

Firm-level Adoption of Technology Survey

The World Bank

2022

INTRODUCTION

This survey is being conducted by _____ on behalf of _____.

The goal of this survey is to gather information about technologies adopted by firms in Ethiopia. The information gathered here will help the World Bank to develop new policies and programs that enhance employment, economic growth and shared prosperity.

The information obtained here will be anonymized. Neither your name nor the name of your business will be used in any document based on this survey.

INTERVIEWER: WE DEFINE TECHNOLOGY AS MACHINERY, EQUIPMENT, SOFTWARE, OR PROCESS USED BY THE FIRM TO PRODUCE SOMETHING.

Structure of the questionnaire

- A. GENERAL INFORMATION AND FIRM CHARACTERISTICS
- B. GENERAL BUSINESS FUNCTIONS
- C. SECTOR SPECIFIC TECHNOLOGIES
- D. DRIVERS AND BARRIERS FOR ADOPTION
- E. BALANCE SHEET AND PERFORMANCE

QUESTIONS BEGIN HERE

A. CONTROL AND GENERAL INFORMATION

TO BE COMPLETED AT THE TIME OF THE INTERVIEW
TO BE MERGED WITH THE SCREENING QUESTIONNAIRE

A.1 Time interview begins:

Day (dd)	Month (mm)	Year (yyyy)	Hour (00 to 23)	Minutes (00 to 59)
a1a	a1b	a1c	a1d	a1e

READ OUT THE FOLLOWING INTRODUCTORY SENTENCE ONLY IF s4= 1 (yes):
The first few questions apply to the firm which this establishment is part of.

A.3 Ownership

What percentage of this firm is owned by each of the following: SHOW CARD 1	Share	DON'T KNOW (SPONTANEOUS)
Private foreign individuals, companies or organizations	a3b%	-9
Government or state	a3c%	-9

Condition: The sum of a3b + a3c should be below or equal to 100%.

Question	Variable	Answer
Is this firm owned by the founder or someone of her/his family?	a4b	1 = Yes. By the founder. 2 = Yes. By the founder's family (2nd generation or more) 3 = No -9 = Don't know -7 = Not applicable
Amongst the owners of the firm, are there any females?	a4e	1 = Yes 2 = No -9 = Don't know

READ ONLY IF s4=1 (yes)

I want to proceed by asking you about this establishment only.

A5	Over the year [2020], please tell me what type of product or service represents this establishment's greatest share of annual sales? INTERVIEWER: PLEASE RECORD THE DESCRIPTION OF THE ACTIVITY AND PRODUCT IN DETAIL, FOR EXAMPLE, "RETAIL SALE OF WOMEN'S OUTDOOR CLOTHING" NOT JUST "CLOTHING".
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a5a	DETAILED DESCRIPTI ON OF MAIN ACTIVITY AND PRODUCT	a5c What sector specific questionnaire should be used ? IF a5c IS DIFFERENT FROM s6b, PLEASE DOUBLE CHECK THE INFORMATION. CONDITION: IF a5c=0 SKIP SECTION C.
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Agriculture (except Livestock)	1	a5b	1
Livestock	2		2
Food Processing	3		3
Wearing Apparel	4		4
Motor Vehicles	5		5
Pharmaceuticals	6		6
Wholesale and Retail	7		7
Financial Services	8		8
Land Transport	9		9
Health Services	10		10
Leather and Footwear	11		11
Accommodation	12		12
Other Manufacturing	101		0
Other Services	102		0

Question	Variable	Answer
In what year did this establishment begin operations?	a6	(year) Year the establishment began operations -9 = Don't know

INTERVIEWER: PROVIDE FOUR DIGITS FOR YEAR

Question	Variable	Answer
How many years of experience working in this sector does the Top Manager have?	a7a	(Number of years) 1 = If less than a year -9 = Don't know
Is the Top Manager female?	a7b	1 = Yes 2 = No -9 = Don't know
What is the highest level of education of the Top Manager? SHOW CARD 2	a7c	1 = Primary school 2 = Secondary school 3 = Complete high-school 4 = College degree 5 = Post-Graduation (MBA, Master or PhD) 6 = Vocational training -9 = Don't know
Did the Top Manager study abroad for more than a month?	a7d	1 = Yes 2 = No -9 = Don't know

B. GENERAL BUSINESS FUNCTIONS

READ THE FOLLOWING TO THE RESPONDENT BEFORE PROCEEDING:

The next topic to be covered is about use of water, electricity, telecommunications, and internet for business purpose.

TECHNOLOGY ENABLERS

B.1 Use of electrical energy

Does this establishment have an electrical connection from the grid? [SKIP: IF b1a =2 OR b1a =-9, GO TO b2a]	b1a 1 = Yes 2 = No -9 = Don't know
Over the year [2020] did this establishment experience power outages? [SKIP: IF b1b =2, GO TO b2a]	b1b 1 = Yes 2 = No
In a typical month, over the year [2020], how many power outages did this establishment experience?	b1c (Number of power outages in a typical month) 1 = Less than one per month -9 = Don't know

B.2 Use of generators

Over the year [2020], did this establishment own or share a generator? [SKIP: IF b2a =2 OR b2a =-9, GO TO b2a]	b2a 1 = Yes 2 = No -9 = Don't know
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Energy consumption/Efficiency block

Does this establishment use any of the following sources of energy in 2020?	Variable	Answer	
Natural Gas	b2d1	1 = Yes 2 = No	-9 = Don't know
Fuel Oil	b2d2	1 = Yes 2 = No	-9 = Don't know
Liquefied Petroleum Gases (LPG)	b2d3	1 = Yes 2 = No	-9 = Don't know
Coal or Wood fuels (wood, charcoal, others)	b2d4	1 = Yes 2 = No	-9 = Don't know
Own renewable sources, such as power plants using solar, wind, hydro, biomass or geothermal energy	b2d5	1 = Yes 2 = No	-9 = Don't know
What percentage of the energy use in 2020 comes from own renewable sources such as solar, wind, hydro, biomass or geothermal energy? [CONDITION: ASK ONLY IF b2d5 =1]	b2d5a	<u> </u> % (0-100%)	

B.4 Computers use

How many desktop or laptop computers does this establishment use for business purpose? INTERVIEWER: IT INCLUDES OWNED OR RENTED COMPUTERS	b4a (number of computers) -9 = Don't know
How many tablets or smartphones does this establishment use for business purpose? INTERVIEWER: IT INCLUDES OWNED OR RENTED DEVICES	b4b (number) -9 = Don't know

B.5 Internet service and coverage

Does this establishment have an Internet connection?	b5a YES = 1, NO = 2
What is the fastest type of Internet connection does this establishment has? SHOW CARDS 4	b5b 1 = Dial up 2 = DSL or Fiber 3 = Wireless or Satellite 4 = BPL 5 = Other
At the present time, does this establishment (or firm) have its own website?	b5f YES = 1, NO = 2 -9 = Don't know
At the present time, does this establishment (or firm) use an account on an online social media for business purpose?	b5g YES = 1, NO = 2 -9 = Don't know
Does this establishment (or firm) use cloud computer services for business purpose?	b5h YES = 1, NO = 2 -9 = Don't know

READ THE FOLLOWING TO THE RESPONDENT BEFORE PROCEEDING:

Now, we turn to questions about methods and procedures to perform general business functions

TECHNOLOGY ADOPTION

B.7 Self-evaluation on this establishment level of adoption

Question	Answer
In a scale from 1 to 10, where 10 means that the establishment is using the most advanced production processes available in its sector, where do you think this establishment stands with respect to:	
other firms in [ADD COUNTRY NAME]?	b7a score (1-10)
most advanced firms in the world?	b7b score (1-10)

B.8 Business administration

Question: Does this establishment use any of the following methods for managing finance, accounting, and HR processes?	Variable	Answer

Handwritten processes	b8a1	1 = Yes 2 = No	-9 = Don't know
Computers with standard software such as Excel or equivalent	b8a2	1 = Yes 2 = No	-9 = Don't know
Mobile Apps or digital platforms	b8a3	1 = Yes 2 = No	-9 = Don't know
Computers with specialized software	b8a4	1 = Yes 2 = No	-9 = Don't know
Enterprise Resource Planning (ERP) or equivalent software integrated with other back office functions	b8a5	1 = Yes 2 = No	-9 = Don't know
Other	b8a6	1 = Yes 2 = No	-9 = Don't know

Question:	Variable	Answer
What is the method used more often by this establishment for managing finance, accounting, and HR processes? [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE b8a VARIABLES] SHOW CARDS 5	b8b	1 = Handwritten processes 2 = Computers with standard software 3 = Mobile Apps or digital platforms 4 = Computers with specialized software 5 = Enterprise Resource Planning (ERP) 6 = Other -9 = Don't know

Question	Variable	Answer
For how many years has this establishment been using specialized or ERP software for managing HR processes, finance, and accounting? [CONDITION: ASK ONLY IF b8a4=1 OR b8a5=1]	b8c	(Number of years) 1= If less than a year -9 = Don't know

B.9 Production or service operations planning

Question: Does this establishment use any of the following methods for production or service operations planning?	Variable	Answer
Handwritten processes	b9a1	1 = Yes 2 = No -9 = Don't know
Computers with standard software such as Excel or equivalent	b9a2	1 = Yes 2 = No -9 = Don't know
Mobile Apps or digital platforms	b9a3	1 = Yes 2 = No -9 = Don't know
Specialized software for production or service operations planning and demand forecast	b9a4	1 = Yes 2 = No -9 = Don't know
Enterprise Resource Planning (ERP) software integrated with other administrative functions	b9a5	1 = Yes 2 = No -9 = Don't know
Other	b9a6	1 = Yes 2 = No -9 = Don't know

Question:	Variable	Answer
<p>What is the method used more often by this establishment for production planning?</p> <p>[CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE b9a VARIABLES]</p> <p>SHOW CARDS 7</p>	b9b	<p>1 = Handwritten production planning</p> <p>2 = Computers with standard software such as Excel or equivalent</p> <p>3 = Mobile Apps or digital platforms</p> <p>4 = Specialized software for production planning and demand forecast</p> <p>5 = Enterprise Resource Planning (ERP) integrated with other administrative functions</p> <p>6 = Other</p> <p>-9 = Don't know</p>

B.10 Sourcing, Procurement, and Supply Chain Management

Question: Does this establishment use any of the following procedures to select and manage suppliers and purchase materials and services?	Variable	Answer	
Manual search of suppliers, including personal visit or phone calls	b10a1	1 = Yes 2 = No	-9 = Don't know
Management of supply chain information using PCs, manually updated (e.g. Microsoft Excel)	b10a2	1 = Yes 2 = No	-9 = Don't know
Online social media, specialized Apps or digital platforms	b10a3	1 = Yes 2 = No	-9 = Don't know
Supplier Relation Management (SRM) specialized software (not integrated with production planning)	b10a4	1 = Yes 2 = No	-9 = Don't know
Supplier Relation Management (SRM) specialized software (integrated with production planning)	b10a5	1 = Yes 2 = No	-9 = Don't know
Other	B10a6	1 = Yes 2 = No	-9 = Don't know

Question	Variable	Answer
<p>What is the procedure used more often by this establishment to select and manage suppliers and purchase materials and services?</p> <p>[CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE b10a VARIABLES]</p> <p>SHOW CARDS 8</p>	b10a	<p>1 = Manual search of suppliers, including personal visit or phone calls.</p> <p>2 = Management of supply chain information using PCs, manually updated (e.g. Microsoft Excel)</p> <p>3 = Online social media, specialized Apps or digital platforms</p> <p>4 = Supplier Relation Management (SRM) specialized software not integrated with production planning</p> <p>5 = Supplier Relation Management (SRM) specialized software integrated with production planning</p> <p>6 = Other</p> <p>-9 = Don't know</p>

Question	Variable	Answer
For how many years has this establishment been using SRM for supply chain management? [CONDITION: ASK ONLY IF b10a4=1 OR b10a5=1]	b10c	(Number of years) 1= If less than a year -9 = Don't know

B.11 Marketing and product development

Question: Does this establishment uses any of the following methods to collect and analyze information from customers for marketing purposes or product development?	Variable	Answer	
Face-to-face chat	b11a1	1 = Yes 2 = No	-9 = Don't know
Online chat (e.g. Whatsapp or Internet)	b11a2	1 = Yes 2 = No	-9 = Don't know
Structured surveys by phone, face-to-face, online, or focus groups	b11a3	1 = Yes 2 = No	-9 = Don't know
Customer Relationship Management software (CRM) or equivalent specialized software	b11a4	1 = Yes 2 = No	-9 = Don't know
Big data Analytics or Machine learning algorithms (Artificial Intelligence) with Big Data	b11a5	1 = Yes 2 = No	-9 = Don't know
Other	b11a6	1 = Yes 2 = No	-9 = Don't know

Question:	Variable	Answer
What is the method used more often by this establishment to collect and analyze information from customers? [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE b11a VARIABLES]	b11b	1= Face-to-face chat 2 = Online chat (e.g. Whatsapp or Internet) 3 = Structured customer surveys by phone, face-to-face, online, or focus groups 4 = Customer Relationship Management software (CRM) or other equivalent specialized software 5 = Big data Analytics or Machine learning algorithms (Artificial Intelligence) with Big Data 6 = Other -9 = Don't know

Question	Variable	Answer
For how many years has this establishment been using a specialized software to analyze customer information? [CONDITION: ASK THIS QUESTION ONLY IF b11a4=1 OR b11a5= 1]	b11c	(Number of years) 1 = If less than a year -9 = Don't know

B.12 Fabrication [MANUFACTURING ONLY]

[CONDITION: ASK B.12 QUESTIONS ONLY IF **a5a =3 OR a5a =4 OR a5a =5 OR a5a =6 OR a5a =11**]

Question: Does this establishment use any of the following processes for assembling and production? SHOW CARDS 10	Variable	Answer	
Manual processes	b12a1	1 = Yes 2 = No	-9 = Don't know
Machines controlled by operators without computers	b12a2	1 = Yes 2 = No	-9 = Don't know
Computer numerical controlled machine or other machines controlled by computers	b12a3	1 = Yes 2 = No	-9 = Don't know
Robots	b12a4	1 = Yes 2 = No	-9 = Don't know
Additive manufacturing including rapid prototyping and 3D printers	b12a5	1 = Yes 2 = No	-9 = Don't know
Other advanced manufacturing processes (e.g. as laser, plasma sputtering, high speed machine, E-beam, micromachining)	b12a6	1 = Yes 2 = No	-9 = Don't know
Other	b12a7	1 = Yes 2 = No	-9 = Don't know

Question:	Variable	Answer
What is the assembling and production process used more often by this establishment? [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE b12a VARIABLES]	b12b	1 = Manual processes 2 = Machines controlled by operators without computers 3 = Computer numerical controlled machine or other machines controlled by computers 4 = Robot(s) 5 = Additive manufacturing/3D printers 6 = Other advanced manufacturing 7 = Other -9 = Don't know

Question	Variable	Answer
For how many years has this establishment been using computer numerical controlled machine, robots, 3D printers, or other advanced manufacturing? [CONDITION: ASK THIS QUESTION ONLY IF b12a3=1 OR b12a4=1 OR b12a5=1 OR b12a6=1]	b12c	(Number of years) 1 = If less than a year -9 = Don't know

B.13 Sales methods

Question:	Variable	Answer	
Does this establishment sell some or all of its products directly to final consumers?	b13a	1 = Yes 2 = No	-9 = Don't know

Question: Does this establishment use any of the following sale methods?	Variable	Answer	
Sales at the establishment's premises	b13b1	1 = Yes 2 = No	-9 = Don't know
Sales by phone, email orders, or sales representatives	b13b2	1 = Yes 2 = No	-9 = Don't know
Sales through social media platforms or apps	b13b3	1 = Yes 2 = No	-9 = Don't know
Online sales using external digital platforms (ex. Amazon, eBay, Alibaba)	b13b4	1 = Yes 2 = No	-9 = Don't know
Online sales (e-commerce) using its own website	b13b5	1 = Yes 2 = No	-9 = Don't know
Electronic orders integrated to specialized supply chain management systems	b13b6	1 = Yes 2 = No	-9 = Don't know
Other	b13b7	1 = Yes 2 = No	-9 = Don't know

Question:	Variable	Answer	
What is the sale method used more often by this establishment? [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE b13b VARIABLES]	b13c	1 = Direct sales at the establishment's premises 2 = Direct sales by phone, email orders, or sales representatives 3 = Sales through social media platforms or apps 4 = On line sales using external digital platforms 5 = On line sales using using its own website 6 = Electronic orders 7 = Other -9 = Don't know	

Question	Variable	Answer
For how many years has this establishment been using online sales or electronic orders? [CONDITION: ASK THIS QUESTION ONLY IF b13b4=1 OR b13b5=1 OR b13b6=1]	b13d	(Number of years) 1 = If less than a year -9 = Don't know

Question:	Variable	Answer
What was the share of online sales in total sales in 2020? [CONDITION: ASK THIS QUESTION ONLY IF b13b4=1 OR b13b5=1 OR b13b6=1]	b13e	(Share) -9 = Don't know

What was the share of online sales in total sales in 2021? [CONDITION: ASK THIS QUESTION ONLY IF b13b4=1 OR b13b5=1 OR b13b6=1]	b13e2	(Share) -9 = Don't know
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B.14 Payment methods

Question: Does this establishment use any of the following payment methods?	Variable	Answer	
Exchange of goods	b14a1	1 = Yes 2 = No	-9 = Don't know
Cash	b14a2	1 = Yes 2 = No	-9 = Don't know
Cheque, voucher, or bank wire at the branch	b14a3	1 = Yes 2 = No	-9 = Don't know
Prepaid card, Debit card, or Credit card	b14a4	1 = Yes 2 = No	-9 = Don't know
Online or electronic payment through a bank wire	b14a5	1 = Yes 2 = No	-9 = Don't know
Online payment through platform (including mobile money, mobile wallet, PayPal or similar App-based payment service)	b14a6	1 = Yes 2 = No	-9 = Don't know
Virtual or Cryptocurrency (e.g. Bitcoin, Ether, or others)	b14a7	1 = Yes 2 = No	-9 = Don't know
Other	b14a8	1 = Yes 2 = No	-9 = Don't know

"INTERVIEWER: <DO NOT READ> When in doubt please explain that the question is about how the clients can pay. "

Question:	Variable	Answer
What is the payment method used more often by this establishment? [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE b14a VARIABLES]	b14b	1 = Exchange of goods 2 = Cash 3 = Cheque, voucher, or bank wire at the branch 4 = Prepaid card, Debit card, or Credit card 5 = Online or electronic payment through a bank wire 6 = Online payment through platform 7 = Virtual or Cryptocurrency 8 = Other -9 = Don't know

Question	Variable	Answer
For how many years has this establishment been using online or electronic payment methods? [CONDITION: ASK THIS QUESTION ONLY IF b14a5=1 OR b14a6=1 or b14a7=1]	b14c	(Number of years) 1 = If less than a year -9 = Don't know

B.15 Quality control inspection

Question: Does this establishment use any of the following quality control inspection methods?	Variable	Answer	
Manual, visual, or written processes	b15a1	1 = Yes 2 = No	-9 = Don't know
Human inspection with the support of computers or phones	b15a2	1 = Yes 2 = No	-9 = Don't know
Statistical process control with software monitoring and data management	b15a3	1 = Yes 2 = No	-9 = Don't know
Automated systems for inspection such as laser-based, sensor-based, voice-control	b15a4	1 = Yes 2 = No	-9 = Don't know
Other	b15a5	1 = Yes 2 = No	-9 = Don't know

"INTERVIEWER: <DO NOT READ> Quality refers to quality of products, services and processes."

Question:	Variable	Answer	
What is the quality control method used more often by this establishment? [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE b15a VARIABLES]	b15b	1 = Manual, visual, or written processes 2 = Human inspection with the support of computers or phones 3 = Statistical process control 4 = Automated systems for inspection 5 = Other -9 = Don't know	

Question	Variable	Answer	
For how many years has this establishment been using statistical process control with software monitoring and data management or automated systems for inspection as a quality control method? [CONDITION: ASK THIS QUESTION ONLY IF b15a3=1 OR b15a4=1]	b15c	(Number of years) 1= If less than a year -9 = Don't know	

B.16A Energy efficiency

Are the premises of this establishment LEED (Leadership in Energy and Environmental Design) certified?	b16a	1 = Yes 2 = No	-9 = Don't know
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Question: Does this establishment use any of the following energy efficiency methods?	Variable	Answer	
Energy Star/efficient rated equipment, computers and appliances based recognized energy labelling certifications (such as Energy Star, EU Energy...) Note: Question needs adjustment to i) standard used in the country, and ii) level of efficiency in Energy Star	b16a1	1 = Yes 2 = No	-9 = Don't know

(>75), EU Energy (>A* after 2021 and >C before 2021), China Energy Label (CEL) (ratings 1 or 2).			
Energy efficient lighting (LED light-emitting diode /CFL compact fluorescent lamp)	b16a2	1 = Yes 2 = No	-9 = Don't know
VAV (variable air volume) HVAC systems	b16a3	1 = Yes 2 = No	-9 = Don't know
Programmable thermostats, timers, robots, motion sensors	b16a4	1 = Yes 2 = No	-9 = Don't know
Internet of things (IoT) enabled system to control premises temperatures, lighting system and/or refrigeration units	b16a5	1 = Yes 2 = No	-9 = Don't know

B.16B Water/chemicals management

Does this establishment treat wastewater from production? [SKIP: Go to section C if b16b=2]	b16b	1 = Yes 2 = No	-9 = Don't know
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Question: What type of wastewater treatment does this establishment implement?	Variable	Answer	
Primary treatment through sedimentation tanks to remove settleable solids, and/or scrape fats and oils.	b16b1	1 = Yes 2 = No	-9 = Don't know
Secondary treatment methods to remove organic contaminants: such as bioreactors/ aerobic bacteria additives, filter beds, aerated ponds, activated sludge or rotating biological contactors	b16b2	1 = Yes 2 = No	-9 = Don't know
Tertiary treatment methods disinfecting water and treating wastewater for public water systems, including UV disinfection or chemical disinfection	b16b3	1 = Yes 2 = No	-9 = Don't know

C. SECTOR SPECIFIC TECHNOLOGIES

READ THE FOLLOWING TO THE RESPONDENT BEFORE PROCEEDING:

Now, we turn to questions about methods and procedures to perform sector specific business functions
ADD SECTOR SPECIFIC QUESTIONNAIRE – SEPARATED DOCUMENT

INTERVIEWER: ASK THESE QUESTIONS ONLY FOR FIRMS THAT BELONG
TO THE SECTORS FOR WHICH SECTOR SPECIFIC QUESTIONS ARE AVAILABLE.

IF THE FIRM DO NOT BELONG TO THOSE, SKIP THIS SECTION AND GO TO SECTION D.

Agriculture (except Livestock)	C1
Livestock	C2
Food Processing	C3
Wearing Apparel	C4
Motor Vehicles	C5
Pharmaceuticals	C6
Wholesale and Retail	C7
Financial Services	C8
Land Transport	C9
Health Services	C10
Leather and Footwear	C11
Accommodation	C12

D. DRIVERS OF TECHNOLOGY ADOPTION

INTERVIEWER: The next questions aim to understand the main drivers of technology adoption.

D.1 Acquisition of machines, equipments, and software

Question: Over the years [2019, 2020, and 2021], did this establishment:	Answer
Purchase or lease new or second-hand equipment or machines?	<p>d1a</p> <p>1 = Yes, new 2 = Yes, second hand 3 = Yes, both (new and second hand) 4 = No -9 = Don't know</p>
Purchase or lease licence for software?	<p>d1b</p> <p>1 = Yes 2 = No -9 = Don't know</p>

D.2 Awareness and information

What was the source of information more often used by this establishment to make decisions about the acquisition of new machines, equipments, or software? SHOW CARDS 15	<p>d2a</p> <p>1 = Other firms 4 = Industrial or trade associations 5 = Public technology extension services 6 = Private consultants 7 = Fairs, events, and missions 8 = Other -9 = Don't know</p>
Over the years [2019, 2020, and 2021], did this establishment have business, as a supplier or a buyer, with a multinational firm?	<p>d2d</p> <p>1 = Yes 2 = No -9 = Don't know</p>
Does the CEO or top manager of this establishment have previous experience working in a multinational or a national firm with more than 50 employees in the same sector?	<p>d2e</p> <p>1 = Yes 2 = No -9 = Don't know</p>

D.3 Access to finance

Over the years [2019, 2020, and 2021], has this establishment got a loan for purchasing machines, equipment, or licensing software or processes?	<p>d3a</p> <p>1 = Yes 2 = No -9 = Don't know</p>
Over the years [2019, 2020, and 2021], how many times this establishment needed to borrow money to expand production, but could not get it?	<p>d3c</p> <p>Number of times</p>

D.4 Management

Question	Answers
Does this establishment provide formal incentives for workers in the form of money, gift, or recognition to suggest and/or use better ways to produce goods or provide services?	d4a 1 = Yes 2 = No -9 = Don't know
In the year [2021], how many key performance indicators were monitored at this establishment? Examples: Metrics on production, cost, waste, quality, inventory, energy, absenteeism and deliveries on time (mark one option):	d4b 1 = 1-2 key performance indicators 2 = 3-9 key performance indicators 3 = 10 or more key performance indicators 4 = No key performance indicators

D.6 Trade barriers and uncertainty of demand

Question	Answers
Over the years [2019, 2020, and 2021], did this establishment export?	d6a 1 = Yes 2 = No -9 = Don't know
In the year [2021], what percentage of this establishment's sales were direct exports? [CONDITION: ASK THIS QUESTION ONLY IF d6a=1]	d6b _____% (Percent)
Over the years [2019, 2020, and 2021], has this establishment imported material inputs, machines, or equipment directly?	d6c 1 = Yes 2 = No -9 = Don't know

D.7 Government support

Are you aware of any government support program or subsidy in relation to the adoption of a new machines, equipment or software that could benefit this establishment?	d7a 1= Yes 2= No -9 = Don't know
Over the years [2019, 2020, and 2021], has this establishment benefited from any government support program or subsidy in relation to the adoption of a new machine, equipment, or software?	d7b 1 = Yes 2 = No -9 = Don't know
Which kind of government support in the adoption of a new technology has this establishment received? [CONDITION: ASK ONLY IF d7b=1] SHOW CARD 21	d7c 1 = Information 2 = Technical assistance 3 = Tax incentive 4 = Grant 5 = Loan 6 = Other

D.8 Obstacles and Drivers - ranking

<p>Please select the most important obstacle faced by this establishment to adopt new equipment, machine, software, or process? SHOW CARDS 22</p>	<p style="text-align: center;">d8a</p> <p>1 = Lack of information, knowledge, or technical capacity 2 = Lack or uncertainty of demand 3 = Cost 4 = Lack of finance 5 = Government regulations 6 = Lack of infrastrucutre 7 = Other 8 = No obstacles or need to adopt -9 = Don't know -7 = not applicable</p>
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<p>Please select the most important reason for the acquisition of new equipment, machine, or software by this establishment? SHOW CARDS 23</p>	<p style="text-align: center;">d8d</p> <p>1 = Depreciation or replacement 2 = Competition 3 = Other firms adopted 4 = Produce new products 5 = Access new markets 6 = Reduce costs 7 = Adjust to regulations 8 = Other -9 = Don't know -7 = not applicable</p>
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D.9 Environmental and sustainability management practices

Question: Which of the following environmental and sustainability management practices are used by this establishment?	Variable	Answer	
ISO 14001 (or at least in one of the ISO 14000 family) certified.	d9a	1 = Yes 2 = No	-9 = Don't know
ISO 50001 certified.	d9b	1 = Yes 2 = No	-9 = Don't know
Periodically audited for compliance with environmental regulatory requirements by a third party.	d9c	1 = Yes 2 = No	-9 = Don't know
Formally evaluates contractors and suppliers' environmental compliance.	d9d	1 = Yes 2 = No	-9 = Don't know
Participates in any form of carbon-trading, tracking, purchasing and/or selling carbon offset credits.	d9e	1 = Yes 2 = No	-9 = Don't know
Monitors CO2 and/or CO emissions explicitly at least annually.	d9f	1 = Yes 2 = No	-9 = Don't know

E. LABOR, BALANCE SHEET AND PERFORMANCE

A.2 On which calendar date did the last completed fiscal year end?

Year	Month	Day
a2a	a2b	a2c

LABOR

READ THE FOLLOWING TO THE RESPONDENT BEFORE PROCEEDING:

Now I would like to ask you a few questions about this establishment's labor force and performance

E.1 How many paid workers (full-time and part-time) does this establishment have currently, by the end of 2021, and by the end of 2019? Please include all employees and managers. **(INTERVIEWER: INCLUDE INTERVIEWEE IF APPLICABLE).**

	Number
Total number of workers currently?	e1a
Total number of workers by the end of the year [2021]	e1
Total number of workers by the end of the year [2019]	e2
DON'T KNOW (SPONTANEOUS)	-9

What was the total share of female workers by the end of the year [2021]? **e1f**
(share)
-9 = Don't know

E.4 How many individuals were working in this establishment according to their main occupation, by the end of 2020? (INTERVIEWER: READ EACH CATEGORY)	Number 2020	DON'T KNOW
CEO Managers, Professionals, and Technicians	e3a	-9
Clerical support workers and sales workers	e3d	-9
Production workers (directly involved in the production process)	e3e	-9
Service workers	e3f	-9

How many engineers, scientific professionals, and Research and Development workers does this establishment have? **e3h**
Numbers
-9 = Don't know

E.5 What is the percentage of workers who completed the following degrees as maximum level of schooling achievement?

	Share (%)	DON'T KNOW
Completed secondary school (about 12 years of education)	e5b	-9
Vocational training (about 12 years of education)	e5c	-9
Completed college degree or more (15+ years of education)	e5d	-9

BALANCE SHEET

READ THE FOLLOWING TO THE RESPONDENT BEFORE PROCEEDING:

Now, we would like to ask you a few questions about the financial results of this establishment. It is important that this information be as accurate as possible. The individual data are treated as confidential. The identity of this establishment will not be revealed at any point.

E.6 | What were this establishment’s total annual sales for **ALL** products and services?

	LCUs
Complete year [2021] total sales	e6a
Complete year [2019] total sales [CONDITION: ASK ONLY IF e2a>0]	e6b
DON'T KNOW (SPONTANEOUS)	-9

E.7 | From this establishment’s Income Statement or book records for the year [2021], please provide the following information:

	LCU	DON'T KNOW
Total annual cost of labor including wages, salaries, bonuses, social security payments	e7a	-9
Total annual cost of raw materials and intermediate goods used in production or materials purchased to resell	e7b	-9
Total annual cost of electricity	e7c	-9
Total annual cost of natural gas [CONDITION: ASK ONLY IF b2d1=1]	e7c1	-9
Total annual cost of fuel oils [CONDITION: ASK ONLY IF b2d2=1]	e7c2	-9
Total annual cost of Liquefied Petroleum Gases (LPG) [CONDITION: ASK ONLY IF b2d3=1]	e7c3	-9
Total annual cost of Coal or Wood fuels (wood, charcoal, others) [CONDITION: ASK ONLY IF b2d4=1]	e7c4	-9
Total annual cost of own renewable sources used in your production [CONDITION: ASK ONLY IF b2d5=1]	e7c5	-9
TOTAL COST OF OF PRODUCTION SHOULD INCLUDE ALL ABOVE COSTS AND OTHER COSTS NOT LISTED ABOVE		
Total cost of production or service operations (it also includes costs of marketing, distribution, and others not listed above)	e7d	-9

During the year 2020, what was the total quantity of electricity purchased and delivered to this establishment, regardless of when payment was made.	b7e <hr/> (Kwh)
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E.8 Hypothetically, if this establishment were to purchase all the machinery, vehicles, equipment, and buildings it **uses now**, in their current condition and regardless of whether the establishment owns them or not, how much would they cost, independently of whether they are owned, rented or leased?

	LCUs	DON'T KNOW
Machinery, vehicles, and equipment	e8a	-9
Buildings	e8b	-9
Power plant for renewable sources [CONDITION: ASK ONLY IF b2d5=1]	e8c	-9

E.9 What is the total expenditure on R&D (external and internal) by this establishment in 2020?

	LCUs	DON'T KNOW
Total expenditure on R&D	e9rd	-9

E.10 Currently, with respect to the main product produced by this establishment?

	% (share)	DON'T KNOW
What is the share in total sales?	e10a	-9
What is the average markup (the percentage over total costs to derive the final price)?	e10b	-9

CONTROL QUESTIONS

INTERVIEWER READ AT THE END OF THE INTERVIEW:

The survey ends here. I would like to gather a few final details. Thank you for your time and cooperation.

A.8 Interviewer code a8

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A.9 Time face-to-face interview ends:

Day (dd)	Month (mm)	Year (yyyy)	Hour (00 to 23)	Minutes (00 to 59)
a9d	a9m	a9y	a9h	a9min

A.10 Please indicate which option best describes the main respondents position:

Owner	1
President, Executive Director, or CEO	2
Chief Financial, Chief Operational Officer (CFO/COO)	3
Operational or plant manager	4
Sales or marketing manager	5
Accountant	6
Lawyer	7
Other Administrative	8
Other Management	9
Other (Specify) - a10b	10

a10a

A.11 Please complete the following information about the interviewee(s)

	Years with the establishment	Gender	Email
Main respondent	a11a	a11b	a11c

A.12 The responses to the questions regarding figures (productivity and employment numbers) were:

Taken directly from establishment records	1
Estimates computed with some precision	2
Arbitrary and unreliable numbers	3
In some case taken from books and in some case estimates	4

a12

ADD IF INFORMATION IS AVAIAABLE

GPS COORDINATES	Degrees North (Latitude)	lat
	Degrees East (Longitude)	lon

ADD QUESTiON ON THE PERCEPTION

INTERVIEWER COMMENTS: (IF DONE BY PHONE)

a13

(Problems occurred/extraordinary circumstances which could influence results)

A.14 This questionnaire was completed in:

One call interview with one person	1	STOP HERE
One call interview with different managers/staff	2	
Several calls	3	

a14

A.15 If option 2 or 3 in **A.14**, estimate duration of the whole interview

Hour	Minutes

a15h **a15m**

SUPERVISOR SECTION

A.14 Supervisor code

a16

INFORMATION BASED ON LOCATION OF INTERVIEW (s2d). ENSURE s2d IS THE NAME OF AN OFFICIAL LOCALITY AND NOT A NEIGHBORHOOD

Is this city the official capital city?	a3b	Is this city the main business city?	a3c	Size of locality	a3
Yes	1	Yes	1	City with population over 1 million	2
No	2	No	2	Over 250.000 to 1 million	3
				50.000 to 250.000	4
				Less than 50.000	5

SUPERVISOR: THE DESCRIPTION OF THE ESTABLISHMENT'S MAIN PRODUCT AND ACTIVITY IS PROVIDED IN c1b. PLEASE REVIEW c1b IN ORDER TO IDENTIFY THE CORRESPONDING SECTOR CODE IN c1d

A5	PLEASE CHOOSE THE 4-DIGIT ISIC REV. 4 SECTOR CODE THAT BEST APPLIES TO THE ESTABLISHMENT'S MAIN ACTIVITY AND PRODUCT.
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	Code
CODE OF THE MAIN PRODUCT AND ACTIVITY	a17