdmxe	*	INDICATOR	a05	e_webcht <= e_web
Sdmxe	*	INDICATOR	a05	e_webcht <= e_web1_ge1
Sdmxe	*	INDICATOR	a05	e_webchtx <= e_web
Sdmxe	*	INDICATOR	a05	e_webctm <= e_web
Sdmxe	*	INDICATOR	a05	e_webctm <= e_web1_ge1
Sdmxe	*	INDICATOR	a05	e_webctm <= e_webf2
Sdmxe	*	INDICATOR	a05	e_webctmx <= e_web
Sdmxe	*	INDICATOR	a05	e_webf2 <= e_web
Sdmxe	*	INDICATOR	a05	e_webf2 <= e_webacc + e_webctm + e_webot + e_webper
Sdmxe	*	INDICATOR	a05	e_webf3 <= e_web
Sdmxe	*	INDICATOR	a05	e_webf3 <= e_webf2
Sdmxe	*	INDICATOR	a05	e_webf3 <= e_webord
Sdmxe	*	INDICATOR	a05	e_weblang <= e_web
Sdmxe	*	INDICATOR	a05	e_weblang <= e_web1_ge1
Sdmxe	*	INDICATOR	a05	e_weblangx <= e_web
Sdmxe	*	INDICATOR	a05	e_webord <= e_web
Sdmxe	*	INDICATOR	a05	e_webord <= e_web1_ge1
Sdmxe	*	INDICATOR	a05	e_webordx <= e_web
Sdmxe	*	INDICATOR	a05	e_webot <= e_web
Sdmxe	*	INDICATOR	a05	e_webot <= e_web1_ge1
Sdmxe	*	INDICATOR	a05	e_webot <= e_webf2
Sdmxe	*	INDICATOR	a05	e_webotx <= e_web
Sdmxe	*	INDICATOR	a05	e_webper <= e_web
Sdmxe	*	INDICATOR	a05	e_webper <= e_web1_ge1
Sdmxe	*	INDICATOR	a05	e_webper <= e_webf2
Sdmxe	*	INDICATOR	a05	e_webperx <= e_web
Sdmxe	*	INDICATOR	a05	e_webvac <= e_web
Sdmxe	*	INDICATOR	a05	e_webvac <= e_web1_ge1

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	a05	e_webvacx <= e_web
Sdmxe	*	INDICATOR	a06	e_iuse = e_mobapp + e_mobappx
Sdmxe	*	INDICATOR	a06	e_iuse >= e_mobapp + e_mobappx
Sdmxe	*	INDICATOR	a06	e_mobapp <= e_iuse
Sdmxe	*	INDICATOR	a06	e_mobappx <= e_iuse
Sdmxe	*	INDICATOR	a06a04	e_web_mobapp <= e_mobapp
Sdmxe	*	INDICATOR	a06a04	e_web_mobapp <= e_web
Sdmxe	*	INDICATOR	a07	e_iuse = e_sm1_blog + e_sm1_ blogx
Sdmxe	*	INDICATOR	a07	e_iuse = e_sm1_cntshr + e_sm1_ cntshrx
Sdmxe	*	INDICATOR	a07	e_iuse = e_sm1_snet + e_sm1_snetx
Sdmxe	*	INDICATOR	a07	e_iuse >= e_sm1_blog + e_sm1_ blogx
Sdmxe	*	INDICATOR	a07	e_iuse >= e_sm1_cntshr + e_sm1_ cntshrx
Sdmxe	*	INDICATOR	a07	e_iuse >= e_sm1_snet + e_sm1_ snetx
Sdmxe	*	INDICATOR	a07	e_sm1_1 <= e_iuse
Sdmxe	*	INDICATOR	a07	e_sm1_1 <= e_sm1_any
Sdmxe	*	INDICATOR	a07	e_sm1_2 <= e_iuse
Sdmxe	*	INDICATOR	a07	e_sm1_2 <= e_sm1_any
Sdmxe	*	INDICATOR	a07	e_sm1_2 <= e_sm1_ge2
Sdmxe	*	INDICATOR	a07	e_sm1_3 <= e_iuse
Sdmxe	*	INDICATOR	a07	e_sm1_3 <= e_sm1_any
Sdmxe	*	INDICATOR	a07	e_sm1_3 <= e_sm1_ge2
Sdmxe	*	INDICATOR	a07	e_sm1_any <= e_iuse
Sdmxe	*	INDICATOR	a07	e_sm1_any <= e_sm1_snet + e_ sm1_blog + e_sm1_cntshr
Sdmxe	*	INDICATOR	a07	e_sm1_any = e_sm1_1 + e_sm1_ge2
Sdmxe	*	INDICATOR	a07	e_sm1_blog <= e_iuse
Sdmxe	*	INDICATOR	a07	e_sm1_blog <= e_sm1_any
Sdmxe	*	INDICATOR	a07	e_sm1_blogx <= e_iuse
Sdmxe	*	INDICATOR	a07	e_sm1_cntshr <= e_iuse

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	a07	e_sm1_cntshr <= e_sm1_any
Sdmxe	*	INDICATOR	a07	e_sm1_cntshrx <= e_iuse
Sdmxe	*	INDICATOR	a07	e_sm1_ge2 <= e_iuse
Sdmxe	*	INDICATOR	a07	e_sm1_ge2 <= e_sm1_any
Sdmxe	*	INDICATOR	a07	e_sm1_ge2 = e_sm1_2 + e_sm1_3
Sdmxe	*	INDICATOR	a07	e_sm1_snet <= e_iuse
Sdmxe	*	INDICATOR	a07	e_sm1_snet <= e_sm1_any
Sdmxe	*	INDICATOR	a07	e_sm1_snetx <= e_iuse
Sdmxe	*	INDICATOR	a07a04	e_web_sm1_any <= e_iuse
Sdmxe	*	INDICATOR	a07a04	e_web_sm1_any <= e_sm1_any
Sdmxe	*	INDICATOR	a07a04	e_web_sm1_any <= e_web
Sdmxe	*	INDICATOR	a07a06a04	e_web_ma_sm1_any <= e_iuse
Sdmxe	*	INDICATOR	a07a06a04	e_web_ma_sm1_any <= e_mobapp
Sdmxe	*	INDICATOR	a07a06a04	e_web_ma_sm1_any <= e_sm1_any
Sdmxe	*	INDICATOR	a07a06a04	e_web_ma_sm1_any <= e_web
Sdmxe	*	INDICATOR	a08	e_sm_padvert <= e_sm_pany
Sdmxe	*	INDICATOR	a08	e_sm_padvert <= e_sm_pcu
Sdmxe	*	INDICATOR	a08	e_sm_padvert <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_padvertx <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pany <= e_sm_padvert + e_sm_pcuqor + e_sm_pcudev + e_sm_pbpcoll + e_sm_prcr + e_sm_pexchvok
Sdmxe	*	INDICATOR	a08	e_sm_pany <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pbpcoll <= e_sm_pany
Sdmxe	*	INDICATOR	a08	e_sm_pbpcoll <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pbpcollx <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pbpcu <= e_sm_pbpcoll
Sdmxe	*	INDICATOR	a08	e_sm_pbpcu <= e_sm_pcu
Sdmxe	*	INDICATOR	a08	e_sm_pbpcu <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pbpncu <= e_sm_padvertx
Sdmxe	*	INDICATOR	a08	e_sm_pbpncu <= e_sm_pbpcoll
Sdmxe	*	INDICATOR	a08	e_sm_pbpncu <= e_sm_pcudevx

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	a08	e_sm_pbpncu <= e_sm_pcuqorx
Sdmxe	*	INDICATOR	a08	e_sm_pbpncu <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pcu <= e_sm_padvert + e_sm_pcuqor + e_sm_pcudev
Sdmxe	*	INDICATOR	a08	e_sm_pcu <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pcudev <= e_sm_pany
Sdmxe	*	INDICATOR	a08	e_sm_pcudev <= e_sm_pcu
Sdmxe	*	INDICATOR	a08	e_sm_pcudev <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pcudevx <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pcuq_pndev <= e_sm_pbpcollx
Sdmxe	*	INDICATOR	a08	e_sm_pcuq_pndev <= e_sm_pcudevx
Sdmxe	*	INDICATOR	a08	e_sm_pcuq_pndev <= e_sm_pexchvokx
Sdmxe	*	INDICATOR	a08	e_sm_pcuq_pndev <= e_sm_prcrx
Sdmxe	*	INDICATOR	a08	e_sm_pcuq_pndev <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pcuqor <= e_sm_pany
Sdmxe	*	INDICATOR	a08	e_sm_pcuqor <= e_sm_pcu
Sdmxe	*	INDICATOR	a08	e_sm_pcuqor <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pcuqorx <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pexchvok <= e_sm_pany
Sdmxe	*	INDICATOR	a08	e_sm_pexchvok <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pexchvokq <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_pexchvokx <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_prcr <= e_sm_pany
Sdmxe	*	INDICATOR	a08	e_sm_prcr <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm_prcrx <= e_sm1_any
Sdmxe	*	INDICATOR	a08	e_sm1_any = e_sm_padvert + e_sm_padvertx
Sdmxe	*	INDICATOR	a08	e_sm1_any = e_sm_pbpcoll + e_sm_pbpcollx
Sdmxe	*	INDICATOR	a08	e_sm1_any = e_sm_pcudev + e_sm_pcudevx

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	a08	e_sm1_any = e_sm_pcuqor + e_sm_pcuqorx
Sdmxe	*	INDICATOR	a08	e_sm1_any = e_sm_pexchvok + e_sm_pexchvokx
Sdmxe	*	INDICATOR	a08	e_sm1_any = e_sm_prcr + e_sm_prcrx
Sdmxe	*	INDICATOR	a08	e_sm1_any >= e_sm_padvert + e_sm_padvertx
Sdmxe	*	INDICATOR	a08	e_sm1_any >= e_sm_pbpcoll + e_sm_pbpcollx
Sdmxe	*	INDICATOR	a08	e_sm1_any >= e_sm_pcudev + e_sm_pcudevx
Sdmxe	*	INDICATOR	a08	e_sm1_any >= e_sm_pcuqor + e_sm_pcuqorx
Sdmxe	*	INDICATOR	a08	e_sm1_any >= e_sm_pexchvok + e_sm_pexchvokx
Sdmxe	*	INDICATOR	a08	e_sm1_any >= e_sm_prcr + e_sm_prcrx
Sdmxe	*	INDICATOR	a09	e_ads <= e_iuse
Sdmxe	*	INDICATOR	a09	e_adsx <= e_iuse
Sdmxe	*	INDICATOR	a09	e_iuse = e_ads + e_adsx
Sdmxe	*	INDICATOR	a09	e_iuse >= e_ads + e_adsx
Sdmxe	*	INDICATOR	a09a04	e_ads_web <= e_ads
Sdmxe	*	INDICATOR	a09a04	e_ads_web <= e_web
Sdmxe	*	INDICATOR	a10	e_ads = e_ads_kw + e_ads_kwx
Sdmxe	*	INDICATOR	a10	e_ads = e_ads_loc + e_ads_locx
Sdmxe	*	INDICATOR	a10	e_ads = e_ads_oth + e_ads_othx
Sdmxe	*	INDICATOR	a10	e_ads = e_ads_trk + e_ads_trkx
Sdmxe	*	INDICATOR	a10	e_ads >= e_ads_kw + e_ads_kwx
Sdmxe	*	INDICATOR	a10	e_ads >= e_ads_loc + e_ads_locx
Sdmxe	*	INDICATOR	a10	e_ads >= e_ads_oth + e_ads_othx
Sdmxe	*	INDICATOR	a10	e_ads >= e_ads_trk + e_ads_trkx
Sdmxe	*	INDICATOR	a10	e_ads_kw <= e_ads
Sdmxe	*	INDICATOR	a10	e_ads_kw <= e_ads3
Sdmxe	*	INDICATOR	a10	e_ads_kwx <= e_ads

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	a10	e_ads_loc <= e_ads
Sdmxe	*	INDICATOR	a10	e_ads_loc <= e_ads3
Sdmxe	*	INDICATOR	a10	e_ads_locx <= e_ads
Sdmxe	*	INDICATOR	a10	e_ads_oth <= e_ads
Sdmxe	*	INDICATOR	a10	e_ads_othx <= e_ads
Sdmxe	*	INDICATOR	a10	e_ads_trk <= e_ads
Sdmxe	*	INDICATOR	a10	e_ads_trk <= e_ads3
Sdmxe	*	INDICATOR	a10	e_ads_trkx <= e_ads
Sdmxe	*	INDICATOR	a10	e_ads3 <= e_ads
Sdmxe	*	INDICATOR	a10	e_ads3 <= e_ads_kw + e_ads_trk + e_ads_loc
Sdmxe	*	INDICATOR	b1	e_aws_cboth <= e_aws_cmp
Sdmxe	*	INDICATOR	b1	e_aws_cboth <= e_aws_cown
Sdmxe	*	INDICATOR	b1	e_aws_cboth <= e_iuse
Sdmxe	*	INDICATOR	b1	e_aws_cmp <= e_awsell
Sdmxe	*	INDICATOR	b1	e_aws_cmp <= e_iuse
Sdmxe	*	INDICATOR	b1	e_aws_cmpx <= e_iuse
Sdmxe	*	INDICATOR	b1	e_aws_cown <= e_awsell
Sdmxe	*	INDICATOR	b1	e_aws_cown <= e_iuse
Sdmxe	*	INDICATOR	b1	e_aws_cownx <= e_iuse
Sdmxe	*	INDICATOR	b1	e_awsell <= e_aws_cmp + e_aws_ cown
Sdmxe	*	INDICATOR	b1	e_awsell <= e_iuse
Sdmxe	*	INDICATOR	b1	e_awsell = e_aws_cmp + e_aws_ cown - e_aws_cboth
Sdmxe	*	INDICATOR	b1	e_awsellx <= e_iuse
Sdmxe	*	INDICATOR	b1	e_iuse = e_aws_cmp + e_aws_cmpx
Sdmxe	*	INDICATOR	b1	e_iuse = e_aws_cown + e_aws_ cownx
Sdmxe	*	INDICATOR	b1	e_iuse = e_awsell + e_awsellx
Sdmxe	*	INDICATOR	b1	e_iuse >= e_aws_cmp + e_aws_ cmpx
Sdmxe	*	INDICATOR	b1	e_iuse >= e_aws_cown + e_aws_ cownx

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	b1	e_iuse >= e_awsell + e_awsellx
Sdmxe	*	INDICATOR	b2	e_awsell = e_wsel0 + e_wselz
Sdmxe	*	INDICATOR	b2	e_awsell >= e_wsel0 + e_wselz
Sdmxe	*	INDICATOR	b2	e_awsval <= tovt
Sdmxe	*	INDICATOR	b2	e_awsval = e_awsvalb + e_awsvals
Sdmxe	*	INDICATOR	b2	e_awsvalb <= tovt
Sdmxe	*	INDICATOR	b2	e_awsvals <= tovt
Sdmxe	*	INDICATOR	b2	e_wsel0 <= e_awsell
Sdmxe	*	INDICATOR	b2	e_wsel1 <= e_wsel0
Sdmxe	*	INDICATOR	b2	e_wsel10 <= e_wsel5
Sdmxe	*	INDICATOR	b2	e_wsel2 <= e_wsel1
Sdmxe	*	INDICATOR	b2	e_wsel25 <= e_wsel10
Sdmxe	*	INDICATOR	b2	e_wsel5 <= e_wsel2
Sdmxe	*	INDICATOR	b2	e_wsel50 <= e_wsel25
Sdmxe	*	INDICATOR	b2	e_wselz <= e_awsell
Sdmxe	*	INDICATOR	b3	e_awsval = e_awsval_cown + e_awsval_cmp
Sdmxe	*	INDICATOR	b3	e_awsval >= e_awsval_cown + e_awsval_cmp
Sdmxe	*	INDICATOR	b3	e_awsval_cmp <= e_awsval
Sdmxe	*	INDICATOR	b3	e_awsval_cown <= e_awsval
Sdmxe	*	INDICATOR	b3b2b1	e_aws_cmp_ge20 <= e_aws_cmp
Sdmxe	*	INDICATOR	b3b2b1	e_aws_cmp_ge50 <= e_aws_cmp
Sdmxe	*	INDICATOR	b3b2b1	e_aws_cmp_ge50 <= e_aws_cmp_ge20
Sdmxe	*	INDICATOR	b3b2b1	t_aws_cmp_ge20 <= tovt
Sdmxe	*	INDICATOR	b3b2b1	t_aws_cmp_ge50 <= t_aws_cmp_ge20
Sdmxe	*	INDICATOR	b3b2b1	t_aws_cmp_ge50 <= tovt
Sdmxe	*	INDICATOR	b4	e_aws_b2bg <= e_awsell
Sdmxe	*	INDICATOR	b4	e_aws_b2c <= e_awsell
Sdmxe	*	INDICATOR	b4	e_awsell <= e_aws_b2c + e_aws_b2bg

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	b4	e_awsell >= (e_aws_b2c + e_aws_b2bg) / 2
Sdmxe	*	INDICATOR	b4	e_awsval = e_awsval_b2c + e_awsval_b2bg
Sdmxe	*	INDICATOR	b4	e_awsval >= e_awsval_b2c + e_awsval_b2bg
Sdmxe	*	INDICATOR	b4	e_awsval_b2bg <= e_awsval
Sdmxe	*	INDICATOR	b4	e_awsval_b2bg <= e_eturn
Sdmxe	*	INDICATOR	b4	e_awsval_b2bg <= tovt
Sdmxe	*	INDICATOR	b4	e_awsval_b2c <= e_awsval
Sdmxe	*	INDICATOR	b4	e_awsval_b2c <= e_eturn
Sdmxe	*	INDICATOR	b4	e_awsval_b2c <= tovt
Sdmxe	*	INDICATOR	b4b1	e_aws_b2c_cmp <= e_aws_b2c
Sdmxe	*	INDICATOR	b4b1	e_aws_b2c_cmp <= e_aws_cmp
Sdmxe	*	INDICATOR	b4b2	e_aws_b2c_gt1ws <= e_aws_b2c
Sdmxe	*	INDICATOR	b4b2	e_aws_b2c_gt1ws <= e_awsell
Sdmxe	*	INDICATOR	b4b2	e_aws_gt1_b2c_gt10ws <= e_aws_b2c
Sdmxe	*	INDICATOR	b4b2	e_aws_gt1_b2c_gt10ws <= e_awsval_b2c_ge10ws
Sdmxe	*	INDICATOR	b4b2	e_awsval_b2c_ge10ws <= e_aws_b2c
Sdmxe	*	INDICATOR	b4b2	e_awsval_b2c_ge10ws <= e_awsell
Sdmxe	*	INDICATOR	b4b2	e_awsval_b2c_ge10ws <= e_awsval_b2c_ge5ws
Sdmxe	*	INDICATOR	b4b2	e_awsval_b2c_ge5ws <= e_aws_b2c
Sdmxe	*	INDICATOR	b4b2	e_awsval_b2c_ge5ws <= e_aws_b2c_gt1ws
Sdmxe	*	INDICATOR	b4b2	e_awsval_b2c_ge5ws <= e_awsell
Sdmxe	*	INDICATOR	b4b2	e_awsval_gt1_b2c_gt10ws <= e_awsval_b2c
Sdmxe	*	INDICATOR	b4b2	e_awsval_gt1_b2c_gt10ws <= t_aws_gt1_b2c_gt10ws
Sdmxe	*	INDICATOR	b4b2	t_aws_gt1_b2c_gt10ws <= tovt
Sdmxe	*	INDICATOR	b4b2b1	e_awsval_b2c_ge10ws_cmp <= e_aws_cmp

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	b4b2b1	e_awsval_b2c_ge10ws_cmp <= e_awsval_b2c_ge10ws
Sdmxe	*	INDICATOR	b5	e_axsell <= e_iuse
Sdmxe	*	INDICATOR	b5	e_axsell = e_xsel0 + e_xselz
Sdmxe	*	INDICATOR	b5	e_axsell >= e_xsel0 + e_xselz
Sdmxe	*	INDICATOR	b5	e_axsellx <= e_iuse
Sdmxe	*	INDICATOR	b5	e_axsellz <= e_iuse
Sdmxe	*	INDICATOR	b5	e_iuse = e_axsell + e_axsellx + e_axsellz
Sdmxe	*	INDICATOR	b5	e_iuse >= e_axsell + e_axsellx + e_axsellz
Sdmxe	*	INDICATOR	b5b1	e_aesell <= e_awsell + e_axsell
Sdmxe	*	INDICATOR	b5b1	e_aesell <= e_iuse
Sdmxe	*	INDICATOR	b5b1	e_awsell <= e_aesell
Sdmxe	*	INDICATOR	b5b1	e_axsell <= e_aesell
Sdmxe	*	INDICATOR	b5b2	e_wsel1q <= e_axsellx
Sdmxe	*	INDICATOR	b5b2	e_wsel1q <= e_wsel1
Sdmxe	*	INDICATOR	b6	e_axsval <= tovt
Sdmxe	*	INDICATOR	b6	e_axsval = e_axsvalb + e_axsvals
Sdmxe	*	INDICATOR	b6	e_axsvalb <= e_axsval
Sdmxe	*	INDICATOR	b6	e_axsvalb <= tovt
Sdmxe	*	INDICATOR	b6	e_axsvals <= e_axsval
Sdmxe	*	INDICATOR	b6	e_axsvals <= tovt
Sdmxe	*	INDICATOR	b6	e_xsel0 <= e_axsell
Sdmxe	*	INDICATOR	b6	e_xsel1 <= e_xsel0
Sdmxe	*	INDICATOR	b6	e_xsel10 <= e_xsel5
Sdmxe	*	INDICATOR	b6	e_xsel2 <= e_xsel1
Sdmxe	*	INDICATOR	b6	e_xsel25 <= e_xsel10
Sdmxe	*	INDICATOR	b6	e_xsel5 <= e_xsel2
Sdmxe	*	INDICATOR	b6	e_xsel50 <= e_xsel25
Sdmxe	*	INDICATOR	b6	e_xselz <= e_axsell
Sdmxe	*	INDICATOR	b6b2	e_awsval <= e_eturn
Sdmxe	*	INDICATOR	b6b2	e_awsvalb <= e_eturn

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	b6b2	e_awsvals <= e_eturn
Sdmxe	*	INDICATOR	b6b2	e_axsval <= e_eturn
Sdmxe	*	INDICATOR	b6b2	e_axsvalb <= e_eturn
Sdmxe	*	INDICATOR	b6b2	e_axsvals <= e_eturn
Sdmxe	*	INDICATOR	b6b2	e_esell <= e_aesell
Sdmxe	*	INDICATOR	b6b2	e_eturn <= tovt
Sdmxe	*	INDICATOR	b6b2	e_eturn = e_awsval + e_axsval
Sdmxe	*	INDICATOR	b6b2	e_eturn = e_awsvals + e_awsvalb + e_axsvals + e_axsvalb
Sdmxe	*	INDICATOR	b6b4b2	e_awsval_b2c_ge10ec <= e_aws_b2c
Sdmxe	*	INDICATOR	c1	e_bsany <= e_crm1 + e_erp1 + e_itbi
Sdmxe	*	INDICATOR	c1	e_bsany <= e_iuse
Sdmxe	*	INDICATOR	c1	e_crm1 <= e_bsany
Sdmxe	*	INDICATOR	c1	e_crm1 <= e_iuse
Sdmxe	*	INDICATOR	c1	e_crm1x <= e_iuse
Sdmxe	*	INDICATOR	c1	e_erp1 <= e_bsany
Sdmxe	*	INDICATOR	c1	e_erp1 <= e_iuse
Sdmxe	*	INDICATOR	c1	e_erp1x <= e_iuse
Sdmxe	*	INDICATOR	c1	e_itbi <= e_bsany
Sdmxe	*	INDICATOR	c1	e_itbi <= e_iuse
Sdmxe	*	INDICATOR	c1	e_itbix <= e_iuse
Sdmxe	*	INDICATOR	c1	e_iuse = e_crm1 + e_crm1x
Sdmxe	*	INDICATOR	c1	e_iuse = e_erp1 + e_erp1x
Sdmxe	*	INDICATOR	c1	e_iuse = e_itbi + e_itbix
Sdmxe	*	INDICATOR	c1	e_iuse >= e_crm1 + e_crm1x
Sdmxe	*	INDICATOR	c1	e_iuse >= e_erp1 + e_erp1x
Sdmxe	*	INDICATOR	c1	e_iuse >= e_itbi + e_itbix
Sdmxe	*	INDICATOR	c1a07	e_erp1_sm1_any <= e_erp1
Sdmxe	*	INDICATOR	c1a07	e_erp1_sm1_any <= e_iuse
Sdmxe	*	INDICATOR	c1a07	e_erp1_sm1_any <= e_sm1_any
Sdmxe	*	INDICATOR	c2	e_iuse = e_sisc + e_siscx

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	c2	e_iuse >= e_sisc + e_siscx
Sdmxe	*	INDICATOR	c2	e_sisc <= e_iuse
Sdmxe	*	INDICATOR	c2	e_siscx <= e_iuse
Sdmxe	*	INDICATOR	c2c1	e_crm1 <= e_erp_crm_bi_sisc
Sdmxe	*	INDICATOR	c2c1	e_crm1 <= e_si1
Sdmxe	*	INDICATOR	c2c1	e_erp_crm_bi_sisc <= e_erp1 + e_crm1 + e_itbi + e_sisc
Sdmxe	*	INDICATOR	c2c1	e_erp_crm_bi_sisc <= e_iuse
Sdmxe	*	INDICATOR	c2c1	e_erp1 <= e_erp_crm_bi_sisc
Sdmxe	*	INDICATOR	c2c1	e_erp1 <= e_si1
Sdmxe	*	INDICATOR	c2c1	e_itbi <= e_erp_crm_bi_sisc
Sdmxe	*	INDICATOR	c2c1	e_si1 <= e_erp1 + e_crm1 + e_sisc
Sdmxe	*	INDICATOR	c2c1	e_si1 <= e_iuse
Sdmxe	*	INDICATOR	c2c1	e_sisc <= e_erp_crm_bi_sisc
Sdmxe	*	INDICATOR	c2c1	e_sisc <= e_si1
Sdmxe	*	INDICATOR	c3	e_daown <= e_iuse
Sdmxe	*	INDICATOR	c3	e_daownx <= e_iuse
Sdmxe	*	INDICATOR	c3	e_iuse = e_daown + e_daownx
Sdmxe	*	INDICATOR	c3	e_iuse >= e_daown + e_daownx
Sdmxe	*	INDICATOR	c4	e_daown = e_dascrm + e_dascrmx
Sdmxe	*	INDICATOR	c4	e_daown = e_daserp + e_daserpx
Sdmxe	*	INDICATOR	c4	e_daown = e_dasgov + e_dasgovx
Sdmxe	*	INDICATOR	c4	e_daown = e_dasloc + e_daslocx
Sdmxe	*	INDICATOR	c4	e_daown = e_dassat + e_dassatx
Sdmxe	*	INDICATOR	c4	e_daown = e_dassds + e_dassdsx
Sdmxe	*	INDICATOR	c4	e_daown = e_dassm + e_dassmx
Sdmxe	*	INDICATOR	c4	e_daown = e_dasweb + e_daswebx
Sdmxe	*	INDICATOR	c4	e_daown >= e_dascrm + e_dascrmx
Sdmxe	*	INDICATOR	c4	e_daown >= e_daserp + e_daserpx
Sdmxe	*	INDICATOR	c4	e_daown >= e_dasgov + e_dasgovx
Sdmxe	*	INDICATOR	c4	e_daown >= e_dasloc + e_daslocx
Sdmxe	*	INDICATOR	c4	e_daown >= e_dassat + e_dassatx

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	c4	e_daown >= e_dassds + e_dassdsx
Sdmxe	*	INDICATOR	c4	e_daown >= e_dassm + e_dassmx
Sdmxe	*	INDICATOR	c4	e_daown >= e_dasweb + e_ daswebx
Sdmxe	*	INDICATOR	c4	e_dasany <= e_daserp + e_dascrm + e_dassm + e_dasweb + e_dasloc + e_dassds + e_dasgov + e_dassat
Sdmxe	*	INDICATOR	c4	e_dasany <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dasany2 <= e_daown
Sdmxe	*	INDICATOR	c4	e_dasany2 <= e_dasany
Sdmxe	*	INDICATOR	c4	e_dasany2 <= e_dasweb + e_dasloc + e_dassds + e_dasgov + e_dassat
Sdmxe	*	INDICATOR	c4	e_dasany2 <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dascrm <= e_daown
Sdmxe	*	INDICATOR	c4	e_dascrm <= e_dasany
Sdmxe	*	INDICATOR	c4	e_dascrm <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dascrmx <= e_daown
Sdmxe	*	INDICATOR	c4	e_dascrmx <= e_iuse
Sdmxe	*	INDICATOR	c4	e_daserp <= e_daown
Sdmxe	*	INDICATOR	c4	e_daserp <= e_dasany
Sdmxe	*	INDICATOR	c4	e_daserp <= e_iuse
Sdmxe	*	INDICATOR	c4	e_daserpx <= e_daown
Sdmxe	*	INDICATOR	c4	e_daserpx <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dasge3 <= e_daown
Sdmxe	*	INDICATOR	c4	e_dasge3 <= e_dasany
Sdmxe	*	INDICATOR	c4	e_dasge3 <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dasgov <= e_daown
Sdmxe	*	INDICATOR	c4	e_dasgov <= e_dasany
Sdmxe	*	INDICATOR	c4	e_dasgov <= e_dasany2
Sdmxe	*	INDICATOR	c4	e_dasgov <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dasgovx <= e_daown
Sdmxe	*	INDICATOR	c4	e_dasgovx <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dasloc <= e_daown

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	c4	e_dasloc <= e_dasany
Sdmxe	*	INDICATOR	c4	e_dasloc <= e_dasany2
Sdmxe	*	INDICATOR	c4	e_dasloc <= e_iuse
Sdmxe	*	INDICATOR	c4	e_daslocx <= e_daown
Sdmxe	*	INDICATOR	c4	e_daslocx <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dassat <= e_daown
Sdmxe	*	INDICATOR	c4	e_dassat <= e_dasany
Sdmxe	*	INDICATOR	c4	e_dassat <= e_dasany2
Sdmxe	*	INDICATOR	c4	e_dassat <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dassatx <= e_daown
Sdmxe	*	INDICATOR	c4	e_dassatx <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dassds <= e_daown
Sdmxe	*	INDICATOR	c4	e_dassds <= e_dasany
Sdmxe	*	INDICATOR	c4	e_dassds <= e_dasany2
Sdmxe	*	INDICATOR	c4	e_dassds <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dassdsx <= e_daown
Sdmxe	*	INDICATOR	c4	e_dassdsx <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dassm <= e_daown
Sdmxe	*	INDICATOR	c4	e_dassm <= e_dasany
Sdmxe	*	INDICATOR	c4	e_dassm <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dassmx <= e_daown
Sdmxe	*	INDICATOR	c4	e_dassmx <= e_iuse
Sdmxe	*	INDICATOR	c4	e_dasweb <= e_daown
Sdmxe	*	INDICATOR	c4	e_dasweb <= e_dasany
Sdmxe	*	INDICATOR	c4	e_dasweb <= e_dasany2
Sdmxe	*	INDICATOR	c4	e_dasweb <= e_iuse
Sdmxe	*	INDICATOR	c4	e_daswebx <= e_daown
Sdmxe	*	INDICATOR	c4	e_daswebx <= e_iuse
Sdmxe	*	INDICATOR	c4a09	e_dasany_ads <= e_ads
Sdmxe	*	INDICATOR	c4a09	e_dasany_ads <= e_dasany
Sdmxe	*	INDICATOR	c4a09	e_dasany_ads <= e_iuse
Sdmxe	*	INDICATOR	c5	e_daext <= e_iuse

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	c5	e_daextx <= e_iuse
Sdmxe	*	INDICATOR	c5	e_iuse = e_daext + e_daextx
Sdmxe	*	INDICATOR	c5	e_iuse >= e_daext + e_daextx
Sdmxe	*	INDICATOR	c5c3	e_da <= e_daown + e_daext
Sdmxe	*	INDICATOR	c5c3	e_da >= e_daext
Sdmxe	*	INDICATOR	c5c3	e_da >= e_daown
Sdmxe	*	INDICATOR	c6	e_dsell <= e_iuse
Sdmxe	*	INDICATOR	c6	e_dsellx <= e_iuse
Sdmxe	*	INDICATOR	c6	e_iuse = e_dsell + e_dsellx
Sdmxe	*	INDICATOR	c6	e_iuse >= e_dsell + e_dsellx
Sdmxe	*	INDICATOR	c6c4	e_dasloc_sell <= e_dasloc
Sdmxe	*	INDICATOR	c6c4	e_dasloc_sell <= e_dsell
Sdmxe	*	INDICATOR	c6c4	e_dassds_sell <= e_dassds
Sdmxe	*	INDICATOR	c6c4	e_dassds_sell <= e_dsell
Sdmxe	*	INDICATOR	c6c4	e_dassm_sell <= e_dassm
Sdmxe	*	INDICATOR	c6c4	e_dassm_sell <= e_dsell
Sdmxe	*	INDICATOR	c6c4	e_dasweb_sell <= e_dasweb
Sdmxe	*	INDICATOR	c6c4	e_dasweb_sell <= e_dsell
Sdmxe	*	INDICATOR	c7	e_dbuy <= e_iuse
Sdmxe	*	INDICATOR	c7	e_dbuyx <= e_iuse
Sdmxe	*	INDICATOR	c7	e_iuse = e_dbuy + e_dbuyx
Sdmxe	*	INDICATOR	c7	e_iuse >= e_dbuy + e_dbuyx
Sdmxe	*	INDICATOR	c7c4	e_dasloc_buy <= e_dasloc
Sdmxe	*	INDICATOR	c7c4	e_dasloc_buy <= e_dbuy
Sdmxe	*	INDICATOR	c7c4	e_dassds_buy <= e_dassds
Sdmxe	*	INDICATOR	c7c4	e_dassds_buy <= e_dbuy
Sdmxe	*	INDICATOR	c7c4	e_dassm_buy <= e_dassm
Sdmxe	*	INDICATOR	c7c4	e_dassm_buy <= e_dbuy
Sdmxe	*	INDICATOR	c7c4	e_dasweb_buy <= e_dasweb
Sdmxe	*	INDICATOR	c7c4	e_dasweb_buy <= e_dbuy
Sdmxe	*	INDICATOR	d1	e_cc <= e_iuse
Sdmxe	*	INDICATOR	d1	e_ccx <= e_iuse

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	d1	e_iuse = e_cc + e_ccx
Sdmxe	*	INDICATOR	d1	e_iuse >= e_cc + e_ccx
Sdmxe	*	INDICATOR	d1c5c3	e_cc_da <= e_cc
Sdmxe	*	INDICATOR	d1c5c3	e_cc_da <= e_da
Sdmxe	*	INDICATOR	d2	e_cc = e_cc_pcpu + e_cc_pcpux
Sdmxe	*	INDICATOR	d2	e_cc = e_cc_pcrm + e_cc_pcrmx
Sdmxe	*	INDICATOR	d2	e_cc = e_cc_pdb + e_cc_pdbx
Sdmxe	*	INDICATOR	d2	e_cc = e_cc_pdev + e_cc_pdevx
Sdmxe	*	INDICATOR	d2	e_cc = e_cc_pem + e_cc_pemx
Sdmxe	*	INDICATOR	d2	e_cc = e_cc_perp + e_cc_perpx
Sdmxe	*	INDICATOR	d2	e_cc = e_cc_pfacc + e_cc_pfaccx
Sdmxe	*	INDICATOR	d2	e_cc = e_cc_pfil + e_cc_pfilx
Sdmxe	*	INDICATOR	d2	e_cc = e_cc_psec + e_cc_psecx
Sdmxe	*	INDICATOR	d2	e_cc = e_cc_psoft + e_cc_psoftx
Sdmxe	*	INDICATOR	d2	e_cc = e_cc1_pany + e_cc1_pnone
Sdmxe	*	INDICATOR	d2	e_cc >= e_cc_pcpu + e_cc_pcpux
Sdmxe	*	INDICATOR	d2	e_cc >= e_cc_pcrm + e_cc_pcrmx
Sdmxe	*	INDICATOR	d2	e_cc >= e_cc_pdb + e_cc_pdbx
Sdmxe	*	INDICATOR	d2	e_cc >= e_cc_pdev + e_cc_pdevx
Sdmxe	*	INDICATOR	d2	e_cc >= e_cc_pem + e_cc_pemx
Sdmxe	*	INDICATOR	d2	e_cc >= e_cc_perp + e_cc_perpx
Sdmxe	*	INDICATOR	d2	e_cc >= e_cc_pfacc + e_cc_pfaccx
Sdmxe	*	INDICATOR	d2	e_cc >= e_cc_pfil + e_cc_pfilx
Sdmxe	*	INDICATOR	d2	e_cc >= e_cc_psec + e_cc_psecx
Sdmxe	*	INDICATOR	d2	e_cc >= e_cc_psoft + e_cc_psoftx
Sdmxe	*	INDICATOR	d2	e_cc >= e_cc1_pany + e_cc1_pnone
Sdmxe	*	INDICATOR	d2	e_cc_pcpu <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_pcpu <= e_cc_phw
Sdmxe	*	INDICATOR	d2	e_cc_pcpu <= e_cc1_is_ge1
Sdmxe	*	INDICATOR	d2	e_cc_pcpu <= e_cc1_pany
Sdmxe	*	INDICATOR	d2	e_cc_pcpux <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_pcrm <= e_cc

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	d2	e_cc_pcrm <= e_cc1_pany
Sdmxe	*	INDICATOR	d2	e_cc_pcrm <= e_cc1_si
Sdmxe	*	INDICATOR	d2	e_cc_pcrm <= e_cc1_ss_ge1
Sdmxe	*	INDICATOR	d2	e_cc_pcrmx <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_pdb <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_pdb <= e_cc_pdbfil
Sdmxe	*	INDICATOR	d2	e_cc_pdb <= e_cc_phw
Sdmxe	*	INDICATOR	d2	e_cc_pdb <= e_cc1_is_ge1
Sdmxe	*	INDICATOR	d2	e_cc_pdb <= e_cc1_pany
Sdmxe	*	INDICATOR	d2	e_cc_pdb <= e_cc1_s
Sdmxe	*	INDICATOR	d2	e_cc_pdb <= e_cc1_si
Sdmxe	*	INDICATOR	d2	e_cc_pdbfil <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_pdbfil <= e_cc_pdb + e_cc_pfil
Sdmxe	*	INDICATOR	d2	e_cc_pdbx <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_pdev <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_pdev <= e_cc1_pany
Sdmxe	*	INDICATOR	d2	e_cc_pdev <= e_cc1_s
Sdmxe	*	INDICATOR	d2	e_cc_pdev <= e_cc1_si
Sdmxe	*	INDICATOR	d2	e_cc_pdevx <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_pem <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_pem <= e_cc1_pany
Sdmxe	*	INDICATOR	d2	e_cc_pem <= e_cc1_ss_ge1
Sdmxe	*	INDICATOR	d2	e_cc_pemx <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_perp <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_perp <= e_cc1_pany
Sdmxe	*	INDICATOR	d2	e_cc_perp <= e_cc1_si
Sdmxe	*	INDICATOR	d2	e_cc_perp <= e_cc1_ss_ge1
Sdmxe	*	INDICATOR	d2	e_cc_perpx <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_pfacc <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_pfacc <= e_cc1_pany
Sdmxe	*	INDICATOR	d2	e_cc_pfacc <= e_cc1_si

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	d2	e_cc_pfacc <= e_cc1_ss_ge1
Sdmxe	*	INDICATOR	d2	e_cc_pfaccx <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_pfil <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_pfil <= e_cc_pdbfil
Sdmxe	*	INDICATOR	d2	e_cc_pfil <= e_cc_phw
Sdmxe	*	INDICATOR	d2	e_cc_pfil <= e_cc1_is_ge1
Sdmxe	*	INDICATOR	d2	e_cc_pfil <= e_cc1_pany
Sdmxe	*	INDICATOR	d2	e_cc_pfilx <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_phw <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_phw <= e_cc_pdb + e_cc_pfil + e_cc_pcpu
Sdmxe	*	INDICATOR	d2	e_cc_psec <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_psec <= e_cc1_pany
Sdmxe	*	INDICATOR	d2	e_cc_psec <= e_cc1_s
Sdmxe	*	INDICATOR	d2	e_cc_psec <= e_cc1_si
Sdmxe	*	INDICATOR	d2	e_cc_psec <= e_cc1_ss_ge1
Sdmxe	*	INDICATOR	d2	e_cc_psecx <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_psoft <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc_psoft <= e_cc1_pany
Sdmxe	*	INDICATOR	d2	e_cc_psoft <= e_cc1_ss_ge1
Sdmxe	*	INDICATOR	d2	e_cc_psoftx <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_b <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_b <= e_cc_pcrmx
Sdmxe	*	INDICATOR	d2	e_cc1_b <= e_cc_pdbx
Sdmxe	*	INDICATOR	d2	e_cc1_b <= e_cc_pdevx
Sdmxe	*	INDICATOR	d2	e_cc1_b <= e_cc_pem + e_cc_psoft + e_cc_pfil + e_cc_pcpu
Sdmxe	*	INDICATOR	d2	e_cc1_b <= e_cc_perpx
Sdmxe	*	INDICATOR	d2	e_cc1_b <= e_cc_pfaccx
Sdmxe	*	INDICATOR	d2	e_cc1_b <= e_cc_psecx
Sdmxe	*	INDICATOR	d2	e_cc1_bi <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_bi <= e_cc_pdbx
Sdmxe	*	INDICATOR	d2	e_cc1_bi <= e_cc_pdevx

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	d2	e_cc1_bi <= e_cc_pem + e_cc_psoft + e_cc_pfil + e_cc_pcpu + e_cc_ pfacc + e_cc_perp + e_cc_pcrm
Sdmxe	*	INDICATOR	d2	e_cc1_bi <= e_cc_psecx
Sdmxe	*	INDICATOR	d2	e_cc1_bi = e_cc1_b + e_cc1_i
Sdmxe	*	INDICATOR	d2	e_cc1_i <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_i <= e_cc_pdbx
Sdmxe	*	INDICATOR	d2	e_cc1_i <= e_cc_pdevx
Sdmxe	*	INDICATOR	d2	e_cc1_i <= e_cc_pfacc + e_cc_perp + e_cc_pcrm
Sdmxe	*	INDICATOR	d2	e_cc1_i <= e_cc_psecx
Sdmxe	*	INDICATOR	d2	e_cc1_is_3 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_is_3 <= e_cc_pcpu
Sdmxe	*	INDICATOR	d2	e_cc1_is_3 <= e_cc_pdb
Sdmxe	*	INDICATOR	d2	e_cc1_is_3 <= e_cc_pfil
Sdmxe	*	INDICATOR	d2	e_cc1_is_3 <= e_cc1_is_ge2
Sdmxe	*	INDICATOR	d2	e_cc1_is_ge1 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_is_ge1 <= e_cc_pdb + e_cc_ pfil + e_cc_pcpu
Sdmxe	*	INDICATOR	d2	e_cc1_is_ge2 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_is_ge2 <= e_cc1_is_ge1
Sdmxe	*	INDICATOR	d2	e_cc1_is1ps <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_is1ps <= e_cc_pdev
Sdmxe	*	INDICATOR	d2	e_cc1_is1ps <= e_cc1_is_ge1
Sdmxe	*	INDICATOR	d2	e_cc1_pany <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_pany <= e_cc_pem + e_cc_ psoft + e_cc_pfacc + e_cc_perp + e_ cc_pcrm + e_cc_psec + e_cc_pdb + e_cc_pfil + e_cc_pcpu + e_cc_pdev
Sdmxe	*	INDICATOR	d2	e_cc1_pnone <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_pnone <= e_cc_pcpux
Sdmxe	*	INDICATOR	d2	e_cc1_pnone <= e_cc_pcrmx
Sdmxe	*	INDICATOR	d2	e_cc1_pnone <= e_cc_pdbx
Sdmxe	*	INDICATOR	d2	e_cc1_pnone <= e_cc_pdevx

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	d2	e_cc1_pnone <= e_cc_pemx
Sdmxe	*	INDICATOR	d2	e_cc1_pnone <= e_cc_perpx
Sdmxe	*	INDICATOR	d2	e_cc1_pnone <= e_cc_pfaccx
Sdmxe	*	INDICATOR	d2	e_cc1_pnone <= e_cc_pfilx
Sdmxe	*	INDICATOR	d2	e_cc1_pnone <= e_cc_psecx
Sdmxe	*	INDICATOR	d2	e_cc1_pnone <= e_cc_psoftx
Sdmxe	*	INDICATOR	d2	e_cc1_ps = e_cc_pdev
Sdmxe	*	INDICATOR	d2	e_cc1_s <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_s <= e_cc_psec + e_cc_pdb + e_cc_pdev
Sdmxe	*	INDICATOR	d2	e_cc1_si <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_si <= e_cc_pfacc + e_cc_perp + e_cc_pcrm + e_cc_psec + e_cc_ pdb + e_cc_pdev
Sdmxe	*	INDICATOR	d2	e_cc1_si = e_cc1_s + e_cc1_i
Sdmxe	*	INDICATOR	d2	e_cc1_ss_6 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss_6 <= e_cc_pcrm
Sdmxe	*	INDICATOR	d2	e_cc1_ss_6 <= e_cc_pem
Sdmxe	*	INDICATOR	d2	e_cc1_ss_6 <= e_cc_perp
Sdmxe	*	INDICATOR	d2	e_cc1_ss_6 <= e_cc_pfacc
Sdmxe	*	INDICATOR	d2	e_cc1_ss_6 <= e_cc_psec
Sdmxe	*	INDICATOR	d2	e_cc1_ss_6 <= e_cc_psoft
Sdmxe	*	INDICATOR	d2	e_cc1_ss_6 <= e_cc1_ss_ge3
Sdmxe	*	INDICATOR	d2	e_cc1_ss_ge1 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss_ge1 <= e_cc_pem + e_ cc_psoft + e_cc_pfacc + e_cc_perp + e_cc_pcrm + e_cc_psec
Sdmxe	*	INDICATOR	d2	e_cc1_ss_ge2 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss_ge2 <= e_cc1_ss_ge1
Sdmxe	*	INDICATOR	d2	e_cc1_ss_ge3 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss_ge3 <= e_cc1_ss_ge2
Sdmxe	*	INDICATOR	d2	e_cc1_ss1is1 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss1is1 <= e_cc1_is_ge1
Sdmxe	*	INDICATOR	d2	e_cc1_ss1is1 <= e_cc1_ss_ge1

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	d2	e_cc1_ss1is1ps <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss1is1ps <= e_cc_pdev
Sdmxe	*	INDICATOR	d2	e_cc1_ss1is1ps <= e_cc1_is_ge1
Sdmxe	*	INDICATOR	d2	e_cc1_ss1is1ps <= e_cc1_ss_ge1
Sdmxe	*	INDICATOR	d2	e_cc1_ss1ps <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss1ps <= e_cc_pdev
Sdmxe	*	INDICATOR	d2	e_cc1_ss1ps <= e_cc1_ss_ge1
Sdmxe	*	INDICATOR	d2	e_cc1_ss2is1 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss2is1 <= e_cc1_is_ge1
Sdmxe	*	INDICATOR	d2	e_cc1_ss2is1 <= e_cc1_ss_ge2
Sdmxe	*	INDICATOR	d2	e_cc1_ss2is2 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss2is2 <= e_cc1_is_ge2
Sdmxe	*	INDICATOR	d2	e_cc1_ss2is2 <= e_cc1_ss_ge2
Sdmxe	*	INDICATOR	d2	e_cc1_ss3is1 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss3is1 <= e_cc1_is_ge1
Sdmxe	*	INDICATOR	d2	e_cc1_ss3is1 <= e_cc1_ss_ge3
Sdmxe	*	INDICATOR	d2	e_cc1_ss3is2 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss3is2 <= e_cc1_is_ge2
Sdmxe	*	INDICATOR	d2	e_cc1_ss3is2 <= e_cc1_ss_ge3
Sdmxe	*	INDICATOR	d2	e_cc1_ss3is3 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss3is3 <= e_cc1_is_3
Sdmxe	*	INDICATOR	d2	e_cc1_ss3is3 <= e_cc1_ss_ge3
Sdmxe	*	INDICATOR	d2	e_cc1_ss6is3 <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss6is3 <= e_cc1_is_3
Sdmxe	*	INDICATOR	d2	e_cc1_ss6is3 <= e_cc1_ss_6
Sdmxe	*	INDICATOR	d2	e_cc1_ss6is3ps <= e_cc
Sdmxe	*	INDICATOR	d2	e_cc1_ss6is3ps <= e_cc_pdev
Sdmxe	*	INDICATOR	d2	e_cc1_ss6is3ps <= e_cc1_is_3
Sdmxe	*	INDICATOR	d2	e_cc1_ss6is3ps <= e_cc1_ss_6
Sdmxe	*	INDICATOR	e1	e_ai_tany <= e_ai_ttm + e_ai_tsr + e_ai_tnlg + e_ai_tir + e_ai_tml + e_ai_tpa + e_ai_tar
Sdmxe	*	INDICATOR	e1	e_ai_tany <= e_iuse

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	e1	e_ai_tar <= e_ai_tany
Sdmxe	*	INDICATOR	e1	e_ai_tar <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tarx <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tge2 <= e_ai_tany
Sdmxe	*	INDICATOR	e1	e_ai_tge2 <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tge3 <= e_ai_tge2
Sdmxe	*	INDICATOR	e1	e_ai_tge3 <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tir <= e_ai_tany
Sdmxe	*	INDICATOR	e1	e_ai_tir <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tirx <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tml <= e_ai_tany
Sdmxe	*	INDICATOR	e1	e_ai_tml <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tmlx <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tnlg <= e_ai_tany
Sdmxe	*	INDICATOR	e1	e_ai_tnlg <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tnlgx <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tpa <= e_ai_tany
Sdmxe	*	INDICATOR	e1	e_ai_tpa <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tpax <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tsr <= e_ai_tany
Sdmxe	*	INDICATOR	e1	e_ai_tsr <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tsrx <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_ttm <= e_ai_tany
Sdmxe	*	INDICATOR	e1	e_ai_ttm <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_ttmx <= e_iuse
Sdmxe	*	INDICATOR	e1	e_ai_tx <= e_iuse
Sdmxe	*	INDICATOR	e1	e_iuse = e_ai_tany + e_ai_tx
Sdmxe	*	INDICATOR	e1	e_iuse = e_ai_tar + e_ai_tarx
Sdmxe	*	INDICATOR	e1	e_iuse = e_ai_tir + e_ai_tirx
Sdmxe	*	INDICATOR	e1	e_iuse = e_ai_tml + e_ai_tmlx
Sdmxe	*	INDICATOR	e1	e_iuse = e_ai_tnlg + e_ai_tnlgx
Sdmxe	*	INDICATOR	e1	e_iuse = e_ai_tpa + e_ai_tpax

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	e1	e_iuse = e_ai_tsr + e_ai_tsrx
Sdmxe	*	INDICATOR	e1	e_iuse = e_ai_ttm + e_ai_ttmx
Sdmxe	*	INDICATOR	e1	e_iuse >= e_ai_tany + e_ai_tx
Sdmxe	*	INDICATOR	e1	e_iuse >= e_ai_tar + e_ai_tarx
Sdmxe	*	INDICATOR	e1	e_iuse >= e_ai_tir + e_ai_tirx
Sdmxe	*	INDICATOR	e1	e_iuse >= e_ai_tml + e_ai_tmlx
Sdmxe	*	INDICATOR	e1	e_iuse >= e_ai_tnlg + e_ai_tnlgx
Sdmxe	*	INDICATOR	e1	e_iuse >= e_ai_tpa + e_ai_tpax
Sdmxe	*	INDICATOR	e1	e_iuse >= e_ai_tsr + e_ai_tsrx
Sdmxe	*	INDICATOR	e1	e_iuse >= e_ai_ttm + e_ai_ttmx
Sdmxe	*	INDICATOR	e1c5c3	e_ai_da <= e_ai_tany
Sdmxe	*	INDICATOR	e1c5c3	e_ai_da <= e_da
Sdmxe	*	INDICATOR	e1d1	e_ai_cc <= e_ai_tany
Sdmxe	*	INDICATOR	e1d1	e_ai_cc <= e_cc
Sdmxe	*	INDICATOR	e1d2c4	e_ai_cc1si_dasany <= e_ai_tany + e_cc1_si + e_dasany
Sdmxe	*	INDICATOR	e1d2c4	e_ai_cc1si_dasany2 <= e_ai_cc1si_ dasany
Sdmxe	*	INDICATOR	e1d2c4	e_ai_cc1si_dasany2 <= e_ai_tany + e_cc1_si + e_dasany2
Sdmxe	*	INDICATOR	e1d2c4	e_ai_cc1si_dasge3 <= e_ai_cc1si_ dasany
Sdmxe	*	INDICATOR	e1d2c4	e_ai_cc1si_dasge3 <= e_ai_tany + e_cc1_si + e_dasge3
Sdmxe	*	INDICATOR	e1d2c4	e_ai_tany <= e_ai_cc1si_dasany
Sdmxe	*	INDICATOR	e1d2c4	e_ai_tany <= e_ai_cc1si_dasany2
Sdmxe	*	INDICATOR	e1d2c4	e_ai_tany <= e_ai_cc1si_dasge3
Sdmxe	*	INDICATOR	e1d2c4	e_cc1_si <= e_ai_cc1si_dasany
Sdmxe	*	INDICATOR	e1d2c4	e_cc1_si <= e_ai_cc1si_dasany2
Sdmxe	*	INDICATOR	e1d2c4	e_cc1_si <= e_ai_cc1si_dasge3
Sdmxe	*	INDICATOR	e1d2c4	e_dasany <= e_ai_cc1si_dasany
Sdmxe	*	INDICATOR	e1d2c4	e_dasany2 <= e_ai_cc1si_dasany2
Sdmxe	*	INDICATOR	e1d2c4	e_dasge3 <= e_ai_cc1si_dasge3
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1si_da <= e_ai_tany

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1si_da <= e_cc1_si
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1si_da <= e_da
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1si_da_any <= e_ai_tany + e_cc1_si + e_da
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1si_dax <= e_ai_tany
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1si_dax <= e_cc1_si
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1si_dax <= e_iuse - e_da
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1six_da <= e_ai_tany
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1six_da <= e_iuse - e_cc1_si
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1six_da <= e_da
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1six_dax <= e_ai_tany
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1six_da <= e_iuse - e_cc1_si
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1six_dax <= e_iuse - e_da
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_tany <= e_ai_cc1si_da_any
Sdmxe	*	INDICATOR	e1d2c5c3	e_aix_cc1si_da <= e_ai_tx
Sdmxe	*	INDICATOR	e1d2c5c3	e_aix_cc1si_da <= e_cc1_si
Sdmxe	*	INDICATOR	e1d2c5c3	e_aix_cc1si_da <= e_da
Sdmxe	*	INDICATOR	e1d2c5c3	e_aix_cc1si_dax <= e_ai_tx
Sdmxe	*	INDICATOR	e1d2c5c3	e_aix_cc1si_dax <= e_cc1_si
Sdmxe	*	INDICATOR	e1d2c5c3	e_aix_cc1si_dax <= e_iuse - e_da
Sdmxe	*	INDICATOR	e1d2c5c3	e_aix_cc1six_da <= e_ai_tx
Sdmxe	*	INDICATOR	e1d2c5c3	e_aix_cc1six_da <= e_iuse - e_cc1_si
Sdmxe	*	INDICATOR	e1d2c5c3	e_aix_cc1six_da <= e_da
Sdmxe	*	INDICATOR	e1d2c5c3	e_cc1_si <= e_ai_cc1si_da_any
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_cc1si_da_any = e_ai_cc1si_da + e_aix_cc1si_da + e_ai_cc1six_da + e_ai_cc1si_dax + e_aix_cc1six_da + e_aix_cc1si_dax + e_ai_cc1six_dax
Sdmxe	*	INDICATOR	e1d2c5c3	e_ai_tany = e_ai_cc1si_da + e_ai_cc1six_da + e_ai_cc1si_dax + e_ai_cc1six_dax
Sdmxe	*	INDICATOR	e1d2c5c3	e_cc1_si = e_ai_cc1si_da + e_aix_cc1si_da + e_ai_cc1si_dax + e_aix_cc1si_dax

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	e1d2c5c3	e_da = e_ai_cc1si_da + e_aix_cc1si_da + e_ai_cc1six_da + e_aix_cc1six_da
Sdmxe	*	INDICATOR	e1d2c5c3	e_da <= e_ai_cc1si_da_any
Sdmxe	*	INDICATOR	e2	e_ai_p1any <= e_ai_pms + e_ai_ppp + e_ai_pbam + e_ai_plog + e_ai_pits + e_ai_pfin + e_ai_prdi
Sdmxe	*	INDICATOR	e2	e_ai_p1any <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_p1ge2 <= e_ai_p1any
Sdmxe	*	INDICATOR	e2	e_ai_p1ge2 <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_p1ge3 <= e_ai_p1ge2
Sdmxe	*	INDICATOR	e2	e_ai_p1ge3 <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_pbam <= e_ai_p1any
Sdmxe	*	INDICATOR	e2	e_ai_pbam <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_pbamx <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_pfin <= e_ai_p1any
Sdmxe	*	INDICATOR	e2	e_ai_pfin <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_pfinx <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_pits <= e_ai_p1any
Sdmxe	*	INDICATOR	e2	e_ai_pits <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_pitsx <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_plog <= e_ai_p1any
Sdmxe	*	INDICATOR	e2	e_ai_plog <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_plogx <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_pms <= e_ai_p1any
Sdmxe	*	INDICATOR	e2	e_ai_pms <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_pmsx <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_ppp <= e_ai_p1any
Sdmxe	*	INDICATOR	e2	e_ai_ppp <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_pppx <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_prdi <= e_ai_p1any
Sdmxe	*	INDICATOR	e2	e_ai_prdi <= e_ai_tany
Sdmxe	*	INDICATOR	e2	e_ai_prdix <= e_ai_tany

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	e2	e_ai_tany = e_ai_pbam + e_ai_ pbamx
Sdmxe	*	INDICATOR	e2	e_ai_tany = e_ai_pfin + e_ai_pfinx
Sdmxe	*	INDICATOR	e2	e_ai_tany = e_ai_pits + e_ai_pitsx
Sdmxe	*	INDICATOR	e2	e_ai_tany = e_ai_plog + e_ai_plogx
Sdmxe	*	INDICATOR	e2	e_ai_tany = e_ai_pms + e_ai_pmsx
Sdmxe	*	INDICATOR	e2	e_ai_tany = e_ai_ppp + e_ai_pppx
Sdmxe	*	INDICATOR	e2	e_ai_tany = e_ai_prdi + e_ai_prdix
Sdmxe	*	INDICATOR	e2	e_ai_tany >= e_ai_pbam + e_ai_ pbamx
Sdmxe	*	INDICATOR	e2	e_ai_tany >= e_ai_pfin + e_ai_pfinx
Sdmxe	*	INDICATOR	e2	e_ai_tany >= e_ai_pits + e_ai_pitsx
Sdmxe	*	INDICATOR	e2	e_ai_tany >= e_ai_plog + e_ai_ plogx
Sdmxe	*	INDICATOR	e2	e_ai_tany >= e_ai_pms + e_ai_ pmsx
Sdmxe	*	INDICATOR	e2	e_ai_tany >= e_ai_ppp + e_ai_pppx
Sdmxe	*	INDICATOR	e2	e_ai_tany >= e_ai_prdi + e_ai_prdix
Sdmxe	*	INDICATOR	e3	e_ai_adown <= e_ai_tany
Sdmxe	*	INDICATOR	e3	e_ai_adownx <= e_ai_tany
Sdmxe	*	INDICATOR	e3	e_ai_aext <= e_ai_tany
Sdmxe	*	INDICATOR	e3	e_ai_aextx <= e_ai_tany
Sdmxe	*	INDICATOR	e3	e_ai_amown <= e_ai_tany
Sdmxe	*	INDICATOR	e3	e_ai_amownx <= e_ai_tany
Sdmxe	*	INDICATOR	e3	e_ai_aos <= e_ai_tany
Sdmxe	*	INDICATOR	e3	e_ai_aosx <= e_ai_tany
Sdmxe	*	INDICATOR	e3	e_ai_ardy <= e_ai_tany
Sdmxe	*	INDICATOR	e3	e_ai_ardyx <= e_ai_tany
Sdmxe	*	INDICATOR	e3	e_ai_tany = e_ai_adown + e_ai_ adownx
Sdmxe	*	INDICATOR	e3	e_ai_tany = e_ai_aext + e_ai_aextx
Sdmxe	*	INDICATOR	e3	e_ai_tany = e_ai_amown + e_ai_ amownx
Sdmxe	*	INDICATOR	e3	e_ai_tany = e_ai_aos + e_ai_aosx

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	e3	e_ai_tany = e_ai_ardy + e_ai_ardyx
Sdmxe	*	INDICATOR	e3	e_ai_tany >= e_ai_adown + e_ai_adownx
Sdmxe	*	INDICATOR	e3	e_ai_tany >= e_ai_aext + e_ai_aextx
Sdmxe	*	INDICATOR	e3	e_ai_tany >= e_ai_amown + e_ai_amownx
Sdmxe	*	INDICATOR	e3	e_ai_tany >= e_ai_aos + e_ai_aosx
Sdmxe	*	INDICATOR	e3	e_ai_tany >= e_ai_ardy + e_ai_ardyx
Sdmxe	*	INDICATOR	e4	e_ai_ec <= e_ai_tx
Sdmxe	*	INDICATOR	e4	e_ai_ecx <= e_ai_tx
Sdmxe	*	INDICATOR	e4	e_ai_tx = e_ai_ec + e_ai_ecx
Sdmxe	*	INDICATOR	e4	e_ai_tx >= e_ai_ec + e_ai_ecx
Sdmxe	*	INDICATOR	e5	e_ai_bcdp <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_bcdpx <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_bcst <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_bcstx <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_bddt <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_bddtx <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_bec <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_becx <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_binc <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_bincx <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_ble <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_bleg <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_blegx <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_blex <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_bnu <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_bnux <= e_ai_ec
Sdmxe	*	INDICATOR	e5	e_ai_ec = e_ai_bcdp + e_ai_bcdpx
Sdmxe	*	INDICATOR	e5	e_ai_ec = e_ai_bcst + e_ai_bcstx
Sdmxe	*	INDICATOR	e5	e_ai_ec = e_ai_bddt + e_ai_bddtx

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	e5	e_ai_ec = e_ai_bec + e_ai_becx
Sdmxe	*	INDICATOR	e5	e_ai_ec = e_ai_binc + e_ai_bincx
Sdmxe	*	INDICATOR	e5	e_ai_ec = e_ai_ble + e_ai_blex
Sdmxe	*	INDICATOR	e5	e_ai_ec = e_ai_bleg + e_ai_blegx
Sdmxe	*	INDICATOR	e5	e_ai_ec = e_ai_bnu + e_ai_bnux
Sdmxe	*	INDICATOR	e5	e_ai_ec >= e_ai_bcdp + e_ai_bcdpx
Sdmxe	*	INDICATOR	e5	e_ai_ec >= e_ai_bcst + e_ai_bcstx
Sdmxe	*	INDICATOR	e5	e_ai_ec >= e_ai_bddt + e_ai_bddtx
Sdmxe	*	INDICATOR	e5	e_ai_ec >= e_ai_bec + e_ai_becx
Sdmxe	*	INDICATOR	e5	e_ai_ec >= e_ai_binc + e_ai_bincx
Sdmxe	*	INDICATOR	e5	e_ai_ec >= e_ai_ble + e_ai_blex
Sdmxe	*	INDICATOR	e5	e_ai_ec >= e_ai_bleg + e_ai_blegx
Sdmxe	*	INDICATOR	e5	e_ai_ec >= e_ai_bnu + e_ai_bnux
Sdmxe	*	INDICATOR	f1	e_inv4s_ap <= e_iuse
Sdmxe	*	INDICATOR	f1	e_inv4s_apx <= e_iuse
Sdmxe	*	INDICATOR	f1	e_inv4s_emp <= e_iuse
Sdmxe	*	INDICATOR	f1	e_inv4s_empx <= e_iuse
Sdmxe	*	INDICATOR	f1	e_inv4s_pmp <= e_iuse
Sdmxe	*	INDICATOR	f1	e_inv4s_pmpx <= e_iuse
Sdmxe	*	INDICATOR	f1	e_iuse = e_inv4s_ap + e_inv4s_apx
Sdmxe	*	INDICATOR	f1	e_iuse = e_inv4s_emp + e_inv4s_ empx
Sdmxe	*	INDICATOR	f1	e_iuse = e_inv4s_pmp + e_inv4s_ pmpx
Sdmxe	*	INDICATOR	f1	e_iuse >= e_inv4s_ap + e_inv4s_apx
Sdmxe	*	INDICATOR	f1	e_iuse >= e_inv4s_emp + e_inv4s_ empx
Sdmxe	*	INDICATOR	f1	e_iuse >= e_inv4s_pmp + e_inv4s_ pmpx
Sdmxe	*	INDICATOR	f2	e_inv4s_ap = e_inv4s_ap_lt10 + e_inv4s_ap_10_24 + e_inv4s_ ap_25_49 + e_inv4s_ap_50_74 + e_inv4s_ap_ge75

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	f2	e_inv4s_ap >= e_inv4s_ap_lt10 + e_inv4s_ap_10_24 + e_inv4s_ap_25_49 + e_inv4s_ap_50_74 + e_inv4s_ap_ge75
Sdmxe	*	INDICATOR	f2	e_inv4s_ap_10_24 <= e_inv4s_ap
Sdmxe	*	INDICATOR	f2	e_inv4s_ap_25_49 <= e_inv4s_ap
Sdmxe	*	INDICATOR	f2	e_inv4s_ap_50_74 <= e_inv4s_ap
Sdmxe	*	INDICATOR	f2	e_inv4s_ap_ge75 <= e_inv4s_ap
Sdmxe	*	INDICATOR	f2	e_inv4s_ap_lt10 <= e_inv4s_ap
Sdmxe	*	INDICATOR	p_a01	empl = p_iuse + p_iusex
Sdmxe	*	INDICATOR	p_a01	empl >= p_iuse + p_iusex
Sdmxe	*	INDICATOR	p_a01	p_iuse <= empl
Sdmxe	*	INDICATOR	p_a01	p_iusex <= empl
Sdmxe	*	INDICATOR	p_b1	p_awsell <= empl
Sdmxe	*	INDICATOR	p_b5	p_axsell <= empl
Sdmxe	*	INDICATOR	p_b5b1	p_aesell <= empl
Sdmxe	*	INDICATOR	p_b5b1	p_aesell <= p_awsell + p_axsell
Sdmxe	*	INDICATOR	p_b5b1	p_awsell <= p_aesell
Sdmxe	*	INDICATOR	p_b5b1	p_axsell <= p_aesell
Sdmxe	*	INDICATOR	zdi	e_di3_gelo <= ent
Sdmxe	*	INDICATOR	zdi	e_di3_gelo = e_di3_lo + e_di3_hi + e_di3_vhi
Sdmxe	*	INDICATOR	zdi	e_di3_gelo >= e_di3_lo + e_di3_hi + e_di3_vhi
Sdmxe	*	INDICATOR	zdi	e_di3_hi <= ent
Sdmxe	*	INDICATOR	zdi	e_di3_lo <= e_di3_gelo
Sdmxe	*	INDICATOR	zdi	e_di3_lo <= ent
Sdmxe	*	INDICATOR	zdi	e_di3_vhi <= e_di3_gelo
Sdmxe	*	INDICATOR	zdi	e_di3_vhi <= ent
Sdmxe	*	INDICATOR	zdi	e_di3_hi <= e_di3_gelo
Sdmxe	*	INDICATOR	zdi	e_di3_vlo <= ent
Sdmxe	*	INDICATOR	zdi	ent = e_di3_vlo + e_di3_lo + e_di3_hi + e_di3_vhi

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	zdi	ent >= e_di3_vlo + e_di3_lo + e_di3_hi + e_di3_vhi
Sdmxe	*	INDICATOR	zdic1	e_di3_hi_bsany <= e_di3_hi
Sdmxe	*	INDICATOR	zdic1	e_di3_hi_bsany <= e_erp1 + e_crm1 + e_itbi
Sdmxe	*	INDICATOR	zdic1	e_di3_lo_bsany <= e_di3_lo
Sdmxe	*	INDICATOR	zdic1	e_di3_lo_bsany <= e_erp1 + e_crm1 + e_itbi
Sdmxe	*	INDICATOR	zdic1	e_di3_vhi_bsany <= e_di3_vhi
Sdmxe	*	INDICATOR	zdic1	e_di3_vhi_bsany <= e_erp1 + e_crm1 + e_itbi
Sdmxe	*	INDICATOR	zdic1	e_di3_vlo_bsany <= e_di3_vlo
Sdmxe	*	INDICATOR	zdic1	e_di3_vlo_bsany <= e_erp1 + e_crm1 + e_itbi
Sdmxe	*	INDICATOR	zdic2	e_di3_hi_sisc <= e_di3_hi
Sdmxe	*	INDICATOR	zdic2	e_di3_hi_sisc <= e_sisc
Sdmxe	*	INDICATOR	zdic2	e_di3_lo_sisc <= e_di3_lo
Sdmxe	*	INDICATOR	zdic2	e_di3_lo_sisc <= e_sisc
Sdmxe	*	INDICATOR	zdic2	e_di3_vhi_sisc <= e_di3_vhi
Sdmxe	*	INDICATOR	zdic2	e_di3_vhi_sisc <= e_sisc
Sdmxe	*	INDICATOR	zdic2	e_di3_vlo_sisc <= e_di3_vlo
Sdmxe	*	INDICATOR	zdic2	e_di3_vlo_sisc <= e_sisc
Sdmxe	*	INDICATOR	zdic2	e_sisc = e_di3_vlo_sisc + e_di3_lo_sisc + e_di3_hi_sisc + e_di3_vhi_sisc
Sdmxe	*	INDICATOR	zdic2	e_sisc >= e_di3_vlo_sisc + e_di3_lo_sisc + e_di3_hi_sisc + e_di3_vhi_sisc
Sdmxe	*	INDICATOR	zdic4	e_dasany = e_di3_vlo_dasany + e_di3_lo_dasany + e_di3_hi_dasany + e_di3_vhi_dasany
Sdmxe	*	INDICATOR	zdic4	e_dasany >= e_di3_vlo_dasany + e_di3_lo_dasany + e_di3_hi_dasany + e_di3_vhi_dasany
Sdmxe	*	INDICATOR	zdic4	e_di3_hi_dasany <= e_dasany
Sdmxe	*	INDICATOR	zdic4	e_di3_hi_dasany <= e_di3_hi
Sdmxe	*	INDICATOR	zdic4	e_di3_lo_dasany <= e_dasany

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	INDICATOR	zdic4	e_di3_lo_dasany <= e_di3_lo
Sdmxe	*	INDICATOR	zdic4	e_di3_vhi_dasany <= e_dasany
Sdmxe	*	INDICATOR	zdic4	e_di3_vhi_dasany <= e_di3_vhi
Sdmxe	*	INDICATOR	zdic4	e_di3_vlo_dasany <= e_dasany
Sdmxe	*	INDICATOR	zdic4	e_di3_vlo_dasany <= e_di3_vlo
Sdmxe	*	INDICATOR	zdic5c3	e_ai_tany = e_di3_vlo_ai_tany + e_di3_lo_ai_tany + e_di3_hi_ai_tany + e_di3_vhi_ai_tany
Sdmxe	*	INDICATOR	zdic5c3	e_ai_tany >= e_di3_vlo_ai_tany + e_di3_lo_ai_tany + e_di3_hi_ai_tany + e_di3_vhi_ai_tany
Sdmxe	*	INDICATOR	zdic5c3	e_da = e_di3_vlo_da + e_di3_lo_da + e_di3_hi_da + e_di3_vhi_da
Sdmxe	*	INDICATOR	zdic5c3	e_da >= e_di3_vlo_da + e_di3_lo_da + e_di3_hi_da + e_di3_vhi_da
Sdmxe	*	INDICATOR	zdic5c3	e_di3_hi_da <= e_da
Sdmxe	*	INDICATOR	zdic5c3	e_di3_hi_da <= e_di3_hi
Sdmxe	*	INDICATOR	zdic5c3	e_di3_lo_da <= e_da
Sdmxe	*	INDICATOR	zdic5c3	e_di3_lo_da <= e_di3_lo
Sdmxe	*	INDICATOR	zdic5c3	e_di3_vhi_da <= e_da
Sdmxe	*	INDICATOR	zdic5c3	e_di3_vhi_da <= e_di3_vhi
Sdmxe	*	INDICATOR	zdic5c3	e_di3_vlo_da <= e_da
Sdmxe	*	INDICATOR	zdic5c3	e_di3_vlo_da <= e_di3_vlo
Sdmxe	*	INDICATOR	zdie1	e_di3_hi_ai_tany <= e_ai_tany
Sdmxe	*	INDICATOR	zdie1	e_di3_hi_ai_tany <= e_di3_hi
Sdmxe	*	INDICATOR	zdie1	e_di3_lo_ai_tany <= e_ai_tany
Sdmxe	*	INDICATOR	zdie1	e_di3_lo_ai_tany <= e_di3_lo
Sdmxe	*	INDICATOR	zdie1	e_di3_vhi_ai_tany <= e_ai_tany
Sdmxe	*	INDICATOR	zdie1	e_di3_vhi_ai_tany <= e_di3_vhi
Sdmxe	*	INDICATOR	zdie1	e_di3_vlo_ai_tany <= e_ai_tany
Sdmxe	*	INDICATOR	zdie1	e_di3_vlo_ai_tany <= e_di3_vlo
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E0T1 <= E0T9
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E0T1 >= 0

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E0T9 = E0T1 + E2T9
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E0T9 >= 0
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E10T249 <= EGE10
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E10T249 = E10T49 + E50T249
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E10T249 >= 0
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E10T49 <= E10T249
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E10T49 <= EGE10
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E10T49 >= 0
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E2T9 <= E0T9
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E2T9 >= 0
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E50T249 <= E10T249
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E50T249 <= EGE10
Sdmxe	*	NUMBER_EMPLOYEES	bySize	E50T249 >= 0
Sdmxe	*	NUMBER_EMPLOYEES	bySize	EGE10 = E10T49 + E50T249 + EGE250
Sdmxe	*	NUMBER_EMPLOYEES	bySize	EGE10 >= 0
Sdmxe	*	NUMBER_EMPLOYEES	bySize	EGE250 <= EGE10
Sdmxe	*	NUMBER_EMPLOYEES	bySize	EGE250 >= 0
Sdmxe	AT	REGIONAL	AT	_Z = AT1 + AT2 + AT3
Sdmxe	AT	REGIONAL	AT	AT1 <= _Z
Sdmxe	AT	REGIONAL	AT	AT1 = AT11 + AT12 + AT13
Sdmxe	AT	REGIONAL	AT	AT11 <= AT1
Sdmxe	AT	REGIONAL	AT	AT12 <= AT1

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	AT	REGIONAL	AT	AT13 <= AT1
Sdmxe	AT	REGIONAL	AT	AT2 <= _Z
Sdmxe	AT	REGIONAL	AT	AT2 = AT21 + AT22
Sdmxe	AT	REGIONAL	AT	AT21 <= AT2
Sdmxe	AT	REGIONAL	AT	AT22 <= AT2
Sdmxe	AT	REGIONAL	AT	AT3 <= _Z
Sdmxe	AT	REGIONAL	AT	AT3 = AT31 + AT32 + AT33 + AT34
Sdmxe	AT	REGIONAL	AT	AT31 <= AT3
Sdmxe	AT	REGIONAL	AT	AT32 <= AT3
Sdmxe	AT	REGIONAL	AT	AT33 <= AT3
Sdmxe	AT	REGIONAL	AT	AT34 <= AT3
Sdmxe	BA	UNIT_MEASURE	Cur	EUR = XDC / 1.95583
Sdmxe	BE	REGIONAL	BE	_Z = BE1 + BE2 + BE3
Sdmxe	BE	REGIONAL	BE	BE1 <= _Z
Sdmxe	BE	REGIONAL	BE	BE1 = BE10
Sdmxe	BE	REGIONAL	BE	BE10 <= BE1
Sdmxe	BE	REGIONAL	BE	BE2 <= _Z
Sdmxe	BE	REGIONAL	BE	BE2 = BE21 + BE22 + BE23 + BE24 + BE25
Sdmxe	BE	REGIONAL	BE	BE21 <= BE2
Sdmxe	BE	REGIONAL	BE	BE22 <= BE2
Sdmxe	BE	REGIONAL	BE	BE23 <= BE2
Sdmxe	BE	REGIONAL	BE	BE24 <= BE2
Sdmxe	BE	REGIONAL	BE	BE25 <= BE2
Sdmxe	BE	REGIONAL	BE	BE3 <= _Z
Sdmxe	BE	REGIONAL	BE	BE3 = BE31 + BE32 + BE33 + BE34 + BE35
Sdmxe	BE	REGIONAL	BE	BE31 <= BE3
Sdmxe	BE	REGIONAL	BE	BE32 <= BE3
Sdmxe	BE	REGIONAL	BE	BE33 <= BE3
Sdmxe	BE	REGIONAL	BE	BE34 <= BE3
Sdmxe	BE	REGIONAL	BE	BE35 <= BE3
Sdmxe	BG	REGIONAL	BG	_Z = BG3 + BG4

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	BG	REGIONAL	BG	BG3 <= _Z
Sdmxe	BG	REGIONAL	BG	BG3 = BG31 + BG32 + BG33 + BG34
Sdmxe	BG	REGIONAL	BG	BG31 <= BG3
Sdmxe	BG	REGIONAL	BG	BG32 <= BG3
Sdmxe	BG	REGIONAL	BG	BG33 <= BG3
Sdmxe	BG	REGIONAL	BG	BG34 <= BG3
Sdmxe	BG	REGIONAL	BG	BG4 <= _Z
Sdmxe	BG	REGIONAL	BG	BG4 = BG41 + BG42
Sdmxe	BG	REGIONAL	BG	BG41 <= BG4
Sdmxe	BG	REGIONAL	BG	BG42 <= BG4
Sdmxe	BG	UNIT_MEASURE	Cur	EUR = XDC / 1.9558
Sdmxe	CY	REGIONAL	CY	CY0 = _Z
Sdmxe	CY	REGIONAL	CY	CY00 = CY0
Sdmxe	CZ	REGIONAL	CZ	CZ0 = _Z
Sdmxe	CZ	REGIONAL	CZ	CZ0 = CZ01 + CZ02 + CZ03 + CZ04 + CZ05 + CZ06 + CZ07 + CZ08
Sdmxe	CZ	REGIONAL	CZ	CZ01 <= CZ0
Sdmxe	CZ	REGIONAL	CZ	CZ02 <= CZ0
Sdmxe	CZ	REGIONAL	CZ	CZ03 <= CZ0
Sdmxe	CZ	REGIONAL	CZ	CZ04 <= CZ0
Sdmxe	CZ	REGIONAL	CZ	CZ05 <= CZ0
Sdmxe	CZ	REGIONAL	CZ	CZ06 <= CZ0
Sdmxe	CZ	REGIONAL	CZ	CZ07 <= CZ0
Sdmxe	CZ	REGIONAL	CZ	CZ08 <= CZ0
Sdmxe	CZ	UNIT_MEASURE	Cur	EUR = XDC / 24.566
Sdmxe	DE	REGIONAL	DE	_Z = DE1 + DE2 + DE3 + DE4 + DE5 + DE6 + DE7 + DE8 + DE9 + DEA + DEB + DEC + DED + DEE + DEF + DEG
Sdmxe	DE	REGIONAL	DE	DE1 <= _Z
Sdmxe	DE	REGIONAL	DE	DE1 = DE11 + DE12 + DE13 + DE14
Sdmxe	DE	REGIONAL	DE	DE11 <= DE1
Sdmxe	DE	REGIONAL	DE	DE12 <= DE1
Sdmxe	DE	REGIONAL	DE	DE13 <= DE1

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	DE	REGIONAL	DE	DE14 <= DE1
Sdmxe	DE	REGIONAL	DE	DE2 <= _Z
Sdmxe	DE	REGIONAL	DE	DE2 = DE21 + DE22 + DE23 + DE24 + DE25 + DE26 + DE27
Sdmxe	DE	REGIONAL	DE	DE21 <= DE2
Sdmxe	DE	REGIONAL	DE	DE22 <= DE2
Sdmxe	DE	REGIONAL	DE	DE23 <= DE2
Sdmxe	DE	REGIONAL	DE	DE24 <= DE2
Sdmxe	DE	REGIONAL	DE	DE25 <= DE2
Sdmxe	DE	REGIONAL	DE	DE26 <= DE2
Sdmxe	DE	REGIONAL	DE	DE27 <= DE2
Sdmxe	DE	REGIONAL	DE	DE3 <= _Z
Sdmxe	DE	REGIONAL	DE	DE3 = DE30
Sdmxe	DE	REGIONAL	DE	DE30 <= DE3
Sdmxe	DE	REGIONAL	DE	DE4 <= _Z
Sdmxe	DE	REGIONAL	DE	DE4 = DE40
Sdmxe	DE	REGIONAL	DE	DE40 <= DE4
Sdmxe	DE	REGIONAL	DE	DE5 <= _Z
Sdmxe	DE	REGIONAL	DE	DE5 = DE50
Sdmxe	DE	REGIONAL	DE	DE50 <= DE5
Sdmxe	DE	REGIONAL	DE	DE6 <= _Z
Sdmxe	DE	REGIONAL	DE	DE6 = DE60
Sdmxe	DE	REGIONAL	DE	DE60 <= DE6
Sdmxe	DE	REGIONAL	DE	DE7 <= _Z
Sdmxe	DE	REGIONAL	DE	DE7 = DE71 + DE72 + DE73
Sdmxe	DE	REGIONAL	DE	DE71 <= DE7
Sdmxe	DE	REGIONAL	DE	DE72 <= DE7
Sdmxe	DE	REGIONAL	DE	DE73 <= DE7
Sdmxe	DE	REGIONAL	DE	DE8 <= _Z
Sdmxe	DE	REGIONAL	DE	DE8 = DE80
Sdmxe	DE	REGIONAL	DE	DE80 <= DE8
Sdmxe	DE	REGIONAL	DE	DE9 <= _Z

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	DE	REGIONAL	DE	DE9 = DE91 + DE92 + DE93 + DE94
Sdmxe	DE	REGIONAL	DE	DE91 <= DE9
Sdmxe	DE	REGIONAL	DE	DE92 <= DE9
Sdmxe	DE	REGIONAL	DE	DE93 <= DE9
Sdmxe	DE	REGIONAL	DE	DE94 <= DE9
Sdmxe	DE	REGIONAL	DE	DEA <= _Z
Sdmxe	DE	REGIONAL	DE	DEA = DEA1 + DEA2 + DEA3 + DEA4 + DEA5
Sdmxe	DE	REGIONAL	DE	DEA1 <= DEA
Sdmxe	DE	REGIONAL	DE	DEA2 <= DEA
Sdmxe	DE	REGIONAL	DE	DEA3 <= DEA
Sdmxe	DE	REGIONAL	DE	DEA4 <= DEA
Sdmxe	DE	REGIONAL	DE	DEA5 <= DEA
Sdmxe	DE	REGIONAL	DE	DEB <= _Z
Sdmxe	DE	REGIONAL	DE	DEB = DEB1 + DEB2 + DEB3
Sdmxe	DE	REGIONAL	DE	DEB1 <= DEB
Sdmxe	DE	REGIONAL	DE	DEB2 <= DEB
Sdmxe	DE	REGIONAL	DE	DEB3 <= DEB
Sdmxe	DE	REGIONAL	DE	DEC <= _Z
Sdmxe	DE	REGIONAL	DE	DEC = DEC0
Sdmxe	DE	REGIONAL	DE	DEC0 <= DEC
Sdmxe	DE	REGIONAL	DE	DED <= _Z
Sdmxe	DE	REGIONAL	DE	DED = DED2 + DED4 + DED5
Sdmxe	DE	REGIONAL	DE	DED2 <= DED
Sdmxe	DE	REGIONAL	DE	DED4 <= DED
Sdmxe	DE	REGIONAL	DE	DED5 <= DED
Sdmxe	DE	REGIONAL	DE	DEE <= _Z
Sdmxe	DE	REGIONAL	DE	DEE = DEE0
Sdmxe	DE	REGIONAL	DE	DEE0 <= DEE
Sdmxe	DE	REGIONAL	DE	DEF <= _Z
Sdmxe	DE	REGIONAL	DE	DEF = DEF0
Sdmxe	DE	REGIONAL	DE	DEF0 <= DEF

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	DE	REGIONAL	DE	DEG <= _Z
Sdmxe	DE	REGIONAL	DE	DEG = DEG0
Sdmxe	DE	REGIONAL	DE	DEG0 <= DEG
Sdmxe	DK	REGIONAL	DK	DK0 = _Z
Sdmxe	DK	REGIONAL	DK	DK0 = DK01 + DK02 + DK03 + DK04 + DK05
Sdmxe	DK	REGIONAL	DK	DK01 <= DK0
Sdmxe	DK	REGIONAL	DK	DK02 <= DK0
Sdmxe	DK	REGIONAL	DK	DK03 <= DK0
Sdmxe	DK	REGIONAL	DK	DK04 <= DK0
Sdmxe	DK	REGIONAL	DK	DK05 <= DK0
Sdmxe	DK	UNIT_MEASURE	Cur	EUR = XDC / 7.4396
Sdmxe	EE	REGIONAL	EE	EE0 = _Z
Sdmxe	EE	REGIONAL	EE	EE00 = EE0
Sdmxe	EL	REGIONAL	EL	_Z = EL3 + EL4 + EL5 + EL6
Sdmxe	EL	REGIONAL	EL	EL3 <= _Z
Sdmxe	EL	REGIONAL	EL	EL3 = EL30
Sdmxe	EL	REGIONAL	EL	EL30 <= EL3
Sdmxe	EL	REGIONAL	EL	EL4 <= _Z
Sdmxe	EL	REGIONAL	EL	EL4 = EL41 + EL42 + EL43
Sdmxe	EL	REGIONAL	EL	EL41 <= EL4
Sdmxe	EL	REGIONAL	EL	EL42 <= EL4
Sdmxe	EL	REGIONAL	EL	EL43 <= EL4
Sdmxe	EL	REGIONAL	EL	EL5 <= _Z
Sdmxe	EL	REGIONAL	EL	EL5 = EL51 + EL52 + EL53 + EL54
Sdmxe	EL	REGIONAL	EL	EL51 <= EL5
Sdmxe	EL	REGIONAL	EL	EL52 <= EL5
Sdmxe	EL	REGIONAL	EL	EL53 <= EL5
Sdmxe	EL	REGIONAL	EL	EL54 <= EL5
Sdmxe	EL	REGIONAL	EL	EL6 <= _Z
Sdmxe	EL	REGIONAL	EL	EL6 = EL61 + EL62 + EL63 + EL64 + EL65
Sdmxe	EL	REGIONAL	EL	EL61 <= EL6

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	EL	REGIONAL	EL	EL62 <= EL6
Sdmxe	EL	REGIONAL	EL	EL63 <= EL6
Sdmxe	EL	REGIONAL	EL	EL64 <= EL6
Sdmxe	EL	REGIONAL	EL	EL65 <= EL6
Sdmxe	ES	REGIONAL	ES	_Z = ES1 + ES2 + ES3 + ES4 + ES5 + ES6 + ES7
Sdmxe	ES	REGIONAL	ES	ES1 <= _Z
Sdmxe	ES	REGIONAL	ES	ES1 = ES11 + ES12 + ES13
Sdmxe	ES	REGIONAL	ES	ES11 <= ES1
Sdmxe	ES	REGIONAL	ES	ES12 <= ES1
Sdmxe	ES	REGIONAL	ES	ES13 <= ES1
Sdmxe	ES	REGIONAL	ES	ES2 <= _Z
Sdmxe	ES	REGIONAL	ES	ES2 = ES21 + ES22 + ES23 + ES24
Sdmxe	ES	REGIONAL	ES	ES21 <= ES2
Sdmxe	ES	REGIONAL	ES	ES22 <= ES2
Sdmxe	ES	REGIONAL	ES	ES23 <= ES2
Sdmxe	ES	REGIONAL	ES	ES24 <= ES2
Sdmxe	ES	REGIONAL	ES	ES3 <= _Z
Sdmxe	ES	REGIONAL	ES	ES3 = ES30
Sdmxe	ES	REGIONAL	ES	ES30 <= ES3
Sdmxe	ES	REGIONAL	ES	ES4 <= _Z
Sdmxe	ES	REGIONAL	ES	ES4 = ES41 + ES42 + ES43
Sdmxe	ES	REGIONAL	ES	ES41 <= ES4
Sdmxe	ES	REGIONAL	ES	ES42 <= ES4
Sdmxe	ES	REGIONAL	ES	ES43 <= ES4
Sdmxe	ES	REGIONAL	ES	ES5 <= _Z
Sdmxe	ES	REGIONAL	ES	ES5 = ES51 + ES52 + ES53
Sdmxe	ES	REGIONAL	ES	ES51 <= ES5
Sdmxe	ES	REGIONAL	ES	ES52 <= ES5
Sdmxe	ES	REGIONAL	ES	ES53 <= ES5
Sdmxe	ES	REGIONAL	ES	ES6 <= _Z
Sdmxe	ES	REGIONAL	ES	ES6 = ES61 + ES62 + ES63 + ES64

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	ES	REGIONAL	ES	ES61 <= ES6
Sdmxe	ES	REGIONAL	ES	ES62 <= ES6
Sdmxe	ES	REGIONAL	ES	ES63 <= ES6
Sdmxe	ES	REGIONAL	ES	ES64 <= ES6
Sdmxe	ES	REGIONAL	ES	ES7 <= _Z
Sdmxe	ES	REGIONAL	ES	ES7 = ES70
Sdmxe	ES	REGIONAL	ES	ES70 <= ES7
Sdmxe	FI	REGIONAL	FI	_Z = FI1 + FI2
Sdmxe	FI	REGIONAL	FI	FI1 <= _Z
Sdmxe	FI	REGIONAL	FI	FI1 = FI19 + FI1B + FI1C + FI1D
Sdmxe	FI	REGIONAL	FI	FI19 <= FI1
Sdmxe	FI	REGIONAL	FI	FI1B <= FI1
Sdmxe	FI	REGIONAL	FI	FI1C <= FI1
Sdmxe	FI	REGIONAL	FI	FI1D <= FI1
Sdmxe	FI	REGIONAL	FI	FI2 <= _Z
Sdmxe	FI	REGIONAL	FI	FI2 = FI20
Sdmxe	FI	REGIONAL	FI	FI20 <= FI2
Sdmxe	FR	REGIONAL	FR	_Z = FR1 + FRB + FRC + FRD + FRE + FRF + FRG + FRH + FRI + FRJ + FRK + FRL + FRM + FRY
Sdmxe	FR	REGIONAL	FR	FR1 <= _Z
Sdmxe	FR	REGIONAL	FR	FR1 = FR10
Sdmxe	FR	REGIONAL	FR	FR10 <= FR1
Sdmxe	FR	REGIONAL	FR	FRB <= _Z
Sdmxe	FR	REGIONAL	FR	FRB = FRB0
Sdmxe	FR	REGIONAL	FR	FRB0 <= FRB
Sdmxe	FR	REGIONAL	FR	FRC <= _Z
Sdmxe	FR	REGIONAL	FR	FRC = FRC1 + FRC2
Sdmxe	FR	REGIONAL	FR	FRC1 <= FRC
Sdmxe	FR	REGIONAL	FR	FRC2 <= FRC
Sdmxe	FR	REGIONAL	FR	FRD <= _Z
Sdmxe	FR	REGIONAL	FR	FRD = FRD1 + FRD2
Sdmxe	FR	REGIONAL	FR	FRD1 <= FRD

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	FR	REGIONAL	FR	FRD2 <= FRD
Sdmxe	FR	REGIONAL	FR	FRE <= _Z
Sdmxe	FR	REGIONAL	FR	FRE = FRE1 + FRE2
Sdmxe	FR	REGIONAL	FR	FRE1 <= FRE
Sdmxe	FR	REGIONAL	FR	FRE2 <= FRE
Sdmxe	FR	REGIONAL	FR	FRF <= _Z
Sdmxe	FR	REGIONAL	FR	FRF = FRF1 + FRF2 + FRF3
Sdmxe	FR	REGIONAL	FR	FRF1 <= FRF
Sdmxe	FR	REGIONAL	FR	FRF2 <= FRF
Sdmxe	FR	REGIONAL	FR	FRF3 <= FRF
Sdmxe	FR	REGIONAL	FR	FRG <= _Z
Sdmxe	FR	REGIONAL	FR	FRG = FRG0
Sdmxe	FR	REGIONAL	FR	FRG0 <= FRG
Sdmxe	FR	REGIONAL	FR	FRH <= _Z
Sdmxe	FR	REGIONAL	FR	FRH = FRH0
Sdmxe	FR	REGIONAL	FR	FRH0 <= FRH
Sdmxe	FR	REGIONAL	FR	FRI <= _Z
Sdmxe	FR	REGIONAL	FR	FRI = FRI1 + FRI2 + FRI3
Sdmxe	FR	REGIONAL	FR	FRI1 <= FRI
Sdmxe	FR	REGIONAL	FR	FRI2 <= FRI
Sdmxe	FR	REGIONAL	FR	FRI3 <= FRI
Sdmxe	FR	REGIONAL	FR	FRJ <= _Z
Sdmxe	FR	REGIONAL	FR	FRJ = FRJ1 + FRJ2
Sdmxe	FR	REGIONAL	FR	FRJ1 <= FRJ
Sdmxe	FR	REGIONAL	FR	FRJ2 <= FRJ
Sdmxe	FR	REGIONAL	FR	FRK <= _Z
Sdmxe	FR	REGIONAL	FR	FRK = FRK1 + FRK2
Sdmxe	FR	REGIONAL	FR	FRK1 <= FRK
Sdmxe	FR	REGIONAL	FR	FRK2 <= FRK
Sdmxe	FR	REGIONAL	FR	FRL <= _Z
Sdmxe	FR	REGIONAL	FR	FRL = FRL0
Sdmxe	FR	REGIONAL	FR	FRL0 <= FRL

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	FR	REGIONAL	FR	FRM <= _Z
Sdmxe	FR	REGIONAL	FR	FRM = FRM0
Sdmxe	FR	REGIONAL	FR	FRM0 <= FRM
Sdmxe	FR	REGIONAL	FR	FRY <= _Z
Sdmxe	FR	REGIONAL	FR	FRY = FRY1 + FRY2 + FRY3 + FRY4 + FRY5
Sdmxe	FR	REGIONAL	FR	FRY1 <= FRY
Sdmxe	FR	REGIONAL	FR	FRY2 <= FRY
Sdmxe	FR	REGIONAL	FR	FRY3 <= FRY
Sdmxe	FR	REGIONAL	FR	FRY4 <= FRY
Sdmxe	FR	REGIONAL	FR	FRY5 <= FRY
Sdmxe	HR	REGIONAL	HR	HR0 = _Z
Sdmxe	HR	REGIONAL	HR	HR0 = HR02 + HR03 + HR05 + HR06
Sdmxe	HR	REGIONAL	HR	HR02 <= HR0
Sdmxe	HR	REGIONAL	HR	HR03 <= HR0
Sdmxe	HR	REGIONAL	HR	HR05 <= HR0
Sdmxe	HR	REGIONAL	HR	HR06 <= HR0
Sdmxe	HR	UNIT_MEASURE	Cur	EUR = XDC / 7.5345
Sdmxe	HU	REGIONAL	HU	_Z = HU1 + HU2 + HU3
Sdmxe	HU	REGIONAL	HU	HU1 <= _Z
Sdmxe	HU	REGIONAL	HU	HU1 = HU11 + HU12
Sdmxe	HU	REGIONAL	HU	HU11 <= HU1
Sdmxe	HU	REGIONAL	HU	HU12 <= HU1
Sdmxe	HU	REGIONAL	HU	HU2 <= _Z
Sdmxe	HU	REGIONAL	HU	HU2 = HU21 + HU22 + HU23
Sdmxe	HU	REGIONAL	HU	HU21 <= HU2
Sdmxe	HU	REGIONAL	HU	HU22 <= HU2
Sdmxe	HU	REGIONAL	HU	HU23 <= HU2
Sdmxe	HU	REGIONAL	HU	HU3 <= _Z
Sdmxe	HU	REGIONAL	HU	HU3 = HU31 + HU32 + HU33
Sdmxe	HU	REGIONAL	HU	HU31 <= HU3
Sdmxe	HU	REGIONAL	HU	HU32 <= HU3

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	HU	REGIONAL	HU	HU33 <= HU3
Sdmxe	HU	UNIT_MEASURE	Cur	EUR = XDC / 391.29
Sdmxe	IE	REGIONAL	IE	IE0 = _Z
Sdmxe	IE	REGIONAL	IE	IE0 = IE04 + IE05 + IE06
Sdmxe	IE	REGIONAL	IE	IE04 <= IE0
Sdmxe	IE	REGIONAL	IE	IE05 <= IE0
Sdmxe	IE	REGIONAL	IE	IE06 <= IE0
Sdmxe	IS	REGIONAL	IS	IS0 = _Z
Sdmxe	IS	REGIONAL	IS	IS00 = IS0
Sdmxe	IS	UNIT_MEASURE	Cur	EUR = XDC / 142.24
Sdmxe	IT	REGIONAL	IT	_Z = ITC + ITF + ITG + ITH + ITI
Sdmxe	IT	REGIONAL	IT	ITC <= _Z
Sdmxe	IT	REGIONAL	IT	ITC = ITC1 + ITC2 + ITC3 + ITC4
Sdmxe	IT	REGIONAL	IT	ITC1 <= ITC
Sdmxe	IT	REGIONAL	IT	ITC2 <= ITC
Sdmxe	IT	REGIONAL	IT	ITC3 <= ITC
Sdmxe	IT	REGIONAL	IT	ITC4 <= ITC
Sdmxe	IT	REGIONAL	IT	ITF <= _Z
Sdmxe	IT	REGIONAL	IT	ITF = ITF1 + ITF2 + ITF3 + ITF4 + ITF5 + ITF6
Sdmxe	IT	REGIONAL	IT	ITF1 <= ITF
Sdmxe	IT	REGIONAL	IT	ITF2 <= ITF
Sdmxe	IT	REGIONAL	IT	ITF3 <= ITF
Sdmxe	IT	REGIONAL	IT	ITF4 <= ITF
Sdmxe	IT	REGIONAL	IT	ITF5 <= ITF
Sdmxe	IT	REGIONAL	IT	ITF6 <= ITF
Sdmxe	IT	REGIONAL	IT	ITG <= _Z
Sdmxe	IT	REGIONAL	IT	ITG = ITG1 + ITG2
Sdmxe	IT	REGIONAL	IT	ITG1 <= ITG
Sdmxe	IT	REGIONAL	IT	ITG2 <= ITG
Sdmxe	IT	REGIONAL	IT	ITH <= _Z
Sdmxe	IT	REGIONAL	IT	ITH = ITH1 + ITH2 + ITH3 + ITH4 + ITH5

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	IT	REGIONAL	IT	ITH1 <= ITH
Sdmxe	IT	REGIONAL	IT	ITH2 <= ITH
Sdmxe	IT	REGIONAL	IT	ITH3 <= ITH
Sdmxe	IT	REGIONAL	IT	ITH4 <= ITH
Sdmxe	IT	REGIONAL	IT	ITH5 <= ITH
Sdmxe	IT	REGIONAL	IT	ITI <= _Z
Sdmxe	IT	REGIONAL	IT	ITI = ITI1 + ITI2 + ITI3 + ITI4
Sdmxe	IT	REGIONAL	IT	ITI1 <= ITI
Sdmxe	IT	REGIONAL	IT	ITI2 <= ITI
Sdmxe	IT	REGIONAL	IT	ITI3 <= ITI
Sdmxe	IT	REGIONAL	IT	ITI4 <= ITI
Sdmxe	LT	REGIONAL	LT	LT0 = _Z
Sdmxe	LT	REGIONAL	LT	LT0 = LT01 + LT02
Sdmxe	LT	REGIONAL	LT	LT01 <= LT0
Sdmxe	LT	REGIONAL	LT	LT02 <= LT0
Sdmxe	LU	REGIONAL	LU	LU0 = _Z
Sdmxe	LU	REGIONAL	LU	LU00 = LU0
Sdmxe	LV	REGIONAL	LV	LV0 = _Z
Sdmxe	LV	REGIONAL	LV	LV00 = LV0
Sdmxe	MK	UNIT_MEASURE	Cur	EUR = XDC / 61.6228
Sdmxe	MT	REGIONAL	MT	MT0 = _Z
Sdmxe	MT	REGIONAL	MT	MT00 = MT0
Sdmxe	NL	REGIONAL	NL	_Z = NL1 + NL2 + NL3 + NL4
Sdmxe	NL	REGIONAL	NL	NL1 <= _Z
Sdmxe	NL	REGIONAL	NL	NL1 = NL11 + NL12 + NL13
Sdmxe	NL	REGIONAL	NL	NL11 <= NL1
Sdmxe	NL	REGIONAL	NL	NL12 <= NL1
Sdmxe	NL	REGIONAL	NL	NL13 <= NL1
Sdmxe	NL	REGIONAL	NL	NL2 <= _Z
Sdmxe	NL	REGIONAL	NL	NL2 = NL21 + NL22 + NL23
Sdmxe	NL	REGIONAL	NL	NL21 <= NL2
Sdmxe	NL	REGIONAL	NL	NL22 <= NL2

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	NL	REGIONAL	NL	NL23 <= NL2
Sdmxe	NL	REGIONAL	NL	NL3 <= _Z
Sdmxe	NL	REGIONAL	NL	NL3 = NL31 + NL32 + NL33 + NL34
Sdmxe	NL	REGIONAL	NL	NL31 <= NL3
Sdmxe	NL	REGIONAL	NL	NL32 <= NL3
Sdmxe	NL	REGIONAL	NL	NL33 <= NL3
Sdmxe	NL	REGIONAL	NL	NL34 <= NL3
Sdmxe	NL	REGIONAL	NL	NL4 <= _Z
Sdmxe	NL	REGIONAL	NL	NL4 = NL41 + NL42
Sdmxe	NL	REGIONAL	NL	NL41 <= NL4
Sdmxe	NL	REGIONAL	NL	NL42 <= NL4
Sdmxe	NO	REGIONAL	NO	NO0 = _Z
Sdmxe	NO	REGIONAL	NO	NO0 = NO02 + NO06 + NO07 + NO08 + NO09 + NO0A + NO0B
Sdmxe	NO	REGIONAL	NO	NO02 <= NO0
Sdmxe	NO	REGIONAL	NO	NO06 <= NO0
Sdmxe	NO	REGIONAL	NO	NO07 <= NO0
Sdmxe	NO	REGIONAL	NO	NO08 <= NO0
Sdmxe	NO	REGIONAL	NO	NO09 <= NO0
Sdmxe	NO	REGIONAL	NO	NO0A <= NO0
Sdmxe	NO	REGIONAL	NO	NO0B <= NO0
Sdmxe	NO	UNIT_MEASURE	Cur	EUR = XDC / 10.1026
Sdmxe	PL	REGIONAL	PL	_Z = PL2 + PL4 + PL5 + PL6 + PL7 + PL8 + PL9
Sdmxe	PL	REGIONAL	PL	PL2 <= _Z
Sdmxe	PL	REGIONAL	PL	PL2 = PL21 + PL22
Sdmxe	PL	REGIONAL	PL	PL21 <= PL2
Sdmxe	PL	REGIONAL	PL	PL22 <= PL2
Sdmxe	PL	REGIONAL	PL	PL4 <= _Z
Sdmxe	PL	REGIONAL	PL	PL4 = PL41 + PL42 + PL43
Sdmxe	PL	REGIONAL	PL	PL41 <= PL4
Sdmxe	PL	REGIONAL	PL	PL42 <= PL4
Sdmxe	PL	REGIONAL	PL	PL43 <= PL4

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	PL	REGIONAL	PL	PL5 <= _Z
Sdmxe	PL	REGIONAL	PL	PL5 = PL51 + PL52
Sdmxe	PL	REGIONAL	PL	PL51 <= PL5
Sdmxe	PL	REGIONAL	PL	PL52 <= PL5
Sdmxe	PL	REGIONAL	PL	PL6 <= _Z
Sdmxe	PL	REGIONAL	PL	PL6 = PL61 + PL62 + PL63
Sdmxe	PL	REGIONAL	PL	PL61 <= PL6
Sdmxe	PL	REGIONAL	PL	PL62 <= PL6
Sdmxe	PL	REGIONAL	PL	PL63 <= PL6
Sdmxe	PL	REGIONAL	PL	PL7 <= _Z
Sdmxe	PL	REGIONAL	PL	PL7 = PL71 + PL72
Sdmxe	PL	REGIONAL	PL	PL71 <= PL7
Sdmxe	PL	REGIONAL	PL	PL72 <= PL7
Sdmxe	PL	REGIONAL	PL	PL8 <= _Z
Sdmxe	PL	REGIONAL	PL	PL8 = PL81 + PL82 + PL84
Sdmxe	PL	REGIONAL	PL	PL81 <= PL8
Sdmxe	PL	REGIONAL	PL	PL82 <= PL8
Sdmxe	PL	REGIONAL	PL	PL84 <= PL8
Sdmxe	PL	REGIONAL	PL	PL9 <= _Z
Sdmxe	PL	REGIONAL	PL	PL9 = PL91 + PL92
Sdmxe	PL	REGIONAL	PL	PL91 <= PL9
Sdmxe	PL	REGIONAL	PL	PL92 <= PL9
Sdmxe	PL	UNIT_MEASURE	Cur	EUR = XDC / 4.6861
Sdmxe	PT	REGIONAL	PT	_Z = PT1 + PT2 + PT3
Sdmxe	PT	REGIONAL	PT	PT1 <= _Z
Sdmxe	PT	REGIONAL	PT	PT1 = PT11 + PT15 + PT16 + PT17 + PT18
Sdmxe	PT	REGIONAL	PT	PT11 <= PT1
Sdmxe	PT	REGIONAL	PT	PT15 <= PT1
Sdmxe	PT	REGIONAL	PT	PT16 <= PT1
Sdmxe	PT	REGIONAL	PT	PT17 <= PT1
Sdmxe	PT	REGIONAL	PT	PT18 <= PT1

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	PT	REGIONAL	PT	PT2 <= _Z
Sdmxe	PT	REGIONAL	PT	PT2 = PT20
Sdmxe	PT	REGIONAL	PT	PT20 <= PT2
Sdmxe	PT	REGIONAL	PT	PT3 <= _Z
Sdmxe	PT	REGIONAL	PT	PT3 = PT30
Sdmxe	PT	REGIONAL	PT	PT30 <= PT3
Sdmxe	RO	REGIONAL	RO	_Z = RO1 + RO2 + RO3 + RO4
Sdmxe	RO	REGIONAL	RO	RO1 <= _Z
Sdmxe	RO	REGIONAL	RO	RO1 = RO11 + RO12
Sdmxe	RO	REGIONAL	RO	RO11 <= RO1
Sdmxe	RO	REGIONAL	RO	RO12 <= RO1
Sdmxe	RO	REGIONAL	RO	RO2 <= _Z
Sdmxe	RO	REGIONAL	RO	RO2 = RO21 + RO22
Sdmxe	RO	REGIONAL	RO	RO21 <= RO2
Sdmxe	RO	REGIONAL	RO	RO22 <= RO2
Sdmxe	RO	REGIONAL	RO	RO3 <= _Z
Sdmxe	RO	REGIONAL	RO	RO3 = RO31 + RO32
Sdmxe	RO	REGIONAL	RO	RO31 <= RO3
Sdmxe	RO	REGIONAL	RO	RO32 <= RO3
Sdmxe	RO	REGIONAL	RO	RO4 <= _Z
Sdmxe	RO	REGIONAL	RO	RO4 = RO41 + RO42
Sdmxe	RO	REGIONAL	RO	RO41 <= RO4
Sdmxe	RO	REGIONAL	RO	RO42 <= RO4
Sdmxe	RO	UNIT_MEASURE	Cur	EUR = XDC / 4.9313
Sdmxe	RS	UNIT_MEASURE	Cur	EUR = XDC / 117.4588
Sdmxe	SE	REGIONAL	SE	_Z = SE1 + SE2 + SE3
Sdmxe	SE	REGIONAL	SE	SE1 <= _Z
Sdmxe	SE	REGIONAL	SE	SE1 = SE11 + SE12
Sdmxe	SE	REGIONAL	SE	SE11 <= SE1
Sdmxe	SE	REGIONAL	SE	SE12 <= SE1
Sdmxe	SE	REGIONAL	SE	SE2 <= _Z
Sdmxe	SE	REGIONAL	SE	SE2 = SE21 + SE22 + SE23

Survey	Country	KeyName	KeyGroup	Message
Sdmxe	SE	REGIONAL	SE	SE21 <= SE2
Sdmxe	SE	REGIONAL	SE	SE22 <= SE2
Sdmxe	SE	REGIONAL	SE	SE23 <= SE2
Sdmxe	SE	REGIONAL	SE	SE3 <= _Z
Sdmxe	SE	REGIONAL	SE	SE3 = SE31 + SE32 + SE33
Sdmxe	SE	REGIONAL	SE	SE31 <= SE3
Sdmxe	SE	REGIONAL	SE	SE32 <= SE3
Sdmxe	SE	REGIONAL	SE	SE33 <= SE3
Sdmxe	SE	UNIT_MEASURE	Cur	EUR = XDC / 10.6296
Sdmxe	SI	REGIONAL	SI	SI0 = _Z
Sdmxe	SI	REGIONAL	SI	SI0 = SI03 + SI04
Sdmxe	SI	REGIONAL	SI	SI03 <= SI0
Sdmxe	SI	REGIONAL	SI	SI04 <= SI0
Sdmxe	SK	REGIONAL	SK	SK0 = _Z
Sdmxe	SK	REGIONAL	SK	SK0 = SK01 + SK02 + SK03 + SK04
Sdmxe	SK	REGIONAL	SK	SK01 <= SK0
Sdmxe	SK	REGIONAL	SK	SK02 <= SK0
Sdmxe	SK	REGIONAL	SK	SK03 <= SK0
Sdmxe	SK	REGIONAL	SK	SK04 <= SK0
Sdmxe	TR	UNIT_MEASURE	Cur	EUR = XDC / 17.4088
Sdmxe	UK	UNIT_MEASURE	Cur	EUR = XDC / 0.85276

Annex 3 - Metadata reporting template

- Full view -

Template INFOSOC_ETNSI_A_2023

National Reference Metadata in SIMS structure for INFOSOC Enterprises

Compiling agency:

Eurostat metadata

Reference metadata

For any question on data and metadata, please contact: Eurostat user support

1. Contact	Top

1.1. Contact organisation	
1.2. Contact organisation unit	
1.3. Contact name	
1.4. Contact person function	
1.5. Contact mail address	
1.6. Contact email address	
1.7. Contact phone number	
1.8. Contact fax number	

2. Metadata update Top

2.1. Metadata last certified	
2.2. Metadata last posted	
2.3. Metadata last update	

3. Statistical presentation Top

3.1. Data description

Data on the Information and Communication Technologies (ICT) usage and e-commerce in enterprises are survey data. They are collected by the National Statistical Institutes or Ministries and are in principle based on Eurostat's **annual model questionnaires** on **ICT usage and e-commerce in enterprises**.

Large part of the data collected is used to measure the progress in the implementation of one of the main political priorities of the European Commission for 2019 to 2024 – A Europe fit for the digital age. Part of this is the "European strategy for data", envisioning a single market for data to ensure the EU's global competitiveness and data sovereignty, in which context a comprehensive set of new rules for all digital services was proposed: the Digital Services Act and the Digital Markets Act, which are centrepieces of the EU digital strategy. Furthermore, the Commission and the High Representative of the Union for Foreign Affairs and Security Policy presented a new "EU cybersecurity strategy", which is intended to bolster the EU's collective resilience against cyber threats, safeguard a global and open internet and protect EU values and the fundamental rights of its people. Furthermore, data will allow monitoring the progress towards A Europe fit for the digital age, one of the six priorities for the period 2019-2024 of the von der Leyen European Commission.

The aim of the European survey on ICT usage and e-commerce in enterprises is to collect and disseminate harmonised and comparable information at European level.

Name of data collection

Please complete for the Metadata report.

3.2. Classification system

NACE Rev.2 2008

3.3. Coverage - sector

All economic activities in the scope of Annex I of the Commission Regulation are intended to be included in the general survey, covering enterprises with 10 or more employees and self-employed persons. These activities are: NACE Rev. 2 sections C, D, E, F, G, H, I, J, L, M and N, division 95.1.

For micro-enterprises see the sub-concepts below.

3.3.1. Coverage-sector economic activity for micro-enterprises - All NACE Rev. 2 categories are covered

3.3.2. Coverage sector economic activity for micro-enterprises - If the answer is "No", which ones were covered?

3.4. Statistical concepts and definitions

The model questionnaire on ICT usage and e-commerce in enterprises provides a large variety of variables covering among others the following areas:

- Access to and use of the Internet
- E-commerce and e-business
- Use of cloud computing services
- Artificial Intelligence
- Other topics: Data utilisation, sharing, analytics and trading, Invoicing.

The annual model questionnaires and the European businesses statistics compliers' manual for ICT usage and e-commerce in enterprises comprise definitions and explanations regarding the topics of the survey.

3.5. Statistical unit

Please complete for the Metadata report.

3.6. Statistical population

Target Population

As required by Annex of the Commission Implementing Regulation, enterprises with 10 or more employees and self-employed persons shall be covered by the survey.

For micro-enterprises see the sub-concepts below.

3.6.1. Coverage of micro-enterprises

3.6.2. Breakdown between size classes [0 to 1] and [2 to 9]

3.6.3. If for micro-enterprises different size delimitation was used, please indicate it.

3.7. Reference area

Please complete for the Metadata report.

3.8. Coverage - Time

Years 2022 and 2023.

3.9. Base period

Not applicable

4. Unit of measure Top

Percentages of enterprises, Percentages of turnover, Percentages of employees and self-employed persons.

5. Reference Period Top

Please complete for the Metadata report.

6. Institutional Mandate

Top

6.1. Institutional Mandate - legal acts and other agreements

Complementary national legislation constituting the legal basis for the survey on the use of ICT in enterprises:

Please complete for the Metadata report.

6.2. Institutional Mandate - data sharing

Please complete for the Metadata report.

7. Confidentiality

Top

7.1. Confidentiality - policy

Regulation (EC) No 223/2009 on European statistics (recital 24 and Article 20(4)) of 11 March 2009 (OJ L 87, p. 164), stipulates the need to establish common principles and guidelines ensuring the confidentiality of data used for the production of European statistics and the access to those confidential data with due account for technical developments and the requirements of users in a democratic society.

At national level :

Please complete for the Quality report.

7.2. Confidentiality - data treatment

Data are transmitted via eDamis (encrypted) and delivered to a secure environment where they are treated. Flags are added for confidentiality in case results must not be disclosed.

At national level :

Please complete for the Quality report.

8. Release policy

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8.1. Release calendar

Please complete for the Quality report.

8.2. Release calendar access

Please complete for the Quality report.

8.3. Release policy - user access

Please complete for the Quality report.

9. Frequency of dissemination

Top

Annual

10. Accessibility and clarity

Top

10.1. Dissemination format - News release

Please complete for the Quality report.

10.2. Dissemination format - Publications

Please complete for the Quality report.

10.3. Dissemination format - online database

See detailed section 10.3.1.

10.3.1. Data tables - consultations

Results for selected variables collected in the framework of this survey are available for all participating countries on Digital economy and society of Eurostat website.

At national level :

Please complete for the Quality report.

10.4. Dissemination format - microdata access

Please complete for the Quality report.

10.5. Dissemination format - other

Not requested

10.5.1. Metadata - consultations

Not requested

10.6. Documentation on methodology

Please complete for the Quality report.

10.6.1. Metadata completeness - rate

Not requested

10.7. Quality management - documentation

Please complete for the Quality report.

11. Quality management

Top

11.1. Quality assurance

The European businesses statistics compliers' manual for ICT usage and e-commerce in enterprises provides guidelines and standards for the implementation of the surveys. It is updated every year according to the changed contents of the model questionnaires.

At national level :

Please complete for the Metadata report.

11.2. Quality management - assessment

European level :

At European level, the recommended use of the annual Eurostat model questionnaire aims at improving comparability of the results among the countries that conduct the survey on ICT usage and e-commerce in enterprises. Moreover, the Methodological Manual provides guidelines and clarifications for the implementation of the surveys.

National level :

Please complete for the Metadata report.

12. Relevance

Top

12.1. Relevance - User Needs

European level :

At European level, European Commission users (e.g. DG CNECT, DG GROW, DG JUST, DG REGIO, DG JRC) are the principal users of the data on **ICT usage and e-commerce in enterprises** and contribute in identifying/defining the topics to be covered. Hence, main users are consulted regularly (at hearings, task forces, ad hoc meetings) for their needs and are involved in the process of the development of the model questionnaires at a very early stage.

User needs are considered throughout the whole discussion process of the model questionnaires aiming at providing relevant statistical data for monitoring and benchmarking of European policies.

National level :

Please complete for the Metadata report.

12.2. Relevance - User Satisfaction

European level :

At European level, contacts within the Commission, the OECD and other stakeholders give a clear picture about the key users' satisfaction as to the following data quality aspects: accuracy and reliability of results, timeliness, satisfactory accessibility, clarity and comparability over time and between countries, completeness and relevance. Overall users have evaluated positively (good, very good) the data quality on the ICT usage and e-commerce in enterprises.

National level :

Please complete for the Metadata report.

12.3. Completeness

Detailed information is available in " Annex I _ Completeness " excel file - related to questionnaire, coverage, additional questions.

12.3.1. Data completeness - rate

Not requested.

13. Accuracy

Top

13.1. Accuracy - overall

Comments on reliability and representativeness of results and completeness of dataset

These comments reflect overall standard errors reported for the indicators and breakdowns in section 13.2.1 (Sampling error - indicators) and the rest of the breakdowns for national and European aggregates, as well as other accuracy measurements. The estimated standard error should not exceed 2pp for the overall proportions and should not exceed 5pp for the proportions related to the different subgroups of the population (for those NACE aggregates for the calculation and dissemination of national aggregates). If problems were found, these could have implications for future surveys (e.g. need to improve sampling design, to increase sample sizes, to increase the response rates).

More detailed information is available in " Annex II. _ Accuracy " excel file - related to European aggregates, comments on reliability and use of flag.

13.2. Sampling error

For calculation of the standard error see 13.2.1.1.

13.2.1. Sampling error - indicators

Standard error (for selected indicators and breakdowns)

Precision measures related to variability due to sampling, unit non-response (the size of the subset of respondents is smaller than the size of the original sample) and other (imputation for item non-response, calibration etc.) are not (yet) required from the Member states for all indicators. Eurostat will make basic assumptions to compute these measures for all indicators produced (e.g. stratified random sampling assuming as strata the crossing of the variables "Number of employees and self-employed persons" and "Economic Activity" as it was defined in the 3 tables of section 18.1).

More detailed information is available in" Sample and standard error tables 2023 " excel file – worksheets starting with "Standard error".

13.2.1.1. Sampling error indicator calculation

Calculation of the standard error

Various methods can be used for the calculation of the standard error for an estimated proportion. The aim is to incorporate into the standard error the sampling variability but also variability due to unit non-response, item non-response (imputation), calibration etc. In case of census / take-all strata, the aim is to calculate the standard errors comprising the variability due to unit non-response and item non-response.

a) Name and brief description of the applied estimation approach
b) Basic formula
c) Main reference in the literature
d) How has the stratification been taken into account?
e) Which strata have been considered?

13.3. Non-sampling error

See detailed sections below.

13.3.1. Coverage error

See concept 18.1.1. A) Description of frame population.

13.3.1.1. Over-coverage - rate

Please complete for the Quality report.

13.3.1.2. Common units - proportion

Not requested

13.3.2. Measurement error

Please complete for the Quality report.

13.3.3. Non response error

See detailed sections below.

13.3.3.1. Unit non-response - rate

See detailed sub-concepts below.

13.3.3.1.1. Unit response

The following table contains the number of units (i.e. enterprises), by type of response to the survey and by the percentage of these values in relation to the gross sample size.

Type of response	Enterprises			
	0-9 employees and self-employed persons		10 or more employees and self-employed persons	
	Number	%	Number	%
Gross sample size (as in section 3.1 C)		**100%**		**100%**
1. Response (questionnaires returned by the enterprise)				
1.1 Used for tabulation and grossing up (Net sample or Final Sample; as in section 3.1 D)				
1.2 Not used for tabulation				
1.2.1 Out of scope (deaths, misclassified originally in the target population, etc.)				
1.2.2 Other reasons (e.g. unusable questionnaire)				
2. Non-response (e.g. non returned mail, returned mail by post office)				

Comments on unit response, if unit response is below 60%

13.3.3.1.2. Methods used for minimizing unit non-response

Please complete for the Quality report.

13.3.3.1.3. Methods used for unit non-response treatment

1. No treatment for unit non-response	
2. Treatment by re-weighting	
2.1 Re-weighting by the sampling design strata considering that non-response is ignorable inside each stratum (the naïve model)	
2.2 Re-weighting by identified response homogeneity groups (created using sample-level information)	
2.3 Re-weighting through calibration/post-stratification (performed using population information) by the groups used for calibration/post-stratification	
3. Treatment by imputation (done distinctly for each variable/item)	

4. Method(s) and the model(s) corresponding to the above or other method(s) used for the treatment of unit non-response. (e.g. Re-weighting using Horvitz-Thompson estimator, ratio estimator or regression estimator, auxiliary variables)

13.3.3.1.4. Assessment of unit non-response bias

Please complete for the Quality report.

13.3.3.2. Item non-response - rate

Please complete for the Quality report.

13.3.3.2.1. Methods used for item non-response treatment

1. No treatment for item non-response	
2. Deductive imputation An exact value can be derived as a known function of other characteristics.	
3. Deterministic imputation (e.g. mean/ median, mean/median by class, ratio-based, regression-based, single donor nearest-neighbour) Deterministic imputation leads to estimators with no random component, that is, if the imputation were to be re-conducted, the outcome would be the same	
4. Random imputation (e.g. hot-deck, cold-deck) Random imputation leads to estimators with a random component, that is, if the imputation were re-conducted, it would have led to a different result	
5. Re-weighting	
6. Multiple imputation In multiple imputation each missing value is replaced (instead of a single value) with a set of plausible values that represent the uncertainty of the right value to impute. Multiple imputation methods offer the possibility of deriving variance estimators by taking imputation into account. The incorporation of imputation into the variance can be easily derived based on variability of estimates among the multiply imputed data sets.	
7. Method(s) and the model(s) corresponding to the above or other method(s) used for the treatment of item non-response.	

13.3.3.2.2. Questions or items with item response rates below 90% and other comments

Other comments relating to the item non-response

Additional issues concerning "non-response" calculation (e.g. method used in national publications).
Questions and items with low response rates (cut-off value is 90%) and item non-response rate.

13.3.4. Processing error

Please complete for the Quality report.

13.3.5. Model assumption error

Not requested

14. Timeliness and punctuality

Top

14.1. Timeliness

See detailed section below.

14.1.1. Time lag - first result

Not applicable

14.1.2. Time lag - final result

European level :

Data are to be delivered to Eurostat in the fourth quarter of the reference year (due date for the finalised dataset is 5th October). European results are released before the end of the survey year or in the beginning of the year following the survey year (T=reference year, T+0 for indicators referring to the current year, T+12 months for other indicators referring to the previous year e.g. e-commerce).

At national level :

Please complete for the Quality report.

14.2. Punctuality

See detailed section below.

14.2.1. Punctuality - delivery and publication

Please complete for the Quality report.

15. Coherence and comparability

Top

15.1. Comparability - geographical

The model questionnaire is generally used by the countries that conduct the survey on ICT usage and e-commerce in enterprises. Due to (small) differences in translation, in the used survey vehicle, in non-response treatment or different routing through the questionnaire, some results for some countries may be of reduced comparability. In these cases, notes are added in the data.

Detailed information on differences in the wording of the questions in the national questionnaires is available in " Annex I _ Completeness " excel file - related to questionnaire, coverage, additional questions.

15.1.1. Asymmetry for mirror flow statistics - coefficient

Not applicable

15.2. Comparability - over time

See section below.

15.2.1. Length of comparable time series

The length of comparable time series depends on the module and the variable considered within each survey module. Additional information is available in annexes attached to the European metadata.

Please complete for the Quality report.

15.3. Coherence - cross domain

Not applicable

15.3.1. Coherence - sub annual and annual statistics

Not applicable

15.3.2. Coherence - National Accounts

Not applicable

15.4. Coherence - internal

Not applicable

16. Cost and Burden Top

Please complete for the Quality report.

17. Data revision Top

17.1. Data revision - policy

Please complete for the Quality report.

17.2. Data revision - practice

Please complete for the Quality report.

17.2.1. Data revision - average size

Not requested

18. Statistical processing Top

18.1. Source data

A) Frame population description and distribution

For more information see concept 18.1.1.

B) Sampling design - Sampling method

Description of the sampling method used (e.g. stratified random sample, quota sampling, cluster sampling; one-stage or two-stage sampling) and information which variables were used to stratify, the categories of those variables, in particular for the NACE Rev. 2 categories related to the "possible calculation of European aggregates", and the final number of strata:

Please complete for the Metadata report.

C) **Gross sample distribution**

More detailed information is available in " Sample and standard error tables 2023 " excel file (Worksheet: GROSS SAMPLE)

D) Net sample distribution

More detailed information is available in " Sample and standard error tables 2023 " excel file (Worksheet: NET SAMPLE)

18.1.1. Population frame

A) Description of frame population

a) When was the sample for the ICT usage and e-commerce in enterprise survey drawn?	
b) When was the last update of the Business register that was used for drawing the sample of enterprises for the survey?	
c) Please indicate if the frame population is the same as, or is in some way coordinated with, the one used for the Structural Business Statistics (different snapshots)	
d) Please describe if different frames are used during different stages of the statistical process (e.g. frame used for sampling vs. frame used for grossing up):	
e) Please indicate shortcomings in terms of timeliness (e.g. time lag between last update of the sampling frame and the moment of the actual sampling), geographical coverage, coverage of different subpopulations, data available etc., and any measures taken to correct it, for this survey.	

B) Frame population distribution

More detailed information is available in " Sample and standard error tables 2023 " excel file (Worksheet: FRAME POPULATION)

18.2. Frequency of data collection

Annual

18.3. Data collection

See detailed sections below.

18.3.1. Survey period

Survey / Collection	Date of sending out questionnaires	Date of reception of the last questionnaire treated
General survey		
Micro-enterprises		

18.3.2. Survey vehicle – general survey

General survey - Stand-alone survey

18.3.3. Survey vehicle – enterprises

Was the collection of micro-enterprises integrated with the general survey?

18.3.4. Survey type

Please complete for the Metadata report.

18.3.5. Survey participation

Mandatory

18.4. Data validation

Please complete for the Quality report.

18.5. Data compilation

Grossing-up procedures

Please complete for the Quality report.

18.5.1. Imputation - rate

Please complete for the Quality report

18.6. Adjustment

Not applicable

18.6.1. Seasonal adjustment

Not applicable

19. Comment

Top

Problems encountered and lessons to be learnt:

19.1. Documents

Questionnaire in national language	
Questionnaire in English (if available)	
National reports on methodology (if available)	
Analysis of key results, backed up by tables and graphs in English (if available)	
Other Annexes	

Related metadata

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Annexes

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Annex I._Completeness 2023
Annex II._ Accuracy 2023
Sample and standard error tables 2023

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European businesses statistics compilers' manual for ICT usage and e-commerce in enterprises

Information and Communications Technologies (ICT) account for a significant part of EU productivity and growth and are transforming our societies and economies in a profound and unprecedented way. The uptake of digital technologies by enterprises transforms the way they conduct their activities, their business models, jobs, production. Statistics on information and communications technologies (ICT) usage and e-commerce in enterprises statistics measure the uptake of EU technologies and the digitalisation of the EU economy.

These statistics are gathered through the annual 'ICT usage and e-commerce in enterprises' survey. The 2023 survey measured enterprises' access to and use of the internet and e-commerce (i.e. sale of goods and services online), use of cloud computing services, artificial intelligence and invoicing as well as data utilisation, sharing, analytics and trading.

The purpose of the compilers' manual is meant to serve as a practical reference document for all National Statistical Institutes (NSIs) involved in the compilation of data on the use of ICT and e-commerce in enterprises. Among others, the manual aims to help NSIs translate Eurostat model questionnaires into national languages and to ensure that the same methodology is used by all countries when conducting national surveys and to set out the concepts, definitions, and compilation, guiding the compilation of data.

The purpose of this publication is to provide the compilers of European statistics on information and communication technology (ICT) usage and e-commerce in enterprises with clarifications on how to apply the EU legal provisions. With the help of explanations and legal references, the Manual is meant to serve as a practical reference document for National Statistical Authorities.

For more information
https://ec.europa.eu/eurostat/

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