

**Information & Communication Technology Survey- Households**

**2016**

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 makers, policymakers and those who are interested in whatsoever studies. This coincides with keeping up with rapid and continuous development in studies, a step which is achieved 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 households, 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 down to earth data on communications and information technology within the Emirati society, whether UAE nationals or residents. The project comes within the authority plan, as part of the statistical information program on communications and information technology down to earth. 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 on the ground that the latter 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 households 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 Dubai households, which database will be the base for development and formulation of policies and strategies in the Emirate.

2- Assess Dubai households’ satisfaction with quality and cost of communications and information technology services.

3- Identify, detect, analyze and develop appropriate solutions for those obstacles, which hamper using communications and information technology services (Fixed Line, Mobile Phone, Internet) by Dubai households. The study aims, also, to identify level of expenditure on each of those services.

**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 a sample of households from all planning areas of the Emirate –with a size of (1, 316) households. Collected data will help identify the following:

* Demographical and social characteristics of families and individuals.
* Characteristics of the random sample of individuals who currently available at households.
* Fixed line services
* Mobile phone services
* Internet services

**2.2 Survey Sample Framework:**

The survey framework means those households 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 households from which the sample is taken. The survey depended on the most recent framework for sampling, namely, the families’ record framework that is available at DSC with periodic update.

Dubai Emirate is divided into two strata: the first covers those areas where UAE Nationals constitute 40%, upward, of population. The second stratum covers other areas. Areas of both strata are divided into PSUs; the size of each is about 100 residential units. The households update process covered all areas of the first stratum approximately and third of PSUs of the second stratum, which was randomly chosen from the second stratum. The framework includes locations of households according to the planning sector, area and number of such plot occupied by the building. The updated enumeration units constituted a basic sample of households for drawing units of samples for surveys conducted after 2013.

**3.2 Individuals Selection Method: 15 years old or upward (Randomly):**

There are several scientific methods used in demographical and households surveys and studies; the most important of which are Kish random individual selection method, the random number table and birthdate method. For the purposes and objectives of this survey, the technical team deemed the birthdate method as fit to determine and select random individuals to be interviewed to identify to what extent they use communication and information technology services and their opinions on the same.

The random individual selection method depends on data of household and the following points shall be taken into account:

1. A household members (males and females) who are (15) year old or more are registered with the birthdate of each (Day, Month, Year). Servants and labors will be excluded (Eg: maid, driver, nanny, farmer…etc.) according to the number stated at the question S.
2. Household eligible individuals who are (15) year old or more are registered with the birthdate of each (Day, Month, Year), i.e., an individual shall be of legal age and of sound mind to be interviewed.
3. Household individuals who are (15) year old or more and who are currently available for being interviewed at any time during the survey are registered with the birthdate of each (Day, Month, Year).
4. After the registration of all eligible and currently available household members who are 15 years old or more and after accurate determination of their birth dates, individuals are selected as follow:

* An individual with the nearest birthdate following the interview date.
* In case all household members, who are 15 years old or more, are eligible and available whilst their birthdates are before the interview date, then, such individual with the nearest birthdate before the interview will be selected.

**3. Survey Sample**

**3.1 Sample Size**

The sample size is determined by the TRA as (1, 316) households, which size will provide data for all relative indicators with a random error percent not exceeding 1.5% and confidence level standing at 95%. The survey targets collecting data of Emiratis and non-Emiratis with estimated relative indicators for both segments with a reasonable error margin while reserving the total sample size, thus, the sample size was determined with maximum random errors 2.6% and 2.1% for all estimates of Emiratis and Non-Emiratis respectively, according to the following correlation between the size of the simple random sample and random error: the variance ratio reaches its peak when 



= Sample Size

=Phenomenon estimated ratio

، and = random error

Owing to the fact that the basic sample framework comprises two strata with each having a number of enumeration units (clusters), thus, it is a cluster-stratified sample. For minimizing the internal correlation effect and ensuring most widespread of the sample, 10 households were randomly drawn from each cluster with addition of four households to deal with foreseeable non-response. The following procedure was taken, before drawing samples, to ensure that target segments are covered: the first stratum was divided into two sub-strata: the first comprises the Emiratis and the second comprises the non-Emiratis and the sample size was distributed as shown at the table No.1

**Table No. 1: Ratio distribution of strata and sample size for each**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Stratum** | **Stratum size** | **Clusters No.** | **Clusters Size** | **Households No.** |
| **: First**  Emiratis  Non-Emiratis | 18,120  68,776 | 38  16 | 14  14 | 532  224 |
| **Second**  Non-Emiratis | 53,908 | 40 | 14 | 560 |
| **Total** | 140,804 | 94 | 14 | 1,316 |

**3.2 Sampling Units Selection:**

The sample of households for each cluster is drawn in three stages:

* First Stage: (PSUs) of each strata were drawn in a systemic manner with the probability proportional to size.
* Second Stage: the determined number of households was randomly drawn from each cluster.
* Third Stage: an eligible individual was selected from eligible household members (15 years old or more), using Kish grid or the last birthdate method.

It is noteworthy lists of the sample may not be identical with the status quo of occupants of residential units owing to expected population movement since households update process, thus, households occupying residential units at date of the survey shall be interviewed, provided that such households shall be of the same target strata.

**3.3 Sampling Coverage:**

Field results showed that all items of the sample-, which are 1,316 - were interviewed. The table No. 2 below shows distribution of interviews according to each stratum and result. Results reveal that 989 interviews were successfully conducted with households, whilst the total response ratio reached 99.4% as calculated on the basis of number of filled questionnaires 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 each stratum and results of the same**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Stratum** | **Complete** | **Refused** | **No eligible individual** | **Incomplete** | **The unit is closed/vacant** | **Other** | **Households No.** |
| Emiratis | 381 | 6 | 1 | 0 | 12 | 132 | **532** |
| Non-Emiratis | 608 | 0 | 4 | 0 | 25 | 147 | **784** |
| **Total** | **989** | **6** | **5** | **0** | **37** | **279** | **1,316** |

**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 employees 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, and the instructions manual for supervisors and researchers and rules of desktop 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 questionnaire 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 questionnaire on smart tablets and auditing process.

The questionnaire comprises three key parts:

1. Identification data
2. Household data

* Characteristics of currently available household individuals who are 15 years old or more.
* Average of monthly household income.
* Devices available at a household unit.
* Internet
* Fixed line services at a household unit.

1. Data of the random individual, 15 years old or more. The third part comprises the following:

* Mobile phone services.
* Internet services.

**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 questionnaire 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 questionnaire with focus on 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 & Nationalities classification – UN 2014
* International Standard Classification of Education - ISCED F-2013
* The International Standard Classification of Occupations ISCO 08

**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 five field teams with each team comprising five 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 questionnaire to approve finishing the same and give comments on errors.
* **Researchers:** 25 researchers were distributed within the survey territory. The tasks of the researcher includes, inter alia, collecting data, ensuring that all fields are filled before leaving households units, 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 questionnaire, approving finished questionnaire and providing field supervisors with comments on erroneous questionnaire.
* **Auditors:** Three auditors were designated with each auditor assigned with auditing questionnaire 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, inter alia, 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 households 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 households 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 validation of data based on the rules of auditing to detect errors 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:**

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 nurses as well as distributing the same to field teams along with completing the training course and pretest, the field performance stage commenced. The field teams visit households 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 11/09/2016 until 09/10/2016.

**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 questionnaires 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 households 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 households. 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 households between employees of the supervision office.

**8.1 Desktop Preparation**

During field collection of data, the supervision office was examining and approving complete data of households- 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 auditing team audit data. 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 11/09/2016 until 09/10/2016 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 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:**

The 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 households and individuals and all key sections at the questionnaire. 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 questionnaire 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:

**Household:** An individual or more sharing residence and food or they may share residence only. They may have relative relations, in which case, there is a head of household. If they do not have relative relations, then, there is no head of household as the case with the collective household. Notwithstanding collective labors, Dubai households are classified into the following three categories owing to the social circumstances diversity and effect of immigration on components of households in Dubai Emirate:

* **Emirati Household**
* **Non-Emirati Household**
* **Collective Household**

**Emirati Household:** An Emirati individual or more sharing residence and food with most of the same having relative relations under the umbrella of a head of household, designated as per mutual agreement by all members, who shall be of legal age and sound mind.

**Non-Emirati Household:** A non-Emirati individual or more sharing residence and food with most of the same having relative relations under the umbrella of a head of household, designated as per mutual agreement by family members, who shall of legal age and sound mind. A household is non-Emirati in case the head of the same is non-Emirati and the wife is non-Emirati even if the wife has Emirati sons from another husband.

**Collective Household:** A group of individuals (2 or more), regardless of their nationalities, sharing residence and they may share the same food. They usually do not have relative relations with no head of household and they are often of the same sex, whether males or females.

**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.

**Enumeration Area No.** The serial number of the enumeration area at the basic sample and such list handed over to the researcher. The enumeration unit includes (100) residential units approximately.

**Stratum:** a group of households according to classification, whether Emirati or non-Emirati, together with the collective labors stratum which includes labors at accommodation provided for the same at specific areas according to the methodology of designing the sample of this survey.

**Household Status:** a household is divided into three cases (original, replacement of the same classification, not matching)

**Interview Result:** the result of last interview or visit, as any of the following options are registered (responded, refused, there is no eligible individual, unit is closed, and unit is vacant).

**Household Head:** A household member (deemed by other members as household head) at age of “15 year old or upward”. It is not necessary that a household head must be the elder, the member who has the biggest income or from a specific sex (male or female). A household head does not necessarily have relative relations with most of household members. A household head must be of legal age, wise and registered at the survey as one of such household members.

**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)