

Firm-level Adoption of Technology Survey

The World Bank

2020

INTRODUCTION

This survey is being conducted by Kantar Korea on behalf of the World Bank.

The goal of this survey is to gather information about technologies adopted by firms in Korea. 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

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Frame level

FIELDWORK SUPERVISORS AND MANAGEMENT ARE RESPONSIBLE FOR THE ACCURACY OF THIS SECTION.

INFORMATION ACQUIRED PRIOR TO SCREENING:

Sampling Information [CODES FROM WBG PROGRESS REPORT]	
Sampling sector	s1a
Sampling size	s1b
Sampling location	s1c

COVER [TO BE COMPLETED FROM SCREENER BEFORE INTERVIEW]

Screener Information	
Screener sector	s6a
Module	s5
Screener region	s2e
Name of City/town/village	s2d
Screener size	s7
Multi-establishment firm	s4
Language	s2j

QUESTIONS BEGIN HERE

A. CONTROL AND GENERAL INFORMATION

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

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

A.1 Time face-to-face interview begins:

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

A.2	On which calendar date did the last completed fiscal year end?
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Year	Month	Day
a2a	a2b	a2c

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 domestic individuals, companies or organizations	a3a%	-9
Private foreign individuals, companies or organizations	a3b%	-9
Government or state	a3c%	-9
Other	a3d%	-9
	100%	

INTERVIEWER: CHECK THAT TOTAL SUMS TO 100% (UNLESS DON'T KNOW)

Question	Variable	Answer	
Is this a shareholding company with shares publicly traded in the stock market? SKIP: IF a4a =1 GO TO a4c	a4a	1 = Yes 2 = No	-9 = Don't know
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	

Is the founder or her/his family member also the top manager?	a4c	1 = Yes. The founder. 2 = Yes. A founder's family member (2nd generation or more) 3 = No -9 = Don't know -7 = Not applicable
Is the largest owner of the firm also the top manager?	a4d	1 = Yes 2 = No -9 = Don't know
Amongst the owners of the firm, are there any females?	a4e	1 = Yes 2 = No -9 = Don't know
What percentage of the firm is owned by females? CONDITION: ASK ONLY IF a4e=1	a4f	(share) Percentage of female ownership -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 [2019], 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 DESCRIPTION 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.
Agriculture (except Livestock)	1	a5b	1
Livestock	2		2
Food Processing	3		3
Wearing Apparel	4		4
Pharmaceuticals	5		5
Motor Vehicles	6		6
Wholesale or Retail	7		7
Financial Services	8		8
Land Transport	9		9

Health Services	10		10
Leather and Footwear	11		11
Other Manufacturing	12		0
Other Services or Construction	13		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

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 [2019] 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 [2019], 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	
How many hours did these power outages last on average?	b1d (Hours) -9 = Don't know	b1e (Min) 1 = Less than one minute -9 = Don't know

B.2 Use of generators

Over the year [2019], 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	
Over the year [2019], what percentage of this establishment's electricity came from a generator that the establishment owned or shared?	b2b (share %)	
What is the main source of energy used by this establishment owned or shared generator? SHOW CARDS 3	b2c 1 = Solar power 2 = Fuel 3 = Grid or Battery-stored backup 4 = Wind power 5 = Other	

B.3 Mobile phone coverage

How many telephone landline does this establishment use for business purpose? INTERVIEWER: IT INCLUDES EQUIVALENT NUMBER OF LANDLINE SUBSCRIPTION PLANS PAID	b3a (number of telephone lines) -9 = Don't know	
How many mobile phone lines does this establishment use for business purpose? INTERVIEWER: IT INCLUDES OWNED DEVICES AND COVERAGE PLANS PAID TO EMPLOYEES	b3b (number of cell phone lines) -9 = Don't know	

B.4 Computer coverage

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	
In a typical month, over fiscal year [2019], how many times was the Internet service down in this establishment? [SKIP: IF b5c =0 OR b5c =-9, GO TO b5f]	b5c (number of times) 1 = Less than one -100 = To many to count -9 = Don't know	
How many hours did the Internet service down last on average?	b5d (Hours) -9 = Don't know	b5e (Min) 1 = Less than one minute -9 = Don't know
At the present time, does this establishment have its own website?	b5f YES = 1, NO = 2 -9 = Don't know	
At the present time, does this establishment use an account on an online social media for business purpose?	b5g YES = 1, NO = 2 -9 = Don't know	
Does this establishment use cloud computer services for business purpose?	b5h YES = 1, NO = 2 -9 = Don't know	

B.6 Water

Does this establishment have water connection to the network?	b6a YES = 1, NO = 2 -9 = Don't know
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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
What is the method used more often by this establishment for production planning? [CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE b9a VARIABLES] SHOW CARDS 7	b9b	1 = Handwritten production planning 2 = Computers with standard software such as Excel or equivalent 3 = Mobile Apps or digital platforms 4 = Specialized software for production planning and demand forecast 5 = Enterprise Resource Planning (ERP) integrated with other administrative functions 6 = Other -9 = Don't know

Question	Variable	Answer
For how many years has this establishment been using a specialized software for production planning? [CONDITION: ASK THIS QUESTION ONLY IF b9a4=1 OR b9a5=1]	b9c	(Number of years) 1 = If less than a year -9 = Don't know

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, without stored supplier's information in centralized database.	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) or other specialized software not integrated with production planning	b10a4	1 = Yes 2 = No	-9 = Don't know
Supplier Relation Management (SRM) 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
What is the procedure used more often by this establishment to select and manage suppliers and purchase materials and services? SHOW CARDS 8	b10a	1 = Manual search of suppliers, including personal visit or phone calls, without stored supplier's information in centralized database. 2= Management of supply chain information using PCs, manually updated (e.g. Microsoft Excel) 3 = Online social media, specialized Apps or digital platforms 4 = Supplier Relation Management (SRM) or other specialized software not integrated with production planning 5 = Supplier Relation Management (SRM) integrated with production planning 6 = Other -9 = Don't know

Question	Variable	Answer
For how many years has this establishment been using Supplier Relation Management (SRM) software for managing suppliers and purchasing materials and services? [CONDITION: ASK THIS QUESTION ONLY IF b10a4=1 OR b10a5=1]	b10c	(Number of years) 1= If less than a year -9 = Don't know

<p>What procedure does this establishment use most often when searching for new employees or collaborators?</p> <p>SHOW CARDS 9</p>	b10b	<p>1 = Direct reference from employees and colleagues face-to-face or using phone, Whatsapp, SMS or email</p> <p>2 = Job search announcements in newspapers or magazines</p> <p>3 = Use of job search online networks (e.g. LinkedIn, Xing,..) or digital platforms (e.g. Facebook)</p> <p>4 = Job search announcements in their own website</p> <p>5 = Recruitment agencies</p> <p>6 = Other</p> <p>-9 = Don't know</p>
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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	
<p>What is the method used more often by this establishment to collect and analyze information from customers?</p> <p>[CONDITION: ASK ONLY IF THE ANSWER IS YES FOR MORE THAN ONE OF THE b11aVARIABLES]</p>	b11b	<p>1= Face-to-face chat</p> <p>2 = Online chat (e.g. Whatsapp or Internet)</p> <p>3 = Structured customer surveys by phone, face-to-face, online, or focus groups</p> <p>4 = Customer Relationship Management software (CRM) or other equivalent specialized software</p> <p>5 = Big data Analytics or Machine learning algorithms (Artificial Intelligence) with Big Data</p> <p>6 = Other</p> <p>-9 = Don't know</p>	

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? SHOW CARDS 11	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
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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: What is the share of sales of this establishment by this method?	Variable	Answer
Online sales using external digital platforms (ex. Amazon, eBay, Alibaba) [CONDITION: ASK THIS QUESTION ONLY IF b13b4=1]	b13e1	(Share) -9 = Don't know
Online sales (e-commerce) using its own website [CONDITION: ASK THIS QUESTION ONLY IF b13b5=1]	b13e2	(Share) -9 = Don't know
Electronic orders integrated to specialized supply chain management systems [CONDITION: ASK THIS QUESTION ONLY IF b13b6=1]	b13e3	(Share) -9 = Don't know

B.14 Payment methods

Question: Does this establishment use any of the following payment methods? SHOW CARDS 12	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

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]	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? SHOW CARDS 13	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

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 b15a4=1 OR b15a5=1]	b15c	(Number of years) 1= If less than a year -9 = Don't know

Question: Does this establishment use any of the following quality management practices?	Variable	Answer	
Business certification – ISO 9000 or other equivalent	b15c1	1 = Yes 2 = No	-9 = Don't know
Six sigma	b15c2	1 = Yes 2 = No	-9 = Don't know
Total Quality Management (TQM)	b15c3	1 = Yes 2 = No	-9 = Don't know
Lean manufacturing, Just-in-Time, or Kaizen method	b15c4	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
Pharmaceuticals	C5
Motor Vehicles	C6
Wholesale or Retail	C7
Financial Services	C8
Land Transport	C9
Health Services	C10
Leather and Footwear	C11

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 [2017, 2018, and 2019], did this establishment: READ OUT	Answer
Purchase or lease new or second-hand equipment or machines?	d1a 1 = Yes, new 2 = Yes, second hand 3 = Yes, both (new and second hand) 4 = No -9 = Don't know
Purchase or lease licence for software?	d1b 1 = Yes 2 = No -9 = Don't know
Develop, customize, or significantly modify any equipment, machine, or software?	d1c 1 = Yes 2 = No -9 = Don't know
Was the development, customizaiton, or modification of equipments, machine, or software done in partnership with other institutions or with other firms? [CONDITION: ASK ONLY IF d1c=1]	d1d 1 = Yes 2 = No -9 = Don't know
Which one was the partner that contributed the most in developping, customizing, or significantly modifying any equipment, machine, or software? SHOW CARD 14 [CONDITION: ASK ONLY IF d1d=1]	d1e 1 = Academic or research organization 2 = Other enterprises 3 = Both -9 = Don't know

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	d2a 1 = Other firms in the sector 2 = Other firms in the locality, but different sector 3 = Suppliers or buyers 4 = Industrial or trade associations 5 = Public technolgy extension services 6 = Private consultants 7 = Fairs, events, and missions 8 = Other -9 = Don't know
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Is there any firm with more than 50 employees in the range of 50 kilometers from this establishment producing similar products or offering similar services as this establishment?	d2b 1 = Yes 2 = No -9 = Don't know
Over the years [2017, 2018, and 2019], did this establishment have any business relationship, either as a supplier or as a buyer, with a firm with more than 50 employees in the range of 50 kilometers from this establishment.	d2c 1 = Yes 2 = No -9 = Don't know
Over the years [2017, 2018, and 2019], did this establishment have business, as a supplier or a buyer, with a multinational firm?	d2d 1 = Yes 2 = No -9 = Don't know
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?	d2e 1 = Yes 2 = No -9 = Don't know

D.3 Access to finance

Over the years [2017, 2018, and 2019], has this establishment got a loan for purchasing machines, equipment, or licensing software or processes?	d3a 1 = Yes 2 = No -9 = Don't know
What was the interest rate faced by the establishment for this loan? INTERVIEWER: IF MORE THAN ONE INTEREST RATE, PLEASE ADD THE HIGHEST AVERAGE. NOMINAL INTEREST RATE [CONDITION: ASK ONLY IF d3a=1]	d3b Interest rate (average annual rate) -9 = Don't know
Over the years [2017, 2018, and 2019], how many times this establishment needed to borrow money to expand production, but could not get it?	d3c Number of times

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

<p>In the year [2019], 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): [SKIP: IF d4b=4 GO TO d4d]</p>	<p style="text-align: center;">d4b</p> <p>1 = 1-2 key performance indicators 2 = 3-9 key performance indicators 3 = 10 or more key performance indicators 4 = No key performance indicators</p>
<p>In the year [2019], how frequently were the key performance indicators reviewed by managers at this establishment?</p>	<p style="text-align: center;">d4c</p> <p>1 = Yearly 2 = Quarterly 3 = Monthly 4 = Weekly 5 = Daily 6 = Hourly or more frequently 7 = Never</p>
<p>In the year [2019], what best describes the time frame of production targets at this establishment? Examples of production targets are: production, quality, efficiency, waste, on-time delivery. SHOW CARD 16</p>	<p style="text-align: center;">d4d</p> <p>1= Main focus was on short-term (less than one year) production targets 2 = Main focus was on long-term (more than one year) production targets 3 = Combination of short-term and long-term production targets 4 = No production targets</p>

D.5 Availability of human capital

Question	Answers
<p>Over the years [2017, 2018, and 2019], has this establishment hired or tried to hire engineers, computer programmers, or equivalent professionals?</p>	<p style="text-align: center;">d5a</p> <p>1 = Yes. It hired. 2 = Yes. It tried it, but not hired. 3 = No -9 = Don't know</p>
<p>What was the main challenge faced by this establishment when hiring engineers, computer programmers, or equivalent professionals? [CONDITION: ASK ONLY IF d5a=1 OR d5a=2] SHOW CARD 17</p>	<p style="text-align: center;">d5b</p> <p>1 = No challenges 2 = Lack of availability of professionals 3 = Lack of availability of high-skills professionals 4 = High salaries required -9 = Don't know</p>
<p>Over the years [2017, 2018, and 2019], has this establishment used any external consultants or organizations to help select, adapt, or use new machines, equipment, software, or production process?</p>	<p style="text-align: center;">d5c</p> <p>1 = Yes 2 = No -9 = Don't know</p>

<p>What was the main source of external consultants or organizations used by this establishment?</p> <p>[CONDITION: ASK THIS QUESTION ONLY IF d5c=1]</p> <p>SHOW CARD 18</p>	<p>d5d</p> <p>1 = Universities 2 = Government agency 3 = Other local companies 4 = Foreign company 5 = Business associations 6 = Other sources -9 = Don't know</p>
<p>Why did this establishment not use any consultants or organizations to help with adoption machines, equipment, software, or process?</p> <p>[CONDITION: ASK THIS QUESTION ONLY IF d5c=2]</p> <p>SHOW CARD 19</p>	<p>d5e</p> <p>1 = I don't know any consultant or organization 2 = Lack of trust in the quality of the services they provide 3 = Too costly or not convinced of the economic benefit 4 = There was no need 5 = Other -9 = Don't know</p>
<p>How did this firm adjust labor when acquiring a new machine, equipment, or software?</p> <p>SHOW CARD 20</p>	<p>d5f</p> <p>0 = Did not do any changes to the number on workers 1 = Used same workers and offered some specialized training 2 = Fired some workers and did not replace them 3 = Hire more workers with same skills 4 = Hire more workers with more specialized skills -9 = Don't know</p>

D.6 Trade barriers and uncertainty of demand

Question	Answers
<p>Over the years [2017, 2018, and 2019], did this establishment export?</p>	<p>d6a</p> <p>1 = Exported (mostly) directly 2 = Exported (mostly) through trading firms 3 = Did not export -9 = Don't know</p>
<p>In the year [2019], what percentage of this establishment's sales were direct exports?</p> <p>[CONDITION: ASK THIS QUESTION ONLY IF d6a=1]</p>	<p>d6b (Percent)</p>

Over the years [2017, 2018, and 2019], has this establishment imported material inputs, machines, or equipment directly?	d6c 1 = Yes 2 = No -9 = Don't know
If the vendor price of an imported input, machines, or equipment is 100, what is the average final price paid for this establishment, including tariffs, tax, storage, and transportation cost? [CONDITION: ASK THIS QUESTION ONLY IF d6c=1]	d6d (Value above 100) -9 = Don't know
How many days did it take on average from the time these goods arrived to their point of entry (e.g. port, airport) until the time these goods could be claimed from customs? [CONDITION: ASK THIS QUESTION ONLY IF d6c=1]	d6e (Number of days) -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
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

Please select three of the major obstacles faced by this establishment to adopt new equipment,	d8a 1 st obstacle	d8b 2 nd obstacle	d8c 3 rd obstacle
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<p>machine, software, or process to improve its performance?</p> <p>SHOW CARDS 22</p> <p>CONDITION: SAME OPTION CANNOT BE REPEATED ACROSS VARIABLES</p>	<p>1 = Lack of information on what is available 2 = Uncertainty of demand 3 = Too costly or not convinced of the economic benefit 4 = Lack of technical skills required to support this equipment. 5 = Consumer preferences do not value quality of products 6 = Difficulty in obtaining financing 7 = Lack of knowledge on how to acquire it 8 = It is difficult or costly to comply with government regulations 9 = Electricity, water, or Internet connection are too expensive 10 = Other -9 = Don't know</p>
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<p>Please select three of the major reasons for the acquisition of new equipment, machine, or software by this establishment to improve its performance?</p> <p>SHOW CARDS 23</p> <p>CONDITION: SAME OPTION CANNOT BE REPEATED ACROSS VARIABLES</p>	<p>d8d 1st reason</p>	<p>d8e 2nd reason</p>	<p>d8f 3rd reason</p>
	<p>1 = Depreciation or replacement 2 = Competition in the domestic market 3 = Competition in the external market 4 = Other firms in the same sector adopted 5 = Other firms in the locality, from other sectors, adopted 6 = Produce new products 7 = Access new markets 8 = Produce similar products more efficiently 9 = Adjust to regulations 10 = Other -9 = Don't know</p>		

E. LABOR, BALANCE SHEET AND PERFORMANCE

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 At the end of the year [2019], how many permanent full-time, permanent part-time, temporary (or seasonal) full-time, and temporary (or seasonal) part-time individuals worked in this establishment? Please include all employees and managers.

(Permanent full-time employees are defined as all paid employees that are contracted for a term of one or more fiscal years and/or have a guaranteed renewal of their employment contract and that work a full shift)

(Permanent part-time employees are defined as all paid employees that are contracted for a term of one or more fiscal years and/or have a guaranteed renewal of their employment contract and that work in part-time shift, usually less than 20 hours per week)

(Temporary or seasonal, full-time workers are all short-term, that is for less than a year, workers with no guarantee of renewal of employment and work full-time.)

(Temporary or seasonal, part-time workers are all short-term, that is for less than a year, workers with no guarantee of renewal of employment and work usually less than 20 hours per week.)

(INTERVIEWER: INCLUDE INTERVIEWEE IF APPLICABLE).

	Number
Permanent workers, full-time, at the end of the year [2019]	e1a
Permanent workers, part-time, at the end of the year [2019]	e1b
Temporary or seasonal workers, full time, at the end of the year [2019]	e1c
Temporary or seasonal workers, part-time, at the end of the year [2019]	e1d
DON'T KNOW (SPONTANEOUS)	-9

	Months
What was the average length of employment of seasonal or temporary workers in the year [2019]?	e1e -9 = Don't know

What was the total share of female workers by the end of the year [2019]?	e1f (share) -9 = Don't know
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E.2	At the end of the year [2017], how many permanent full-time, permanent part-time, temporary (or seasonal) full-time, and temporary (or seasonal) part-time individuals worked in this establishment? Please include all employees and managers (INTERVIEWER: INCLUDE INTERVIEWEE IF APPLICABLE) .
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	Number
Permanent, full-time workers, at the end of the year [2017]	e2a
Permanent, Part-time, at the end of the year [2017]	e2b
Temporary or seasonal workers, full time, at the end of the year [2017]	e2c
Temporary or seasonal workers, part-time, at the end of the year [2017]	e2d
IF ESTABLISHMENT WAS NOT IN BUSINESS THREE YEARS AGO	-7
DON'T KNOW (SPONTANEOUS)	-9

What was the average length of seasonal or temporary workers in the year [2017]?	Months
Average length of seasonal or temporary employment in the year [2017], in months	e2e -9 = Don't know

What was the share of female workers in the year [2017]? (INTERVIEWER: INCLUDE FULL TIME AND PART TIME) .	e2f Percentage -9 = Don't know
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E.3	<p>At the end of the year [2019], how many individuals were working in this establishment according to their main occupation?</p> <p>(INTERVIEWER: READ EACH CATEGORY)</p> <p>Professionals are highly skilled workers with university degree working on their field, such as science and engineering, architecture, finance, IT, and law.</p> <p>Technicians are skilled workers with technical training working on their field associated with professionals, such as science and engineering or financial technicians.</p> <p>Other production employees are workers directly involved in the production process, excluding professionals and technicians.</p>
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	Number	DON'T KNOW
CEOs, Directors, and Managers	e3a	-9
Professionals	e3b	-9

Technicians	e3c	-9
Clerical support workers [e.g. administrative support]	e3d	-9
Production workers (directly involved in the production process)	e3e	-9
Service or sales workers	e3f	-9

E.4 At the end of the year [2017], how many individuals were working in this establishment according to their main occupation: **(INTERVIEWER: READ EACH CATEGORY)**
 [SKIP: IF e2a = -7 GO TO e5a]

	Number	DON'T KNOW
CEOs and Managers	e4a	-9
Professionals	e4b	-9
Technicians	e4c	-9
Clerical support workers [e.g. administrative support]	e4d	-9
Production workers (directly involved in the production process)	e4e	-9
Service or sales workers	e4f	-9

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

	Share (%)	DON'T KNOW
Completed primary school (about 9 years of education)	e5a	-9
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

What is the number of workers with college degree in Engineering or applied science; and Master or Doctoral degrees?

	Number	DON'T KNOW
Engineering or applied science	e5e	-9
MBA, Master or Doctoral degree	e5f	-9

Does this establishment have workers exclusively dedicated to Research and Development activities?	e3g 1= Yes 2= No -9 = Don't know
How many workers are exclusively dedicated to Research and Development activities in this establishment? [CONDITION: ASK ONLY IF e3g=1]	e3h Numbers -9 = Don't know

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 [2019] total sales	e6a
Complete year [2017] 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 [2019], please provide the following information:

	LCUs	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 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

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

E.9 At the end of the year [2019], what was the average salary of individuals working in this establishment in the following categories?

	Monthly Salary (local currency)	DON'T KNOW
CEOs and Managers	e9a	-9
Professionals	e9b	-9
Technicians	e9c	-9

Clerical support workers [e.g. administrative support]	e9d	-9
Production workers (directly involved in the production process)	e9e	-9
Service or sales workers	e9f	-9

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

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 QUESITON ON THE PERCEPTION

INTERVIEWER COMMENTS:

a13

(Problems occurred/extraordinary circumstances which could influence results)

A.14 | This questionnaire was completed in:

One visit in face-to-face interview with one person	1
One visit in face-to-face interview with different managers/staff	2
Several visits	3

STOP HERE

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

a14

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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

C.1d	<p>PLEASE CHOOSE THE 4-DIGIT ISIC REV. 4 SECTOR CODE THAT BEST APPLIES TO THE ESTABLISHMENT'S MAIN ACTIVITY AND PRODUCT.</p>
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	Code
CODE OF THE MAIN PRODUCT AND ACTIVITY	c1d