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CONFIDENTIAL

SURVEY ON ICT USAGE AND E-COMMERCE IN ENTERPRISES 2023

GENERAL INFORMATION:

- 1 The aim of the survey is to collect data about the use of information and communication technologies by the enterprises, the access and use of the Internet, e-commerce, Data utilization, sharing, analytics and trading, use of Cloud Computing services, Artificial Intelligence, and Invoicing. These data are necessary for the implementation of policy programmes of both the Government and the Private Sector.
- 2 All requested information must be supplied by the **IT manager of the enterprise**. Regarding the enterprise's background information (Module X), these should be provided by the General Manager or by the Accountant or by any other person responsible.
- 3 An authorised employee of the Statistical Service will contact the IT manager of the enterprise by phone in order to fill in the questionnaire.
- 4 Definitions of the terms used in the questionnaire can be found in the glossary attached.
- 5 The reference period for the data is the survey period (2023), unless the question refers to other specific period.
- 6 The collection of data is carried out in accordance with the Official Statistics Law of 2021 (Law No. 25(I)/2021). The Statistical Service is bound by the Statistics Law to treat all information obtained as **CONFIDENTIAL**. Your responses will be used solely for statistical purposes.

S. Karagiorgis
Director
Statistical Service

January, 2023

Module A: Access and use of the Internet ⁽¹⁶⁾

(Scope: all enterprises)

A1. How many persons employed have access to the internet for business purposes? (including fixed line and mobile 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	(Number) % If the value=0, go to X1
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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)	Yes ☐	No ☐ ->go to A4										
A3. What is the maximum contracted download speed of the fastest fixed internet connection of your enterprise? (Tick only one) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">a) less than 30 Mbit/s</td> <td style="width: 30%; text-align: center;"> ☐ </td> </tr> <tr> <td>b) at least 30 but less than 100 Mbit/s</td> <td style="text-align: center;"> ☐ </td> </tr> <tr> <td>c) at least 100 Mbit/s but less than 500 Mbit/s</td> <td style="text-align: center;"> ☐ </td> </tr> <tr> <td>d) at least 500 Mbit/s but less than 1 Gbit/s</td> <td style="text-align: center;"> ☐ </td> </tr> <tr> <td>e) at least 1 Gbit/s</td> <td style="text-align: center;"> ☐ </td> </tr> </table>			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	☐
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 ⁽³¹⁾		
A4.	Does your enterprise have a website?	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 ⁽⁴⁾ , 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 ⁽¹⁾

A6.	Does your enterprise have a mobile app for clients (e.g. for loyalty program, e-commerce, customer support)?	Yes ☐ No ☐
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Use of social media ⁽²⁶⁾		
Enterprises <u>using</u> 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?	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:	Yes	No
	a) Develop the enterprise's image or market products (e.g. advertising or launching products)	☐	☐
	b) Obtain or respond to <u>customer</u> opinions, reviews, questions	☐	☐
	c) Involve <u>customers</u> in development or innovation of goods or services	☐	☐
	d) Collaborate with <u>business partners</u> (e.g. suppliers) or <u>other organisations</u> (e.g. public authorities, non-governmental organisations)	☐	☐
	e) Recruit employees	☐	☐
	f) Exchange views, opinions or knowledge <u>within</u> the enterprise	☐	☐

Other use of the internet			
A9.	Does your enterprise pay to advertise on the internet? (e.g. adverts on search engines, on social media, on other websites or apps)	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⁽¹⁴⁾ (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:	Yes	No
	a) your enterprise's websites or apps? (including extranets)	☐	☐
	b) e-commerce marketplace⁽¹⁷⁾ 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.)	☐	☐

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)						
	<table border="1"> <tr> <td>a) What was the value of your web sales of goods or services, in 2022?</td> <td>(National currency, excluding VAT) _____</td> </tr> <tr> <td colspan="2" style="text-align: center;">OR</td> </tr> <tr> <td>b) What percentage of total turnover was generated by web sales of goods or services, in 2022? <i>If you cannot provide the exact percentage an approximation will suffice.</i></td> <td>□ □ □ , □ %</td> </tr> </table>	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? <i>If you cannot provide the exact percentage an approximation will suffice.</i>	□ □ □ , □ %
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? <i>If you cannot provide the exact percentage an approximation will suffice.</i>	□ □ □ , □ %						

Question B3 should be answered only if both B1 a) <u>and</u> 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) <i>If you cannot provide the exact percentages an approximation will suffice.</i>						
	<table border="1"> <tr> <td>a) via your enterprise's websites or apps? (including extranets)</td> <td>□ □ □ %</td> </tr> <tr> <td>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.) <i>[Please add national examples of e-commerce marketplaces incl. government marketplaces]</i></td> <td>□ □ □ %</td> </tr> <tr> <td>TOTAL</td> <td>1 0 0 %</td> </tr> </table>	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.) <i>[Please add national examples of e-commerce marketplaces incl. government marketplaces]</i>	□ □ □ %	TOTAL	1 0 0 %
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.) <i>[Please add national examples of e-commerce marketplaces incl. government marketplaces]</i>	□ □ □ %						
TOTAL	1 0 0 %						

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) <i>If you cannot provide the exact percentages an approximation will suffice.</i>	
	a) Sales to private consumers (B2C)	□ □ □ %
	b) Sales to other enterprises (B2B) and Sales to public sector (B2G)	□ □ □ %
	TOTAL	1 0 0 %

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⁽¹³⁾ system. Examples of EDI: EDIFACT, XML⁽³⁴⁾/EDI (e.g. UBL, Rosettanet, <i>[please add national examples]</i>).

B5. During 2022, did your enterprise have EDI-type sales of goods or services?	Yes ☐	No ☐ -> go to C1
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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)	(National currency, excluding VAT) _____
OR b) What percentage of total turnover was generated by EDI-type sales of goods or services, in 2022? <i>If you cannot provide the exact percentage an approximation will suffice.</i>	□ □ □ □ %

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⁽⁷⁾) 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. 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.	Yes ☐	No ☐
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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? <i>Please, consider internal and external data sources.</i>	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 ERP, own webshop)	☐	☐
	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)	☐	☐
	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 ⁽¹⁵⁾)	☐	☐
	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 tags RFID)	☐	☐
	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 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? <i>Please include data analytics based on data from internal and external sources.</i>	Yes ☐	No ☐
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Data trading

C6.	During 2022, did your enterprise sell (access to) any of its own data? <i>e.g. data about your enterprise's customers' preferences, data from your enterprise's smart devices or sensors</i>	Yes ☐	No ☐
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C7.	During 2022, did your enterprise purchase (access to) any data? <i>e.g. data about other enterprise's customers' preferences, data from other enterprise's smart devices or sensors</i>	Yes ☐	No ☐
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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⁽²⁹⁾).

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.)	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 etc.) (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 ⁽⁷⁾) 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**⁽²⁸⁾, **computer vision**⁽⁵⁾, **speech recognition**⁽²⁷⁾, **natural language generation**⁽¹⁹⁾, **machine learning**⁽¹⁸⁾, **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⁽²⁰⁾;
- 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 ⁽²⁴⁾)	☐	☐
	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 data or strategic decision making, 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?	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	☐	☐

Question 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?	Yes ☐	No ☐ -> go to F1
E5.	What are the reasons for your enterprise not to use any of the Artificial Intelligence technologies listed in question E1?	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 <u>send</u> any of the following types of invoices: <i>Include also invoices sent via intermediaries, e.g. accountants, e-invoice service providers</i>	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 <u>sent</u> (in electronic or paper form) to private customers, other enterprises or public authorities, how many were e-invoices in a <u>standard structure suitable for automated processing</u>? (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%	☐

Module X: Background information

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

- 1. 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>
- 2. 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>
- 3. 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
- 4. 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.
- 5. 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
- 6. 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>
- 7. 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.

8. 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>

9. 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](http://en.wikipedia.org/wiki/Electronic_Data_Interchange)

10. 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

11. 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

12. 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.

13. 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.

14. 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.
15. 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
16. 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.
17. 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.
18. 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.
19. Natural language generation (NLG)	Natural language generation is the ability for a computer program to convert data into natural language representation.
20. Natural language processing (NLP)	Natural language processing is the ability for a computer program to understand human language as it is spoken.
21. 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.
22. Online payment	An online payment is an integrated ordering-payment transaction
23. 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.

24. 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.

25. Sales via website (web sales)

Web sales are sales made via an online store (web shop), 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

26. 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.

27. 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.

28. Text mining

Text mining refers to the use of advanced techniques for automated detection of patterns in (large) texts.

29. 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

30. Web e-commerce

Web (e-commerce) sales are sales made via an online store (web shop), 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

31. 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.

32. 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.

33. 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.

34. 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/>