

TECHNICAL NOTES

I. INTRODUCTION

I.1. Background of the survey

The 2019 Survey on Information and Communication Technology (SICT) was the eighth of the series undertaken by the Philippine Statistics Authority (PSA). It is a rider to the 2019 Annual Survey of Philippine Business and Industry (ASPBI) conducted in 2020. The 2019 SICT aims to collect and generate information on the availability, distribution, and access/utilization of Information and Communication Technology (ICT) among establishments in the country.

I.2. Objectives

The SICT aims to measure the following:

- a. component of ICT resources and their utilization by establishments;
- b. diffusion of ICT into establishments from various sources;
- c. e-commerce transactions from data on e-commerce sales/revenue and purchases;
- d. cellular mobile phone business transactions from data on sales/revenue;
- e. estimate of the number of ICT workers in establishments;
- f. methods of disposal of ICT equipment; and
- g. presence of social media accounts of establishments.

I.3. Uses of data

The results of the survey will be used in:

- a. assessing the use of ICT resources by establishments and the available infrastructure;
- b. determining how establishments use the internet, including the activities for which it is used;
- c. determining Web presence in establishments;
- d. determining the revenue generated through e-commerce transactions, and through cellular mobile phones; and
- e. determining the methods of disposal of ICT equipment.

I.4. Historical information on the survey

The first ever ICT survey was the 2002 SICT, with 2001 as the reference period. It was conducted in 2002 by the former National Statistics Office (NSO) in collaboration with the Information Technology and E-Commerce Council (ITECC) of the Office of the President. It was followed by surveys conducted in years 2009, 2010, 2011, 2014, 2016, and 2018 with reference years 2008, 2009, 2010, 2013, 2015, and 2017, respectively. The 2013 SICT round and onwards were handled by the PSA after its creation in 2013 through Republic Act (RA) No. 10625 or the Philippine Statistical Act of 2013.

The data processing of accomplished questionnaires of the 2019 SICT is decentralized to the Provincial Statistical Offices (PSOs). Machine data processing is implemented through the use of an online system called the Establishment Data Management System (EDMS).

I.5. Scope and coverage

Industries covered in the 2019 ASPBI were also covered in the 2019 SICT. These industries are classified as core ICT and non-core ICT sectors. In addition, there are industries identified from these two sectors that are also classified as Business Process Management (BPM) activities. The core ICT industries are those referred to as the Information Economy (IE).

Information Economy is a term used to describe the economic and social value created through the ability to rapidly exchange information at anytime, anywhere to anyone. A distinctive characteristic of the information economy is the intensive use, by businesses, of ICT for the collection, storage, processing, and transmission of information. The use of ICT is supported by supply of ICT products from an ICT-producing sector and through trade.

The IE is composed further of the ICT sector and the Content and Media sector. The industries under each sector are as follows:

a. ICT Sector

- a.1 ICT Manufacturing Industries
- a.2 ICT Trade Industries
- a.3 ICT Service Industries
 - a.3.1 Software publishing
 - a.3.2 Telecommunication services
 - a.3.3 Computer programming, consultancy and related services
 - a.3.4 Data processing, hosting and related activities; web portals
 - a.3.5 Repair of computers and communication equipment

b. Content and Media Sector

- b.1 Publishing activities
- b.2 Motion picture, video and television programme production, sound recording and music publishing activities
- b.3 Programming and broadcasting activities

The industries composing the core ICT industries in the Philippines are listed in Table 1. All the qualified establishments in these industries, regardless of employment size, were completely covered. On the other hand, non-core ICT industries, regardless of employment size, were covered and taken on a sampling basis.

Table 1. List of Core ICT Industries in the Philippines: 2009 Philippine Standard Industrial Classification (PSIC)

2009 PSIC	Industry Description
	ICT Manufacturing Industries
C26110	Manufacture of electronic valves and tubes
C26120	Manufacture of semi-conductor devices and other electronic components
C26200	Manufacture of computers and peripheral equipment and accessories
C26300	Manufacture of communication equipment
C26400	Manufacture of consumer electronic
C26800	Manufacture of magnetic and optical media
	ICT Trade Industries
G46510	Wholesale of computers, computer peripheral equipment and software
G46521	Wholesale of electronic valves and tubes
G46522	Wholesale of semi-conductor devices
G46523	Wholesale of micro-chips and integrated circuits
G46524	Wholesale of printed circuits
G46526	Wholesale of telephone and communications equipment including parts and accessories
G46527	Wholesale of blank audio and video tapes and diskettes, magnetic and optical disks (CDs, DVDs)
	ICT Service Industries
J58200	Software Publishing
	Telecommunications Services
	<i>Wired telecommunications activities</i>
J61101	Wired (landline) services
J61102	Wired internet access service activities (e.g. DSL, leased line, dial-up)
J61103	Telegraph, facsimile/ telefax, and telex services
J61109	Other wired telecommunication activities, including pay phone
	<i>Wireless telecommunications activities</i>
J61201	Wireless landline services
J61202	Mobile telecommunications services
J61203	Wireless internet access services (e.g. Internet Service Provider, broadband)
J61209	Other wireless telecommunication services, n.e.c.
J61300	<i>Satellite telecommunications activities</i>
	<i>Other telecommunications activities</i>
J61901	Telephone access in facilities open to the public service activities
J61902	Internet access in facilities open to the public service activities
J61903	Voice over Internet Protocol (VoIP) service activities
J61909	Other telecommunications service activities, n.e.c.
	Computer Programming, Consultancy and Related Activities
J6201	<i>Computer programming activities</i>
J62011*	Game design and development
J62019*	Other computer programming activities
J62020	Computer consultancy and computer facilities management activities
J62090	Other information technology and computer service activities

Continued

Table 1 – Concluded

2009 PSIC	Industry Description
	Data processing, hosting and related activities; web portals
J63111	Data processing
J63112	Website hosting services
J63113	Application hosting services
J63120	Web portals
	Repair of computers and communication equipment
S95110	Repair of computers and peripheral equipment
S95120	Repair of communication equipment
S95210	Repair of consumer electronics
	Content and Media Industries
	Publishing Activities
J58110	Book publishing
J58120	Publishing of directories and mailing lists
J58130	Publishing of newspapers, journals and periodicals
J58190	Other publishing activities
J63910	News agency activities
J63990	Other information service activities, n.e.c
	Motion picture, video and television programme production, sound recording and music publishing activities
J5911	<i>Motion picture, video and television programme activities</i>
J59111*	Pre & main production of traditional & 2D animation
J59112*	Pre & main production of 3D animation
J59119*	Pre & main production of other motion films and etc.
J5912	<i>Motion picture, video and television programme post-production activities</i>
J59121*	Post production of traditional & 2D animation
J59122*	Post production of 3D animation.
J59129*	Post production of other motion films and etc.
J59130	Motion picture, video and television programme distribution activities
J59140	Motion picture projection activities
J59201	Sound recording activities
J59202	Publishing of music
	Programming and broadcasting activities
J60101	Radio broadcasting and relay station and studios
J60102	Radio program production
J60103	Radio broadcasting activities over the Internet (internet radio stations)
J60201	Television broadcasting and relay station and studios including closed circuit television services
J60202	Television program production
J60203	Television broadcasting activities over the Internet (internet radio stations)

*newly assigned industry codes which were split from selected industries (J59110, J59120, and J62010) and for PSA internal use only

BPM industries under the Information and Communication section and Administrative and Support Service Activities section were also covered in this survey round.

BPM services, as defined in the Central Product Classification version 2.1 (CPC v2.1) of the United Nations Statistical Division (UNSD), is the provision of a bundled service package that combines information technology-intensive services with labour (manual or professional depending on the solution), machinery and facilities to support, host and manage a business process for a client, including:

- a. financial business processes, such as financial transaction processing, credit card processing, payment services, lending services;
- b. human resource business processes, such as benefits administration, payroll processing, personnel administration;
- c. supply chain management business processes, such as inventory management, procurement services, logistics services, production scheduling and order processing;
- d. customer relations management business processes, such as help desk, call center, customer service;
- e. vertical market business processes, conducted by specific industries such as electric, chemical, petroleum; and
- f. other business processes for a client.

Table 2 shows the list of BPM industries in the country.

Table 2. List of BPM Industries in the Philippines: 2009 PSIC

2009 PSIC	Industry Description
BPM under Information and Communication Section	
J58200**	Software Publishing
J62011**	Game design and development
J62019**	Other computer programming activities
J62020**	Computer consultancy and computer facilities management activities
J62090**	Other information technology and computer service activities
J63111**	Data processing
J63112**	Website hosting services
J63113**	Application hosting services
J63120**	Web portals
J58190**	Other publishing activities
J59111**	Pre & main production of traditional & 2D animation
J59112**	Pre & main production of 3D animation
J59121**	Post production of traditional & 2D animation
J59122**	Post production of 3D animation
BPM under Administrative and Support Service Activities Section	
N78103	On-line employment placement agencies
N82211	Customer relationship management activities
N82212	Sales and marketing (including telemarketing) activities
N82219	Other call centers activities (voice), n.e.c.
N82221	Finance and accounting activities
N82222	Human resources and training activities
N82223	Administrative support activities
N82224	Document processes activities
N82225	Payroll maintenance and other transaction processing activities
N82226	Medical Transcription activities

Continued

Table 2 – Concluded

2009 PSIC	Industry Description
N82227	Legal services activities
N82228	Supply chain management activities
N82229	Other back office operations activities, n.e.c
N82291	Engineering outsourcing activities
N82292	Product development activities
N82293	Publishing outsourcing activities
N82294	Research and analysis activities
N82295	Intellectual property research and documentation activities
N82296	Security outsourcing activities
N82299	Other non-voice related activities, n.e.c.

** Industries that are both Core ICT industries and BPM.

I.6. Other related topics

I.6.1. Legal Authority

The conduct of the 2019 SICT is authorized under RA No. 10625 known as the Philippine Statistical Act of 2013 - Reorganizing and strengthening the Philippine Statistical System (PSS), its agencies, and instrumentalities. It shall be the policy of the State to effect the necessary and proper changes in the organizational and functional structures of the PSS in order to rationalize and promote efficiency and effectiveness in the delivery of statistical services.

Penalties

Section 27 of RA No. 10625 states that:

“Respondents of primary data collection activities such as censuses and sample surveys are obliged to give truthful and complete answers to statistical inquiries. The gathering, consolidation and analysis of such data shall likewise be done in the most truthful and credible manner.

To ensure compliance, any violation of this Act shall result in the imposition of the penalty of one (1) year imprisonment and a fine of One hundred thousand pesos (P100,000.00). In cases where the respondent fails to give truthful and complete answer to such statistical inquiries is a corporation, the above penalty shall be imposed against the responsible officer, director, manager and/or agent of said corporation. In addition, such erring corporation or any other juridical entity, depending on the category of the enterprise or business concerned whether small, medium or large, shall be imposed a fine ranging from One hundred thousand pesos (P100,000.00) to Five hundred thousand pesos (P500,000.00).

Any person, including parties within the PSA Board and the PSA, who breach the confidentiality of information, whether by carelessness, improper behavior, behavior with malicious intent, and use of confidential information for profit, are considered guilty of an offense and shall be liable to fines as prescribed by the PSA Board which shall not be less than Five thousand pesos (P5,000.00) nor more than Ten thousand pesos (P10,000.00)

and/or imprisonment of three (3) months but not to exceed one (1) year, subject to the degree of breach of information.

Failure to comply with the survey clearance provision shall be penalized by a fine of Fifty thousand pesos (P50,000.00) to One hundred thousand pesos (P100,000.00), depending on the gravity and seriousness of such noncompliance.”

Confidentiality of Information

Section 26 of RA No. 10625 states that:

“Individual data furnished by a respondent to statistical inquiries, surveys and censuses of the PSA shall be considered privileged communication and as such shall be inadmissible as evidence in any proceeding. The PSA may release aggregated information from statistical inquiries, surveys and censuses in the form of summaries or statistical tables in which no reference to an individual, corporation, association, partnership, institution or business enterprise shall appear...”

Republic Act No. 6713 (Code of Conduct and Ethical Standards for Public Officials and Employees) dated February 20, 1989.

Section 7 of RA No. 6713 states that:

“...(c) Disclosure and/or misuse of confidential information. Public officials and employees shall not use or divulge confidential or classified information officially known to them by reason of their office and not made available to the public, either: (1) to further their private interest, or give undue advantage of anyone, or (2) to prejudice the public interest...”

I.6.2. Reference Period

All information collected in the 2019 SICT refers to calendar year 2019. However, employment data was as of 15 November 2019 to facilitate the accomplishment and to get an accurate estimate of employment for the reference year.

I.6.3. Survey Operations

The 2019 SICT, together with the 2019 ASPBI underwent the following major phases of operation: preparatory activities, training, field operations, data processing, tabulation, and dissemination.

I.6.3.1. Preparatory Activities

PSA officials, Services Statistics Division (SSD) and Industry Statistics Division (ISD) statisticians, selected personnel from the Systems Development Division (SDD), Knowledge Management and Communications Division (KMCD) and Systems Quality Assurance Division (SQAD) of the Information Technology and Dissemination Service (ITDS) and Service and Industry Census Division (SICD) of the National Censuses Service (NCS) undertook the planning activities for the 2019 SICT with the organization and creation of the Working Groups (WGs) through the issuance of Special Order. Activities undertaken during

this phase included the maintenance of the frame, questionnaire design and content, publicity campaign, clearance process, budget preparation, manual preparation, training plans, sampling design and sample selection, preparation of edit specifications, preparation of tabulation formats and specifications, computer systems design and program development, recruitment of Statistical Researchers (SRs), printing of survey forms and manuals, preparation for shipment of survey materials, and other related activities.

I.6.3.2. Training

Training for the field operations and processing was done in two phases.

Phase I - Training for Field Operations and Manual Processing

Training for field operations and manual processing was done in three levels, as follows:

1. Task force training. The first level training was conducted on 08 October 2020. Field operation and processing procedures, technical and administrative aspects of the survey were discussed extensively in this training. It was attended by selected SSD and ISD statisticians and selected SDD and SQAD personnel.
2. Second level training. This level of training was conducted on 15 October 2020 in all Regional Statistical Services Offices with participants in the first level training as trainers. Regional Directors, Chief Statistical Specialists, Officers-in-Charge, regional and provincial focal persons responsible for the establishment participated in this training.
3. Third level training. This training was conducted in all provinces and five districts of the National Capital Region on 22 October 2020 with participants in the second level training as trainers. Participants in this training are the Statistical Specialist II/Statistical Personnel, and hired SRs.

Phase II - Training for Data Processing

Training for data processing was done in three levels, as follows:

1. Task force training. The first level training for data processing was conducted on 12 November 2020. Participants were the SSD and ISD statisticians and selected SDD and SQAD personnel.
2. Second level training. Data processing, folioing, verification of error listing, and the different modules of the EDMS were discussed thoroughly in this training. It was conducted on 19 November 2020. Participants in this training were provincial focal persons, selected provincial statistical offices personnel and hired SRs. SSD and ISD statisticians and selected SDD personnel who attended the task force training served as trainers for the second level trainings.
3. Third level training. This training was conducted on 26 November 2020 with the participants in the second level training as trainers. Participants in this training were the Statistical Specialist II/Statistical Personnel and hired SRs.

I.6.3.3. Field Operations

Distribution of Questionnaires

Distribution of questionnaires for the 2019 SICT was done by the PSO personnel and hired SRs through personal delivery of the questionnaires to the sample establishments. This activity was done from 03 to 29 November 2020.

Collection and Field Editing of Questionnaires

Collection of data was done either through self-administered questionnaire, accomplishment of electronic questionnaire, or web-based online questionnaire.

Field editing of all collected questionnaires was done to ensure completeness and consistency of entries between data items to avoid revisits or callbacks. Collection and field editing of questionnaires was scheduled from 10 November 2020 to 29 January 2021.

Supervision

The Regional Directors, Chief Statistical Specialists, regional and provincial focal persons conducted close supervision on collection and editing of questionnaires to ensure the quality of data and completeness of survey returns.

Receipt and Control

An online version of the Monitoring and Tracking System (MTS) developed by SDD was used by field offices to keep track of the distribution, collection, and transmittal of questionnaires. At the same time, a control list of sample establishments was made available where information on the status of the questionnaire was recorded.

In the Central Office (CO), the online MTS was utilized by SSD and ISD statisticians to monitor the distribution, collection and submission of questionnaires from the provincial offices to the CO. Consolidated progress reports and status reports were prepared regularly to inform the management and field offices on the progress of the survey operations.

I.6.3.4. Data Processing

Processing or editing of accomplished questionnaires was done to check for the completeness, validity, consistency, and reasonableness of data which consisted of two stages.

Stage I – Manual Processing

Provincial Statistical Offices:

Manual processing of questionnaires at PSO includes coding of data items, editing of erroneous entries, checking for completeness and correctness of entries, and consistency checks among data items of accomplished questionnaires. It also includes the verification of the status of operation of the establishment by checking the Remarks portion of the questionnaire. Necessary remarks related to the status of operation of the establishment

should have been indicated by the PSO personnel and/or hired SRs, if any, during distribution.

Central Office:

Manual processing consisted of coding of some data items, editing of erroneous entry, checking for completeness of required data items and consistency checks among data items for accomplished questionnaires with the following special cases:

- a. consolidated report;
- b. changed sector;
- c. merged with other establishment;
- d. new establishments under the certainty stratum that started operation in 2019;
- e. under new management; and
- f. directly submitted to CO

Stage II – Machine Processing

Machine processing at PSOs consisted of online data entry, editing of erroneous data, and checking for completeness and consistency of data through EDMS. Similar to the PSOs, machine processing at CO consisted of data entry, editing of erroneous and verified data, and completeness, correctness, and consistency edits of questionnaires with special cases through the EDMS. However, data entry will only be done for questionnaires with special cases. In addition, generation and review of completeness check and generation and analysis of Summary File Report were done by subject-matter divisions.

An online system designed and developed by the SDD personnel called the EDMS was utilized to facilitate the processing of survey data from data entry up to the generation of statistical tables.

II. DATA COLLECTION

II.1. Data Collection Procedure

The 2019 SICT utilized self-administered questionnaires which were distributed to sample establishments by field office personnel from Provincial Statistical Offices (PSOs). The personnel will set date on when they will collect the questionnaire from the sample establishment. Moreover, sample establishments had the option to accomplish the questionnaire online by accessing the provided Uniform Resource Locator (URL).

II.2. Instruments

Only one type of questionnaire was used for all 18 sections under the 2009 PSIC for the 2019 SICT (SICT Form 1).

The clearance number for the SICT Form 1 was PSA-2042 with expiry date of 30 September 2021.

The 2019 SICT questionnaire was available in three versions, that is, printed, electronic, and online. The printed copy of the 2019 SICT questionnaire was distributed to sample

establishments, while electronic copies in Excel (.xlsx) and fillable portable document format (.pdf) was emailed at the establishment's official email address by request, and the online version can be accessed at <https://sict.psa.gov.ph>.

II.3. Data Items

Table 3 shows the main data items in the 2019 SICT questionnaire.

Table 3. List of Main Data Items in the 2019 SICT Questionnaire

ITEM NO.	DESCRIPTION
(Cover Page)	Name and Address of Establishments and its Reporting Unit
	Control Panel for Establishment Characteristics (For PSA Use Only)
Page 2	How to Accomplish the Online Questionnaire
I	General Information about this Establishment
II	Information and Communication Technology (ICT) Resources of this Establishment
III	Network Channels
IV	Internet Connection of this Establishment
V	Uses of ICT Resources in the Operations of this Establishment
VI	Use of Internet for Other Processes within this Establishment
VII	Website of this Establishment
VIII	E-Commerce via Internet and Network Channels other than Internet
IX	Use of Cellular Mobile Phone/Smartphone in Selling and other Business Operation
X	Social Media Account of this Establishment
XI	Purchase and Disposal of ICT Equipment
XII	Other General Information about the Establishment
XIII	Evaluation of the SICT Questionnaire
	Remarks
	Certification
	Contact Person
	Processing Information

III. METHODOLOGY

III.1. Unit of enumeration

The unit of enumeration in the 2019 SICT is the establishment. An *establishment* is defined in the United Nations International Recommendations on Industrial Statistics as *an economic unit under a single ownership or control, i.e., under a single legal entity, engaged in one or predominantly one kind of economic activity at a single fixed location*.

In actual practice, however, there are some difficulties in applying the ideal definition so the establishment is defined in operational terms to take into account the organization and record-

keeping practices of certain industries by making the single physical location and activity criteria more flexible. It is then necessary to use the kind-of-activity unit (KAU).

The **KAU** is *“the unit that is engaged in the production of the most homogeneous group of goods and services, usually at one location, but sometimes over a wider area, for which separate records are available that can provide data concerning the production of these goods and services and the materials, labor and physical resources used in this production.”* A **KAU** differs from the establishment in that there is no restriction with respect to the geographical areas in which a given kind of activity is carried on by a single legal entity.

The above definition is an inherent characteristic of the following sectors: construction, transportation and storage, financial and insurance activities, and real estate activities. Likewise, it is also applicable to selected industries, namely, electric distribution (electric cooperatives), water distribution (water districts), telecommunications, security and investigation activities, travel agency and tour operator activities, and reservation service and related activities.

III.1.1. Classification of Establishments

An establishment is categorized by its economic organization, legal organization, industrial classification, employment size, and geographic location.

Economic Organization (EO). This relates to the organizational structure or role of the establishment in the organization. The following are the types of EO:

- a. *Single establishment* (EO=1) is an establishment which has neither branch nor main office. It may have ancillary unit/s, other than the main office, located elsewhere.
- b. *Branch only* (EO=2) is an establishment which has a separate main office located elsewhere.
- c. *Establishment and main office* (EO=3), both located in the same address and with branch/es elsewhere.
- d. *Main office only* (EO=4) is the unit which controls, supervises and directs one or more establishments of an enterprise.
- e. *Ancillary unit other than Main Office* (EO=5) is the unit that operates primarily or exclusively for a related establishment or group of related establishments or its parent establishment and provides goods or services that support but do not become part of the output of those establishments.

Legal Organization (LO). This provides the legal basis for ownership of the establishment. The following are the types of LO:

- a. *Single Proprietorship* (LO=1) is a business establishment organized, owned and managed by one person, who alone assumes the risk of the business enterprise.
- b. *Partnership* (LO=2) is an association of two or more individuals for the conduct of a business enterprise based upon an agreement or contract between or among them to contribute money, property or industry into a common fund with the intention of dividing profits among themselves.

- c. *Government Corporation* (LO=3) is a corporation organized for a private aim, benefit or purpose with the government as the majority stockholder, regardless of whether they are stock or non-stock corporations.
- d. *Stock Corporation* (LO=4) is an ordinary business corporation organized by private persons, created and operated for the purpose of making a profit which may be distributed in the form of dividends to stockholders on the basis of their invested capital.
- e. *Non-Stock, Non-Profit Corporation* (LO=5) is a business corporation which does not issue stock to its members and is created not to profit but for the public good and welfare. Of this character are most of the religious, social, charitable, educational, literary, scientific, civic, and political organizations and societies.
- f. *Cooperative* (LO=6) is an organization composed primarily of small producers and/or consumers who voluntarily join together to form a business enterprise, which they themselves own, control, and patronize.
- g. *Others* (LO=7) are organizations not classified in any of the above classification like private associations, foundations, non-government organizations, etc.

Industrial Classification. The industrial classification of the unit of enumeration was determined by the activity from which it derives its major income or revenue. The 2009 Philippine Standard Industrial Classification (PSIC) was utilized to classify economic units according to their economic activities. It was approved for adoption by government agencies and instrumentalities through PSA Board Resolution No.1 Series 2017-158 signed on 14 February 2017.

The 2009 PSIC is aligned with the International Standard Industrial Classification of all Economic Activities (ISIC) Revision 4, and was officially released by the United Nations Statistics Division on 11 August 2008, for adoption by countries in their revised national classifications by 2010.

The structure and coding system of the 2009 PSIC consists of an alpha character and five numeric digits. The alpha character, represents the section also known as sector, the first two digits represent the division; the first three digits, the group; the first four digits, the class; and all five digits, the sub-class.

Below is an example of the five levels of disaggregation for the Information and Communication section for PSIC Code J63111:

Section	J	Information and Communication
Division	J63	Information and service activities
Group	J631	Data processing, hosting and related activities; web portals
Class	J6311	Data processing, hosting and related activities
Sub-class	J63111	Data processing

Table 4 shows the levels of disaggregation of industries in the 2009 PSIC.

Table 4. Levels of Disaggregation of the 2009 PSIC by Section

Section	Division	Group	Class	Sub-Class
Total	88	246	521	1,285
Agriculture, Forestry, and Fishing (A)	3	12	53	157
Mining and Quarrying (B)	5	10	15	32
Manufacturing (C)	24	73	201	476
Electricity, Gas, Steam, and Air Conditioning Supply (D)	1	3	3	3
Water Supply; Sewerage, Waste Management and Remediation Activities (E)	4	6	8	8
Construction (F)	3	8	10	15
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles (G)	3	20	45	189
Transportation and Storage (H)	5	12	21	56
Accommodation and Food Service Activities (I)	2	5	6	20
Information and Communication (J)	6	13	25	39
Financial and Insurance Activities (K)	3	10	21	45
Real Estate Activities (L)	1	2	5	6
Professional, Scientific and Technical Activities (M)	7	16	16	38
Administrative and Support Service Activities (N)	6	19	28	74
Public Administration and Defense; Compulsory Social Security (O)	1	3	7	12
Education (P)	1	6	13	24
Human Health and Social Work Activities (Q)	3	9	11	32
Arts, Entertainment, and Recreation (R)	4	5	10	18
Other Service Activities (S)	3	10	18	34
Activities of Households as Employers; Undifferentiated Goods - and Services - Producing Activities of Private Households for Own Use (T)	2	3	3	3
Activities of Extraterritorial Organizations and Bodies (U)	1	1	2	4

Establishment Size Classification. The size of an establishment is determined by its Total Employment (TE) as of specific date.

Table 5 presents the size code and corresponding employment for the size code used in the survey.

Table 5. Size Code by Total Employment

Size Code	TE	Size Code	TE
0	1-4	5	100-199
1	5-9	6	200-499
2	10-19	7	500-999
3	20-49	8	1,000-1,999
4	50-99	9	2,000 and over

Geographic Classification. Establishments are also classified by geographic area using the Philippine Standard Geographic Code (PSGC) classification. The PSGC contains the latest updates on the official number of regions, provinces, cities, municipalities, and barangays in the Philippines. The geographic code used in the 2019 SICT is in accordance with PSGC as of 31 December 2019.

Based on the latest PSGC, the Philippines has 17 Regions, 81 provinces, 146 cities, 1,488 municipalities, and 42,045 barangays. The update in 2019 was the Renaming of the province of Compostela Valley to Davao de Oro by virtue of Republic Act No. 11297.

III.2. Sampling frame of establishments

The frame for the 2019 SICT is the list of samples of the 2019 ASPBI which was extracted from the preliminary 2019 List of Establishments (LE) as of 05 February 2020. This is to ensure that the sample of SICT is a sample of ASPBI as well.

III.3. Sample selection procedure

III.3.1. Sampling design

The 2019 SICT utilized stratified systematic sampling design with 3-digit PSIC serving as first stratification variable (industry strata/domain) and employment size (TE) as the second stratification variable (employment strata), except for ICT Core and BPM industries which is at the 5-digit PSIC level.

Stratified systematic sampling is a process of dividing the population into homogeneous groups, called strata, and then selecting independent samples in each stratum systematically. This method ensures that all important subgroups of the population are represented in the sample and increases the precision of “overall” survey estimates

III.3.2. Sampling units

Generally, the sampling units for industries not considered as KAU are single establishment (EO=1), branch only (EO=2), and establishment and main office (EO=3). For industries identified as KAU, the sampling units are single establishment (EO=1), establishment and main office (EO=3), and main office only (EO=4). The branches of these establishments do not strictly meet the criteria for defining an establishment as these are classified as kind-of-activity units.

For Government-Owned-and-Controlled Corporations (GOCCs), the sampling units are those with EO = 1, 3 and 4, except for those under Sections G and R in which the sampling units are establishments with EO = 1, 2 and 3. Presented in Table 6 are the sampling units by industry.

Table 6. Sampling Units by Industry

Industry Code	Industry Description	EO
A	Agriculture, Forestry and Fishing	1, 2, 3
B	Mining and Quarrying	1, 2, 3
C	Manufacturing	1, 2, 3
D	Electricity, Gas, Steam, and Air Conditioning Supply	1, 2, 3
E	Water Supply; Sewerage, Waste Management and Remediation Activities	1, 2, 3
F	Construction	1, 3, 4
G	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	1, 2, 3
H	Transportation and Storage	1, 3, 4
I	Accommodation and Food Service Activities	1, 2, 3
J	Information and Communication except J611, J612, J613, J61901, and J61909	1, 2, 3
J611	Wired telecommunications activities	1, 3, 4
J612	Wireless telecommunications activities (J612)	1, 3, 4
J613	Satellite telecommunications activities	1, 3, 4
J61901	Telephone access in facilities open to the public service activities	1, 3, 4
J61909	Other telecommunications service activities, n.e.c.	1, 3, 4
K	Financial and Insurance Activities	1, 2, 3
L	Real Estate Activities	1, 3, 4
M	Professional, Scientific and Technical Activities	1, 2, 3
N	Administrative and Support Service Activities except N791, N799, N80, and N81210	1, 2, 3
N791	Travel agency and tour operation activities	1, 3, 4
N799	Other reservation service and related activities	1, 3, 4
N80	Security and investigation activities	1, 3, 4
N81210	General cleaning of buildings	1, 3, 4
P	Education	1, 2, 3
Q	Human Health and Social Work Activities	1, 2, 3
R	Arts, Entertainment and Recreation	1, 2, 3
S	Other Service Activities	1, 2, 3

III.3.3. Domains

Industry Domain

The industry stratification for the 2019 SICT is the 5-digit PSIC level (sub-class) for core ICT and BPM industries and 3-digit PSIC level (industry group) for non-core ICT industries. Generally, the industry strata are the same for all establishments within the Micro, Small and Medium classification.

MSME Domain

Considering the need for data on MSMEs, the establishments were grouped according to the following employment strata:

Table 7. MSME Domain by Size Code and TE Size

MSME Domain	SZ code	TE size
Micro	0, 1	1 – 19
Small	2, 3, 4	10 – 99
Medium	5	100 – 199
Large	6, 7, 8, 9	200 and over

For sampling purposes, the survey frame was divided into three primary strata. Stratum 1 were considered as certainty stratum, while strata 2 and 3 were treated as non-certainty strata.

A certainty stratum is defined as the stratum whose sampling ratio is 100 percent. In this stratum, all establishments are taken as certainty samples, i.e. the selection probability is 1 and the sampling weight is 1.

On the other hand, a non-certainty stratum is the stratum where only sample establishments are taken.

Table 8 shows the sampling indicator of different sampling units under stratum code.

Table 8. Sampling Indicator of Different Sampling Units under Stratum Code

Stratum Code	Sampling Units	Sampling Indicator
1	Core ICT and BPM industries with TE 100 and over	Certainty
2	Core ICT and BPM Industries with TE less than 100	Non-Certainty
3	All other establishments not classified in stratum 1	Non-Certainty

Geographic Domain

For establishments under core ICT and BPM industries, the geographic domains are the regions. For those under non-core ICT industries, the geographic domain is at the national level. Hence, the samples of the 2019 SICT for core ICT and BPM industries can provide estimates at the regional level, while the non-core ICT industries can provide data at the national level only.

Table 9 shows the geographic domains for core ICT and BPM industries, including the provinces, cities, and municipalities that comprises them.

Table 9. Geographic Domains and Its Composition

REGION	PROVINCE/CITY/MUNICIPALITY
National Capital Region (NCR)	City of Manila, Quezon City, Mandaluyong City, Marikina City, Pasig City, San Juan City, Caloocan City, Malabon City, Navotas City, Valenzuela City, Makati City, Pateros, Taguig City, Parañaque City, Las Piñas City, Muntinlupa City, Pasay City
Cordillera Administrative Region (CAR)	Abra, Apayao, Benguet, Ifugao, Kalinga, Mountain Province
Region I – Ilocos Region	Ilocos Norte, Ilocos Sur, La Union, Pangasinan
Region II – Cagayan Valley	Batanes, Cagayan, Isabela, Nueva Vizcaya, Quirino
Region III – Central Luzon	Aurora, Bataan, Bulacan, Nueva Ecija, Pampanga, Tarlac, Zambales
Region IV-A – CALABARZON	Batangas, Cavite, Laguna, Quezon, Rizal
MIMAROPA Region	Marinduque, Occidental Mindoro, Oriental Mindoro, Palawan, Romblon
Region V – Bicol Region	Albay, Camarines Norte, Camarines Sur, Catanduanes, Masbate, Sorsogon
Region VI – Western Visayas	Aklan, Antique, Capiz, Guimaras, Iloilo, Negros Occidental
Region VII – Central Visayas	Bohol, Cebu, Siquijor, Negros Oriental
Region VIII – Eastern Visayas	Biliran, Eastern Samar, Leyte, Northern Samar, Samar (Western), Southern Leyte
Region IX – Zamboanga Peninsula	Zamboanga del Norte, Zamboanga del Sur, Zamboanga Sibugay, Isabela City
Region X – Northern Mindanao	Bukidnon, Camiguin, Lanao del Norte, Misamis Occidental, Misamis Oriental
Region XI – Davao Region	Compostela Valley, Davao del Norte, Davao del Sur, Davao Oriental, Davao Occidental
Region XII – SOCCSKSARGEN	Cotabato (North), Sarangani, South Cotabato, Sultan Kudarat, Cotabato City

Continued

Table 9 -- Concluded

REGION	PROVINCE/CITY/MUNICIPALITY
Region XIII – Caraga	Agusan del Sur, Agusan del Norte, Dinagat Island, Surigao del Norte, Surigao del Sur
Autonomous Region in Muslim Mindanao (ARMM)	Basilan (excluding Isabela City), Lanao del Sur, Maguindanao (excluding Cotabato City), Sulu, Tawi-Tawi

III.3.4. Sample size

The primary consideration in the determination of sample size for the survey was its manageability at the optimum level of estimated budget without compromising the reliability and timely release of survey results. The sample size was computed based on the target CV of eight (8) percent.

The sample size was determined by MSME Classification and Industry Stratum. Minimum sample size is set to 5 establishments per cell (industry domain and employment stratum). However, when the total number of establishments (N) in the cell is equal to or less than the set minimum sample size, all establishments in that cell are taken as samples.

All establishments with TE 100 and over under the core ICT and BPM industries (Stratum 1) were already considered as samples for the survey.

Proportional allocation was applied to the non-certainty employment strata for each 5-digit level (industry sub-class) under core ICT and BPM industries within the region. Furthermore, samples were proportionately allocated for each 3-digit level (industry group) under non-core ICT industries at the national level.

All samples in the certainty and non-certainty strata are combined to comprise the total samples for the survey of 12,958.

III.4. Estimation procedure

Estimation of Survey Weights

a) Base Weight

The base weight is the inverse of the probability of selection. For the SICT, the base weight for each domain is given by:

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

where:

w_{hk} = weight of the k^{th} establishment in h^{th} stratum
 N_h = total no. of establishments in h^{th} stratum

n_h = total no. of sample establishments in h^{th} stratum
 h = refers to the industry-employment stratum

b) Adjusted Weight

Adjustment Factor Due to Non-Response

To take into account the non-responding sample establishments, the adjustment factor by region and industry domain is as follows:

$$A_{1s} = \frac{\sum_{k=1}^n w_{hk} X_{1k}}{\sum_{k=1}^n w_{hk} X_{2k}}$$

where:

A_{1s} = adjustment factor for industry domain s
 X_{1k} = eligibility status of the k^{th} sample establishment
 (1 if eligible, 0 otherwise)
 X_{2k} = responding status of the k^{th} sample establishment
 (1 if responding, 0 otherwise)

Adjusted Weight

The adjusted weight is the product of the base weight and adjustment factor due to non-response. That is,

$$w_{1hk} = (w_{hk})(A_{1s})$$

where:

w_{1hk} = adjusted weight of the k^{th} sample establishment in stratum h
 w_{hk} = base weight of the k^{th} establishment in the h^{th} stratum
 A_{1s} = adjustment factor for industry domain s

c) Final Weight

Adjustment Factor for Conformity with ASPBI

In order to conform with the estimate of total non-core ICT establishments in the ASPBI, final adjustment factor is computed as follows:

$$A_{2h} = \frac{\hat{Y}_{h,ASPBI}}{\hat{Y}_{h,SICT,p}}$$

where:

A_{2h} = adjustment factor for conformity with ASPBI

$\hat{Y}_{h,ASPBI}$ = estimated number of establishments in stratum h in ASPBI

$\hat{Y}_{h,SICT,p}$ = preliminary estimated number of establishments in stratum h in SICT which is computed as:

$$\hat{Y}_{h,SICT,p} = \sum_{k=1}^{n_h} w_{1hk}$$

Final Weight

The final weight is the product of the adjusted weight and the second adjustment factor. That is,

$$w'_{hk} = (w_{1hk})(A_{2h})$$

where:

w'_{hk} = final weight of the kth sample establishment in stratum h

w_{1hk} = adjusted weight of the kth sample establishment in stratum h

A_{2h} = adjustment factor for conformity with ASPBI

For Core Industries

Estimation of Total

Total by Industry-Employment Stratum

The estimator for the total of a characteristic in each industry-employment stratum in a region (geographic domain) is given by:

$$\hat{Y}_{hc} = \sum_{j=1}^{n_h} w'_{hk} y_{hk}$$

where:

y_{hk} = value of the kth sample establishment in stratum h

w'_{hk} = final weight of the kth sample establishment in stratum h

Total by Industry Stratum and Domain

The estimator for the total of a characteristic in each industry stratum in a domain is given by:

$$\hat{Y}_{ir} = \sum_{h=1}^{h_i} \sum_{j=1}^{n_h} w'_{hk} y_{hk}$$

where:

h_i = number of strata (industry-employment strata) for industry stratum i

Total by Employment Stratum and Domain

The estimator for the total of a characteristic in each employment stratum in a domain is given by:

$$\hat{Y}_{jr} = \sum_{h=1}^{h_j} \sum_{k=1}^{n_h} w'_{hk} y_{hk}$$

where:

h_j = number of strata (industry-employment strata)
for industry stratum j
 r = subscript for geographic domain r

Total by Geographic Domain

The estimator for the total of a characteristic in each geographic domain is given by:

$$\hat{Y}_r = \sum_{i=1}^I \hat{Y}_{ir}$$

or

$$\hat{Y}_r = \sum_{j=1}^J \hat{Y}_{jr}$$

where:

I = total number of industry strata in geographic domain r
 J = total number of employment strata in geographic domain r

Total by Industry Stratum (National)

The estimator for the national total of a characteristic in each industry domain/stratum is given by:

$$\hat{Y}_{ic} = \sum_{r=1}^R \hat{Y}_{ir}$$

where:

R = total number of regions

Total by Employment Stratum (National)

The estimator for the national total of a characteristic in each employment domain/stratum is given by:

$$\hat{Y}_{jc} = \sum_{r=1}^R \hat{Y}_{jr}$$

National Total

The estimator for the national total of a characteristic is given by:

$$\hat{Y}_c = \sum_{i=1}^I \hat{Y}_{ic}$$

or

$$\hat{Y}_c = \sum_{j=1}^J \hat{Y}_{jc}$$

For Non-core Industries

Estimation of Total

Total by Industry-Employment Stratum

The estimator for the total of a characteristic in each industry-employment stratum is given by:

$$\hat{Y}_{hn} = \sum_{k=1}^{n_h} w'_{hk} y_{hk}$$

where:

y_{hk} = sample value of the k^{th} sample establishment in stratum h
 w_{hk} = Final weight of the k^{th} sample establishment in stratum h

Total by Industry Stratum

The estimator for the total of a characteristic in each industry stratum is given by:

$$\hat{Y}_{in} = \sum_{h=1}^{h_i} \sum_{k=1}^{n_h} w'_{hk} y_{hk}$$

where:

h_i = Number of employment strata for industry stratum i

Total by Employment Stratum

The estimator for the total of a characteristic in each employment stratum in a domain is given by:

$$\hat{Y}_{jn} = \sum_{h=1}^{h_j} \sum_{k=1}^{n_h} w'_{hk} y_{hk}$$

where:

h_j = Number of industry strata for employment stratum j

National Total

The estimator for the national total of a characteristic is given by:

$$\hat{Y}_n = \sum_{i=1}^I \hat{Y}_{in}$$

or

$$\hat{Y}_n = \sum_{j=1}^J \hat{Y}_{jn}$$

where:

I = Total number of industry strata

J = Total number of employment strata

For All Establishments

Estimation of Total

Total by Industry-Employment Stratum

The estimator for the total of a characteristic in each industry-employment stratum is given by:

$$\hat{Y}_h = \hat{Y}_{hc} + \hat{Y}_{hn}$$

where:

\hat{Y}_{hc} = Total by industry-employment stratum for core ICT industries

\hat{Y}_{hn} = Total by industry-employment stratum for non-core ICT industries

Total by Industry Stratum

The estimator for the total of a characteristic in each industry stratum is given by:

$$\hat{Y}_{if} = \hat{Y}_{ic} + \hat{Y}_{in}$$

where:

$$\begin{aligned}\hat{Y}_{ic} &= \text{Total by industry stratum for core ICT industries} \\ \hat{Y}_{in} &= \text{Total by industry stratum for non-core ICT industries}\end{aligned}$$

Total by Employment Stratum

The estimator for the total of a characteristic in each employment stratum in a domain is given by:

$$\hat{Y}_{jf} = \hat{Y}_{jc} + \hat{Y}_{jn}$$

where:

$$\begin{aligned}\hat{Y}_{jc} &= \text{Total by employment stratum for core ICT industries} \\ \hat{Y}_{jn} &= \text{Total by employment stratum for non-core ICT industries}\end{aligned}$$

National Total

The estimator for the national total of a characteristic is given by:

$$\hat{Y} = \hat{Y}_{ic} + \hat{Y}_{in}$$

or

$$\hat{Y} = \hat{Y}_{jc} + \hat{Y}_{jn}$$

where:

$$\begin{aligned}\hat{Y}_{ic} &= \text{Total by industry stratum for core ICT industries} \\ \hat{Y}_{in} &= \text{Total by industry stratum for non-core ICT industries} \\ \hat{Y}_{jc} &= \text{Total by employment stratum for core ICT industries} \\ \hat{Y}_{jn} &= \text{Total by employment stratum for non-core ICT industries}\end{aligned}$$

III.5. Imputation Procedure

Data of non-responding establishments were imputed based on the established imputation methods. Sources of information were from previous reports of the same establishment or from report of other responding establishment with similar characteristics.

Data of closed, duplicate, temporarily stopped operation, out of scope, merged with other enterprise, and informal sector establishments were not imputed.

III.6. Tabulation

Tabulation included generation and evaluation of preliminary and final statistical tables. The statistical tables were evaluated for internal and external consistency of data.

The statistical tables were presented at the national level for establishments under non-core ICT industries disaggregated by industry group (3-digit PSIC). For establishments under core ICT and

BPM industries, the statistical tables were presented at the national and regional levels and by IE industry groupings and by industry sub-class (5-digit PSIC), respectively.

III.6.1. Statistical Disclosure Control

Section 26 of RA No. 10625 requires that data furnished by respondents be kept confidential. To avoid disclosure of information of individual establishment, statistical tables do not provide information for any sub-class wherein the number of establishments is less than three. Figures relating to such industries are suppressed in accordance with the guidelines on statistical disclosure control of data for establishments' survey.

The two (2) methods to safeguard the confidentiality of data are as follows:

1. Combination¹

Combination involves the grouping of a confidential cell in a statistical table with another cell of the same group (3-digit PSIC), class (4-digit PSIC), or sub-class (5-digit PSIC) and the information is disseminated for the aggregate and not for the individual cell. Grouping of data shall be done for similar industries. The **bracket (})** symbol shall be used to identify the cell combined.

2. Suppression¹

Suppression means the hiding of confidential data in a cell. The values in the confidential cells (primary suppression) are not published, while publishing the original values of the other cell with establishments' count of more than three (3). If necessary, other cells must also be suppressed to guarantee the protection of the values under the primary cells, leading to the secondary suppression. The symbol "**s**" shall be used to the suppressed cells.

IV. CONCEPTS AND DEFINITION OF TERMS

A **computer virus** is a computer program that can copy itself and infect a computer without the permission or knowledge of the user. A true virus can only spread from one computer to another when its host (some form of executable code) is taken to the target computer, for instance, because a user sent it over a network or the Internet, or carried it on a removable medium such as a floppy disk, CD, or USB drive.

Spyware is computer software that is installed surreptitiously on a personal computer to intercept or take partial control over the user's interaction with the computer, without the user's informed consent. Spyware programs can collect various types of personal information, such as Internet surfing habits, sites that have been visited, but can also interfere with user control of the computer in other ways, such as installing additional software, and redirecting Web browser activity.

¹ Source: Manual on the Statistical Disclosure Control of Data for Establishments Census/Survey

A **worm** can spread itself to other computers without needing to be transferred as part of a host, and a **Trojan horse** is a program that appears harmless but has a hidden agenda. Worms and Trojans, like viruses, may cause harm to a computer system's hosted data, functional performance, or networking throughput, when they are executed.

E-commerce or electronic commerce refers to the sale of goods and services where an order is placed by the buyer, price and terms of sale are negotiated over the Internet Protocol-based networks, an extranet, Electronic Data Interchange (EDI) network, or other on-line system.

ICT Resources are equipment, knowledge and human resources used to support electronic business/manufacturing processes and the conduct of electronic commerce transactions. It includes computer and peripheral equipment, systems and application software, network channels, telecommunication equipment, routers, satellite and other ICT hardware used in electronic business and commerce transactions, ICT support services and ICT workers.

A **desktop computer** is a personal computer (PC) in a form intended for regular use at a single location, as opposed to a mobile laptop or portable computer. Today the phrase usually indicates a particular style of computer case. Most modern desktop computers have separate screens and keyboards. A specialized form of desktop case is used for home theater PC systems, incorporating front-panel mounted controls for audio and video.

A **landline, main line or fixed-line** is a telephone line which travels through a solid medium, either metal wire or optical fibre. This is distinguished from mobile cellular line, where the medium used is the airwaves. Landlines usually cost less than cellular lines and provide better voice quality, and are used when there is no need for mobility or where cellular service is. A fixed phone line (i.e., one that is not a mobile phone line) can be hard-wired or wireless.

A **laptop computer**, also known as a notebook computer, is a small personal computer designed for mobile use. A laptop integrates all of the typical components of a desktop computer, including a display, a keyboard, a pointing device (a touchpad, also known as a trackpad, or a pointing stick) and a battery into a single portable unit.

Mainframes (often colloquially referred to as Big Iron) are computers used mainly by large organizations for critical applications, typically bulk data processing such as census, industry and consumer statistics, ERP, and financial transaction processing.

A **minicomputer** (colloquially, mini) is a class of multi-user computers that lies in the middle range of the computing spectrum, in between the largest multi-user systems (mainframe computers) and the smallest single-user systems (microcomputers or personal computers).

A **mobile phone** (also known as a wireless phone, cell phone, or cellular telephone) is a long-range, electronic device used for mobile voice or data communication over a network of specialized base stations known as cell sites. In addition to the standard voice function of a mobile phone, telephone, current mobile phones may support many additional services, and accessories, such as SMS for text messaging, email, packet switching for access to the Internet, gaming, Bluetooth, infrared, camera with video recorder and MMS for sending and receiving photos and video, MP3 player, radio and GPS.

A **personal digital assistant (PDA)** is a handheld computer also known as palmtop computers. Newer PDAs also have both color screens and audio capabilities, enabling them to be used as mobile phones, (smartphones), web browsers, or portable media players.

Radio is the transmission of signals, by modulation of electromagnetic waves with frequencies below those of visible light. Information is carried by systematically changing (modulating) some property of the radiated waves, such as amplitude, frequency, or phase.

A **satellite telephone, satellite phone, or satphone** is a type of mobile phone that connects to orbiting satellites instead of terrestrial cell sites. Depending on the architecture of a particular system, coverage may include the entire Earth, or only specific regions.

Information and Communication Technology (ICT) as defined by the Commission on Information and Communication Technology (CICT) is "the totality of electronic means to collect, store, process and present information to end-users in support of their activities". It consists, among others, of computer systems, office systems and consumer electronics, as well as network information infrastructure, the components of which include the telephone system, the Internet, fax machines and computers.

Information Economy is a term used to describe the economic and social value created through the ability to rapidly exchange information at anytime, anywhere to anyone. A distinctive characteristic of the information economy is the intensive use, by businesses, of ICT for the collection, storage, processing and transmission of information. The use of ICT is supported by supply of ICT products from an ICT-producing sector and through trade.

Information Technology (IT), as defined by the Information Technology Association of America (ITAA), is "the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware". IT deals with the use of electronic computers and computer software to convert, store, protect, process, transmit, and securely retrieve information.

Network channel is a collection of computers connected to each other that allows them to communicate with each other, and share resources and information. All networks are made up of basic hardware building blocks to interconnect network nodes, such as Network Interface Cards (NICs), Bridges, Hubs, Switches, and Routers.

A **Campus Area Network (CAN)** is a computer network made up of an interconnection of local area networks (LANs) within a limited geographical area. It can be considered one form of a metropolitan area network, specific to an academic setting.

An **extranet** is a network or internetwork that is limited in scope to a single organization or entity but which also has limited connections to the networks of one or more other usually, but not necessarily, trusted organizations or entities (e.g. a company's customers may be given access to some part of its intranet creating in this way an extranet, while at the same time the customers may not be considered 'trusted' from a security standpoint).

Global Area Network (GAN) specifications are in development by several groups, and there is no common definition. In general, however, a GAN is a model for supporting mobile communications across an arbitrary number of wireless LANs, satellite coverage areas, etc. The key challenge in mobile communications is "handing off" the user communications from one local coverage area to the next.

Internet is a global system of interconnected computer networks that interchange data by packet switching using the standardized Internet Protocol Suite (TCP/IP). It is a "network of networks" that consists of millions of private and public, academic, business, and government networks of local to global scope that are linked by copper wires, fiber-optic cables, wireless connections, and other technologies. The Internet carries various information resources and services, such as electronic mail, online chat, file transfer and file sharing, online gaming, and the inter-linked hypertext documents and other resources of the World Wide Web (WWW).

Intranet is a set of networks, using the Internet Protocol and IP-based tools such as web browsers and file transfer applications, that is, under the control of a single administrative entity. That administrative entity closes the intranet to all but specific, authorized users. Most commonly, an intranet is the internal network of an organization.

A **Local Area Network (LAN)** is a computer network covering a small physical area, like a home, office, or small group of buildings, such as a school, or an airport. Current LANs are most likely to be based on Ethernet technology. Each workgroup can get to its local printer. Note that the printers are not accessible from outside their workgroup.

A **Metropolitan Area Network (MAN)** is a network that connects two or more Local Area Networks or Campus Area Networks together but does not extend beyond the boundaries of the immediate town/city. Routers, switches and hubs are connected to create a Metropolitan Area Network.

A **Personal Area Network (PAN)** is a computer network used for communication among computer devices close to one person. Some examples of devices that are used in a PAN are printers, fax machines, telephones, PDAs and scanners. The reach of a PAN is typically about 20- 30 feet (approximately 6-9 meters), but this is expected to increase with technology improvements.

A **Virtual Private Network (VPN)** is a computer network in which some of the links between nodes are carried by open connections or virtual circuits in some larger network (e.g., the Internet) instead of by physical wires.

A **Wide Area Network (WAN)** is a computer network that covers a broad area (i.e., any network whose communications links cross metropolitan, regional, or national boundaries. Less formally, a WAN is a network that uses routers and public communications links. The largest and most well-known example of a WAN is the Internet. A WAN is a data communications network that covers a relatively broad geographic area (i.e. one city to another and one country to another country) and that often uses transmission facilities provided by common carriers, such as telephone companies.

Office automation tool refers to all tools and methods that are applied to office activities which make it possible to process written, visual, and sound data in a computer-aided manner. The term "office suite" refers to all software programs which make it possible to meet office needs.

Commercial Off-the-Shelf (COTS) is a term for software or hardware, generally technology or computer products, that are ready-made and available for sale, lease, or license to the

general public. They are often used as alternatives to in-house developments or one-off government funded developments.

Custom software (also known as Bespoke software) is a type of software that is developed either for a specific organization or function that differs from or is opposite of other already available software (also called off-the-shelf or COTS software). It is generally not targeted to the mass market, but usually created for companies, business entities, and organizations. Custom software is also when companies or governments pay for customized software for budget or project managing.

A **database** is a structured collection of records or data that is stored in a computer system. The structure is achieved by organizing the data according to a database model. The model in most common use today is the relational model. Other models such as the hierarchical model and the network model use a more explicit representation of relationships.

Open Source Software (OSS) began as a marketing campaign for free software. OSS can be defined as computer software for which the human readable source code is made available under a copyright license (or arrangement such as the public domain) that meets the Open Source Definition. This permits users to use, change, and improve the software, and to redistribute it in modified or unmodified form.

Operating system (commonly abbreviated OS and O/S) is the infrastructure software component of a computer system; it is responsible for the management and coordination of activities and the sharing of the limited resources of the computer. The operating system acts as a host for applications that are run on the machine. Common contemporary operating systems include Microsoft Windows, Mac OS, Linux, BSD and Solaris.

Spam is the abuse of electronic messaging systems to indiscriminately send unsolicited bulk messages. While the most widely recognized form of spam is e-mail spam, the term is applied to similar abuses in other media: instant messaging spam, Usenet newsgroup spam, Web search engine spam, spam in blogs, wiki spam, Online classified ads spam, mobile phone messaging spam, Internet forum spam, junk fax transmissions, and file sharing network spam.

A **website** is a collection of Web pages, images, videos or other digital assets that is hosted on one or more web servers, usually accessible via the Internet. All publicly accessible websites are seen collectively as constituting the "World Wide Web". The pages of a website can usually be accessed from a common root URL called the homepage, and usually reside on the same physical server.

Symbols Used in Statistical Tables

}	combined
s	suppressed
A/	pertains to animation industry only

V. DISSEMINATION

Survey results were disseminated in the form of Special Releases and Infographics posted at the PSA website and electronic copy of publication reports.

V.1. Response Rates

The overall response rate for the 2019 SICT was 78.1 percent (10,120 out of the 12,959 establishments). This included receipts of good questionnaires, partially accomplished questionnaires, and reports of closed, moved out, or out-of-scope establishments. Out of the total responding establishments, 388 (3.0%) establishments responded online.