

**Information & Communication Technology Survey- Business Sector 2015**

Methodology

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**1. Background of the Survey**

**1.1 Introduction:**

DSC seeks, since its inception, to provide necessary popular, economic and social data for decision and policy makers and those who are interested in whatsoever studies. DSC is also seeking to keep pace with keeping up with rapid and continuous development in studies through development of its technical and technological capabilities to reach such high standards applicable at statistics bodies of most developed countries.

The communication and information technology survey, which targets Dubai Business Sector, is one of the most important periodic surveys conducted by the center each two years -in collaboration with the Telecommunications Regulatory Authority (TRA), through which the center can provide data on communications and information technology within the Emirate business sector enterprises, with all economic sectors in Dubai. The project comes within the authority plan, as part of the statistical information program on communications and information technology. From one hand, this project aims to create a database on this field. On other hand, it enhances regular and continuous statistical partnerships and coordination between the TRA and DSC is only official body responsible for producing and publishing statistical data.

**1.2 Objectives of the Survey:**

The key objective of the survey is to identify extent of using communications and information technologies by Dubai business sector enterprises along with seeking to achieve the following key objectives:

1- Build a quantitative and qualitative database on extent of using communications and information technology by business sector enterprises of Dubai, which database will be the base for development and formulation of policies and strategies in the Emirate.

2- Assess Dubai business sector satisfaction with quality and cost of communications and information technology services.

3- Identify opinions and orientations of stakeholders at the business sector enterprises of the Emirate about efficiency and quality of communications and information technology services from one-hand and service providers and operators from the other hand.

4- Identify, detect, analyze and develop appropriate solutions for those obstacles which hamper using communications and information technology services (Fixed lines, Mobile Phones, Internet) in Business Sector. The study aims, also, to identify level of expenditure on each of those services.

5- Identify extent of using electronic trade by the business sector enterprises of the Emirate.

**2. Survey Target Community and Sample Framework**

**2.1 Target Community:**

In order to achieve objectives of the survey, the joint technical team of the DSC and TRA agreed that the survey would cover those economic enterprises where ten employees or upward work, provided that the sample should cover the following businesses in the urban and rural areas:

Agriculture, forest exploitation, logging, fishing, transforming industries, construction and building, wholesale and retail trade, repair of vehicles and motor bikes, transportation and storage, catering and hospitality services, securities brokerage and insurance, property investment and lease, education, health and social work activities, according to segments of the following manpower at each business in question:

* Small enterprises (10-49) labors
* Medium-sized enterprises (50-249) labors
* Large enterprises (+250) labors

**2.2 Survey Sample Framework:**

The survey framework means those enterprises covered by the survey without repetition or removal. This framework shall be recent to enable withdrawing the required size of the sample. The survey framework is defined as the list of enterprises from which the sample is taken. The survey depended on the most recent framework for sampling, namely, the enterprises register framework, which is available at DSC with periodic update.

The most recent framework for the survey society is the enterprises register framework available at DSC, which is regularly updated in coordination with different licensing bodies (Department of Economic Development, Duty Free... etc.). This framework includes important information about activity of an enterprise, number of labors, registered office. The following table No (1) shows distribution of enterprises where ten labors or upward work. This framework is recent so it can be reliable as a sample framework as well to draw units of the same from those enterprises where ten labors or upward work. There is no discrimination between urban and rural enterprises because of the few number of rural enterprises, (less than 1%), with no differences in communications and information technology services between urban and rural areas in Dubai.

**Table No (1) showing distribution of enterprises on ground of economic sector and labors classifications**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sector**  | **49-10** | **249-50** | **250+** | **Total**  |
| Agriculture, forestry and fishing  | 9 | 2 | 4 | 15 |
| Transforming Industries  | 2,559 | 631 | 160 | 3,350 |
| Construction  | 5,393 | 877 | 258 | 6,528 |
| wholesale and retail trade, as well as repair of vehicles and motor bikes | 10,455 | 984 | 171 | 11,610 |
| Transportation and Storage  | 2,694 | 587 | 55 | 3,336 |
| Catering and hospitality services | 2,662 | 326 | 73 | 3,061 |
| Security Brokerage & Insurance  | 457 | 114 | 24 | 595 |
| Property Investment  | 460 | 59 | 12 | 531 |
| Education  | 142 | 97 | 15 | 254 |
| Human health activities & social work | 328 | 33 | 16 | 377 |
| **Total**  | **25,159** | **3,710** | **788** | **29,657** |

**3. Survey Sample**

**3.1 Sample Size**

In light of the sample size which is determined nationwide by the TRA as (1, 800) enterprises, a sample of 841 enterprises was allocated for Dubai Emirate, to be distributed as follow according to classifications of labors:

* Sample size for small enterprises: 351 enterprises
* Sample size for medium-sized enterprises: 299 enterprises
* Sample size for large enterprises: 191 enterprises

For representing enterprises on ground of classifications of labors, the sample was distributed among classifications of labors on an equal basis at each sector. In order to face foreseeable non-response by some enterprises, a percent of 40% was added to the sample size of each classification to face non-response. The following table No (2) shows distribution of the sample according to sector and classifications of labors:

**Table No (2) distribution of the sample according to sector and classifications of labors**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sector**  | **49-10** | **249-50** | **250+** | **Total**  |
| Agriculture, forestry and fishing  | 9 | 2 | 4 | 15 |
| Transforming Industries  | 38 | 33 | 24 | 95 |
| Construction  | 38 | 33 | 24 | 95 |
| wholesale and retail trade, as well as repair of vehicles and motor bikes | 38 | 33 | 24 | 95 |
| Transportation and Storage  | 38 | 33 | 24 | 95 |
| Catering and hospitality services | 38 | 33 | 24 | 95 |
| Security Brokerage & Insurance  | 38 | 33 | 24 | 95 |
| Property Investment  | 38 | 33 | 12 | 83 |
| Education  | 38 | 33 | 15 | 86 |
| Human health activities & social work | 38 | 33 | 16 | 87 |
| **Total**  | **351** | **299** | **191** | **841** |

**3.2 Sampling Units Selection:**

Field results showed visiting all items of the sample-, which are 841. The table No. 2 below shows distribution of interviews according to classifications of labors and each sector. Results reveal that 649 interviews were successfully conducted with enterprises, whilst the total response ratio reached 98.2% as calculated on the basis of number of filled forms divided by number of interviews expected to be conducted save as other “not matching, not found”. The table, also, shows incomplete interviews and associated reasons.

**Table No. 2 Distribution of interviews for the survey according to results of the same**

|  |  |
| --- | --- |
| **Visit result**  | **Total**  |
| **Complete**  | 649 |
| **Refused**  | 14 |
| **Incomplete**  | 0 |
| **Closed / vacant**  | 118 |
| **Other**  | 60 |
| **Total**  | **841** |

**4. Stages of the Survey**

The survey stages included a package of interrelated and complementary processes, which required cooperation between the specialists at both DSC and TRA to prepare the work plan and necessary time schedule to achieve such plan as well as to provide all necessary types of labors assign tasks and identify areas for the same to achieve the survey as scheduled. Below are the survey stages:

1. Sample design & selection.
2. Design the survey questionnaire and prepare the instructions manual.
3. Test and develop questionnaire, instructions and programs as well as data filling and processing.
4. Prepare for the field activity stage such as preparing devices, programs, data collection instructions, field, desktop and automated audit instructions and coding guide.
5. Choose the survey cadre and train the same in the method of field data collection and audit.
6. Automated collection of the survey data using Smart Tablet PCs.
7. Direct and automated flow and transmission of data from the field scene to DSC using the latest smart technologies.
8. Audit and electronic coding of data.
9. Data cleansing.
10. Prepare the final database.

**5. Key Documents of the Survey:**

The survey documents included questionnaire, international standard classification guides approved for coding, the instructions manual for supervisors and researchers and business rules and electronic audit. Below is a brief presentation of the most important documents:

**5.1 Survey Questionnaire**

 For achieving the specific objectives of the survey, a special form was designed and came in its final formulation after being tested, reviewed and translated by the specialists at DSC and the team of TRA, taking into account facilitating designing a program for the automated form on smart tablets and auditing process.

The form comprises three key parts:

1. Identification data
2. Communications and information technology services, which part includes the following:
* Fixed line services
* Mobile services
* Internet services
* E-commerce
* Advanced communications services
* Customers complaints

**5.2 Instructions Manual:**

The instructions manual includes all definitions and concepts used in the survey and detailed instructions to field employees with different supervisory and executive levels. In addition, it includes a detailed explanation of all questions and concepts stated at the different parts of the form and classifications of the same. Moreover, it shows how to fill data in a manner that ensures collecting the same with highest degree of truthfulness and accuracy.

The manual, also, includes basic rules of audit that all employees shall follow when auditing forms with focus on the questionnaire completion and the logic relationship between answers (internal consistency) and how to detect and rectify errors.

 **5.3 Encoding Manuals:**

All relevant fields are coded using international standard classifications applicable at DSC such as occupations and nationalities classifications. Below are the classifications:

         Countries and Citizens Classification- United Nations in 2014.

         International Standard Classification of Education: Fields of Education and Training ISCED-F in 2013.

         International Standard Classification of Occupations ISCO 08.

         International Standard Industrial Classification of All **Economic Activities**, (ISIC), Rev.4.

**6. Survey Staff**

**6.1 Functional Structure of Survey Staff:**

Below is the organization of those employees who participated in the technical, administrative and field tasks of the survey:

* **The survey technical general supervisor:** One of his most prominent tasks is to prepare all technical methodologies pertinent to the study “the complementary methodology, auditing methodology, results extracting methodology ….”. Further, he is the only reference for any technical instructions pertinent to questions, concepts, definitions and variables of the questionnaire as well as any other related technical sides or issues. In addition, he is responsible for training and testing employees participating in the survey and submitting a detailed report on most important outputs of the survey to the concerned technical department.
* **Survey field general supervisor:** He is responsible for following-up all field issues of the survey as well as providing the survey team with reports on work progress.
* **Administrative supervisor:** there were two administrative supervisors charged with management and performance of field operations as well as regularly reporting to the general supervisor on workflow.
* **Programmer:** One of his most prominent tasks is to design a program for questionnaire entry and make the link of such program available on smart electronic devices. He is the liaison between researchers and technicians through following-up the field work, solving all problems pertinent to the program and periodic transmission of data and preparing the key database of the survey.
* **Field supervisors:** there were five field supervisors distributed to 5 field teams with each team comprising 5 researchers. The most prominent tasks of a field supervisor is to assign daily field work to his team, permanent availability at the worksite, attend some interviews, audit achieved questionnaires to approve finishing the same and give comments on errors.
* **Researchers:** 20 researchers were distributed within the survey territory. The tasks of the researcher includes, collecting data, ensuring that all fields are filled before leaving enterprises, field auditing of data and daily reporting to the supervisor on their achievements.
* **Auditing Supervisor:** The most prominent tasks of the auditing supervisor are assigning daily-achieved fieldwork to auditing team, following-up auditing of achieved questionnaires, approving finished questionnaires and providing field supervisors with comments on erroneous questionnaires.
* **Auditors:** Three auditors were designated with each auditor assigned with auditing questionnaires electronically through a program specifically prepared for this purpose. The auditor follows-up, together with the administrative supervisor, all questionnaires that need correction.

**6.2 Staff Selection and Training:**

All supervisory and executive employees were chosen on several grounds which include, experience in census, surveys and statistics studies; knowledge of territories; maps reading skills, educational qualifications (most employees have bachelor degrees or higher); master of smart devices used for data collection and mastery of English language and other languages. A training plan was laid down, whether for field employees or others, prior to proceeding to collect data. A specialized team at the DSC held a training course for Arabic native speakers and another training course for English language speakers. The course covered objectives of the survey, data collection technique, data confidentiality, reaching enterprises of the sample and using maps and lists of the sample. The training, also, covered the applied side and ability to use Smart Tablet PCs to identify skills of researchers in using and field dealing with the same. Moreover, the training covered interviews techniques and privacy of the same as well as how to deal with enterprises and overcome difficulties. In the same context, the employees were trained for backend processes and field practical applications on how to fill questionnaires and associated errors. Further, they received training in backend preparation of data, rules of auditing, errors detection and to make possible corrections to ensure consistency of answers. It is noteworthy that employees took a test by the end of the training course upon which the survey employees were chosen.

**7. The Fieldwork Phase:**

This part gives a brief abstract on fieldwork stages, which included procedures for smooth flow of fieldwork and desktop auditing.

**7.1 Organizing Fieldwork:**

The fieldwork was organized and performed in a technique, which ensures obtaining data easily, smoothly and accurately. The work was distributed within all planning sectors and areas of the Emirate. The fieldwork operation was managed at the headquarters of the survey department. The technical team was distributed to work areas in light of volume of work at planning sectors, extent of spread of the sample locations and easiness of contact and communication.

**7.2 Data Collection Method:**

After the selection and appointment of administrative supervisors, supervisors, researchers and distributing the same to field teams along with completing the training course and pretest, the field performance stage commenced. The field teams visit enterprises of the sample to collect data through Smart Tablet PCs. Data is transmitted from the field location to databases at the headquarters. This stage commenced on 13/09/2015 until 29/10/2015.

**7.3 Field Scrutiny:**

Field auditing was one of the most important adopted procedures to ensure data quality. The supervision team made periodic field and surprise visits to locations of all fieldwork teams and they ensured that supervisors audited all finished questionnaires at workplace. In addition, they fill, before leaving the site, a special form (a supervisor form) for a household interviewed by a researcher to ensure truthfulness of submitted data. After completion of fieldwork, supervisors and the supervision office used to audit a sample of the questionnaire at the headquarters, especially during the first stage of work. Moreover, a daily auditing program was designated for each team for regular auditing of achieved work.

This is beside a survey technical team -at the DSC - that used to audit a sample of complete data and make necessary comments. The supervision office used to circular any detected errors to all supervisors and researchers on the following day to avoid the same in the future. In the same context, specialists used to study unforeseeable field cases to take a reasonable decision on the same then circulate such decision to all supervisors.

The purpose of those operations is to reach highest level of accuracy of data and to ensure that each question at the questionnaire was answered as required. Those operations included matching answers – with regard to consistency and logic – to rectify the same through re-interviewing relevant enterprises when possible.

**8. Data Processing Phase**

The dependence on smart technology for achieving the survey together with data transmission from the site to the central databases created for this purpose had a great effect on ensuring storing and saving the complete collected data of enterprises. This was along with having automatic backups of all Smart Tablet PCs of researchers after being edited and finally approved by the supervisor. In addition, a special record was organized and automated to show progress on different operations at all locations covered by the sample and smooth flow of complete data of enterprises between employees of the supervision office.

**8.1 Office Preparation:**

During field collection of data, the supervision office was examining and approving complete data of enterprises- as field audited by supervisors- to send the same, via state of the art smart technologies, to the survey central database at the headquarters where the data audited by the backend auditing team . This stage focused, in particular, on auditing consistency and completeness of data to minimize errors as possible. The automatic desktop auditing process of questionnaires began on 13/09/2015 until 29/10/2015 in parallel with the fieldwork stage.

In addition, a specialized group of DSC employees was assigned with conducting final review of audited data, under the supervision of the survey technical team, to minimize errors to the most possible extent.

**8.2 Electronic Preparation:**

The electronic preparation for the survey was carried out by the programmer assigned for this study who trained auditors on how to use the auditing program, which was specifically designed for this purpose. Available devices were used with optimum possible quality to step up auditing. In addition, data was available, through display walls, for immediate automatic auditing with focus on data completeness and whether values are properly entered or not. Consistency rules were applied to ensure that entered data is consistent and logic according to other variables or not. The application and effectiveness of auditing rules and consequence of logic answers as well as link between all questions of the questionnaire had a great effect on ensuring success of the process. The completion of a clear database was followed by extracting frequency tables of all variables which were considered by specialists at both the survey technical team and TRA team to decide to what extent they are complete, logic and consistent. Then, some direct rules were applied to some questions and data was reviewed, rectified and finally accepted. The following procedure was classification of some results – according to pre-proposed structural tables – and extracted tables were audit on the ground of internal consistency of data within the same table and external consistency between different relevant tables.

**8.3 Display and Dissemination of Results:**

DSC reached an agreement with the TRA on a plan to schedule results and to present the same through Dubai Smart Statistical Suite which is available at DSC via the interactive statistical and statistical indicators systems and through a specialized publication showing key results of the survey as well as through a detailed analytical report on the survey final results which includes all tables of characteristics of enterprises and all key sections at the form. Such outputs are published through several means and below are the most important of which:

1. The websites of DSC and TRA.
2. Dubai Smart Statistical Suite
3. Analytical briefs “Policies Brief” of most important results and indicators of the survey.

**9. Key Definitions**

The definitions and classifications for this survey were prepared according to international standards released by the UN and its specialized agencies and the generally accepted practices of DSC with some slight modifications to fit domestic circumstances. With regard to other sections of the form and in light of the nature and privacy of the survey, thus, the latter depended on those definitions and classifications available at the TRA, which are derived from the guide of measuring communications and information technology indicators released by the United Nations Economic and Social Commission for Western Asia (ESCWA). Below are the most important definitions used in the survey:

**Sector:** planning division delineated with main roads or natural landmarks. It includes several planning areas. Dubai Emirate is divided into (9) main planning sectors comprising (226) planning areas.

**Area Name:** an urban unit, which is delineated with main roads or natural elements. Each area has a code of three decimal numbers.

**Area No.** each planning area at the emirate of Dubai has a code of three decimal numbers. Sectors are divided into key planning areas. There are 226 areas distributed to all sectors.

**Reference:** a seven number reference for each plot of land set by Dubai Municipality with no repetition within each planning area owing to the first three numbers from left which refer to the planning area number whilst the other four numbers refer to the series of the plot of land.

**Interview Result:** for the purpose of programing the form and in order to identify extent of response by an enterprise, any of the following options is registered to decide on the result visit:

1. Responded: the enterprise responded to the researcher who interviewed the official of the enterprise and the random sample of labors at such enterprise. All parts of the forms or only part was filled.
2. Refused: The official at the enterprise and its labors refused to give any data in spite of attempts by the researcher and field supervisor (this may occur prior to proceeding to fill the questionnaire).
3. Closed / Vacant: Inspection and observation, through several visits, showed that the enterprise is closed or vacant.
4. Not found: Attempts to reach the enterprise address and location rendered unsuccessful.
5. Changing an enterprise key business: inquiries showed that the key business of the enterprise not matching to such business stated at lists of the sample.
6. Other.

**Enterprise Operation Period:** the estimated or calculated period from the business commencement in UAE till date of the interview exclusive of whatsoever fractions of years. For example, in case the operation period of an enterprise since its inception / operation in UAE is 12 years and 9 months, then, the operation period will be 12 years. The number (00) will be registered for enterprises with an operation period less than one year. The period is usually calculated from the inception date in the UAE till the interview date.

**Enterprise Business:** the dominant activity of such enterprise where the interviewed individual works. It is description of products or services rendered by such enterprise where the interviewed individual works. The business of those labors – not working for enterprises – is identified and registered based on their occupation: E.g. (trade on clothes by a hawker, a taxi driver). The business of those individuals working for private enterprises will be the same of such private enterprise regardless of nature or type of work.

Businesses are classified at DSC on grounds of international standards using the UN (ISIC4).

 **Service Provider:** specialized companies in communications fields that provide internet services to customers via suitable data transmission technology to supply internet data packages. Below are types of internet connections:

* Dial-up
* ADSL
* Mobile broadband
* broadband wireless

**Personal Computers:** computers vary in operation method, size and speed. Last years witnessed a great variety in manufacture of personal computers in particular along with spread and expansion in computer applications for different fields. Personal computers are classified, on ground of usage, into the following:

* Desktop
* Laptop
* Tablet

**Mobile Phones:** mobile phones witnessed notable development to go beyond those normal mobile phones used in making calls and sending SMSs. Today, smart phones have been fitted with different options and services such as taking high definition photos, move, explore and edit different files (documents, photos, videos…), Social networking service and internet services.

**Social Networking Websites:** those technologies available on the internet through which users communicate and interact. This concept has risen recently to cause great hype. It includes all social networking means available in the twentieth one century. Some individuals use the concept of social media means in a wide range to describe all different cultural phenomena that generally entail communication idea not only communication technologies. Individuals, for instance, use the expression social media means to refer to such content presented in writing, publication or participation in electronic publication means. It is noteworthy that most social networking websites are electronic means through which users can communicate and interact with each other using computers, smart phones, internet and social networks: (Twitter, Facebook, WhatsApp, Snap Chat, LinkedIn…).

**Types of Packages:** Subscriptions differ according to service providers, as each provider has promotional offers with different names and several options such as internet speed (measured in KB or MB/S), package limit (measured in KB or MB) and communication type. Below are examples of types of packages:

* Al Shamil (Internet)
* E-life (Internet –Landline – TV)
* Du packages (Internet –Landline – TV)
* Double Play (Internet + landline)
* Triple Play (Internet –Landline – TV)