Toward an Information Society measurement instrument for Latin America and the Caribbean: getting started with Census, household and business surveys

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Abbreviations

ABS ....Australian Bureau of Statistics
ANZSIC....................Australian and New Zealand Standard Industrial Classification
APEC........................Asia-Pacific Economic Co-operation
B2B...........................Business to business
B2C...........................Business to customer
CELADE ....Centro Latinoamericano y Caribeño de Demografía
cit..............................cited
cp. ....Compare
DANE........................Departamento Administrativo Nacional de Estadística
ECLAC......................United Nations Economic Commission for Latin America and the
                           Caribbean
EDI ....Electronic Data Interchange
et seq.........................and the following (sing.)
et seqq.......................and the following (pl.)
EU.............................European Union
FAO ....Food and Agriculture Organization of the United Nations
GDP ....Gross Domestic Product
IBGE.........................Instituto Brasileiro de Geografia e Estatística
ibid............................ibidem
ICT............................Information and Communication Technology
ICTs ....Information and Communication Technologies

INDEC ....Instituto Nacional de Estadística y Censos
INE ....Instituto Nacional de Estadística
INEC........................Instituto Nacional de Estadística y Censos
INEGI ....Instituto Nacional de Estadística, Geografía e Informática
INEI ....Instituto Nacional de Estadística e Informática
ISIC ....International Standard Classification of Activities
ISP ....Internet Service Providers
LAC ....Latin America and the Caribbean
NCST………………National Council for Science and Technology
NeCS………………National E-Commerce Secretariat, Ministry of Public Administration and Information
NIHERST…………..National Institute of Higher Education, Research, Science and Technology
n.d. ....no date
n.l. ....no location
NSO ....National Statistic Office
OECD ....Organisation for Economic Co-operation and Development
OSILAC....................Observatorio para la Sociedad de la Información en Latinoamérica y el Caribe
PC ....Personal Computer
RICYT ....Red Iberoamericana de Ciencia y Tecnología
Rev. 3........................Revision 3
SCA ....Statistical Conference of the Americas of ECLAC
SCH ....Statistical Clearing House
SME..........................Small and Medium-Sized Enterprises
SMME………………Small, Medium-sized and Micro Enterprises
UN ....United Nations
UNCTAD ....United Nations Conference on Trade and Development
UNDP ....United Nations Development Program
UNESCAP................United Nations Economic and Social Commission for Asia and the Pacific
UNESCO ....United Nations Educational, Scientific and Cultural Organization
UNSTATS ....United Nations Statistics Division
WPIIS ....Working Party on Indicators for the Information Society

Abstract

This document is part of an effort to take inventory of the current state of ICT (Information and Communications Technologies) statistics in Latin American and Caribbean countries, particularly in National Statistic Offices (NSOs). In this study fifteen countries are investigated regarding three sources of information: Internet research, e-mails and phone calls and through the meta-data questionnaire "Status of information society statistics in National Statistic Offices", applied to NSOs of Latin America and the Caribbean during August 2004 in the frame of OSILAC. The effort concluded with a workshop on Information Society Measurement for Latin America and the Caribbean at Santiago in November of 2004. The document is acting as a reference document in the process of building statistical capacities for ICT measurement. It serves as a basic reference for technical cooperation and as an input for ongoing worldwide process of defining and implementing statistical work in census, household-, business- and specific thematic surveys in the field of ICT measurement.

I. Introduction

Managing the transition towards an information society yields the potential to benefit from the multiple positive effects generated to a substantial extent by its core component, *Information and Communication Technologies (ICT)*. The fact that ICT have the potential to impact economic growth and employment and can be employed in health, politics, public administration, education and advanced science, as well as in cultural, social and even religious activities, attests to the current development potential of the information society.[1] On the other hand, a new form of exclusion—dubbed the "*digital divide*"—is taking shape. This digital divide has the potential to widen the gap between regions and countries (the *international digital divide*) and between groups of citizens within a society (the *domestic digital divide*).

The existence of the digital divide shows that the information society paradigm does not automatically imply a great development opportunity, but might also pose a new threat to more socio-economic inequality. To prevent this form happening and to be able to make best benefit from the multiple opportunities of ICT, public policies are indispensable. The market provides most of the ICT products and services needed to obtain these benefits. In this case, ICT and information society measurement primarily serve as a monitoring function, in order to be able to regulate the market and to ensure good market conditions, such as a competitive environment. In case of market failure, however, adequate public policies must be established to stimulate the development of products and services not supplied by the market itself. An appropriate measurement system allows for both, the monitoring of current market development and the detection of obstacles and market failures.

Until now, most statistical information about information society development is coming from industry sectors related to ICT development, such as the telecommunication's industry. Such statistics, which are usually collected by an administrative register of the government (the telecom regulating authority), derived from private sector enterprises (the telecom operators); give a very good picture about the supply side of the technological development. Through this data, it can be seen where and when networks are deployed, and how the dynamics of the market influence ICT supply development. What cannot be seen through this statistical data, however, are the demand side of ICT activities and services and the usage patterns of digitized information and communication activities. Telecom operators cannot provide policy decision makers which information about if the Internet user is male or female, if the user is old or young, indigenous and poor, or non-indigenous and rich. Neither

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[1] cp. Hilbert/Katz (2003); ECLAC (2003a), WSIS Plan of Action, 2003

the kind of services the Internet is used for, nor what the obstacles for using certain kinds of services instead of more sophisticated ones are, can be seen. *National Statistic Offices (NSOs)* will need to get involved into information society measurement in order to obtain information, which will help to understand the behavior and development dynamics of the society that is behind the technology. This will then provide a rational basis for the derivation of suitable political initiatives to create an information society where "the well-being of persons and communities shall occupy a central place in activities aimed at building an information society. The use and benefit of ICT are in order to satisfy the needs of individuals, communities and society in general"[2] and not the other way around, where policy analysis often aim at influencing the society in order to serve the current technological trends.

Considering the importance of more detailed statistics in order to provide policy makers with better information to make rational decisions about public policies, it is not surprising that the demand for information society related statistical data is large, as several political declarations show. In the year 2000 the governments of Latin America and the Caribbean have unanimously called for the "creation of a regional *observatory* to monitor the impact of information technologies on the economy and other related cooperative measures".[3] Three years later, the governments of Latin America and the Caribbean renewed and concretized its call for "furthering and promoting the development and establishment of performance evaluation and dissemination systems and mechanisms that include community measures and indicators that reflect the efforts and progress made by the countries of the region in establishing facilities for ICT access and use within a community context".[4]

Last December 2003, during the World Summit on the Information Society (WSIS), the heads of States and governments that form the United Nations approved a worldwide Plan of Action. One of the issues approved was: "All countries and regions should develop tools so as to provide statistical information on the Information Society, with basic indicators and analysis of its key dimensions. Priority should be given to setting up coherent and internationally comparable indicator systems, taking into account different levels of development".[5]

The *Observatory for the Information Society in Latin America and the Caribbean (OSILAC – Observatorio para la Sociedad de la Información en Latinoamérica y el Caribe)* aims at contributing to the satisfaction of those international calls in the Latin American and Caribbean region. The observatory seeks to raise the importance attributed by national administrations to the collection of ICT indicators in the LAC region. In doing so, it aims at:

(1) a more coherent centralization of data, indicators, methodologies and the networking of qualitative information from all the region

(2) the normalization and harmonizing of ICT related indicators gathered at the sub-regional, national and local level

(3) increase and improve the quantity and quality of ICT data gathered across the region.

Given the magnitude and complexity of the task, it is not the objective of this paper to establish an entire – let alone comprehensive – system. Instead, an information system will be developed in various initiatives – this paper being one of these – and in a step-by-step approach. The OECD calls this type of procedure a "building block"[6] approach. Information Society measurement should, for monetary and complexity reasons, start with a simple set of questions and indicators included in already existing surveys. These may be expanded over

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[2] Bávaro Declaration, Regional Preparatory Ministerial Conference of Latin America and the Caribbean for the World Summit on the Information Society, held with the collaboration of ECLAC, 29-30 January, 2003.
[3] cp. ECLAC (2000)
[4] Regional Preparatory Ministerial Conference of Latin America and the Caribbean for the World Summit on the Information Society (2003), p. 8
[5] www.itu.int/wsis
[6] cp. OECD (2003b), p. 2

time by more questions and more complex indicators in learning by doing process.[7] Developing an information society measurement instrument for Latin America and the Caribbean, possessing the complexity of the one employed by the OECD, for instance, would be a very challenging if not unrealistic endeavor in an ad hoc attempt.

Therefore, initial building blocks of a measurement system are necessary to support NSOs in the process of adopting ICT statistics into their work plans. Considering the existing work of the OECD and other institutes from the developed world, household and business sector surveys must be focused. Other important issues, such as measurement of the ICT Sector itself, the measurement of community access models, or the use of ICT in education and training, are introduced shortly in this study, but will need to be taken up later again, by a more detailed analysis.

The analysis of Census, household and business surveys take into consideration the work of various statistical institutions. The pioneer work of some institutions, such as the OECD, the European Commission, Statistics Canada and the Australian Bureau of Statistics have been analyzed and compared with fifteen NSOs from Latin America and the Caribbean, namely Argentina, Barbados, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Honduras, Jamaica, Mexico, Paraguay, Peru, Trinidad and Tobago, Uruguay and Venezuela. Based on the work by the institutions of international reference and the data already available in Latin America and the Caribbean (LAC), catalogues of questions for household as well as business surveys are proposed. These questions have been derived in a process of harmonizing the different developed and developing world surveys, thus achieving comparability of the suggested questions on a broad regional and interregional basis. The specific objective of the study with regard to Census, household and business surveys is to build an intermediating bridge for information society statistics between already developed statistical instruments for information society measurement (mainly the OECD and European Commission) and existing work and special requirements from Latin American and the Caribbean countries.

For this, the study is separated in two major chapters. After this introductory note, Chapter 2 provides a broad overview about already implemented statistical instruments for information society measurement. It presents the pioneer work of the OECD, European Commission, Statistics Canada and the Australian Bureau of Statistics, in order to identify common elements of measurement instruments. A short introduction about concepts related to household and business surveys and ICT indicators is also provided. This conceptual work sets the ground for Chapter 3, which provides a detailed analysis about the current stage of development of ICT indicators in Census, household and business surveys in the region. After methodological and practical considerations about the challenge faced, the current state of development regarding the incorporation of ICT indicators in national population and housing Census are reviewed. Then, three lists of ICT indicators are proposed for household and business surveys: a list of core indicators, a supplementary list of indicators and a third list, with so-called "nice- to know/ redundancy" indicators. Finally, the concluding Chapter 4 draws some basic conclusions and reflects on future challenges and the task ahead.

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[7] cp. UNCTAD (2003), pp. 4 et seq.

II. Already implemented statistic instruments for Information Society measurements

This chapter summarizes the work concerning information society measurement carried out by several key institutions of the developed world. Subsequently, these efforts are analyzed to determine the extent to which this work could be adopted for such a measurement instrument in LAC.

There are two principal reasons for conducting this analysis. First, by studying measurement instruments that have been already in use for several years, one can learn and profit from the experiences the institutions employing these instruments have made over time. Second, by taking them into account and incorporating as many aspects of them as possible in the system that will be developed for LAC in Chapter III, one is able to ensure that proposed variables and indicators are compatible with international benchmarks.

The objective of this chapter is two-fold: first to review the programs and statistical measurement frameworks as well as the ends pursued by the different institutions; and then, second, based on that review, to identify relevant elements to be taken into consideration against the background of information society measurement in LAC.

2.1. Selection of International Points of Reference

Within the developed world, many national and international institutions have started to inquire statistics on ICT measurement. To handle the amount of information and different sources available, four different organizations from the international and the national level have been selected for an analysis concerning their work in the field of information society measurement. These organizations are:

- the Organisation for Economic Co-operation and Development (OECD),
- the European Commission (EU),
- Statistics Canada and
- the Australian Bureau of Statistics (ABS).

The choice of these institutions has been made for various reasons. All of them are and have been extremely active in conducting research and developing methodological frameworks to establish information society statistics. Standards and classifications have been discussed since the middle of the 1990s within these institutions.[8] They have already accumulated a great amount of experience in these matters. The OECD— in which Statistics Canada and the ABS both play a leading role concerning ICT measurement initiatives— and the EU are international organizations. Thus, their statistical work is designed accordingly. Certain aspects that are easy to measure within a country can be very problematic on an international level. This circumstance has required additional methodological work to be carried out by these organizations and can be considered in the course of the development of a measurement instrument for LAC.

Furthermore all of the chosen institutions are involved in supporting countries and regions of the developing world in their efforts to establish initial information society statistics. In the following sections, the work within the field of information society measurement of these four institutions will be introduced.

2.1.1 Organisation for Economic Co-operation and Development

According to Article 1 of its Convention, the OECD shall pursue the objective of promoting "policies designed to achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries".[9] In order to achieve this goal, economic indicators are needed to guide the decisions of a broad range of economic actors, such as governments, firms, consumers and workers. Traditionally, the national accounts and the Gross Domestic Product (GDP) have been the standard indicators for OECD countries.[10] These measures have never been entirely satisfactory. Environmentalists challenge the GDP, for instance, since it does not incorporate the growing costs of environmental pollution. An additional challenge poses the growing importance of ICT in the course of the rise of the information society. ICT have only been recognized as a major source of economic growth within recent years.[11] This phenomenon needs to be taken into account within the frame of measuring economic performance, since current indicators may fail to capture fundamental aspects of this topic and lead to misinformed economic policies.

The work of the OECD in this field was initiated in the mid-1990s, recognizing the importance of the development of appropriate statistical indicators in order to understand the changes occurring in the information economy and information society and to be capable of deriving adequate conclusions as a basis for public policies. This initiative was carried out through the formation of an ad-hoc statistical experts group, the so-called *Committee for Information, Computers and Communication Policy (ICCP) Statistical Panel*.[12] With the objective of establishing a "set of definitions and methodologies to facilitate the compilation of internationally comparable data for measuring various aspects of the information society, the information economy and electronic commerce",[13] this group was transformed into a Working Party in late 1998, namely the *Working Party on Indicators for the Information Society (WPIIS)*. The WPIIS and its member countries have produced many methodological documents over the years. They are responsible for a substantial part of OECD work in the field of ICT indicators. A non-exhaustive list of the topics the OECD has been and is working on includes:[14]

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[8] cp. OECD (2003c), p. 1
[9] cp. OECD (2002), p. 2
[10] cp. OECD (1996), p. 29
[11] cp. OECD (2002), p. 3
[12] cp. OECD (1999), p. 2
[13] ibid.
[14] cp. OECD (2003c), p. 2

- Household readiness and use of ICT

- Business readiness and use of ICT

- Government readiness and use of ICT

- Supply, demand and trade in ICT products

- Information on enterprises active in industries belonging to the ICT sector

- ICT in education

- ICT and health

- ICT investments

As a result of this work, much progress has been made. Currently, this work is to be compiled in a framework document for information society measurements and analysis, which at the moment is only available in a preliminary draft version. Its wide diffusion is planned for the year 2005.[15] Much of the information produced by the WPIIS has already been made available by the OECD in their publication "Measuring the Information Economy 2002".[16] This publication was updated by the 2003 "OECD Science, Technology and Industry Scoreboard".[17]

Furthermore, important definitions, classifications and guidelines have been developed by the WPIIS, among these are:

- an industry-based definition of the ICT Sector,

- a definition of Electronic Commerce,

- a model questionnaire for measuring ICT usage and e-commerce in enterprises,

- a model questionnaire for measuring ICT usage and e-commerce in households/by individuals and,

- a proposal for a core list of indicators for ICT measurement.

OECD's member countries agreed upon the ICT sector definition in 1998 as "a combination of manufacturing and services industries that capture, transmit and display data and information electronically".[18] It has been viewed as a starting point towards some initial measurements of ICT sector core indicators.[19] The complete definition can be found in Annex 1.

The OECD also introduced a working definition of electronic commerce, which is widely used by its members, including Scandinavian countries, Australia, Canada, the United States, Japan and Eurostat, as well as some developing countries.[20] To arrive at this definition, three key dimensions had to be taken into account. The first dimension is related to the activities or types of transactions; the second to the technological infrastructure itself over which such activities are carried out and the third, the actors related to specific transactions that are conducted over technological platforms, e.g. business to business (B2B) or business

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[15] cp. OECD (2003c), p. 2
[16] ibid.
[17] This publication can be downloaded free of charge at http://www.sourceoecd.org
[18] cp. OECD (2002), p. 81
[19] ibid.
[20] cp. UNCTAD (2003), p. 4 and OECD (2003d), p. 44

to customer (B2C).[21] On this basis, two different definitions—a broad and a narrow one—have been developed, which characterizes a transaction as an "e-commerce transaction". Relevant for the determination of whether or not a transaction is considered an e-commerce transaction is the method by which the order is placed and/or received, not the channel of delivery or payment used to complete the transaction. According to the broad definition, the order has to be placed over computer-mediated networks, while in the narrow definition the placement has to be carried out over the Internet.[22] The complete definitions and guidelines for their interpretation are displayed in Annex 2.

Statistic institutions of OECD member countries have been encouraged to use these definitions in their surveys and keep in mind the guidelines for their interpretation. Furthermore, expert groups are set up to review and refine these definitions in the light of the measurement experiences of those countries, which have already used them to assure their statistical feasibility.[23]

Following the list of elaborated concepts and definitions introduced above, proposals for model questionnaires for measuring ICT usage and electronic commerce in enterprises and its equivalent for households were made. These questionnaires were developed in cooperation with the Voorburg Group[24] and in a joint effort with Eurostat.[25] The enterprise questionnaire was published in 2001, the one for households in 2003. At the moment, the enterprise questionnaire is being revised by OECD's WPIIS. A new version should be published until the end of 2005. They are intended to "provide guidance for the measurement of indicators of ICT, Internet use and electronic commerce"[26] for OECD member countries. These countries are encouraged to incorporate the proposals as a core part of their questionnaire development.[27] So far, only two proposals for model questionnaires have been published. The proposals are introduced step-by-step since the intensity of work within the different fields of ICT measurement differs considerably. This method is part of what the OECD calls a "building block" approach,[28] a subject that will be addressed again in the following chapter.

The work illustrated here then led to the derivation of a proposal for a core list of indicators for ICT measurement.[29] The core list can be viewed as a proposal to all non-member countries of the OECD and covers different fields of ICT measurement.[30]

All illustrated statistical initiatives conducted by the OECD provide excellent examples of the production of new information through the combination of conventional statistical data sources, of prudent and meaningful regrouping of activities and of innovative ways of thinking.[31]

2.1.2 European Commission

At approximately the same time as the OECD started its information society work, namely in 1994, the European Commission developed the first action plan to face the challenges posed by the emergence of the information society.[32] In 1999, the *eEurope* program was initiated. It forms part of the so-called *Lisbon Strategy* adopted in March 2000, which was designed to

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[21] cp. OECD (2003d), p. 43
[22] ibid, p. 44
[23] ibid, p. 43
[24] United Nations City Group on Service Statistics [cp. OECD (2001), p. 2]
[25] cp. OECD (2003b), p. 2
[26] cp. OECD (2001), p. 2
[27] cp. OECD (2001), pp. 2 et seq.
[28] cp. OECD (2003b), p. 2
[29] cp. OECD (2003c), p. 1
[30] cp. OECD (2003c), p. 2
[31] cp. Jeskanen-Sundström, H. (2001), p. 4
[32] cp. European Commission (1994)

transform the European Union into the world's "most competitive and dynamic knowledge-based economy with improved employment and social cohesion by 2010".[33]

At the time eEurope was conceived, many obstacles hampered the use of the Internet within the EU. Among other problems, access was often expensive, insecure and slow; digital literacy[34] rates were low; and the culture was not sufficiently dynamic, entrepreneurial, or service-oriented.[35] To overcome these obstacles, the Action Plan 2002 was developed and endorsed by the EU leaders at their *Feira Summit* in June 2000.[36] The three main objectives pursued in this action plan were first of all a cheaper, faster and secure Internet; secondly to invest in people and skills; and thirdly to stimulate the use of the Internet.

In May 2004 ten new members joined the EU. These Candidate Countries, at the European Ministerial Conference held in Warsaw in May of 2000, also recognized the relevance of these strategic goals as they have been established for the "EU-15"[37] and an equivalent plan of action to the eEurope program called *eEurope+* was adopted. At the time eEurope was launched, the telecommunications sector in the EU had already been privatized and nearly all households had telephone lines. As a result, it is interesting to observe that no indicator measuring fixed telephone lines had to be included in the objectives of the 2002 Action Plan. In Candidate Countries, this is not the case. Thus, an additional section has been included in the eEurope+ Action Plan called "Accelerate the putting in place of the basic building blocks of the Information Society".[38] This addition has a special relevance for the LAC region, as information society development in LAC is often even behind the development stage of the European Candidate Countries. In Paraguay, for instance, only 17 percent of all households[39] possessed a fixed line telephone in 2002.[40] In consequence, measures of this kind will also find their way into the catalogue of questions proposed for the LAC region.

The results of the first action plan are so far available only for the eEurope program, not yet for eEurope+. A progress report shows the current infrastructure of the new ten member countries and the three candidate members.[41] Based on the first action plan results, the second plan, the Action Plan 2005, was approved by the EU leaders in Seville in June 2002. While the 2002 Action Plan successfully put the Internet on top of the European political agenda, the 2005 plan narrows its focus. It concentrates on effective access, usage and the ready availability of the Internet.[42] The results of this Plan of Action are expected to be made available throughout the year 2004.[43]

The EU also plays an active role in providing technical assistance and support outside its region, also in LAC. An example for these efforts is the 2002 Industry Survey of Paraguay. This survey was designed in cooperation with the EU-Mercosur and Chile Statistics Cooperation[44] adopting a methodology in accordance with the recommendations made by this group.[45]

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[33] cp. European Commission (2002b), p. 2
[34] Digital literacy can be defined as "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers". [cp. Discovery.school.com (1998), p. 6]
[35] cp. European Commission (2002c), p. 9
[36] ibid, p. 7
[37] cp. European Commission (2001b), p. 17
[38] cp. European Commission (2001a), p. 5
[39] cp. DGEEC (2003a), p. 23
[40] To put this number into relation: In Luxembourgian households this penetration rate had reached 79.7 percent in the same year [cp. ITU (2003a), p. 3].
[41] cp. eEurope+ (2004)
[42] cp. European Commission (2002c), p. 7
[43] cp. European Commission (2003)
[44] This initiative was carried out within the scope of the EU-Mercosur Interregional Framework Co-operation Agreement signed on 15 December 1995 in Madrid between the European Commission and its Member States and the Mercosur and its Party States [cp. European Commission (n.d.b)].
[45] cp. DGEEC (2003b), p. 3

Throughout 2004 Eurostat is elaborating two new model questionnaires on "ICT usage in households and by individuals 2005" and on "ICT usage and e-commerce in enterprises 2005". By the time of editing this document this model questionnaire has not been approved jet. However, for reasons of completeness, we have taken them into account to strengthen the inclusion of some indicators and to be up to date with the Europe proposals. Throughout this document these model questionnaires will be referred to as "Eurostat ICT households/enterprises 2005 informal version".

2.1.3 Statistics Canada

As Canada's national statistical office, Statistics Canada is collecting and supplying information about the status, progress and achievement of the political goals pursued by its government. Concerning information society issues, these goals have been established within the so-called *Connecting Canadians* program. This program has been designed to "make Canada the most connected country in the world",[46] since a "connected Canada" will attract foreign investors and establish the status of the country as a global hub of the new knowledge-based economy.[47]

It has received enormous international attention. At the Summit of the Americas in 2001 at Quebec City, for instance, the leaders of participating countries of the hemisphere issued a statement on "Connecting the Americas" recognizing the importance of the experience gained from the Connecting Canadians program for the development of an information society in the Americas.[48] Canada is also a very active player in the support of developing countries to overcome the digital divide, not only in the American hemisphere through the Institute for Connectivity in the Americas (ICA),[49] but also through its active participation in global initiatives, like the UN ICT Task Force.[50]

The main results concerning the status and progress of the Connecting Canadians program have been published by Statistics Canada in three steps. First, the 2001 ICT compendium "Networked Canada: Beyond the Information Highway" was published.[51] Second, ongoing analytical activities were disseminated through the so-called "Connectedness Series".[52] Third, the latest update of these results, "Canada's journey to an Information Society", was released in late 2003.[53] In the present paper, these publications provided basic inputs for the analysis required to derive a catalogue of questions for LAC.

2.1.4 Australian Bureau of Statistics

In 2002 the ABS published a discussion paper called "Measuring a Knowledge-based Economy and Society".[54] It proposes a framework for the measurement of the information economy as well as the information society, or as it is called by the ABS, the knowledge-based economy/society. The framework document draws on the work of a number of organizations and individuals. These include most notably the *Asia-Pacific Economic Cooperation* (*APEC*) *Economic Committee*, an effort similar to ABS' framework document conducted by APEC's member countries, and the OECD and its Growth Project,[55] an analysis

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[46] cp. Connecting Canadians (2004)
[47] cp. Connecting Canadians (2003)
[48] cp. Statistics Canada (2003a), p. 237
[49] cp. Statistics Canada (2003a), p. 237; for more information please visit ICA's website:
    http://www.icamericas.net/
[50] UN ICT Task Force (n.d.)
[51] cp. Statistics Canada (2001)
[52]   The   interested   reader   finds   these   publications   at: http://www.statcan.ca/cgi-bin/downpub/
    listpub.cgi?catno=56F0004MIE
[53] cp. Statistics Canada (2003a), p. VII
[54] cp. ABS (2002a)
[55] cp. ABS (2002a), p. 14

of the causes underlying different rates of economic growth among OECD member countries during the 1990s.[56]

The framework the ABS proposes for measuring a knowledge-based economy and society consists of three core dimensions, "Innovation and entrepreneurship", "Human capital" and "Information and communications technology". Additionally, a number of statistical indicators for elements of the framework are suggested.[57] The results obtained in these core dimensions have been published on ABS' website.[58] They form the first ABS compendium of statistics on the Australian knowledge-based economy and society. Supplementary indicators for the core dimensions as well as for the two supporting dimensions are to be introduced over time.[59] The first of these dimensions is the so-called "Context" dimension, incorporating different background elements and preconditions, such as the business environment necessary for effectively functioning markets. The second one is the "Social impacts" dimension, which intends to measure the impact ICT have on the entire economy and society.[60]

The Australian work in the area of information society measurement, however, is not limited to these efforts. For example, Australia is one of two countries, the other one being Chile, that have established an ICT satellite account.

BOX 1.1
ICT SATELLITE ACCOUNTS FOR LAC

An additional potential field of interest would be the establishment and incorporation of an ICT satellite account within the field of work of the statistics division at ECLAC and ultimately as a module of OSILAC.

The Australian government's Statistical Clearing House is using the following explanation of the concept of such an ICT satellite account:

"An Information and Communication Technology (ICT) satellite account uses a national accounting framework to present a picture of ICT within the economy. An ICT satellite account defines ICT products and identifies their supply and use, so that a comprehensive set of economic data relating to ICT activity can be compiled for the Australian economy".

Such a satellite account, among other things, permits to quantify the size of ICT production relative to other types of economic activity. ECLAC is already employing and promoting various types of satellite accounts, such as a tourism or an environment account. The next one of these projects in focus is an ICT satellite account. However, in order to establish such an account, manpower, money and time is needed. To reduce the resources needed, it seems opportune to assume an indirect approach. At this moment, the government of Chile and related institutions, such as INE or the Ministry of Economics and Energy, are developing an ICT satellite account for the country. One of the consult-ants assisting in the project is the OECD. As basis of the sector definition the ISIC Rev.3 classification will be used. The planned completion of the project is the end of 2004. Instead of developing an ICT satellite by itself, it seems appropriate for ECLAC – through, for ex-ample, the close relationship with INE – to follow the advancement of the government project first. The experience derived from this development process concerning important advances and main obstacles will serve ECLAC as an important source of knowledge within the field. This project phase is estimated to occupy around six months. ECLAC can then start to apply the system and adopt it in a suitable manner. In consequence, an ICT satellite for the entire LAC region will have been derived. Once having established the account for the ECLAC members, the obtained information can be integrated into OSILAC. This new module will then provide supply side information of the ICT sector within LAC countries. Because of the used ISIC classifications the results would also be comparable with the results obtained by the OECD.

Source: SCH (2003)

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[56] cp. ABS (2002a), p. 7
[57] cp. ABS (2003b)
[58] cp. ABS (2003a)
[59] cp. ABS (2003b)
[60] cp. ABS (2002a), p. 15

These illustrations demonstrate Australia's level of commitment to working towards a comprehensive instrument to measure relevant complexes within an information society.

Not only is Australia an active player in the development of these measurement concepts, it also promotes their dissemination on a broad international level. Apart from its active participation in OECD initiatives, it is also involved in helping developing countries to establish ICT and information society statistics by sharing its experience, knowledge and skills. An example of this is the leading role it has taken in an Asian-Pacific regional network initiated to further spread common practices in information society measurement.[61] These are the principal reasons the ABS was included in the investigation within the present paper.

The introduction of the institutions included in the analysis here forms the basis for then discussing the different elements of the respective measurement instruments employed by them.

2.2 Elements of Employed Measurement Instruments

The four organizations summarized above have all developed their own measurement systems. However, the basic motivation behind these measurements systems has been the same, namely to provide policy makers with important information, to design and implement information society strategies which improve the socio-economic development of – in the case of the OECD or Europe—the institutions' members, or—for Statistics Canada and the Australian Bureau of Statistics—their country. Some of the systems have been developed in close cooperation, such as the Canadian and the OECD instrument. Others show differences, such as the one of the OECD and the European Commission. As a consequence, the various instruments often follow different categorizations. Nevertheless, they do show mutual elements, which most of them but not necessarily all of them share. These mutual elements have been compiled in a system shown in Figure 2.1.

FIGURE 2.1
MUTUAL ELEMENTS OF INFORMATION SOCIETY MEASUREMENT SYSTEMS

Source: Own elaboration
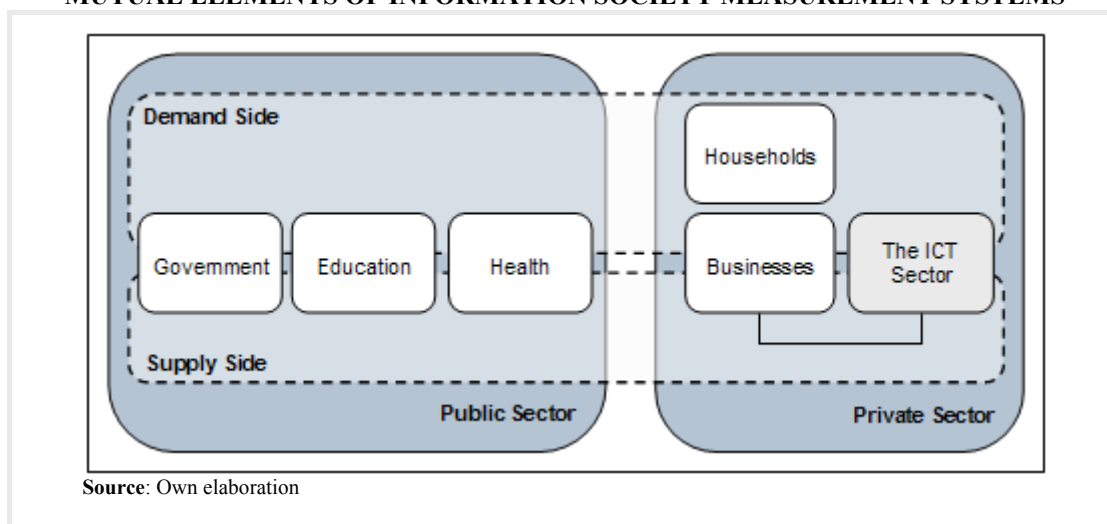
The two axes among which measurement instruments are designed are either the Public or the Private Sector, and supply or demand analysis of activities in a given sector. Measurement is carried out in both the *Public* and the *Private Sector* of an economy. In these sectors, it can be observed, that each of the elements—except for households—can be analyzed looking at either the *Supply* or *Demand* side.

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[61] cp. OECD (2003d), p. 102

2.2.1 Supply and Demand Side Measurement

Within the different elements of these measurement instruments, the supply and the demand side play a very distinct role. For instance, in the analysis of the ICT sector, a sub-sector of the business sector, efforts can be divided into those measuring the supply side, i.e. the production and distribution of ICT goods and services, and those measuring the demand side, namely the diffusion and use of the ICT products and services throughout an economy. So far supply side measurements are much more common in OECD countries.[62]

In the context of the analysis within the rest of the elements, especially the ones belonging to the public sector, i.e. government, education and health, primarily the demand side has been subject to a more intensive investigation so far. This approach is caused by various obstacles related to supply side measurement within these areas, which will be illustrated in a later subsection.

In a first step, however, measurement within the ICT sector will be addressed, since this sector plays a very prominent role within all measurement systems or programs apart from the EU's eEurope.

2.2.2 Measuring the ICT Sector

Logically, of course, the ICT sector forms part of the business sector that will be discussed subsequently. Yet, due to its importance, it forms a separate element of the diagram introduced above.

The OECD's definition of the ICT sector has already been mentioned and will be addressed again subsequently. Before advancing to this discussion, however, a definition of the term *Information and Communication Technologies* (*ICT)* shall be developed. Up to this date, there is no universally accepted definition of the term. Different institutions are using broader or narrower definitions depending on the concrete ICT related objective they wish to investigate. If one wishes to define ICT using a very broad interpretation of the term, for instance, a definition would include not only physical devices, such as telephones, or computers, but also software and satellite systems, as well as various applications and services associated with them, e.g. videoconferencing and distance learning.[63]

A narrower definition, or rather a description of elements belonging to the concepts of ICT is the one used by the International Telecommunication Union (ITU), stating that "ICT devices and services useful for studying access to the information society include radios, televisions, fixed telephones, mobile telephones, personal computers (PC), and the Internet".[64] This definition, however, does not explicitly include alternative types of networks, such as an Intranet or Electronic Data Interchange (EDI). Yet, these ICT are also important to understand the development of an information society. Therefore, a definition developed by the World Bank goes further and states "ICT consists of hardware, software, networks, and media for collection, storage, processing, transmission, and presentation of information (voice, data, text, images)".[65]

The next step is to discuss more detailed concepts, such as an ICT sector definition. It was mentioned earlier that the members of the OECD adopted an industry-based ICT sector definition in 1998.[66] An important feature of this definition is that it does not follow the traditional dichotomy between manufacturing and services industries but is composed of a combination of these two industries. Included in this definition are all industries that capture, transmit and display data and information by electronic means.[67] It is based on the

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[62] cp. OECD (2003d), p. 14
[63] cp. Whatis.com
[64] cp. ITU (2003d), p. 8
[65] cp. World Bank (2002), p. 73
[66] cp. OECD (2003d), p. 14
[67] cp. OECD (2002), p. 19

International Standard Classification of Activities (ISIC Rev. 3) and is limited to the 4-digit level of this classification.[68] This framework is viewed as a starting point towards some initial measurements of ICT sector core indicators.[69] It is now being expanded by an *ICT commodity* definition, i.e. the definition of ICT goods and services, to complement and help to refine the activity-based ICT sector definition introduced above. Due to the rapid changes in the field of ICT products and services, deriving a persistent definition poses many challenges and only recently has an agreement been reached on the products definition, while the definition of ICT services is still in process.[70] Future work in the area will deal with the definition of *ICT content*.[71] Within the defined and already measured ICT sector, key variables, such as sector GDP, employment, exports, imports, revenues and R&D as well as their respective growth performance in recent years are analyzed.[72]

The OECD states that the composition of the ICT-producing industry varies to a great extent across their member states. On average, the ICT sector accounts for a share of ten percent of the OECD business sector GDP in 2000. The sector's importance is growing and some countries, like Sweden and Finland, have built up their competitive advantage in this sector over the last few years.[73]

Of the organizations investigated, the European Commission is the only one not measuring the ICT sector in its information society measurement system. This, however, is due to the fact that the eEurope initiative is not designed to continuously track the status and progress of the information society in the EU. It is rather aimed at the completion of a specific goal at a specific point in time and pursuing specific objectives derived from concrete obstacles to overcome. The other measurement instruments have been designed to provide statistical data related to the information society in the form of time series within a long-term effort.

In LAC, Mexico – as the only OECD member of the region – is the only country having defined and started measuring its ICT sector.[74] Measurement of the ICT sector in the whole region will require a substantial effort (see box "The ICT Sector in LAC").

BOX 2.2
THE ICT SECTOR IN LAC

Establishing ICT measurement will constitute an additional building block within a future measurement instrument for LAC. As a basis, the widely accepted definition of the ICT sector, based in the international standard classification of activities (ISIC Rev. 3)—introduced in Chapter 2.1.1 – should be used. Through the development of concordance tables to alternative industry classification systems, measurement of the ICT sector as proposed by the OECD has been incorporated in a large number of OECD member countries. This concordance has been reached, among others, with the Australian and New Zealand Standard Industrial Classification (ANZSIC) used by Australia and New Zealand, the North American Industry Classification System (NAICS) used by Canada, Mexico and the USA, or the statistical classification of economic activities in the European Community (NACE Rev. 1) used by the EU. (For an overview over these concordances please see the OECD "Framework Document for Information Society Measurements and Analysis", for instance).
As a result of these efforts, a broad comparability of the obtained data from this sector of the economy of a respective country or even regions has been reached. For this reason, it seems obvious to assume an ICT sector definition of the OECD or, for example, the NAICS, that Mexico is using for the development of a LAC ICT sector.
The elements of an economy that belong to the ICT sector according to the OECD definition are situated at the four-digit level of the ISIC system, e.g. the item *3130: Manufacture of insulated wire and cable*. Taking these elements as a base, a pilot investigation project within the LAC region could be started. Mexico, as an OECD member already has established this ICT sector definition and has also begun to

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[68] cp. Jeskanen-Sundström, H. (2001), pp. 3 et seq.
[69] cp. OECD (2002), p. 81
[70] cp. OECD (2003e), p. 2
[71] cp. OECD (2003d), p. 17
[72] cp. Statistics Canada (2001), p. 3
[73] cp. OECD (2002), p. 19
[74] cp. INEGI (2004b)

measure the Mexican ICT sector. So far, it is, however, the only country of the region already disposing of this tool.

An effort that has already started is a region wide initiative to adopt the ISIC Rev. 3 system for all countries. It seems reasonable to begin with countries that are already applying the Rev. 3 classification as opposed to others that are still employing Rev. 2 or even older classification systems. Potential candidates for this project could include Brazil, Chile, Colombia, Costa Rica, and Trinidad and Tobago, among others.

As a starting point, national accounts of the countries could be used. These are derived by compiling data from the manufacturing and services industry surveys and the aggregated data of the annual accounting reports of the companies within these sectors. The national accounts of the countries, established by this procedure, are already classified by the ISIC Rev. 3 system. The task of the investigation will then comprise two steps. The first one would consist of inquiring the level of disaggregation of the respective classification within each country. ECLAC, for example, only possesses data from its member countries disaggregated to the two-digit level, e.g. item *31: Manufacture of electrical machinery and apparatus n.e.c.* As the second step, in case of an insufficient level of disaggregation, one would then have to work with the institutions of a country handling the mentioned industry surveys and accounting reports in order to create the third and fourth level in accordance with the classification, for instance. The result of this study could be an OECD compatible definition of the ICT sector within the countries investigated.

Source: Meeting with Marcelo Ortúzar, Economic Affairs Officer at Statistics Division of ECLAC concerning the subject at ECLAC on 11/12/03; and OECD (2003d), p. 20

2.2.3   Measurement in Economic Sectors

Information society measurement as it is done by the different institutions introduced above includes the measurement throughout the public and the private sector with a special focus on different individual ICT, stressing the core technology of the information society paradigm, namely the Internet. The issues of special interest are its penetration and use across all economic sectors.[75] These include governments, as well as education and health, as part of the public sector, and households and businesses, as part of the private sector. Another important aspect coming into play at this point is the distinction between supply and demand side measurements. This problem possesses a special importance in the public sector ICT measurement.

2.2.3.1 The Public Sector

The units of the three public sectors, government, education and health, within countries but even more on an international level are organized very heterogeneously. Government organizations, for instance, vary considerably in structure, size and function. The same holds true for health and education sector units. Thus, it is very difficult to define standardized units in order to be able to measure supply side issues of these sectors, e.g. how well a certain government unit employs the Internet in order to improve its services to its citizens and to increase its efficiency. So far, data are only available for very few countries and therefore, public sector measurement —at least on the supply side— only forms a very small part of the different measurement systems. Most data are obtained by measuring the demand side, such as citizens' use of online applications offered by government entities. These, however, are measured within demand side surveys, e.g. asking individuals about e-government services they use or about their behavior concerning the incorporation of the Internet for research on health issues.

Measurement of ICT on both the supply and demand sides in the different areas of the public sector is extremely important, though. For instance, students must be introduced to and taught to use ICT at an early age before ICT can be integrated within the education process.[76] This can be achieved more successfully; the better educational facilities are equipped with ICT. In order to analyze the status of this equipment, it has to be measured adequately. The challenge, therefore, is to develop appropriate classifications that facilitate supply side measurement within the different areas of the public sector on a national as well as an international level.

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[75] cp. Statistics Canada (2001), p. 3
[76] cp. OECD (2002), p. 76

On a national basis, this state has been already reached in few countries. However, due to the earlier-mentioned complexity of the task caused by the different structures, sizes and functions of the various entities internationally, so far, no classifications have been established on a broad international scale. Even though there are efforts already under way in this field, such as the development of an OECD model questionnaire for the government sector,[77] future work will have to deal with defining international standards in order to be able to comprehensively measure ICT in the public sector.

2.2.3.2 The Private Sector

Within the last few years, much progress has been made towards defining internationally comparable statistical methodologies to measure ICT penetration and usage within the private sector. The OECD and its member states have conducted pioneering work in the field. Due to the fact that ICT measurement in household and businesses will form the initial elements of the measurement system proposed for LAC, these two complexes are addressed in further detail ahead.

2.3   ICT in Households and Businesses

Measuring ICT use in households and in businesses constitute the focus of effects of every organization introduced above. The measurement of each of these elements possesses a special importance. Household surveys provide an excellent platform to investigate digital divide issues. Since the digital divide does not only exist in developing but also in developed world, it is, of course, also the object of research projects, such as Statistics Canada's research paper "The Digital Divide in Canada".[78] The analysis of these issues can be done best by looking at household ICT penetration and the use of ICT among individuals. Even though digital divide issues also apply for the business sector, ICT measurement in business surveys is primarily aimed at capturing another aspect, namely identifying and tracking the economic progress stemming from ICT.[79] In order to determine the status of this ICT penetration and use, adequate measurements need to be carried out. Business surveys offer an excellent opportunity for the realization of these measurements.

According to the classification introduced in Chapter 2.2.1 measuring ICT in households and businesses mostly consists of demand side measurement (activities demanded by users) as opposed to measurement in the ICT sector where the supply side is measured predominantly (activities and products offered by supplier).

The coverage of the questions included in different household and business measurement frameworks differs considerably. While the ABS within its "Measures of a knowledge-based economy and society" framework is only inquiring about a handful of indicators on ICT penetration in households,[80] Statistics Canada is also collecting information about the use of ICT —especially the Internet— and some e-commerce activities.[81] The situation for business ICT measurement is very similar among the different organizations.

In order to harmonize and normalize ICT measurement in households and businesses, the OECD has suggested two model questionnaires, one called "Measuring ICT Usage and Electronic Commerce in Households by Individuals", the other one "Measuring ICT Usage and Electronic Commerce in Enterprises" for its member countries.[82] Both of these have been mentioned before. The underlying idea of these questionnaires is to "guide the collection of internationally comparable statistics of ICT access in households and usage by individuals as well as in businesses, including indicators of electronic commerce, across OECD Member

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[77] cp. OECD (1999), p. 6

[78] cp. Sciadas (n.d.)

[79] Broad penetration and use of ICT in businesses foster economic growth induced by the increase of overall efficiency due to a more extensive use of ICT in the production process, for example. cp. OECD (2002), p. 37

[80] cp. ABS (2003a)

[81] cp. Statistics Canada (2001), pp. 38-45

[82] cp. OECD (2003b) and OECD (2001)

countries".[83] For non-members of the OECD, "A proposal for a core list of indicators for ICT measurement" has been developed, which "sets out to assist countries in devising a collection strategy for ICT statistics and help them set priorities by suggesting core indicators based on the OECD learning experience".[84] This core list of indicators covers indicators for household as well as business surveys.

These three lists of indicators shall be of paramount relevance in the derivation of the initial elements and indicators for LAC's measurement instrument since they —especially the model questionnaires— have been developed as a result of a broad international cooperation. Key participants in these efforts were the ABS, who led the household model questionnaire initiative, the Nordic countries,[85] responsible for the business model questionnaire,[86] as well as the WPIIS reviewers from Canada, France, Sweden, United Kingdom, United States and, in the case of the household model questionnaire, Eurostat.[87]

The household and the business model questionnaires consist of different modules. These separate, self-contained entities have the advantage that they may be applied independently so that a statistical agency of a respective country is then able to choose which of the modules it wishes to include in its ICT survey. The modular approach also assures flexibility and adaptability in a quickly changing environment. Certain indicators and entire modules will become obsolete as technology and policy priorities evolve and new ones will become relevant. Due to their character of being self-contained, these modules over time may be replaced one-by-one without losing the functionality of the entire questionnaire. The modules currently used in the household model questionnaire are displayed in Table 2.1.

TABLE 2.1
MODULES OF OECD'S MODEL QUESTIONNAIRE FOR MEASURING ICT USAGE AND E-COMMERCE IN HOUSEHOLDS/BY INDIVIDUALS

Household access to computers and Internet
Household barriers to the adoption of the Internet
Use of computers and the Internet by individuals
Internet commerce and barriers to Internet purchases

Source: OECD (2003b), pp. 4 et seq.

These four modules constitute the initial elements of the household model questionnaire. They were designed to be expanded by the addition of modules on use of cellular phones and e-mails. It was agreed upon, however, that this step would be deferred until the first review of the approved model questionnaire.[88] Another additional module that had been discussed was children's use of ICT. It has also been postponed and possibly will be implemented in other survey vehicles, such as school surveys.[89]

The modules of the business model questionnaire are displayed in Table 2.2.

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[83] cp. OECD (2003b), 3 and OECD (2001), p. 3
[84] cp. OECD (2003c), p. 1
[85] These Nordic countries consist of Denmark, Finland, Iceland, Norway and Sweden.
[86] cp. OECD (2001), p. 2
[87] cp. OECD (2003b), p. 2
[88] cp. OECD (2003b), p. 6
[89] ibid.

TABLE 2.2
MODULES OF OECD'S MODEL QUESTIONNAIRE FOR MEASURING ICT USAGE AND E-COMMERCE IN BUSINESSES

General information about ICT systems
Use of the Internet
Electronic commerce: Internet transactions and electronic transactions via EDI and other computer-mediated networks.
Barriers to the use of the Internet to sell goods and services, and barriers to the use of the Internet and ICT in general

Source: OECD (2001), p. 4

OECD is proposing a new model, with restructured modules, but the latest official version is this from 2001. ICT in households and businesses do not fulfill entirely identical functions, that is to say, the investigation of ICT in these different sectors focuses on different aspects. In a household it is important to investigate, for instance, if a household member uses the Internet exclusively at home. This aspect does not possess any relevance in business surveys. Due to these distinct focal points in household and business surveys, their structures are not identical. One of the distinctions in the structure is the placement of questions related to barriers in the adoption of new systems or technologies. As the OECD states, there are two equally valid options to place questions on these barriers.[90] The first is to include one single block of questions inquiring information on the different types of barriers towards ICT in general, the Internet or e-commerce, as it has been done for the business survey. The second option is to place these questions directly behind the respective block of questions concerning access to and use of ICT, especially the Internet or e-commerce. This option has been chosen for the household survey.

Besides these differences, both sets of modules show a very similar structure. Both collect some general information on the penetration of ICT. This relates to the type of devices and speed of connection used to access the Internet in the household survey and to types of computer-mediated devices, applications and networks employed in the enterprise survey.[91] Both questionnaires contain a module on the use of ICT, especially the Internet. For businesses, the connection type and speed initiates this module and is followed by the processes for which the Internet is used. The equivalent topic within the household survey in this module is the inquiry into types of activities carried out on the Internet by individuals.[92]

In the electronic commerce module, transactions transmitted electronically are investigated. For households these include the kinds and value of Internet purchases. In businesses, apart from transactions via the Internet, additional information about online purchases and sales via computer-mediated networks is sought. The purpose of these questions is to monitor the migration towards Internet technologies and the substitution of other computer-mediated transactions by Internet use. To maximize the response rate, relative— instead of absolute— values of online purchases as percentage of total expenditures and online sales as percentage of total turnover are asked.[93]

The fourth module analyzes the barriers to the adoption of all of the previously discussed aspects, i.e. ICT in general, including the Internet, as well as barriers to make use of e-commerce and is contained in both questionnaires. Even though, these perceived barriers are qualitative in nature and therefore limited in their eligibility to be compared internationally, they possess a particular importance for policy makers to identify bottlenecks related to technology or the lack of appropriate skills with respect to digital divide issues, for

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[90] cp. OECD (2001), p. 4
[91] cp. OECD (2003b), p. 4 and OECD (2001), p. 4
[92] ibid.
[93] ibid.

instance. In combination with other qualitative indicators they may be very useful to explain differences between the access to and intensity of use of new technologies across countries.[94]

These two model questionnaires serve as a solid basis for ICT related measurement within the private sector of an economy. As it has been mentioned before, however, countries in the developing world find themselves in different phases of development than the ones for which these model surveys have been designed. Some of them do not yet possess the basic infrastructure for ICT use, others, however, are already collecting statistics that few OECD countries can match.[95]

To meet these different needs, a core list of indicators for ICT measurement for non-members of the OECD has been drawn from the different fields of work within the OECD. This list has taken the different stages of development of the addressed non-member countries into account and therefore has been divided into two parts. The first part contains the very basic indicators that give an idea of a country's information society development, which, in most cases, are already surveyed by most countries. A second —supplementary— list of indicators has then been established for countries with more sophisticated statistical systems. Both the core and supplementary list have been developed for household as well as business surveys. Furthermore, the core indicators list contains the additional research topics "Infrastructure", "Trade" and "The ICT sector".[96] Since these topics will not be investigated with respect to the initial building blocks proposed by this study, they will not be discussed explicitly. All indicators of the core list concerning ICT measurement in households and businesses, however, will figure in one way or another among the questions for ICT measurement as it will be suggested for the LAC region.

2.4   Stages of Research Interest for ICT Indicators

ICT measurement in household and business surveys, as well the rest of areas surveys are conducted in, is based on a certain set of indicators. These indicators can be grouped into different categories, which depend on the development phase an information society is in. The OECD has proposed a model that associates stages of development to indicators. This model has also been applied in the development of OECD household and business model questionnaires, i.e. all indicators of these surveys can be grouped according to the model, which shall now be illustrated briefly.

Depending on the respective phase of development of an information society, indicators to measure this progress can be assigned to three groups, namely *Readiness*, intensity of *Use* and *Impact* indicators. The underlying model of these three groups of indicators was developed within the work carried out by the OECD's Working Party on Indicators for the Information Society (WPIIS). This model, the so-called *WPIIS Model for E-Commerce Indicators*, states that market maturity determines research interest and needs,[97] since, as the development progresses, indicators and related policy issues in focus change over time. It divides the primary fields of research activity concerning ICT indicators into three groups or stages.[98]

In the first stage, the main focus is directed towards e-readiness, i.e. the degree to which a community or society is prepared to participate in the networked world.[99] In the second stage, the use of ICT receives most of the attention within research activities before it is replaced by the impacts ICT may have on an economy and society as a whole.[100] Figure 2.2 displays this model.

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[94] cp. OECD (2001), p. 4
[95] cp. OECD (2003c), p. 3
[96] cp. OECD (2003c), pp. 4-6
[97] cp. Schaaper (2003)
[98] cp. OECD (2003d), p.12
[99] cp. Harvard University (n.d.), p. 5
[100] cp. Schaaper (2003)

FIGURE 2.2
GROUPS OF ICT INDICATORS DEPENDING ON THE STAGE OF DEVELOPMENT OF AN
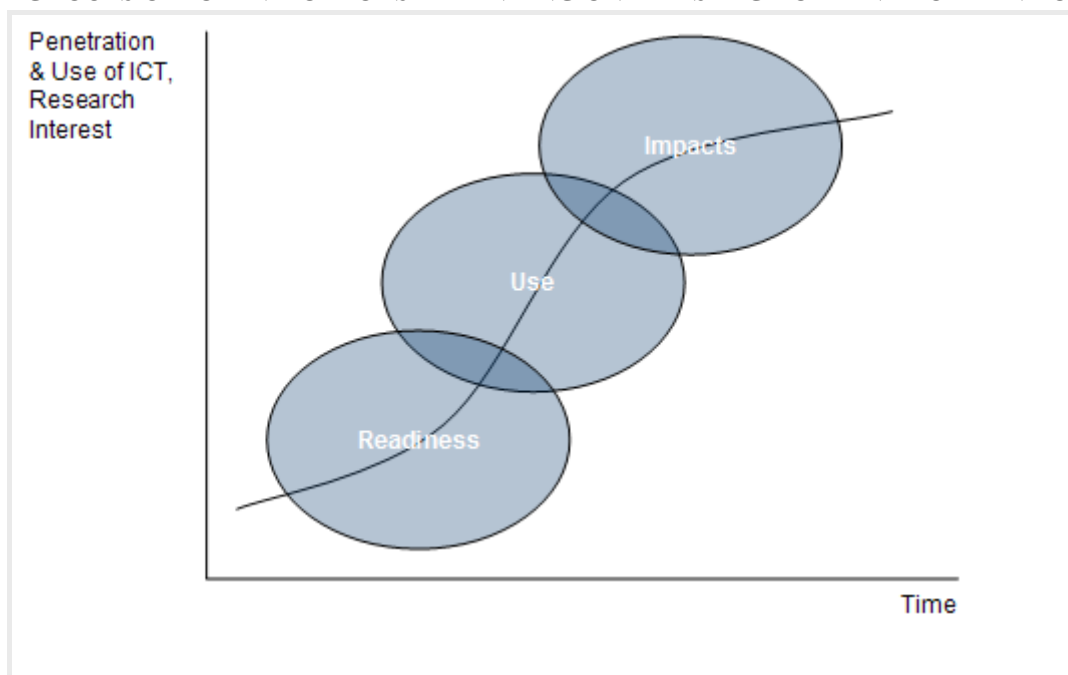
INFORMATION SOCIETY (WPIIS MODEL FOR E-COMMERCE INDICATORS)
Source: Statistics Canada and WPIIS (n.d)

The impacts of ICT is already part of this model, however, since impact indicators are not yet included into current analysis, it has only been added for reasons of completeness at this point and to track the development of the relevant ICT indicators in the future. The OECD, in its core indicators list, states that the impacts of ICT —in general— are of great interest. However, impacts of ICT usage are very diverse. In the case of ICT measurement in the business sector, for instance, they relate to "productivity, profitability, competitiveness, efficiencies and the creation of wealth".[101] For households, the impact of ICT might be to contribute to the overall quality of living, which includes non-monetary aspects, such as access to more information, participation in political decisions and the life of the community, and access to entertainment possibilities. Due to the complexity of this matter and the absence of clear cause and effect relationships, this aspect —at least for now— should be examined analytically and not through direct measurement. Therefore, the OECD does not propose any indicators on impacts at this point.[102] Supporting this argumentation, participants of the *United Nations Conference on Trade and Development (UNCTAD) Expert Meeting* on e-commerce measurement in Geneva in September of 2003 stated that it would be premature to already measure impacts of ICT on society.[103]

Even so, there are initial attempts to measure these kinds of impacts. An effort has been undertaken in a proposal by the ABS within its framework document "Measuring a Knowledge-based Economy and Society". However, this document also points out that the choice of impact indicators is only a cautious first attempt and that the ABS would particularly welcome comment on these indicators.[104]

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[101] OECD (2003c), p. 3
[102] ibid.
[103] cp. UNCTAD (2003), p. 9
[104] cp. ABS (2002a), p. 28

Considering that LAC countries are not as far advanced in the context of ICT adoption within their societies, it seems inappropriate to try to develop adequate indicators of impacts of ICT at this point. Instead it would be more productive to concentrate effects on incorporating adequate readiness and use indicators, following the approach taken in household and business surveys proposed by the OECD.

The most important task at the moment is to start measuring information society matters on a basic level and from there to evolve towards more sophisticated instruments using the experience then acquired. As the development of the information society progresses, the relevant indicators will shift away from readiness towards impact indicators. The classification of indicators according to these stages of development will reflect this change over time.

Even though adaptations will be necessary to adopt the frameworks established by the OECD or the European Commission, there are no compelling reasons, why the main body of conceptual and definitional advancements would not be applicable to other regions or even to all countries in the same manner.[105] Following this idea, the proposal for initial ICT measurement for LAC shall now be outlined.

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[105] cp. OECD (2003d), p. 102

III. Toward a Measurement Instrument for Latin America and the Caribbean

Developing an information society measurement instrument for Latin America and the Caribbean, possessing the complexity of the one employed by the OECD, for instance, would be a very challenging if not unrealistic endeavor.

Given the magnitude and complexity of the task, it is not the objective of this paper to establish an entire —let alone comprehensive— system. It is proposed that measurement instruments should be developed by various initiatives – this paper being one of these – and in a step-by-step approach. The OECD calls this type of procedure a "building block"[106] approach. Choosing this approach has also been the recommendation of officials from various national statistic offices at the expert meeting on measuring electronic commerce hosted by UNCTAD, in September of 2003. Information Society measurement should, for monetary and complexity reasons, start with a simple set of questions and indicators included in already existing surveys. These may be expanded over time by more questions and more complex indicators in a learning by doing process.[107]

3.1 Requirements of a Measurement Instrument

Five basic requirements have been identified. Although only the first building blocks of the instrument will be developed, these requirements hold true for the complete measurement instrument to be developed in the future. The purpose of these requirements is to facilitate the measurement of information society as free of obstructions as possible. Following the introduction of the requirements, the manner in which they will be fulfilled will be illustrated.

3.1.1 Keep It Short and Simple

Simplicity concerning the number as well as the comprehensibility of questions is a basic requirement. A very complex and long survey is counterproductive for four reasons. The first is that long surveys, partially due to a lack of experience in the field of ICT measurement, cause disproportional difficulties in the processing and analysis of the data obtained. The second reason is a psychological one. Using indicators that are limited in their number and easy to read and understand significantly increases the probability that the results obtained

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[106] cp. OECD (2003b), p. 2
[107] cp. UNCTAD (2003), pp. 4 et seq.

will command attention.[108] The third reason is that short surveys are less burdensome to respondents ,[109] thereby increasing respondents' willingness to participate. As a consequence, results of higher quality are obtained because the non-response rate is reduced. Last but not least, survey costs climb up with the number of questions, the inquiry process of the required data and the sample size chosen. Unnecessary to mention that especially for LAC, cost containment is a very decisive factor.

In our present exercise, simplicity of the proposed measurement instrument will be achieved in two ways. First, the suggested questions will be grouped according to their importance. The most important questions, that are indispensable and must be integrated in annual surveys, consist of only a few very basic indicators. Second, all of the questions will be of an easy-to-understand nature so they do not cause problems of comprehension among respondents.

3.1.2   Ensure Comparability

Another very important requirement of a measurement instrument is that it must allow for comparability with those already employed by different institutions, such as the ones covered in Chapter I. For the sake of simplicity, these institutions are further referred as *institutions of international reference*. As mentioned earlier, comparability among these institutions has been achieved by joint efforts of the OECD, Eurostat and national statistic offices of OECD member states in pursuing uniform classifications.

Comparability is also important among countries of the LAC region. Therefore, different surveys of the institutions of international reference and LAC countries have been included in the following analysis. The proposed questions are a synthesis of all questions found within the different surveys investigated.

3.1.3 Capture Regional Particularities and Unique Development Features

The instrument must capture features that are unique to the sage of development of the LAC region. To allow for the instrument to meet this requirement, some indicators will be proposed that are not part of the surveys investigated by the institutions of international reference, but are important to show the particularities of the Latin American and Caribbean information society.

3.1.4   Build on Flexibility and Adaptability

The next aspect to ensure the effectiveness of a measurement tool consists of two elements, flexibility and adaptability. These are inevitable features in an environment that, due to technological progress, is changing quickly. In the course of technological progress and social change, indicators need to be adapted according to their current relevance. New mobile or television technologies to access the Internet are examples for current trends. This requirement of flexibility and adaptability is met by adopting the building blocks approach instead of proposing an entire comprehensive system. A respective country can incorporate these building blocks as it sees fit.

3.1.5   Exploit Existing Resources

The inquiry of data can be approached in different ways. For example, the European Commission conducts surveys especially designed for the purpose of following the objectives determined by the eEurope initiative.[110] Obtaining data this way is naturally very costly. It is unnecessary to mention that the resources required for this approach are simply not available

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[108] cp. European Commission (2002a), p. 2
[109] cp. OECD (2001), p. 3
[110] cp. European Commission (n.d.a)

in the LAC region. The OECD obtains information from existing sources, such as national industrial surveys/censuses, administrative registries; national or regional patents offices and telecommunications regulators.[111] As a result substantial amounts of financial resources can be saved.

Following this approach will develop the first building blocks of the measurement instrument proposed in this study. The method will examine what is already available in existing survey vehicles (of national statistic offices of the region) and suggest additional indicators for future inquiries.

3.2 National Statistic Offices and Census, Household and Business surveys

National Statistic Offices are national governments' statistics agencies or organizations with other missions but also with the mandate to compile statistics. Their principal function is to provide and distribute statistical information that is objective, independent and of a high quality. This information should be available for everyone, including the political institutions, the government, administrative agencies, businesses and industry, as well as citizens in general.[112]

3.2.1 Statistic Offices Investigated

In order to get an overview of the activities of the NSOs within LAC and to establish a base of information, fifteen of these have been included in the analysis. Table 3.1 shows an overview of the investigated countries by sub-region.

TABLE 3.1
COUNTRIES INVESTIGATED GROUPED BY LAC'S SUB-REGIONS

Andean Region	Caribbean	Central America	Southern Cone[113]
Colombia	Barbados	Costa Rica	Argentina
Peru	Dominican Republic	Honduras	Brazil
Venezuela	Jamaica	Mexico	Chile
	Trinidad & Tobago		Paraguay
			Uruguay

Source: Own elaboration

Naturally, not all countries have the same amount and type of information, as it will become clear through a detailed account of the specific characteristics of each country. Some of them can only be studied for the five basic households' questions.

Besides those NSOs, the proposed set of indicators also considers recommendations derived from a LAC initiative which was started in Lima, Peru in 2003. This resulted in the document a "System of ICT Indicators" (this initiative will in the following be referred to as the SITIC initiative). The workshops of the SITIC initiative were attended by various NSOs[114] as well as the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) and the Ibero-American Network on Science and Technology Indicators (RICYT). Besides, in the cases of Barbados and Trinidad and Tobago, the considered surveys have not

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[111] cp. OECD (2002), p.92
[112] cp. Statistisches Bundesamt Deutschland (2002a) or INE (n.d.) among others
[113] Mercosur + Chile
[114] These were the NSOs of Brazil, Canada, Mexico and Spain.

been carried out by the NSO. Those surveys are from NCST (The Barbados' National Council for Science and Technology), NeCS (The Trinidad and Tobago's National E-Commerce Secretariat, Ministry of Public Administration and Information) and NIHERST (The Trinidad and Tobago's National Institute of Higher Education, Research, Science and Technology).

3.2.2   Types of Surveys Investigated

Most agencies carry out three types of core surveys:

- Population and housing censuses
- Household surveys
- Business surveys

Some countries have carried out specific surveys on ICT use and e-commerce in household and businesses. These surveys have been made by the NSOs or by other institutions as in the case of Barbados and Trinidad and Tobago. By integrating ICT questions, each of these surveys has the potential to provide important information about different aspects concerning the status and progress of an information society. Consequently, the present study analyzes the extent to which these three types of surveys may incorporate ICT questions. Three methods have been used to collect information about these surveys. They are Internet research at the websites of the NSOs; e-mails to obtain additional information where necessary, and telephone calls to inquire and verify pending issues. Furthermore, this exercise was complemented by the results obtained from the meta-data survey "Status of information society statistics in National Statistic Offices", applied to most of LAC NSOs during August 2004 in the frame of OSILAC and concluded with a workshop on Information Society Measurement for Latin America and the Caribbean at Santiago in November of 2004 (see annex 4).

3.2.2.1 Census Surveys

A population and housing census provides the frame of reference and the statistical basis not only for political and economic planning and decision-making, but also for scientific research. A census provides the basic data concerning the population of a country as well as its working and living conditions.[115] The United Nations recommends a census be conducted every ten years.[116]

Incorporating information society related questions in a census bear numerous advantages. Due to its character of being a complete enumeration,[117] no other type of statistical survey offers the opportunity of completeness that can also be extensively disaggregated. This provides a unique opportunity to obtain and analyze data about population segments in secluded rural areas, which —due to the enormous necessary efforts that would be required— is not included in sample surveys, such as household surveys. It is the most important —and often only— data source for smaller and geographically isolated regions and communities.[118] Also, other types of surveys, such as a household survey, do not provide the accuracy a census is able to achieve, since it does not cover all the different geographically remote areas.

In addition, a census not only makes it possible to disaggregate information geographically, but also by other socio-demographic and economic variables. Thus, the digital divide can be analyzed not only with regards to geography, but also to income level, age, ethnic origin, gender and the educational level of the population.

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[115] cp. Statistisches Bundesamt Deutschland (n.d.)
[116] UNSTATS (1997), p. 3
[117] cp. Statistisches Bundesamt (2002b)
[118] cp. Jaspers-Faijer/Tacla (2003)

However, the downside of these advantages is the high cost of a census. The 2000 population and housing census of Paraguay, for example, cost around US $9 million. To put this number in perspective, the 2002 Paraguayan industrial survey, in comparison, only cost US $75,000, i.e. less than one percent of the cost of the census. Paraguay's permanent household survey – depending on the available budget determining the sample size— costs between US $100,000 and US $190,000, that is one percent to five percent of the 2002 census.[119] Colombia has even postponed their next census, which had been due in 2003. The director of DANE, the national statistic office of Colombia, stated that one important reason for this delay was that they did not have the budget to carry it out.[120]

Since the census is carried out with such an extensive sample size, adding more questions to it may imply an escalation of costs. Therefore, one has to take into account that even if the available budget of a country allows for the incorporation of ICT related questions, only a very limited number of these would be possible.

As the following sections will show, different countries often ask quite different questions with regard to ICT access and use in household and business surveys. This is not the case within census. In order to save costs and due to existing coordination efforts, such as the collaboration between the statistic offices of the Mercosur countries,[121] variables concerning ICT have already been standardized. Therefore, the objective of the analysis in this regard was to find out whether or not the determined variables already are included in the respective census, not how to standardize the different variables. This facilitates the development of a catalogue containing only the very basic ICT variables that should be included in a census survey. These variables are explained in Section 3.3.

3.2.2.2 Household Surveys

Compared to a census, the sample size of a household survey, i.e. the number of respondents involved, is significantly lower. This implies substantially lower costs per question. A greater amount of information per individual or household surveyed could be obtained through a household survey. This is one of the most important advantages of this type of survey. Another very important advantage of sample surveys is that they are often conducted annually. This is a crucial point especially in a field undergoing rapid technical changes and diffusion rates of technologies and devices. Penetration rates of Internet, for example, are growing very fast: the number of Internet users in LAC has grown by 57 percent in 2002.[122] Keeping these circumstances in mind, measuring this rate once per decade clearly is not adequate. Another significant advantage is the time occupied to obtain results. Due to the magnitude of a census, it naturally requires more time to collect and compile all the data generated than a sample survey.

Table 3.2 offers an overview of advantages and inconveniences of a census in comparison to sample surveys, such as a household or business survey.

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[119] Statement by Nimia Torres (person in charge of Paraguay's Industrial Survey) during a working session on 04/12/2003 in Asunción
[120] cp. Presidencia de la República de Colombia (n.d.)
[121] cp. INE (2003a)
[122] cp. ITU (2002), pp. 1 et seq. and ITU (2003b), pp. 1 et seq.

TABLE 3.2
COMPARISON OF CENSUS AND SAMPLE SURVEYS

Parameters	Census	Sample Survey
Cost	Very high	Substantially cheaper
Frequency of survey	Mostly decennial	Often annually
Amount of information obtained	Limited number of questions	Substantially larger number of questions possible
Geographic disaggregation	Very high level of disaggregation	Restricted level of disaggregation
Time occupied to obtain results	Long	short

Source: INEI (2001a), pp. 12 et seq.

Census and sample surveys should be employed in a complementary manner. A census establishes the statistical basis for other surveys. They are indispensable in order to "take stock" after a certain period of time. Otherwise the foundation on which, for example, household surveys are conducted becomes more and more biased over the years since samples change over time and this change cannot be taken into account adequately. On the basis of a census, household surveys are used to adjust the data during the interim terms between two censuses in annual or even shorter cycles.

These remarks show that both types of surveys are indispensable in order to get a more comprehensive picture of the situation investigated. Incorporating ICT indicators into census and household surveys is especially important with regard to investigating all the different dimensions of the digital divide, as the next section will show.

3.2.2.3 Digital Divide Questions in Census and Household Surveys

The *digital divide* refers to the divide between those that can access and have the ability to use ICT and those that do not. Within the LAC region, six dimensions of the digital divide have been identified as being the most relevant ones.[123] These are the income level of individuals and households, level of education, gender, age, geographic location of residence and ethnic origin. In some way or the other, all of these dimensions affect ICT usage.

In the region, information on these dimensions of the digital divide —however not always in each one of the dimensions— usually included in population and housing censuses as well as in household surveys. For that reason it is useful to include ICT questions in census and household surveys. By incorporating ICT questions, one is able to cross-examine different aspects of ICT, such as the penetration of the Internet in households against the different dimensions of the digital divide. The results obtained provide the basic information needed for the development of adequate public policies. If Internet penetration is significantly lower in rural areas, for instance, incentives could be developed by public policy makers to overcome this drawback. Integrating the question of Internet usage into a Census would allow gaining a complete picture regarding geographic location and Internet usage, to identify disadvantaged remote rural areas and to start acting.

Of course, also with non-ICT indicators we face a definition and comparability problem when working with more than one country. Countries employ different definitions and concepts in measuring basic socio-economic variables. In order to compare the status of the digital divide in its different dimensions, common concepts of these dimensions must be established.

For example, the measurement of *Income* per capita figures, are taken from the household surveys of the different LAC countries.[124] In each country, however, income is calculated differently. Argentina, for example, only obtains the information about the earned

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[123] cp. Hilbert (2003b), pp. 24-28
[124] cp. ECLAC (2003c), p. xxxiii

income realized by a person.[125] Chile and Colombia incorporate additional questions on other types of income. As it can be seen in Table 3.3 the categories of income are similar, but not identical and thus cannot be compared. Therefore, country information must be adopted.

TABLE 3.3
DIFFERENT METHODS TO DETERMINE INCOME WITHIN CHILEAN AND COLOMBIAN HOUSEHOLD SURVEYS

	Chile	Colombia
Type of income	In the last month, what was your liquid remuneration for your primary occupation?	In the last month, how much did you earn carrying out your primary occupation?
	What types of income did you realize additionally within you primary occupation? 1. Bonuses or gratifications 2. Remunerations in natural produce or additional pay 3. Withdrawal of products of your company (not agricultural) for own consumption 4. Value of ceded accommodation 5. Did not receive other income	Apart from the salary in money, did you receive… 1. food as part of your payment? 2. tenement? 3. Other income in natural produce for the work carried out?

Source: MIDEPLAN (n.d.), p. 18 and BADEHOG (2003)

In order to derive valuable information that can be compared internationally, the population may be divided into quintiles[126] or deciles[127] of income. Using this method, one is able to state that in Argentina in 1999, for example, the poorest income decile[128] obtained two percent of the income total,[129] while the richest income decile realized 37 percent of this amount. This method would be adequate to determine income disparities within a country.

Adapting this information in such manner, the income dimension of the digital divide can now be analyzed by cross-tabling it with an ICT question, e.g. connection to the Internet. The result sheds light on the issue of the distribution of ICT within the different income groups. How much income the different income groups dispose of and what proportion of the respective group is connected to the Internet can now be investigated. Harmonizing indicators internationally, however, often bears a trade-off effect regarding the loss of information. In the case of income figures, income disparities within a respective decile or quintile cannot be investigated after applying the harmonization procedure.

Another topic in surveys in which international comparability is problematic is the *Educational Level* a person has obtained. Again, different countries use different classifications. To illustrate this situation, Table 3.4 shows the different options for a person to obtain higher education in Peru and Paraguay.

TABLE 3.4
OPTIONS TO OBTAIN A HIGHER EDUCATION DIFFER AMONG LAC COUNTRIES

	Peru	Paraguay
Options to obtain third level education	Bachelorship Superior incomplete (not university) Superior complete (not university) Superior incomplete (university) Superior complete (university) Post Degree (university)	Commercial bachelorship Technical bachelorship Humanistic bachelorship Scholastic education Military/Political education University

Source: BADEHOG (2003)

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[125] cp. BADEHOG (2003)

[126] A quintile is any of four points that divides a distribution of ranked scores into equal intervals where each interval contains one-fifth of the score [cp. Thefreedictionnary.com (2004)].

[127] A decile is any of nine points that divides a distribution of ranked scores into equal intervals where each interval contains one-tenth of the score [cp. Thefreedictionnary.com (2004)].

[128] Classified according to per capita income.

[129] As it has been stated within the household survey [cp. ECLAC (2003c), p. xxxiii]

In this form the concepts are not comparable on an international level. To address and solve this problem, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has defined a first, second, and third level of education, by which the different educational systems of countries can then be classified and thus reconciled. The complete UNESCO definition can be found in Annex III. This classification then allows for the inclusion of the education dimension in the analysis of the digital divide for a broad international perspective.

A very important sub-topic of education is *Illiteracy*. In many countries of LAC, illiteracy rates have dropped considerably, often to levels below ten percent. However, there are still exceptions of high illiteracy rates, such as Guatemala, Nicaragua, and Haiti with 31 percent, 36 percent, and even 51 percent respectively in the year 2000. Therefore, measuring illiteracy rates is still an important task within LAC.

The definition of illiteracy is unambiguous, namely persons that "cannot with understanding both read and write a short simple statement on his everyday life".[130] The ambiguous part of the illiteracy issue is the age a person must have reached in order to be considered illiterate. Argentina, for example, has published illiteracy related information for persons of the age of ten and older.[131] Mexico and Paraguay define illiteracy of a person for persons having reached the age of 15 or more.[132] This is also the definition ECLAC is currently using.[133] By using this definition, illiteracy rates are available for the entire Latin American and Caribbean region.

As several studies demonstrate, ICT usage also depends on *Gender*, which obviously does not cause any comparability problems due to different definitions. It analyzes the digital divide on the basis of the distribution of men and women within the different countries.

There is also no standardization problem with regard to the *Age* of a person. Most countries offer the results of the distribution of the population concerning age in simple years like Argentina,[134] or as the UN defines it in quinquennial age groups[135] like Brazil.[136] The data will have to be reconciled at the smallest common metadata level. This implies the classification into quinquennial groups in the case of age data for Argentina and Brazil. The price of standardization is that the information of the distribution within the single years is lost from Argentina.

A more problematic issue is the *Geographic* dimension of the digital divide. National definitions are usually based on the size of a locality. A commonly used classification method for spatial distribution is the division into urban and rural areas. However, there is no unequivocal definition that distinguishes urban from rural population.[137] For this reason, ECLAC, for example, publishes spatial distribution in two ways. First, it takes data unchanged, as provided by different countries. This data, of course, is not comparable. Therefore, in a second table, data is displayed by breaking the population down according to the size of their respective residential locality.[138]

The *Ethnic Origin* of an individual is the last dimension taken into account in the investigation of the digital divide. As it has been shown, even if information on geographic location and the educational level of the individual can be converged, different definition

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[130] cp. UNSTATS (2003)
[131] cp. INDEC (n.d.)
[132] cp. INEGI (2004a) and DGEEC (2003a), p. 43
[133] cp. ECLAC (2003b)
[134] cp. INDEC (n.d.)
[135] cp. UNSTATS (2003)
[136] cp. IBGE (n.d.b)
[137] cp. UNSTATS (2003)
[138] cp. ECLAC (2003c), p. xxx

about indigenous people are less likely to be adjusted.[139] The question within this topic is how indigenous people are defined. As has been the case in previous paragraphs, a unique definition that would identify a person as being indigenous does not exist. The ILO has taken a practical approach to tackling this problem. In their *Project to Promote ILO Policy on Indigenous and Tribal Peoples (the ITP Project)* they do not define indigenous peoples but describe peoples who should be protected. Four elements constitute the characterization of indigenous peoples in this context:[140]

- Traditional life styles;

- culture and way of life different from the other segments of the national population, e.g. in their ways of making a living, language, customs, etc.;

- own social organization and political institutions;

- living in historical continuity in a certain area, or before others "invaded" or came to the area.

Another fundamental criterion of the ILO concept to determine if a person belongs to an indigenous people is self-indication, i.e. that person states the membership to such a people.[141] ECLAC uses the data on indigenous peoples as they are provided by the different countries with the underlying definitions employed by the respective country.[142] This approach should also be adopted for analyzing ethnic origin topics, within the proposed measurement blocks.

3.2.2.4 Business Surveys

Following the discussion about census and household surveys and their importance for the quantification of the domestic and international digital divide, business surveys are essential to demonstrate the transition toward the digital economy. There are also complete enumerations in the business sector called industry censuses. Some countries use industry censuses as the basis for their business survey. These, however, are not conducted on such a broad basis and with such regularity as the population and housing censuses. Often, however, the universe that serves as the frame from which the sample for the business surveys is drawn, is the business register of a country, which is often administrated by the respective NSO.[143] Since business surveys are also sample surveys, the same arguments concerning advantages and inconveniences compared with complete enumerations hold true, as they have been discussed for household surveys.

This brief introduction of census, household and business surveys establishes the basis to discuss the different complexes of questions related to ICT and information society measurement in detail.

3.3 Census Surveys

Many developed countries already use censuses as a valuable source for ICT related data.[144] In census surveys, ICT questions are very basic and undisputable. They are standard questions used in surveys of the institutions of international reference and are also present in various

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[139] cp. Hilbert (2003b), pp. 24-28

[140] cp. ILO (2003)

[141] ibid.

[142] cp. UN ECOSOC (2004)

[143] cp. Statistisches Bundesamt Deutschland (2001), p. 2 or Statistics Canada (2004)

[144] At the 2002 meeting of the UNESCAP Committee on Statistics, the Australian Bureau of Statistics pointed out that the inclusion of computer use and Internet access in Australia's *2001 Census of Population and Housing* will serve as a rich source of IT usage statistics for small geographic areas and for small population groups, especially in terms of examining digital divide issues. cp. ABS (2002c), p. 3

censuses within the LAC region. Furthermore, in order to contain the enormous cost of a census mentioned above and due to coordination efforts, such as the collaboration between the statistic offices of the Mercosur countries[145], variables concerning ICT have been harmonized on broad basis already. In consequence, the task in this chapter is not the determination of which questions to include (which will be the task for household and business surveys later), but rather to show the differences in the adaptation process of ICT related questions into national census. In order to provide some support concerning the current status of each country with respect to the proposed ICT questions, technical status reports have been established for each country investigated.

3.3.1 Sets of Questions

Beginning with the analysis of census surveys, a first methodological issue arises when a household is considered as an observation unit, especially in the context of inter-regional comparability between developed and developing countries. The argument goes that — considering the housing situation— the notion of a household in developing countries would be different from a household in the developed world, which refers to generally larger family sizes and the more communal attitudes of people in certain areas within developing countries. This problem, of course, also holds true within the household surveys addressed later. As it has been remarked in the OECD's "Framework Document on Information Society Measurement and Analysis", however, this should not be seen as a major problem. The argument of the OECD is that information society measurement should not try to resolve such issues and it is more important to start working with information society statistics as soon as possible instead of overcoming every minor obstacle on this path first.[146] Within the LAC region, the problem does not exist, since countries are using comparable concepts for the definition of household.[147]

Census surveys, as mentioned before, contribute significantly to investigating digital divide issues. To allow the analysis of the digital divide, the existence of two different topics has been checked in the census surveys. First, there are ICT questions. Secondly, questions concerning socio-demographic indicators are needed, which can be cross-tabled with ICT indicators to characterize the different dimensions of the digital divide. This type of questions will be referred to as *digital divide questions* and have already been addressed in Chapter 3.2.2.3 displays the ICT related questions.

TABLE 3.5
SETS OF ICT QUESTIONS WITHIN CENSUS SURVEYS

ICT Questions
Does this household have a fixed line telephone?
Does this household have a mobile telephone?
Does this household have a TV?
Does this household have a personal computer?
Does this household have access to the Internet?

Source: CELADE (2003)

The questions compiled in Table 3.5 are the very basic ones forming part of all census surveys that already employ ICT questions. They are of primary importance in the context of analyzing the participation of countries in the information society. This set of questions is also adopted in the nucleus of definitions of ICT, such as the one by the ITU, as mentioned in section 2.2.2. This definition also includes radios. These, however, in the ITU definition are referred to as "old ICT",[148] since they have achieved universal presence. Television and fixed

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[145] cp. INE (2003a)

[146] cp. OECD (2003d), p. 102

[147] Statement Simone Cecchini (Economic Affairs Officer at Statistics Division of ECLAC) concerning the subject at ECLAC on 13/12/03

[148] ITU (2003d), p. 8

line telephone also figure among the "old ICT", but they have not reached total presence in the developing world. For example, there were 40 households with television per 100 households in Guatemala and 48 in Honduras by 2001.

The questions of this core list are of utmost interest in order to determine whether or not an individual or a household has access to ICT and therefore the opportunity to profit from the advantages offered by the information society. They establish a solid basis to analyze the digital divide within a country, since each of the ICT questions can be cross-tabled with a question concerning one or more dimensions of the digital divide. It can be evaluated, for instance, how Internet access is distributed among the different income groups, education levels or both.

With the different variables of the analysis at hand, the next step consists of determining the current status of each of the countries investigated.

3.3.2 Technical Status Reports

The country specific status reports consist of different elements. Besides the year of the census it contains a list of the questions discussed above. The objective of these reports is to ultimately harmonize and normalize the ICT related questions in LAC country censuses. Therefore, two different statuses have been used. "0" indicates that a question is not yet included in the country's census questionnaire, "1" that it does exist in the desirable way with respect to international standards. Each variable on the list is then checked in this manner. The status reports of the countries are grouped according to the sub-region they belong to, starting out with the Mercosur countries.

3.3.2.1.1   Southern Cone[149]

Four countries in Table 3.6 have already conducted their census of the so-called *2000 Round of Population and Housing Censuses*, while Uruguay realized it late in the ninety's. As one can see, apart from the two earliest of the listed censuses, Brazil's 2000 and Uruguay's 1996 censuses, every country has already incorporated each of the ICT related questions. Also Argentina asked about possession of cable TV rather than basic TV. Brazil and Uruguay are still lacking two of these questions, including the crucial one of whether or not a household is connected to the Internet.

In conclusion, a reasonably comparable and quite comprehensive picture for this sub-region concerning the status of basic ICT access can be drawn.

TABLE 3.6
TECHNICAL STATUS REPORT FOR THE SOUTHERN CONE (CENSUS SURVEYS)

Questions:	Argentina	Brazil	Chile	Paraguay	Uruguay
Does this household have a fixed line telephone?	1	1	1	1	1
Does this household have a mobile telephone?	1	0	1	1	0
Does this household have a TV?	0	1	1	1	1
Does this household have a personal computer (PC)?	1	1	1	1	1
Does this household have an Internet access at home?	1	0	1	1	0
Year of Census	**2001**	**2000**	**2002**	**2002**	**1996**

Source: Own elaboration

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[149] Southern Cone refers to the Mercosur members plus Chile

3.3.2.1.2 Andean Region

Venezuela is the only of the three countries examined, which has carried out the 2000 round census. This country included all the questions in its 2001 census. The status report displayed in Table 3.7 contains the questions of the respective 1993 census for Colombia and Peru. As can be seen in the table, Colombia is lacking all of the basic ICT questions, and Peru lacks two important questions.

TABLE 3.7
TECHNICAL STATUS REPORT FOR THE ANDEAN REGION (CENSUS SURVEYS)

Questions:	Colombia	Peru	Venezuela
Does this household have a fixed line telephone?	0	1	1
Does this household have a mobile telephone?	0	0	1
Does this household have a TV?	0	1	1
Does this household have a personal computer (PC)?	0	1	1
Does this household have an Internet access at home?	0	0	1
Year of Census	**1993**	**1993**	**2001**

Source: Own elaboration

However, the next census in both countries will probably be held in the year 2005.[150] This is an exceptional opportunity to add a basic ICT package of questions and responsible authorities are quite aware of its importance. The national statistic office of Peru, for example, asked for a proposition of pertinent questions at the international workshop of national statistic offices of the LAC region concerning ICT indicators at Lima, Peru in June of 2003.[151]

3.3.2.1.2 Central America

All Central American countries investigated have carried out their census of the 2000 round, however, it can be observed that they have incorporated just one of the "new ICT" questions. None of them is asking the possession of either a mobile phone or an Internet connection in a household. Table shows the overview of the countries of the Central American sub-region.

TABLE 3.8
TECHNICAL STATUS REPORT FOR CENTRAL AMERICA (CENSUS SURVEYS)

Questions:	Costa Rica	Honduras	Mexico
Does this household have a fixed line telephone?	1	1	1
Does this household have a mobile telephone?	0	0	0
Does this household have a TV?	1	1	1
Does this household have a personal computer (PC)?	1	1	1
Does this household have an Internet access at home?	0	0	0
Year of Census	**2000**	**2001**	**2000**

Source: Own elaboration

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[150] cp. DANE (2003c)
[151] cp. UNDP (2003). p.9

3.3.2.1.4 The Caribbean

Table 3.9 shows the available questions for Caribbean countries. It can be observed that Barbados has not asked directly for fixed line telephone, they included "cellular telephone" and "other telephone" as response options in the question about equipment. The Dominican Republic has not yet included the question concerning the possession of a mobile phone. The census survey is only including the item "telephone or cellular fixed". Jamaica is not asking if a household possesses television.

Unfortunately, only very aggregated information for Trinidad & Tobago was encountered. Therefore, a specific analysis of the status of ICT questions within the census survey of Trinidad & Tobago has not been possible.

TABLE 3.9
TECHNICAL STATUS REPORT FOR THE CARIBBEAN (CENSUS SURVEYS)

Questions:	Barbados	Dominican Republic	Jamaica	Trinidad & Tobago
Does this household have a fixed line telephone?	0	1	1	
Does this household have a mobile telephone?	1	0	1	
Does this household have a TV?	1	1	0	
Does this household have a personal computer (PC)?	1	1	1	**Information not available at the end of research period**
Does this household have an Internet access at home?	1	1	1	
Year of Census	**2000**	**2000**	**2001**	**2000**

Source: Own elaboration

3.4 Household Surveys

The process of generating the catalogue of desired questions in household surveys has proven to be much more complex than in censuses. Generally speaking, up to this point, the coordination efforts with respect to questions of household survey questionnaires are not as sophisticated as they have been for census surveys. However, there is a growing consciousness on the need of coordination. Examples confirming this argument are the international workshop of national statistic offices of the LAC region concerning ICT indicators at Lima, Peru in June of 2003[152] and the Workshop on Information Society Measurement for Latin America and the Caribbean at Santiago in November of 2004.

Another difference to the census surveys is that questions concerning ICT measurement in household surveys are, in most of the questionnaires, directed not only at the entire household but also at each individual. Different aspects of ICT are analyzed more adequately on a household level, such as access to ICT, others on an individual level, such as the use of ICT including purposes and frequencies.[153]

As different countries focus on different aspects in each question, these questions and the options to answer them (in the following referred to as *response options*) should be harmonized. Furthermore, it is important to harmonize the characteristics of individuals in the household who should answer the questions. This topic could be the objective of another study.

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[152] cp. UNDP (2003)
[153] cp. OECD (2003d), p. 39

3.4.1 Selection Process of Questions

The selection process for a catalogue of adequate questions is different for census surveys and household and business surveys. In contrast to census surveys, which have already gone through an extensive process of coordination showing therefore a great degree of harmonization, household surveys were developed incrementally, with less international coordination. Additionally, as household surveys are not as expensive as census surveys, they have the potential to incorporate a far greater number of questions than a census. Therefore, the variety of questions in different household surveys is considerably large. To handle this complexity, the catalogue of desirable questions has been developed in a multi step approach.

All of the various questions from the different statistic institutions investigated, as well as the response options have been included in the analysis. This complete set of questions and response options has been checked for each of the three criteria displayed in Table 3.10.

<p align="center">TABLE 3.10
CATEGORIES QUESTIONS AND RESPONSE OPTIONS HAVE BEEN CHECKED FOR</p>

Selection criterion	Description of selection criterion
International reference	Is this variable[154] being used on a broad international basis, i.e. By the institutions of international reference?
LAC reference	Is this variable already used by Latin American and Caribbean NSOs?
Relevance analysis	What conclusion can be drawn from looking at the quantitative data available for this variable with regard to regional particularities?

Source: Own elaboration

The third selection criterion, the relevance analysis, requires some clarification. For some questions, even if they do not form part of any of the surveys from institutions of international reference, an analysis of factual data was carried out, to identify sufficient reasons for still including this question, given regional particularities. These particularities are related to the different level of development of the information society in LAC, with respect to the information society in the developed world. This phenomenon is usually referred to as the international digital divide. Furthermore, these particularities can stem from heterogeneities within the Latin American and Caribbean region, i.e. between or within LAC countries, which is sometimes termed the domestic digital divide. Both interregional and regional relevance of an indicator would then support its importance for surveys in Latin America and the Caribbean, even though international reference institutions are not considering this particular question as relevant.

The selection process is structured by the principle of subsidiary, with regard to this third selection criterion. If the importance of a question has already been determined unequivocally by the first two criteria of selection, no additional analysis of data has been carried out. In other words, in case that many or even all institutions of international reference, as well as the LAC statistic offices are including a certain question, the international and regional relevance of this indicator has not been taken into consideration additionally. Given the applied principle of subsidiary, the Latin-American and Caribbean relevance analysis will in many cases not be necessary.

There are three different kinds of options these selection criteria have been applied to:

- **Priority ranking of questions:** Different questions need to be put into an order according to their priority;

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[154] Concerning the difference between variables and indicators: The questions are inquiring variables, e.g. the question, if a household possesses a fixed line telephone. Indicators are considered to be variables that are put into some kind of relation, either to the population subject to the survey or other variables. Examples of indicators are the number of fixed line telephones per 100 inhabitants, which is referred to as teledensity, or the number of Internet users per Internet host.

<p align="center">41</p>

- **Harmonization of questions:** Similar questions are aggregated and synthesized in one question;

- **Harmonization of response options:** Different response options need to be aggregated and synthesized in order to obtain the most relevant ones.

Concerning the first option, there are different possibilities for a question to be among the highest priority group. This occurs if the question is considered to be very important within any of the categories mentioned, for example, it is being surveyed by international institutions as well as the LAC region's statistic entities. This is the case of the question of household possession of an Internet connection, for instance.

Concerning the second option, different questions have to be aggregated and synthesized by applying the same check within categories. For example, several international or LAC institutions ask what activities a person uses the Internet for. They propose several alternative activities to answer: e-mail, educational research, purchasing goods and services, among others. Another statistic institute asks if people use the Internet for purchasing goods or services in a separate question, i.e. not integrating it into the question about Internet usage. Since an analysis with the selection criteria (i.e International Reference and LAC Reference) show that it is more effective to integrate the purchasing question into the question about usage activities, it will not be taken into the catalogue of proposed questions separately, but rather as an answer item of the usage question. This way, the selection criteria are used to harmonize questions and to aim at the most cost-effective solution. Figure 3.1 illustrates this process.

FIGURE 3.1
EXAMPLE FOR PROCESS OF DETERMINING DESIRABLE QUESTIONS WITHIN STATISTICAL SURVEYS
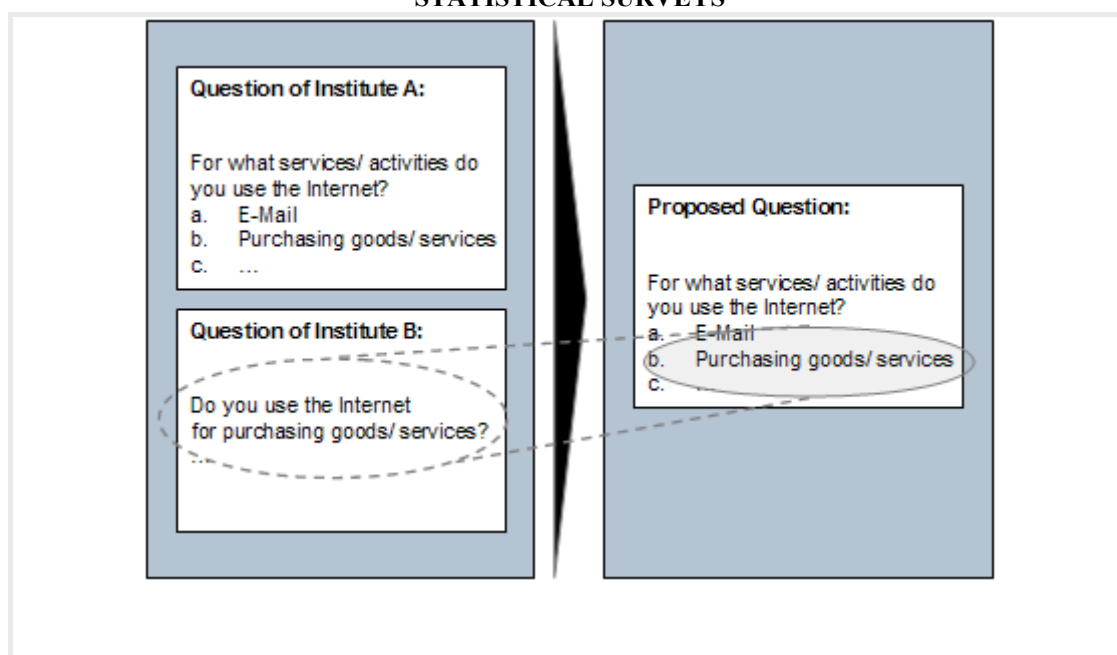
Source: Own elaboration

The harmonization of response options follows the same logic. If certain alternatives to answer a question yield a high importance with regard to the first and second selection criterion (International Reference and LAC Reference), these items have been integrated in the catalogue in a harmonized manner. If an answer item is only included in one or very few surveys or if it has already been used as an answer item for another question, it is not included.

After going through all different questions and response options of a respective survey, lists of questions according to their priority can be established. There are three different priorities displayed in table 3.11.

TABLE 3.11
PRIORITIES OF QUESTIONS OF HOUSEHOLD SURVEYS

Priority[155]	Affiliation of the different questions
H-A. Core questions	International reference: question is part of at least two surveys of the institutions of international reference *or* Lac reference: question is part of at least two country-surveys *or* Relevance analysis: data indicates a high importance due to particularities between developed world and LAC and/or intra-LAC particularities
H-B. Supplementary list	Second priority indicators. Incorporation depends on financial liquidity of the NSO (e.g. Sporadic surveys)
H-C. Nice to Know/Redundancy	Not comparable internationally; data analysis does not indicate great importance; already in corporated in other question

Source: Own elaboration

It is proposed to include the block of *Core Questions* (H-A indicators) in the different surveys in any case. According to the results of the investigation in the context of the paper at hand, they constitute the cornerstone of ICT variables and indicators in household and business surveys.

The next group of questions is labeled *Supplementary List* (H-B indicators). There are two types of questions that are proposed to be included in this list. The first type are questions more qualitative in nature that do not necessarily have to be surveyed frequently. Such questions often ask for perceptions of people about certain issues, such as the blocks of questions concerning the barriers to the adoption of ICT and e-commerce. These indicators are important to identify temporal bottlenecks, but are not necessarily in constant demand. The second type of questions are those that are also important within the concept of measuring ICT but do not show sufficient importance with regard to the first selection criterion, International Reference, and are therefore not of the same status as the core questions.

The indicators of the supplementary list could be surveyed in a more sporadic manner, in case they are needed for policy analysis of a special legislation, for example. Such a survey can be held spontaneously, in order to obtain specific information that will help to develop specific public policies. This supplementary list, of course, would have to be expanded by additional questions of interest but of the same character. Potential questions will be illustrated in the chapters on household and business survey questions proposed for this supplementary list. It is up to the respective national statistic office to add one or another of these questions to their annual surveys, if they see fit.

The last group to be addressed is the *Nice to Know/ Redundancy* group (H-C indicators). This group includes questions that are considered to be of minor importance compared to the anterior questions. There are two possible reasons for a question to be assigned to this group. The first one is that it is neither a standard question on an international level, nor in the LAC region and the Relevance Analysis does not indicate that this question should be included. The second reason is that a question may already form part of another question and therefore becomes redundant.

The lists of questions proposed do not necessarily provide the logic of an actual questionnaire, but rather the logic of variables that will be the outcome of the questionnaire,

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[155] The nomenclature A, B and C has been assigned to each group of questions to later be able to unequivocally identify the questions belonging to each group. Within the household survey section, the letter H (household), within the business survey section, the letter B (business) has been added to the questions.

which is the final product. Establishing the logic of a questionnaire, e.g. the route through the questionnaire, the use of filter questions or the structure and sequence of the questions is to be done by the respective authority carrying out the survey, since this authority will develop its specific survey employing its own predefined logic. For example, we propose the question B-A11 for enterprises: *value of Internet sales as perc*entage *of the total sales* and other sales-related questions in the *supplementary list*, but we do not introduce a filter question. Then, a survey can include first a filter question as OECD proposes: "*Has the enterprise received orders via the Internet in year t?*"[156] and next, ask for the rest of the sales-questions. Other possibility is to use a response option as filter for other questions. Following the example, one of the response options for the question B-A10 is "Receiving orders". An affirmative answer for this option can serve as filter to a set of questions related to sales.

3.4.2 Core Questions

The questions assigned to the core block form part of at least two of the international surveys or the Relevance Analysis indicates that the respective question needs to be included, since it possesses a high importance due to particularities between the developed world and LAC (Interregional Relevance) and/or Intra-LAC particularities (Regional Relevance).[157] In many cases, these are the same questions that also figure among two or more LAC surveys.

In order to give an indication of what organization or country's NSO is incorporating a question, the abbreviated name of an institution or country has been added to each of the questions. Furthermore, if a question has been added because of its interregional relevance and/or regional relevance, a respective abbreviation is also being used stating which of the particularities applies to a certain question. These abbreviations are explained in Table 3.12.

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[156] cp. OECD (2001), p.11

[157] An exception to this rule are the questions concerning barriers to the adoption of ICT in general, the Internet, or e-commerce, since this information is not typically the field of research of official surveys, it gives valuable indications for policy needs, though. Therefore, the OECD concludes, these kinds of questions would not necessarily have to be carried out on an annual basis, which is the frequency of many household and business surveys the core questions are proposed for [cp. OECD (2003d), p. 78]

TABLE 3.12
ABBREVIATIONS USED FOR DIFFERENT ORGANIZATIONS/COUNTRIES AND TYPES OF PARTICULARITIES

Country/Institution/Type of particularity	Abbreviation
Australian Bureau of Statistics	A
European Commission	E
Eurostat ICT households/ enterprises 2005 *informal version*	*ES*
Organisation for Economic Co-operation and Development	O
Statistics Canada	C
Argentina	Ar
Barbados	Bb
Brazil	Br
Chile	Cl
Colombia	Co
Costa Rica	CR
Dominican Republic	DR
Honduras	Hn
Jamaica	Jm
Mexico	Mx
Paraguay	Pa
Peru	Pe
Trinidad and Tobago	TT
Uruguay	Uy
Venezuela	Ve
System of ICT Indicators (SITIC) initiative	S
Particularity between developed world and LAC or within LAC region	Relevant for LAC
Not necessary (since already justified by other selection criteria)	Consolidated practice

Source: Own elaboration

Table 3.13 displays the questions considered to be core questions within the frame of household surveys.

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TABLE 3.13
CORE QUESTIONS AND RESPONSE OPTIONS IN HOUSEHOLD SURVEYS

Question	Response Options	Selection Criteria		
		Intern. Reference	LAC Reference	Relevance Analysis
H-A1. Does this household have a fixed line telephone?	Yes No	C, E, O	ALL	Consolidated practice
H-A2. Does this household have a mobile telephone?	Yes No	A, C, O	ALL (less Uruguay)	Consolidated Practice
H-A2a. How many members of the household have access to a mobile phone?	Number			
H-A3. Does this household have TV?	Yes No	C, ES	ALL	Relevant for LAC
H-A4. Does this household have a personal computer (PC)?	Yes No	A, C, O, ES	ALL (less Honduras)	Consolidated practice
H-A5. Does this household have an Internet access at home?	Yes No	A, C, E, O, ES	ALL (less Honduras)	Consolidated practice
H-A6. What modes of access/bandwidth does the household use for Internet access?	Analogue modem ISDN DSL Cable Mobile wireless Fixed wireless Other Do not know	C, E, O, ES	Bb, Co, CR, Mx, TT	Consolidated practice
H-A7. Where did you use the Internet most frequently in the last 12 months? (tick all that apply)	Did not use At Home At Work Educational Facility At another person's home Free public access center (specific denomination depends on national practices) Commercial access center (specific denomination depends on national practices: cyber café, Kioskonet, etc.) Other	E, O, ES	Bb, Cl, Co, CR, Mx, S, TT	Consolidated practice
H-A8. How often did you usually use the Internet in the last 12 months (from any location)? (tick one)	At least once a day At least once a week, but not every day At least once a month, but not every week Less than once a month	C, E, O, ES	Bb, Co, Mx, TT	Consolidated practice
H-A9. How many hours did you usually spend on Internet use weekly over the last 12 months?	Number of hours per week	-	Bb, TT	Relevant for LAC

(continuation Table 3.13)

Question	Response Options	Selection Criteria	Question	Response Options
		Intern. Reference	LAC Reference	Relevance Analysis
-A10. For what services/activities have you used the Internet in the last 12 months?	Communication (e-mail, chat) Information search Purchasing/ordering goods or services Health related activities Interaction with public authorities Using electronic banking or other financial services Education, research and related activities Reading/downloading online newspapers/news magazines Playing/downloading games, music, software	A, C, E, O, *ES*	Bb, Cl, Co, CR, Mx, S, TT	Consoli-dated practice
H-A11. What kind of products/services did you buy over the Internet?	Food Electronics (Entertainment) Video Music Publications (books, magazines, etc.) Hardware Software Travel Tickets Banking and financial Automotive products Clothing, jewelry, accessories House wares (furniture & appliances) Others	C, O, *ES*	Bb, Co, Mx, TT	Consoli-dated practice
H-A12. What was the value of purchased goods/services over the Internet the last X months?	Ranges of expenditures Do not know	C, O	Bb, Mx, TT	Consolidated practice

Source: Own elaboration based on institutions investigated.

The number of this first set of questions appears to be quite large. Many of these questions, however, are already part of different household surveys of countries, some of them even form part of every ICT related survey included in the analysis. Only a manageable number of questions will have to be added to the survey of each country.

These core questions, according to the Model for E-Commerce Indicators developed by OECD's Working Party on Indicators for the Information Society, can be divided into readiness, usage of the Internet and impact indicators. Following this classification, questions H-A1 to H-A6 can be assigned to the Readiness group, H-A7 to H-A12 to the Usage group. As explained in section 2.4, no Impact indicators were analyzed.

In the following pages, each indicator will be discussed in terms of inclusion in the list of core questions and response options in household surveys.

Question H-A1. Does this household have a fixed line telephone? H-A2. Does this household have a mobile telephone? H-A3. Does this household have TV? H-A4. Does this household have a personal computer (PC)? and **H-A5. Does this household have an Internet access at home?:** The first five questions are identical to the ones of census surveys.

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Once per decade, the census survey reestablishes the validity of these variables. Startingfrom this base, the sample surveys provide a regular adjustment of these variables. In this manner, the census and the household surveys complement each other.

These questions possess the highest priority within the surveys investigated across different regions. They are part of the surveys of the institutions of international reference,[158] as well as the surveys of LAC.

H-A2a. How many members of the household have access to a mobile phone? This is one additional question proposed for household surveys during the Workshop on Information Society Measurement for Latin America and the Caribbean. It is important not only to know if someone in the household has a mobile phone or how many phones are there in the household, but how many members of the household have access to a mobile phone. In this way one is considering access instead of ownership.

Question H-A6. What modes of access/bandwidth does the household use for Internet access? This question is also part of the list of proposed core indicators by the OECD,[159] the eEurope 2005 benchmarking indicators,[160] Canadian ICT compendium 2003[161] and the proposed Eurostat 2005 informal version.[162] Additionally, it is being surveyed in Barbados, Colombia, Costa Rica, México, as well as Trinidad and Tobago.

There are two aspects to this topic. The first one is whether a person is accessing the Internet via a broadband connection or via, for example, an analogue modem. Broadband access is defined by the European Commission as "high speed e.g. xDSL, cable, satellite, fixed-wireless, LAN and UMTS".[163]

The applications related to Internet activities, streaming video technologies, for instance, demand more and more bandwidth. The question, therefore, is not only if a person is able to access the Internet but if that person has the ability to make use of the applications he or she desires to use due to the bandwidth of the technology required. Consequently, if applications become too large to be handled by low bandwidth technologies, even people that are connected to the Internet, but lack sufficient bandwidth, may be excluded from the information society.

The other aspect of the topic is related to the advance and penetration of new modes of access, i.e. access technologies, such as different mobile access technologies like the 3G standard that, in the case of the European Union, would be implemented through UMTS technology.[164]

The specific response options depend on the technologies available in a given country.

Table 3.14 shows the common items derived according to the different selection criteria. In this case, the Relevance Analysis criterion was not applied, since there was no indication of an item of a special interregional or regional importance that would not have already been included using the first two (International Reference and LAC Reference) selection criteria.

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[158] cp. OECD (2003c), p. 7 or European Commission (2002a), p. 5
[159] cp. OECD (2003c), p. 9
[160] cp .European Commission (2002a), p. 11
[161] cp. Statistics Canada (2003a), p. 96
[162] cp. Eurostat (2004a), p.2
[163] cp .European Commission (2002a), p. 11
[164] Universal Mobile Telecommunications System

TABLE 3.14
RESPONSE OPTIONS FOR MODES OF ACCESS USED FOR INTERNET ACCESS

Modes of access/bandwidth used for Internet access	Criteria of Selection	
	International Reference	LAC Reference
Analogue modem	O, *ES*	Bb, Co, CR, Mx, TT
ISDN	O, *ES*	Co
xDSL	C, E, O, *ES*	Bb, TT
Cable	C, E, O, *ES*	Co, CR, Mx
Mobile wireless	O, *ES*	Co, TT
Fixed wireless (Wi-Fi)	O, *ES*	Co
Other	O	Co, TT

Source: Own elaboration based on European Commission, OECD, Statistics Canada, Eurostat, DANE, INEC.

Question H-A7. Where did you use the Internet most frequently in the last 12 months?
This question has been included as a core question for various reasons. It figures among surveys of the institutions of international reference on a broad basis, the eEurope 2005 related surveys,[165] Statistics Canada's Household Internet Use Survey,[166] the OECD's list of core indicators[167] and the proposed Eurostat 2005 informal version[168]. It is also already being surveyed in various LAC countries investigated, such as Barbados, Chile, Colombia, Costa Rica, México and was proposed by the SITIC initiative.[169] The response options adopted for this question have been very similar throughout the different surveys, they are displayed in Table 3.15.

TABLE 3.15
RESPONSE OPTIONS FOR LOCATIONS OF INTERNET USE

Locations of Internet use	Criteria of Selection	
	International Reference	LAC Reference
At Home	C, E, O, *ES*	Bb, Cl, Co, CR, Mx, TT, S
At Work	C, E, O, *ES*	Bb, Cl, Co, CR, Mx, TT, S
Educational Facility (includes public libraries)	C, E, O, *ES*	Bb, Cl, Co, CR, Mx, TT, S
Free or subsided public access center[170]	C, E	Bb, Cl, Co, S
Comercial access center (Cyber Café, Kioskonet, etc.)	E, O, *ES*	Bb, Cl, Co, CR, TT,
At another person's home (House of friend, relative or neighbor)	O, *ES*	Bb, Cl, Co, Mx
Other	C, E, O, *ES*	Cl, Co, CR, Mx, TT, S

Source: Own elaboration based on European Commission, OECD, Statistics Canada, DANE, INE (Cl), SITIC

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[165] cp. European Commission (2002a), p. 5
[166] cp. Statistics Canada (2001), p. 38
[167] cp. OECD (2003c.), p. 7
[168] cp. Eurostat (2004a), p.4
[169] cp. INEI (2003b), p. 27
[170] These are defined as centers subsidized by public funds or run by public authorities.

Of special importance are the definitions of the items "Digital Community Center" and "Private Location". These form part of a *Community Access* measurement initiative addressing the question of who uses public versus private locations to access the Internet.

BOX 3.1
COMMUNITY ACCESS MEASUREMENT IN LAC

Establishing a set of adequate community access indicators is an additional building block of a future measurement instrument for LAC. Within the Plan of Action agreed on at the World Summit on the Information Society in Geneva, two of the goals to be reached by 2015 were "to connect villages with ICTs and establish community access points" and "to ensure that more than half the world's inhabitants have access to ICT within their reach".

Community access measurement, however, is still in a fledging stage. It is, for instance, not even completely clear what should be subsumed under community access facilities. So most definitions include private Internet cafés, while the European Commission explicitly excludes these. Key issues in the definition are agreed upon, though. These are that (1) Internet access has to be provided to the (2) general public by (3) private or (4) public institutions, so-called *Public Internet Access Centers (PIACs)*. These PIACs can be *Digital Community Centers (DCCs)* or other PIACs, such as *Internet cafés, Telecenters*, *Postoffices*, etc. *Education Centers* can be included as PIACs when they open the general public outside teaching hours and satisfy the proposed conditions for any of both kinds of PIACs.)

Measuring community access always means measuring a supply and a demand side, i.e. surveys among the users and providers of PIACs. The most convenient way, would be to measure both sides within a single survey vehicle. Unfortunately this is not always feasible, so the most appropriate approach is to include demand side measurement in household surveys. A number of important community access indicators concerning the demand side already forms part of proposed household survey questions. Examples are the *number of people who use the Internet from PIACs* (see question H-A7), the *age of users of PIACs* (see question H-A7), the *frequency of use by a respective user by type of PIAC* (see question H-B16 in the Supplementary List), the *number of male/female PIAC users* (see question H-A7), or the *content* consumed (see question H-A10). All these indicators are already included in various questions proposed for household surveys. Another possible indicator on the importance of PIACs would be to ask *how frequently a person uses the Internet in places other than home or work*. Response options could be "1 out of 10", "3 out of 10", "5 out of 10", "7 out of 10", or "10 out of 10" times.

The supply side of community access can be measured in a very limited manner in household surveys. This task should rather be taken on by *Telecommunication Regulators* in a separate study, not necessarily by the NSO. However, it would be very convenient if close cooperation existed between NSO and national telecommunications regulatory authority. The telecom regulator can provide the data needed from the supply side, such as the *density of different types of PIACs in urban and rural areas*, the *total number of computers in DCCs and other PIACs*, the *average hourly access cost*, *public subsidies to DCCs* or, the *user satisfaction*. Some of these questions will be directed at the proprietors of PIACs, others at their clients.

Source: European Commission (2000), p. 9, ITU (2003a), pp. 1 et seq. and ITU (2003c), pp. 1 et seq., ITU (2003e), ITU (2003f), p. 1, pp. 4-7, ITU (2003h), pp. 1 et seq., ITU (2004), WSIS (2004), p. 2

Shared-access models are important to provide understanding on the nature of the information society in the LAC region. For some countries in the region it is estimated that users of public access centers make up for 80-90 percent of all Internet users. A possible approach towards community access in LAC is illustrated in the box above.

Question H-A8. How often did you usually use the Internet in the last 12 months? One of the central topics within Internet related behavior in households is the question about the frequency a person uses the Internet. The OECD in its indicators list,[171] Statistics Canada,[172] the European Commission,[173] the proposed Eurostat 2005 informal version,[174] as well as Barbados, Colombia, Mexico and Trinidad and Tobago[175] in the LAC region, are employing

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[171] cp. OECD (2003c), p. 9
[172] cp. Statistics Canada (2001), p. 40
[173] cp. European Commission (2002a), p. 5
[174] cp. Eurostat (2004a), p.4
[175] cp. NIHERST (2002), p. 33

this question. Questions on specific locations and frequency of access will be addressed at in the supplementary list of indicators in section 3.4.3 (see questions H-B4 and H-B5, H-B10 and H-B11, H-B12 and H-B13).

Response options can be viewed in Table 3.16. They are the intervals used by the institutions of international reference and are also part of OECD's core list of indicators for ICT measurement. Therefore, comparability is assured on a broad international basis. Furthermore these intervals are a result of interval tests of various statistic offices of OECD member countries over several years.[176]

TABLE 3.16
FREQUENCY OF INTERNET USE OF PERSONS

At least once a day
At least once a week, but not every day
At least once a month, but not every week
Less than once a month

Source: OECD (2003c), p. 8

Question H-A9. How many hours did you usually spend on Internet use weekly over the last 12 months?: When determining if a person can be considered a "member of the information society", it is not only important to know if that person has the opportunity to access a PC or the Internet and with what frequency this person does so (see Questions H-A8 and H-B17), but also how much time the person spends using the PC or the Internet. If a person, for instance, only writes one e-mail during his or her 10 minutes Internet session daily, this person will score very high in question H-A8. On the contrary, a person doing an extensive 5 hour Internet session once a week, will score fairly low. This would obviously distort the picture about the aggregated intensity of Internet usage per week between the two users. This question aim to better quantify the true participation of the population in the information society. A similar question has been asked by Barbados and Trinidad and Tobago. Furthermore, it was suggested to be included as core question by participants in the Workshop on Information Society Measurement for Latin America and the Caribbean.

Question H-A10. For what services/activities have you used the Internet in the last 12 months? This question is one of most important questions in the context of household ICT surveys and is incorporated in most of the institutions that are conducting ICT related surveys: the institutions of international reference as well as those from Latin America and the Caribbean. Due to the number of surveys asking this question, different response options from different countries had to be synthesized by using the first two selection criteria (International Reference and LAC Reference). The response options used in LAC surveys sometimes mix items related to purposes of use with others related to specific activities according to OECD categorization in these two types. Then, it is recommended to make difference between purposes and activities as OECD proposes[177] (see question H-B15 of supplementary list). The Relevance Analysis criterion did not have to be applied since no items had to be integrated due to a special interregional or regional importance. The response options were widely discussed during the Workshop on Information Society Measurement for Latin America and the Caribbean. The result of the synthesis, i.e. the items discussed, is displayed in Table 3.17.

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[176] cp. OECD (2003b), p. 2
[177] cp. OECD (2003c), p. 8

TABLE 3.17
RESPONSE OPTIONS CONCERNING SERVICES/ACTIVITIES A PERSON USES THE INTERNET FOR

Services/activities a person uses Internet for	Criteria of Selection	
	International Reference	LAC Reference
Communication (e-mail, chat)	C, E, O, *ES*	Bb, Cl, Co, CR, Mx, S, TT
Education activities	A,C, E, O, *ES*	Bb, Co, Mx, S, TT
Finding information about/interact with government	A, C, E, O, *ES*	Co, S
Finding information about goods and services, etc.	C, E, O, *ES*	Bb
Purchasing/ordering goods or services	A,C, O, *ES*	Bb, Ci, Co, TT
Finding health related information	C, O, *ES*	Bb, Co
Finding general information / online search	-	Ci, Co, CR, Mx, TT
Using electronic banking or other financial services	C, E, O, *ES*	Bs, Co, S
Playing/downloading games, music, software	C, E, O, *ES*	Bb, Co, Mx, S, TT
Reading/downloading online newspapers/news magazines	E, O, *ES*	Co, S

Source: Own elaboration based on ABS, European Commission, OECD, Statistics Canada, Eurostat, DANE, INE (Cl),   NEGI, NCST, NIHERST, SITIC

Question H-A11. What kind of products/services did you buy over the Internet? The question about products and/or services acquired over the Internet are incorporated in a considerable number of surveys. On the one hand, it is already part of OECD's model questionnaire for household surveys,[178] Statistics Canada's ICT compendium,[179] as well as proposed Eurostat 2005 informal version.[180] On the other hand it has also found its way in LAC surveys, such as the Barbadian, Colombian, Mexican as well as Trinidad and Tobago's.

        To establish a list of definite response options for the entire LAC region would be very difficult, bearing in mind all different products and services available in different countries. Therefore, the items of Table 3.18 are to be viewed as a proposal aimed at a high level of comparability but not as a rigid and inadaptable list. They were derived in the same manner as the items of question H-A10 (Services/activities the Internet is used for), which are displayed in Table 3.17. In the case of Trinidad y Tobago, information is combined from two surveys.[181]

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[178] cp. OECD (2003b), p. 18
[179] cp. Statistics Canada (2001), p. 44
[180] cp. Eurostat (2004a), p.7
[181] cp. NIHERST (2002), p.35 and NeCS (2003a), p.19

TABLE 3.18
RESPONSE OPTIONS FOR PRODUCTS/SERVICES BOUGHT OVER THE INTERNET

Products and services bought over the Internet	Criteria of Selection	
	International Reference	LAC Reference
Food	C, O, *ES*	Co, TT
Electronics (Entertainment	C, *ES*	Bb, Co, TT
Videos	C, O, *ES*	Bb, Co, TT
Music	C, O, *ES*	Bb, Co, Mx, TT
Publications (books, papers, magazines, etc.)	C, O, *ES*	Bb, Co, Mx, TT
Hardware	C, *ES*	Bb, Co, TT
Software	C, O, *ES*	Co, Mx, TT
Travel	C, O, *ES*	Bb, Co, Mx, TT
Tickets for events	C, O, *ES*	Mx
Banking and financial	C, O, *ES*	Co, TT
Automotive products	C	Bb, TT
Clothing, jewelry, accessories	C, *ES*	Bb, Co, Mx, TT
Housewares (furniture & appliances)	C, *ES*	Co, Mx, TT
Others	C, *ES*	Bb, Co, Mx, TT

Source: Own elaboration based on OECD, Statistics Canada, Eurostat, DANE, INEGI, NeCS, NIHERST

Question H-A12. What was the value of purchased goods/services over the Internet in the last X months?: The value of purchases of goods and/or services over the Internet is asked by Statistics Canada[182] and the OECD.[183] Barbados, Mexico, as well as Trinidad and Tobago have also included the question.[184]

The response options are usually ranges of money spent. These ranges, of course, would have to be established by each country specifically. Furthermore, to be able to compare the results internationally, one would have to calculate the amount an individual spent on Internet purchases in relation to a common base, such as the total income of the respective individual. The critical aspect of this question is the recall period applied. The twelve-month recall period proposed by OECD's WPIIS caused concerns in a number of member countries. While a twelve-month period has the advantage that bias occurring due to seasonal purchasing behavior (around Christmas, for example) can be avoided, it shows the inconvenience that a recall bias effect may be introduced which might lead to underestimation of the amount spent.[185] The problem of a shorter recall period is that international comparability is lost, since reference dates may differ. Therefore, the OECD at this point suggests that each country may select its own recall period for value of Internet purchases, which should be capable of producing reasonable quality unbiased annual estimates, i.e. avoiding recall or seasonal bias.[186]

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[182] cp. Statistics Canada (2001), pp. 43 et seq.
[183] cp. OECD (2003c), p. 9
[184] cp. NIHERST (2002), p. 35
[185] cp. OECD (2003b), p. 5
[186] ibid.

3.4.3 Supplementary List

The next block of questions deals with the supplementary list introduced in section 3.4.1. The core questions discussed so far are proposed to be incorporated in household surveys. The decision about the additional incorporation of questions from the supplementary list in household surveys will have to be based on the amount of financial resources available. The supplementary list is intended to function as a "shopping list" to add valuable question to the investigation concerning the readiness for the adoption and use of ICT and related issues in a given country.

Table 3.19 offer an overview of all questions of the supplementary list. The abbreviations used in the table within the Selection Criteria column are indicating which organization or country is already employing the questions. They are the same as in Table 3.12. The Relevance Analysis did not have to be applied within this catalogue.

TABLE 3.19
SUPPLEMENTARY LIST OF HOUSEHOLD SURVEY QUESTIONS

Question	Response Options	Selection Criteria	
		Intern. Reference	LAC Reference
H-B1a. Does this household have cable TV?	Yes No	C, *ES*	Ar, CR, Mx, Pa, Pe, S, TT
H-B1b. Does this household have TV via satellite?	Yes No	C, *ES*	Bb, Mx
H-B2. By which means do members of this household access the Internet at home?	Through a home PC Through a portable computer Through a digital television set or set top box Through a mobile phone Through a games machine with Internet connection Using other means? (Please specify)	E, O, *ES*	-
H-B3. In the last 12 months, did you use a computer at home?	Yes No	O, *ES*	-
H-B4. In the last 12 months, did you access the Internet at home?	Yes No	O, *ES*	S
H-B5. How often did you usually access the Internet at home in the last 12 months?	At least once a day At least once a week but not every day At least once a month but not every week Less than once a month	O	-
H-B6. Why does the household not possess a PC?	High Cost Not necessary/no one to use it Lack of computer education/training Use at workplace or elsewhere Other (Please specify)	-	Bb, Mx, TT
H-B7. Household barriers to Internet use (Why does the household not have an Internet access)?	Costs too high Lack of skills Lack of interest Language barrier Insufficient equipment/hardware Use Internet elsewhere Other (Please specify)	O, *ES*	Bb, Mx
H-B8. Why did you not buy over the Internet?	Have no need (but have no objection in principle) Prefer to shop in person or like to see the product Security concerns (worried about giving debit or credit card details over the Internet) Privacy concerns (worried about giving personal details over the Internet) Concerned about warranties, receiving or returning goods Delivery of goods ordered over the Internet is a problem (e.g. takes too long or is logistically difficult) No access to a credit card More expensive than traditional forms of shopping Speed of connection is too slow Other (Please specify)	O, *ES*	Bb, TT

(continuation Table 3.19)

H-B9. In the last 12 months, did you use a PC at work?	Yes No	O, *ES*	-
H-B10. In the last 12 months, did you access the Internet at work?	Yes No	O, *ES*	-
H-B11. How often did you usually access the Internet at work in the last 12 months?	At least once per working day At least once a week but not every working day At least once a month but not every week Less than once a month	O	-
H-B12. Did you access the Internet at places other than home or work in the last 12 months?	Yes, using a mobile access device (e.g. a portable computer connected to a mobile phone, mobile WAP phone) Yes, using a fixed access device No	O	-
H-B13. How often did you use the Internet in a Public Internet Access Center [(Educational Facility, Digital Community Center or Free Access Center, Commercial Access Center (Cyber Café, etc..)]?	At least once a day At least once a week, but not every day At least once a month, but not every week Less than once a month (*Offer these response options for each type of location*)	-	-
H-B14. For what purposes do you use the PC?	Paid work or business Education or study Voluntary or community work Personal or private Other	-	Bb, Cl, Co, Mx, TT
H-B15. For what purposes do you use the internet?	Paid work or business Education or study Voluntary or community work Personal or private Other	A, O	Bb, Cl, Co, CR, Mx, TT
H-B16. Where did you have the most frequent access to a PC in the last 12 months?	At Home At Work Educational Facility At another person's home Free public access center (specific denomination depends on national practices) Commercial access center (specific denomination depends on national practices: cyber café, Kioskonet, etc.) Other	-	Cl, Co
H-B17. How often did you usually use a PC in the last 12 months?	At least once a day At least once a week, but not every day At least once a month, but not every week Less than once a month	*ES*	TT
H-B18. How many hours did you usually spend on PC use weekly over the last 12 months?	Number of hours per week	-	Bb, TT
H-B19. On which service/activity carried out on the Internet did you spend the most time?	(Please specify)_____	O	-
H-B20. Did you make use of online payment (e.g. via credit card)?	Yes No	O	TT

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(*continuation Table 3.19*)

H-B21. Are you satisfied with the service provided by the Internet establishment?	**If not:** High Cost Too much time for connection Interruption while working Other (Please specify):	-	Bb, TT
H-B22. In the last 12 months, did you buy or order goods or services for personal or domestic use over the Internet?	Yes, at home Yes, at work Yes, at other places No	O, *ES*	-
H-B23. How often did you usually buy or order goods or services for personal or domestic use over the Internet in the last 12 months?	At least once a week At least once a month but not every week At least every three months but not every month Less than once every three months	O	-
H-B24. Where did you buy goods/services over the Internet?	Within the country Within Andean Region/Caribbean/Central America/Mercosur (depending on which subregion is the country located in) Within Latin American or the Caribbean region Outside LAC region	O	Bb, Mx
H-B25. What is the language of the Internet sites are you using?	Spanish Portuguese English Indigenous Language (to be defined by each country) Other	-	-

Source: Own elaboration based on institutions investigated

The questions within the supplementary list have also been grouped by *Readiness* and *Usage* indicators according to the WPIIS Model. Questions H-B1 to H-B10 by this classification belong to the readiness group, questions H-B11 to H-B25 to the usage group. As explained previously, no *Impact* indicators were considered.

Question H-B1a. Does this household have cable TV? This question is only asked by one of the institutions of international reference, namely Statistics Canada[187] and it is projected to be included in the proposed Eurostat survey on ICT in household 2005 informal version[188] as an answer option. The question has interregional relevance. Cable TV penetration rates between the developed world and LAC differ substantially. The rate in Brazil and Colombia is as low as 8.6 percent and 2.9 percent respectively,[189] while it reaches 45.4 percent in Finland and even 95 percent in Belgium.[190] Furthermore, as explained in section 3.3.1, due to the ongoing ICT convergence, additional potential access technology, like digital TV through cable, should be taken into consideration. Another alternative access technology for digital TV would be through satellite. Integrating these two aspects in one question should be considered for the future.

Question H-B1b. Does this household have TV via satellite? This question is asked by Statistics Canada[191] and is included as an answer option in the proposed Eurostat 2005 informal version.[192] Barbados and Mexico[193] are the only LAC countries asking it. It goes hand in hand with the argument for cable TV, namely tracking new access technologies for the Internet. Due to the lack of international presence,[194] the question is not included in the core block of questions. It would be recommendable, however, to integrate this aspect in the

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[187] cp. Statistics Canada (2001), p. 39

[188] cp. Eurostat (2004a), p. 1

[189] cp. World Screen News (2004b)

[190] cp. World Screen News (2004a)

[191] cp. Statistics Canada (2001), p. 39

[192] cp. Eurostat (2004a), p.1

[193] cp. INEGI (2004b)

[194] Eurostat is just proposing it.

question regarding the possession of cable or asking one TV question that includes for example: satellite TV, cable TV, digital TV, as Eurostat proposal.

Question H-B2. By which means do members of this household access the Internet at home? This question addresses the means of access an individual uses to access the Internet at home. It forms part of the eEurope benchmarking indicators[195] as well as the OECD model questionnaire for ICT measurement in households[196] and the proposed Eurostat 2005 informal version.[197] It possesses special importance bearing in mind the technological progress and the so-called ICT-convergence that permits that people access the Internet by other means than just the PC.[198] This question provides valuable information to track the dynamics and the importance of ICT-convergence.

The response options to the question have been taken from the OECD questionnaire, since the items surveyed by the EU are part of the OECD items and Eurostat proposal is very similar, including only one additional option: handheld computer. Table 3.20 shows these items.

TABLE 3.20
RESPONSE OPTIONS FOR MEANS OF INTERNET ACCESS AT HOME

Means of access to Internet at home
Through a home PC
Through a portable computer
Through a digital television set or set top box
Through a mobile phone
Through a games machine with Internet connection
Using other means? (Please specify)

Source: OECD (2003b), p. 12

Question H-B3. In the last 12 months, did you use a computer at home? and **H-B4. In the last 12 months, did you access the Internet at home?** Both questions are part of the OECD model questionnaire for ICT and e-commerce measurement in households/for individuals.[199] The proposed Eurostat 2005 informal version[200] includes two specific questions: where have you used a computer in the last three months? Where have you used the internet in the last three months? Both include home as an answer option, but related to a period of three months, not twelve months. The period for this kind of questions should be discussed in future events, but the decision of which period to use is let to the country. It is recommendable to maintain the international comparability. Furthermore H-B4 has been proposed by the SITIC initiative.[201] They inquire what proportion of people that own a PC have used this PC in the last year and what proportion that has access to Internet, uses it. Since a computer is necessary to access the Internet, it can be expected that the second group form part of the first group.

Question H-B5. How often did you usually access the internet at home in the last 12 months? The question is taken from the OECD household/individuals model survey.[202] the response options are the same of the response options of H-**A**8, the core-list question about the frequency a person uses internet, illustrated in Table 3.16. The added value of this question is that one is able to now about the frequency of internet use at home.

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[195] cp. European Commission (2002a), p. 5

[196] cp. OECD (2003b), p. 12

[197] cp. Eurostat (2004a), p.1

[198] For a discussion about the process of ICT convergence and its implications for developing countries, i.e. in the context of Latin America, see Hilbert/Katz (2003), pp. 25-29

[199] cp. OECD (2003b), p. 14

[200] cp. Eurostat (2004), pp.3, 4

[201] cp. INEI (2003b), p. 27

[202] cp. OECD (2003b), p. 14

Question H-B6. Why does the household not possess a PC?: Barbados, Mexico and Trinidad and Tobago[203] are the LAC countries surveying this question. It is not present in any of the surveys of the institutions of international reference. However, PC penetration rates in LAC are still very low. In 2002, there were only seven PCs per 100 inhabitants in the LAC region, while this number for the "EU15-countries" amounted to 34, 49 in Canada and 66 in the USA.[204] Therefore, there is no longer urgent need to inquire about this rate in countries of the developed world, while it remains a fundamentally important question for the LAC region. The response options for this question have been adopted from Trinidad and Tobago's survey. Barbados and Mexico's response options can be adapted to them. They are displayed in Table 3.21.

TABLE 3.21
RESPONSE OPTIONS FOR HOUSEHOLD BARRIERS TO THE USE OF THE INTERNET

Household barriers to PC possession
High Cost
Lack of computer education/training
Not necessary/no one to use it
Use at workplace or elsewhere
Other (Please specify)

Source: NIHERST (2002), p. 31

Question H-B7. Household barriers to Internet use (Why does the household not have an Internet access)? Question H-B7, which surveys the existing barriers to household Internet use, constitutes part of the OECD's model questionnaire for ICT usage measurement in households/by individuals[205] and the proposed Eurostat 2005 informal version.[206] It has also been incorporated in the core list of indicators for ICT measurement proposed by the OECD.[207] In the LAC region, Barbados and Mexico have incorporated this question to their surveys. As the anterior question, the question about barriers to the adoption of the Internet possesses a high importance for the Latin American and Caribbean region. Internet penetration rates were around 6.4 percent in 2002.[208] This same penetration rate had already reached 21.6 percent on average, in Europe in 2002, even though there are countries with very low penetration rates, such as Moldova and Belarus with 3.4 percent and 8.2 percent respectively.[209] The response options to this question can be found in Table 3.22. They have been adopted from the OECD list of core indicators and the Mexico's household ICT readiness and usage Survey.

TABLE 3.22
RESPONSE OPTIONS FOR HOUSEHOLD BARRIERS TO THE USE OF THE INTERNET

Household barriers to PC possession
Costs too high
Lack of skills
Lack of interest
Language barrier
Insufficient equipment/hardware
Use Internet elsewhere
Other (Please specify)

Source: OECD (2003c), p. 9, INEGI Endutih (2004)

Question H-B8. Why did you not buy over the Internet? The next question of the supplementary list is the question about barriers encountered in the adoption of purchasing goods or services online. The question has been derived from OECD's ICT model survey for

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[203] cp. NIHERST (2002), p. 31
[204] cp. ITU (2003b), pp. 1-3
[205] cp. OECD (2003b), p. 13
[206] cp. Eurostat (2004), p.2
[207] cp. OECD (2003c), p. 9
[208] cp. ITU (2003b), pp. 1 et seq.
[209] cp. ITU (2003b), p. 3

households and individuals.[210] Besides, it is included in the proposed Eurostat 2005 informal version.[211] In the LAC region, Barbados and Trinidad and Tobago have incorporated the question in their recent surveys. The response options have been adopted from the common items derived according to the mentioned surveys. The items from which selection was made can be found in Table 3.23.

TABLE 3.23
RESPONSE OPTIONS FOR BARRIERS TO PURCHASE GOODS/SERVICES OVER INTERNET

Barriers to purchasing goods/services over the internet	Criteria of Selection	
	International Reference	LAC Reference
Have no need (but have no objection in principle)	O, *ES*	Bb
Prefer to shop in person or like to see the product	O, *ES*	Bb
Security concerns (worried about giving debit or credit card details over the Internet)	O, *ES*	Bb, TT
Privacy concerns (worried about giving personal details over the Internet)	O, *ES*	Bb
Concerned about warranties, receiving or returning goods	O, *ES*	Bb, TT
Delivery of goods ordered over the Internet is a problem (e.g. takes too long or is logistically difficult)	O, *ES*	-
No access to a credit card	*ES*	Bb, TT
More expensive than traditional forms of shopping	O, *ES*	Bb
Lack of skills	*ES*	-
Shipping costs are prohibitive		TT
Customs duties are prohibitive		TT
Speed of connection is too slow	O, *ES*	-
I could not find what I wanted		TT
Others (please specify)	O, *ES*	Bb, TT

Source: OECD (2003b), p. 17, Eurostat (2004a), p.8, NCST (2004), p.43, NeCS (2003a), p.9

Questions H-B9. In the last 12 months, did you use a PC at work? and **H-B10. In the last 12 months, did you access the Internet at work?**

These two questions have been adopted from the OECD household/individuals model survey. [212] As mentioned for questions H-B3 and H-B4, the proposed Eurostat 2005 informal version[213] includes two specific questions related, and both include work as answer options, but related to a period of three months, not twelve months. These questions inquire additional information about individual ICT usage in households.

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[210] cp. OECD (2003b), p. 17
[211] cp. Eurostat (2004a), p.8
[212] cp. OECD (2003b), p. 14
[213] cp. Eurostat (2004a), p.3, 4

Question H-B11. How often did you usually access the internet at work in the last 12 months? The question also is taken from the OECD household/individuals model survey.[214] The response options are similar to the response options of H-A8, the core-list question about the frequency a person's internet use, illustrated in Table 3.16 with the difference being that the term "working days" is used in question H-B11 instead of "days" in question H-A8.

Question H-B12. Did you access the Internet at places other than home or work in the last 12 months? H-B12 is another question adopted from the OECD household/individuals model survey.[215] It investigates in more detail by what means a person accesses the Internet, via mobile or fixed channels. While this question is aimed at the different Internet access patterns with regard to mobile and fixed devices, in Latin America and the Caribbean it might be valuable to extend the response options to other alternative fixed access devices, such as digital community centers, educational facilities or the common Internet access at the house of a neighbor or friend. The response options used can be found in Table 3.24.

TABLE 3.24
RESPONSE OPTIONS FOR PLACES AND ACCESS DEVICES OF INTERNET ACCESS OTHER THAN AT HOME OR WORK

Places and access devices of Internet access other than at home or work
Yes, using a mobile access device (e.g. a portable computer connected to a mobile phone, mobile WAP phone)
Yes, using a fixed access device at a digital community center
Yes, using a fixed access device at an educational facility
Yes, using a fixed access device at a private location (Cyber Café, house of a neighbor, Kiosk net, etc.)
No

Source: Own elaboration, adapted from OECD (2003b), p. 15

Question H-B13. How often did you use the Internet in a Public Internet Access Center? H-B13 is another question related to *Community Access* measurement introduced within question H-A7.[216] The question aims at investigate the frequency a person uses *Public Internet Access Centers* (PIACs) in order to get better insight about the usage patterns of this important part of the LAC information society. These PIACs include educational facilities, digital community centers and private locations. The frequency is inquired for each one of these options.

Question H-B14. For what purposes do you use the PC? Chile,[217] Colombia,[218] Mexico as well as Trinidad and Tobago[219] have incorporated this question in their surveys. The OECD classification to the response options from the purposes of Internet question[220] have been adopted for the purposes of PC use. These response options are listed in table 3.25.

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[214] cp. OECD (2003b), p. 14
[215] cp. OECD (2003b), p. 15
[216] For more details on the discussion on Public Internet Access Centers please see : ITU (2003a), ITU (2003c), ITU (2003e), ITU (2003f), ITU (2003h), ITU (2004)
[217] cp. MIDEPLAN (n.d.), p. 2
[218] cp. DANE (2003a), p. 70 y 170
[219] cp. NIHERST (2002), p. 33
[220] cp. OECD (2003c), p. 8

TABLE 3.25
RESPONSE OPTIONS FOR PURPOSES OF PC AS WELL AS INTERNET USE

Purposes of PC
Paid work or business
Education or study
Voluntary or community work
Personal or private
Other

Source: OECD (2003c), p. 8

Two reasons justify this decision. First of all, as one can see in Table 3.26, two of the countries obtaining this variable encountered–depending on the answer options they gave– about the same priorities for the purposes of the PC use.

TABLE 3.26
PURPOSES OF PC USE IN CHILE AND COLOMBIA
(percentage)

Purposes of PC use	Chile	Colombia
Work	29.3	28.1
Studies	47.6	62.1
Entertainment/Fun	9.1	28.9
Improve knowledge	--	36.6
Be up to date concerning these tools	--	281
Financial transactions	--	2.4
Commercial transactions	--	2.0
Handle public entity related issues	--	1.9
Communicate with family and friends	--	12.8
Make use of e-mail	--	19.3
Get informed about News		9.0
Other personal necessities	2.4	0.4
Doesn't use it	11.5	--
Doesn't know/Doesn't respond	0.1	2.5

Source: BADEHOG (2003) and own calculation based on DANE (2003a), p. 77

These were "Work", "Studies", "Entertainment/Fun", "Improve knowledge", "Be up to date concerning these tools". The item "Entertainment/Fun" can be subsumed under the item "Personal or private", "Improve knowledge" and "Be up to date concerning these tools" under "Work or Studies". Therefore, a list, which integrates the different response options, is obtained. Secondly, with these response options, the question —again, if it is asked within the same survey—is comparable with the purposes a person uses the Internet for as well (see question H-B15).

The remaining response options for this question, such as "Make use of e-mail" or "Get informed about news", have been transferred to the question of what services and/or activities a person is using the Internet for (Question H-A10), as these activities are only possible with an Internet connection. This process has been illustrated in section 3.4.2.

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Question H-B15. For what purposes do you use the Internet? The question about the purposes of Internet use among individuals also forms part of the list of supplementary indicators for ICT measurement of the OECD.[221] Furthermore, it is surveyed by the Australian Bureau of Statistics[222] and Barbados, Chile, Colombia and Mexico in the LAC region. Despite of this question accomplishes the required characteristics to be core, it is not considered because of two reasons: first, in some countries, it has been mixed with "activities internet is used for" and second, OECD is considering if they continue asking it, because the obtained results have been unsatisfactory. Nevertheless, it is important to know Internet users behavior and Internet usefulness.

Right now, the OECD distinguishes between the *purposes of Internet use* and the *services or activities one uses the Internet for*. Different statistic entities phrase the question differently. The response options used by different statistic institutions are also sometimes taken from what OECD categorizes as purposes and sometimes as services or activities (see question H-A10). In order to obtain a clear concept, the nomenclature from the OECD seems to be adequate. Surveys can use this question together with question H-A10 in their questionnaires. Response options are displayed in Table 3.27. These are also the items that are proposed for LAC.

TABLE 3.27
RESPONSE OPTIONS FOR THE PURPOSES OF INTERNET USE

Purposes of Internet use
Paid work or business
Education or study
Voluntary or community work
Personal or private
Other

Source: OECD (2003c), p. 8

Other options used by Australia and Colombia, such as "Use of e-mail" or "Get informed about news", may be transferred to the question H-A10, the services/activities a person uses the Internet for. Figure 3.2 illustrates this process.

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[221] cp. OECD (2003c), p. 8
[222] cp. ABS (2003a)

FIGURE 3.2
RESPONSE OPTIONS OF QUESTIONS ARE SPLIT UP AND ASSIGNED TO DIFFERENT QUESTIONS TO ACHIEVE INTERNATIONAL COMPARABILITY
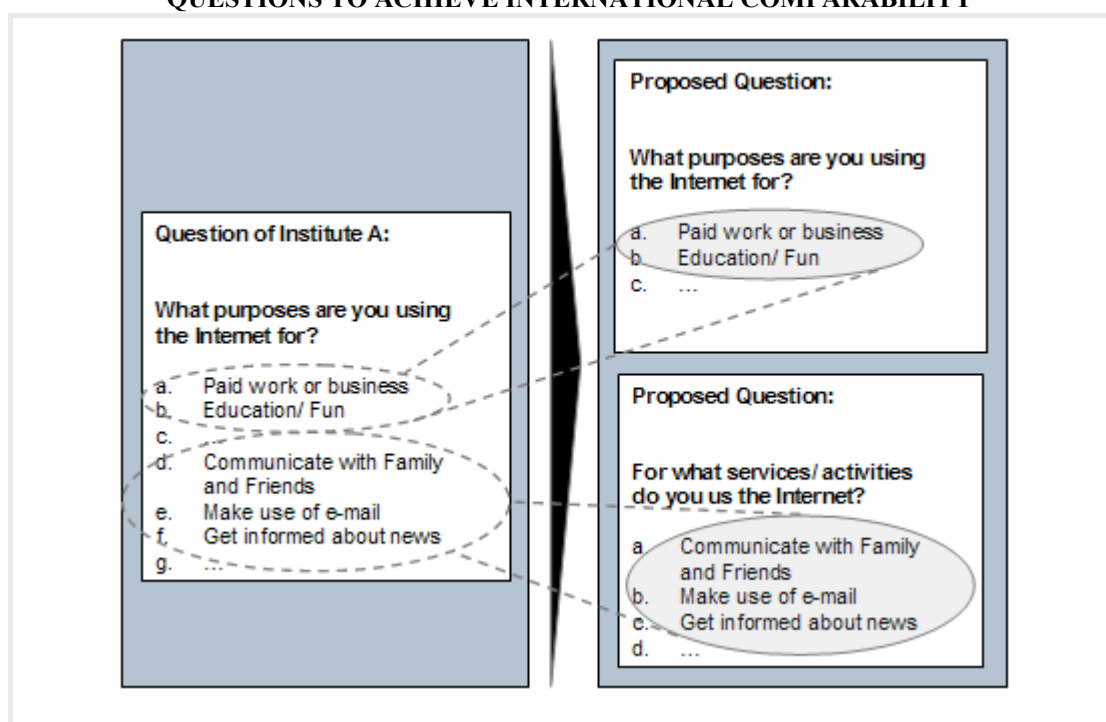
Source: Own elaboration

Question H-B16. Where did you have the most frequent access to a PC in the last 12 months? None of the institutions of international reference are incorporating this question about the location a person accesses the PC **most frequently**. However, Chile[223] and Colombia,[224] two countries where only 7.5 percent and 2.6 percent of the PCs have been connected to the Internet respectively in 2002,[225] are both asking this question. Table 3.28 displays the results. It can be stated that the most frequent locations are the home or workplace of the respondents as well as educational facilities. These options in total account for over 90 percent in Chile and more or less 90 percent in Colombia.

TABLE 3.28
LOCATIONS OF MOST FREQUENT PC USE IN CHILE AND COLOMBIA
(percentage)

Location of most frequent Pc use	Chile	Colombia
At Home	43.5	10.1
At Work	14.5	25.8
Educational Facility	37.8	58.1
Community Telecenter or Infocenter	0.1	1.0
Private Location (Cyber Café, Kioskonet, etc.)	0.2	3.7
Where there is a Relative or Friend	3.6	--
Other	0.3	2.5
Doesn't know/Doesn't respond	0.0[226]	3.6

Source: BADEHOG (2003) and DANE (2003a), p. 102

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[223] cp. MIDEPLAN (n.d.), p. 2

[224] cp. DANE (2003a), p. 102 y 170

[225] cp. ITU (2003b), p. 1

[226] These 0 percent are due to the fact that the no-response cases have already been filtered by a prior question

Due to the additional fact that these response options are identical with those of the institutions of international reference[227] about the location a person uses the Internet most frequently, they have been adopted as desirable options for the proposed list of questions. It should be considered that the Relevance Analysis from Chile and Colombia suggests that the response options "community centers" and "private locations" might not make a lot of sense for PC use only. They are almost insignificant, which is understandable, since most shared ICT access points which have PCs, also provide Internet access and only few users are not accessing this service when provided. However, by selecting these response options one also has the option to compare the answers given for the most frequent locations of PC —in case these two questions are asked in the same survey— with the answers given for most frequent Internet use, as it is done by Chile, for instance. Therefore, in order to keep these two questions comparable, the response options are not changed.

Question H-B17. How often did you usually use a PC in the last 12 months? This question is included in the proposed Eurostat 2005 informal version.[228] In Latin America, it has only been employed by Trinidad and Tobago.[229] This is justified, as only 7 percent of the PCs in this country have Internet access[230] and therefore it is essential to understand usage patterns of the 93 percent of the PCs without Internet, in order to understand the development of the information society. Furthermore, the logic of the questionnaire was designed in a way that only people that possessed a PC in their home were asked this question. In other surveys, such as the Chilean[231] one, respondents are usually asked where they use a PC, if they do not possess one at home, and subsequent questions are related to the purposes of PC use and the like.

In order to make the question comparable on an international level, two adaptations are proposed. The first is to change the logic underlying the question. As it has been in the example of the Chilean survey, instead of only applying it to home PCs it should specifically be asked in what locations a person is using a PC, as in question H-A14, and then asking how frequently that person uses the PC. The second adaptation is the adoption of the response options proposed for the frequency of Internet use by core indicator H-A8. By adjusting the question in this manner, it could —if both questions are being asked in the same survey— be compared to the frequency an interviewed person uses the Internet as well. The response options are displayed in 3.29.

TABLE 3.29
RESPONSE OPTIONS FOR FREQUENCY OF PC USE OF A PERSON

Frequency of PC use of persons
At least once a day
At least once a week, but not every day
At least once a month, but not every week
Less than once a month

Source: OECD (2003c), p.8

These options are nearly the same proposed in the Eurostat 2005 informal version.

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[227] cp. OECD (2003c), p. 7, European Commission (2002a), p. 5 or Eurostat (2004a), p.3
[228] cp. Eurostat (2004a), p.3
[229] cp. NIHERST (2002), p. 33
[230] cp. ITU (2003b), p. 2
[231] cp. MIDEPLAN (n.d.), p. 2

Questions H-B18. How many hours did you usually spend on PC use weekly over the last 12 months? This question has been asked by Barbados as well as Trinidad and Tobago.[232] As we stated in question H-A9, when determining if a person can be considered a "member of the information society", it is not only important to know if that person has the opportunity to access a PC and with what frequency this person does so (see Questions H-B17 and H-A8), but also how much time the person spends using the PC or the Internet.

Barbados asks for the number of hours per week, while Trinidad and Tobago asks for the daily use, employing categories from one hour up to five hours and more. The question has been adopted as in the way of Barbados's survey, because it is similar to the used for time spent on internet use (H-A9) proposed during the Workshop on Information Society Measurement for Latin America and the Caribbean.

Question H-B19. On which service/activity carried out on the Internet did you spend the most time? H-B19 is another one from the OECD's ICT household model survey.[233] It supplements question H-A10 of the core questions block, inquiring all services/activities a person uses the Internet for.

Question H-B20. Did you make use of online payment (e.g. via credit card)? The question on whether a person also paid for purchases realized via the Internet is being proposed for surveying in the OECD model questionnaire for household surveys.[234] Trinidad and Tobago's survey of household e-commerce usage and awareness[235] includes a specific question on the method of payment used to complete the Internet transactions. If this question is included, it would have to be in conjunction with the question if a person has been buying goods and/ or services over the Internet. The OECD, in its model questionnaire, has placed it following the question about which products and services a person has purchased over the Internet. The same is occurring in Trinidad and Tobago's survey.

Question H-B21. Are you satisfied with the service provided by the Internet establishment? This question would have to be broken down into two parts. First – as a filter – a respondent would be asked if he or she is satisfied with the service provided. If not, the person will be asked for his or her reasons of dissatisfaction. The response options are shown in Table 3.30. They have been adopted from Trinidad and Tobago's survey,[236] since it is the only country asking a specific question. Barbados is asking some related questions: degree of comfort with the Internet, satisfaction with speed and reliability of "in home" Internet access. If a person is satisfied, this question, of course, is skipped.

TABLE 3.30
RESPONSE OPTIONS FOR DISSATISFACTION WITH THE INTERNET SERVICE PROVIDED

Reasons of dissatisfaction with the Internet service provided
High Cost
Too much time to establish connection
Interruption while working
Other (Please specify)

 Source: NIHERST (2002), p. 34

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[232] cp. NIHERST (2002), pp. 33-34
[233] cp. OECD (2003b), p. 16
[234] cp. OECD (2003b), p. 19
[235] cp. NeCS (2003a), p.5
[236] cp. NIHERST (2002), p. 34

Question H-B22. In the last 12 months, did you buy or order goods or services for personal or domestic use over the Internet? This question has also been adopted from the OECD ICT and e-commerce model questionnaire for households/individuals.[237] It inquires about additional useful information on the patterns concerning e-commerce activities carried out by individuals with a special focus on the location where these transactions have been conducted. The response options are displayed in Table 3.31.

TABLE 3.31
RESPONSE OPTIONS FOR LOCATIONS FROM WHERE PRIVATE E-COMMERCE
TRANSACTIONS HAVE BEEN CONDUCTED

Locations of private e-commerce transactions
Yes, at home
Yes, at work
Yes, at other places
No

Source: OECD (2003b), p. 17

Question H-B23. How often did you usually buy or order goods or services for personal or domestic use over the Internet in the last 12 months? The question follows the anterior one asking for the frequency personal e-commerce activities have been carried out, instead of the locations from which this has been done. It has also been taken from OECD's ICT household model survey.[238] The response options differ slightly from the rest of the frequency questions, since it is expected that persons do not shop online with the same regularity as they access the Internet. Therefore the periods are longer. The items are displayed in Table 3.32.

TABLE 3.32
RESPONSE OPTIONS FOR FREQUENCY OF PRIVATE E-COMMERCE TRANSACTIONS

Frequency of private e-commerce transactions
At least once a week
At least once a month but not every week
At least every three months but not every month
Less than once every three months
Do not know

Source: OECD (2003b), p. 18

Questions H-B24. Where did you buy goods/services over the Internet? This question addresses the crucial issue of where a person primarily bought goods or services: in the domestic market, in the respective sub-region (Andean Region/ Caribbean/ Central America/ Mercosur), in the LAC region, or outside this region. This question has been adapted from the OECD,[239] which offers the domestic market, in Europe or abroad as response options, and

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[237] cp. OECD (2003b), p. 17
[238] cp. OECD (2003b), p. 18
[239] cp. OECD (2002), p. 69

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adjusted, to Latin America and the Caribbean. In the LAC region, Barbados[240] and Mexico are surveying this question. Barbados is offering options similar to those adapted from OECD: 'Country', 'Caribbean', 'International territories'), Mexico is offering 'National', 'Foreign', 'both' and 'do not know' as answer options. It has been recognized by the OECD that this question might cause difficulties for a respondent, since they might not know where the seller of the product is located. For this reason the question has not yet been adopted in OECD's ICT model survey for households but is due to be considered for inclusion at the first review of the survey.[241] To ease this difficulty, the second answer item (sub-regions) might be removed, distinguishing only between domestic, LAC or outer-regional purchases. For the development of the information society in Latin America and the Caribbean, various studies show[242] that this question is of crucial importance. It is estimated that while in the year 2000 only 9 percent of online purchases in the U.S. have been made outside the country, nearly two thirds of the Latin American online purchases have been made on websites outside the region. In order to be able to understand the development and dependencies of the LAC Information Society adequately, such information is indispensable.

H-B25. What is the language of the Internet sites are you using? This question is directed towards the ethnic origin dimension of the digital divide, addressing the primary language of the web sites a person visits. Potential response options could then be "Spanish", "Portuguese", "English", an indigenous language (to be chosen according to the indigenous peoples living in a respective country) and "Other language".

These aspects conclude the discussion on questions related to the supplementary list proposed.

3.4.4 Nice to Know/Redundancy

The last set of questions that have been found in certain household surveys in the past, but it is not advised to include them in future household surveys. One of the reasons may be that the question is not comparable with indicators inside and outside LAC, since too many adjustments would be necessary to achieve this comparability. Another may be that the relevance analysis suggests that the question does not provide useful information. A third reason for a question to be grouped into this set is that the question already forms part of another question and would therefore be redundant. In order to complete the picture, an overview of these questions is displayed in Table 3.33.

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[240] cp. NCST (2003), p.69
[241] cp. OECD (2003b), p. 7
[242] cp. Hilbert (2001a), p. 109, Hilbert (2001b), p. 39 and Elkin (2003), p. 72

TABLE 3.33
NICE TO KNOW/REDUNDANCY GROUP OF QUESTIONS IN HOUSEHOLD SURVEYS

Nice to Know/Redundancy

H-C1. If household owns a PC, is it being used?

H-C2. Do you have access to a PC?

H-C3. Does any PC you are using access the Internet?

H-C4. Principal purpose of PC use at home?

H-C5. Does the household have e-mail access?

H-C6. Expenses of fixed line phone within last month?

H-C7. Expenses of mobile phone within last month?

H-C8. Expenses of Internet connection within last month?

H-C9. Did you buy goods/services over the Internet?

H-C10. How much are you concerned about security on the Internet?

Source: Own elaboration based on institutions investigated

Question H-C1. If household owns a PC, is it being used? Colombia[243] has included the question of whether a PC that is owned by a household is also in use. It is the only country that has surveyed this question. Furthermore, the Relevance Analysis shows that in Metropolitan areas, the percentage of people using the PC they own amounted to more than 93 percent. This analysis illustrates that there is no significant gap between PC ownership and usage, and therefore such an indicator would not be of substantial value for policy analysis. Table 3.34 displays the results obtained. The question is very similar to question H-B3, asking if a person did use the PC at home in the last twelve months. The difference is that while Colombia is interested in whether the PC in a household is in use, the OECD is asking if a member of the household has used the PC within the last twelve months.

TABLE 3.34
PCs IN COLOMBIAN HOUSEHOLDS BY STATUS OF USAGE

Area	PCs in use	PCs not in use
Metropolitan Areas	93.9%	6.1%

Source: DANE (2003a), p. 54

Questions H-C2. Do you have access to a PC? and **H-C3. Does any PC you are using access the Internet?** Chile[244] —as a filter question— is asking if a person has access to a PC at all (Question H-C2) and as follow-up – if a person does have access, where this person uses the PC most frequently. The same is done later in question H-C3, asking if one of the computers a person is using is able to access the Internet. This question is very useful, since filtering all Internet related questions is essential for future questions on Internet usage. However, since the structure and logic of the final questionnaire is left to NSOs, such a filter question will not be included in the proposed catalogue.

Question H-C4. Principal purpose of PC use at home? This question sounds very similar to the one addressed in the supplementary list, namely H-B14, the purposes of PC use. H-C4, the principal purpose of PC use at home —incorporated in the Colombian household

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[243] cp. DANE (2003a), pp. 54 y 177
[244] cp. MIDEPLAN (n.d.), p. 2

survey[245]— was specifically designed to investigate Colombia's status of telecommuting jobs. In order to keep international comparability and to stay within the scope of questions about broad PC usage, this question is not proposed for incorporation at this point.

Question H-C5. Does the household have e-mail access? The question of whether or not a household member possesses an e-mail account is being asked only by Peru.[246] Within this framework, however, it already forms part of question H-A10, for what services/ activities a person uses the Internet.

Questions H-C6. Expenses of fixed line phone within last month? H-C7. Expenses of mobile phone within last month? and H-C8. Expenses of Internet connection within last month? The three questions concerning monthly expenses of the fixed line telephone, the mobile phone and the Internet are part of the Peruvian survey.[247] A question on the monthly costs of ICT within households has also been proposed by the SITIC initiative.[248] These questions concerning expenses are very valuable, since they allow important analysis with regard to expenditure habits and may be useful in determining adequate ICT prices in order to connect different income groups. However, in order to gather useful information about these variables within the framework of an international comparison, they would have to undergo various adjustments, such as a comparison of prices of these kinds of services and prices of other goods and services and its relation to the per capita income of a person, etc. Due to these complications, it seems reasonable to incorporate questions about ICT expenditures into existing consumer questionnaires, not in general household surveys. While such consumer questionnaires in some countries might be carried out by the Central Bank, not by the NSOs, there are already mechanisms in place for international harmonization of consumer expenditures. Therefore, while recognizing the great importance of ICT expenditure figures and that unfortunately not many consumer surveys include ICT expenditures until now, it is recommended not to complicate general household surveys with such questions but rather to delegate this task to the next review of consumption surveys. The review of consumption surveys and the inclusion on ICT expenditures in them, is a very urgent task. While, for example, the last consumer expenditure survey from Mexico (which is one of the more complete consumption surveys in LAC) includes detailed spending about "stamps" and "envelopes" in the "households spending on communication" section, expenditures on Internet charges are not yet included.

Question H-C9. Did you buy goods/services over the Internet? This question is proposed within the OECD model questionnaire for ICT measurement in households and by individuals as a filter question.[249] However, the question already forms part of question H-A10, for what services/activities a person uses the Internet.

Question H-C10. How much are you concerned about security on the Internet? One may incorporate a specific question asking about the level of security concerns a person perceives (not at all concerned, somewhat concerned, very much concerned). This option, however, has only been pursued by Trinidad and Tobago.[250] Again, in order to achieve international comparability, it is recommendable to include the question as an answer item —generally asking if a person is concerned about security issues or not —in question H-B8, the barriers of household e-commerce adoption, i.e. why a person does not purchase goods/services over the Internet.

With question H-C10 all identified ICT related questions for the household surveys have been discussed. This procedure will now be applied to the different business surveys analyzed.

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[245] cp. DANE (2003a), p. 13
[246] cp. INEI (2001b), p. 56
[247] cp. INEI (2001c), p. 9
[248] cp. INEI (2003b), p. 28
[249] cp. OECD (2003b), p. 17
[250] cp. NIHERST (2002), p. 34

3.5   Business Surveys

The process used to develop the list of proposed questions and variables for the household surveys was also used for the business surveys. As in the case of the household surveys, countries focus on different aspects of a question. All of the different facets of questions have been examined in this analysis.

3.5.1 Selection Process of Questions

Different aspects of questions have been compared with one another according to the three selection criteria explained in section 3.4.1, namely International Reference, LAC Reference and Relevance Analysis. As with household survey questions, those three selection criteria have been used to (1) set up a priority ranking of questions, assigning them to a set of core questions (B-A indicators), a supplementary list (B-B indicators) and a set of nice to know/redundancy questions (B-C indicators); (2) to harmonize the questions and (3) to harmonize the response options for each question.

Questions within a group are displayed first as they are proposed at the beginning of each section. The discussion of the questions follows beneath the tables. The first group of discussed questions —similarly to the discussion of household survey questions— is considered the group of core questions.

3.5.2 Core Questions

Table 3.35 displays the core questions in business surveys. The number of this first set of questions appears to be quite large. However, many of these questions already form part of different business surveys of countries, such as the question if an enterprise uses fixed line telephones. Only a manageable number of questions will have to be added to surveys. The first question "fixed line telephones" could not be core for many developing countries because most of businesses, even micro enterprises, count with this service. That is not the case of some other less developed countries, for this reason it is advisable to consider it as core.

The abbreviations used in the table for the Selection Criteria column indicate what organization or country is already employing which questions and if a question possesses a special interregional or regional relevance. They are identical to the ones explained in Table 3.12. The Relevance analysis did not have to be applied within this catalogue.

TABLE 3.35
CORE QUESTIONS AND RESPONSE OPTIONS IN BUSINESS SURVEYS

Question	Response Options	Selection Criteria		
		Intern. Reference	LAC Reference	Relevance Analysis
B-A1. Does the enterprise use fixed line telephones?	Yes No	-	Cl, Co, Pa, TT	Relevant for LAC
B-A2. Does the enterprise use mobile telephones?	Yes No	-	Ar, Co, Uy	Relevant for LAC
B-A3. How many computers (PCs) does the enterprise have?	None Number Do not know	C	Cl, Co, Pe, S, TT	Relevant for LAC
B-A4. How many PCs did the enterprise buy or lease within the last year?	Buy: ___Number Lease: ___Number Do not know	-	Cl, Co, Mx	Relevant for LAC
B-A5. Does the enterprise use one of the following networks? (tick all that apply)	Internet Intranet Extranet LAN WAN	A, C, E, O, ES	Ar, Bb, Br, Cl, Co, Mx, Pe, S, TT, Uy	Consolidated practice
B-A6. What modes of access/bandwidth does the enterprise use for Internet access?	Analogue modem ISDN xDSL Cable / Fiber optics Mobile phone Fixed wireless Other	C, E, O, ES	Bb, Cl, Co, Pe, TT	Consolidated practice
B-A7. Does the enterprise have a website?	Yes No	A, C, E, O, ES	Ar, Bb, Br, Cl, Co, Mx, Pe, S, TT, Uy	Consolidated practice
B-A8. What is the share of the total number of employees using a PC in their normal work routine?	% of total employees Do not know	C, O, ES	Cl, Co, Uy, S	Consolidated practice
B-A9. What is the share of the total number of employees using a computer connected to the Internet in their normal work routine?	% of total employees Do not know	C, E, O, ES	Ar, Bb, Cl, Co, Uy, S	Consolidated practice
B-A10. What services/activities does the enterprise use the Internet for [external focus]? (tick all that apply)	Communication (e-mail, chat) Information search Placing orders Receiving orders Financial/banking services Interaction with public authorities Marketing or client support Education, research or training Other	C, E, O, ES	Cl, Co, Pe, S, TT	Consolidated practice
B-A11. Value of Internet sales?	% of annual total turnover Do not know	C, E, O, ES	Ar, Br, Cl, Co, TT	Consolidated practice
B-A12. Value of Internet purchases?	% of annual expenditure Do not know	C, O, ES	Cl, Co, TT	Consolidated practice

Source: Own elaboration based on institutions investigated.

According to the Model for E-Commerce Indicators developed by OECD's Working Party on Indicators for the Information Society, these questions can be divided into *Readiness*, *Usage of the Internet* and *Impact* indicators. By this classification, questions B-A1 to B-A9 fall into the readiness group, B-A10 to B-A12 into the usage group. As in the case of household surveys, no impact indicators are suggested.

Question B-A1. Does the enterprise use fixed line telephones? In order to understand the usage of ICT in some less developed countries in Latin America and the Caribbean, this question is very important. It is not incorporated in business surveys of the institutions of international reference, since —as it has been illustrated in section 2.1.2 —penetration rates of

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fixed line telephones often are already very high in these countries. Various LAC countries are employing this variable, sometimes implicit and sometimes as a response option for available infrastructure or detailed expenses as in the case of Paraguay. Sometimes, as it is the case for Chile, Colombia, Paraguay[251] or Trinidad and Tobago, data is obtained previously. Participants of a business survey are usually taken from a business directory, which is derived from an industry census or business register. Based on this, businesses are selected for the business survey. In the Paraguayan case the base for this directory has been its 1997 Industry Census. In the selection process, businesses are contacted and required to communicate their phone numbers to the DGEEC, if they possess a telephone. Therefore, when the actual survey was conducted, the DGEEC already had the information of which enterprises were in possession of a telephone and which ones were not and it did not make sense to ask this question again in the actual survey.[252] An implicit way of having this information is to ask for the phone number in the business' identification data, as is the case of Chile.

Penetration rates of fixed line telephones often are very high in LAC countries doing businesses surveys, however the question could be valuable for some less developed countries. Furthermore, an enterprise that has fixed line telephones and has computers could be not connected to internet, even that it counts with the tools to do it, at least for short time during the day. Then, the question suggests a base to establish ICT usage behavior.

Question B-A2. Does the enterprise use mobile telephones? This question does not figure among surveys of the institutions of international reference. It is, however, important for the LAC region and used in Argentina[253], Colombia[254] and Uruguay. The special importance of this question for the region has its roots in the fact that in the year 2003 mobile telephone penetration rates have been higher than penetration rates of fixed line telephones on a regional average.[255] In Argentina, for example, 99 percent of the large and 71 percent of the small enterprises are relying on the services of mobile telephony in 2001.[256] If this question would not be included, a skewed picture with respect to telephony in enterprises would be drawn.

As an example, this question has been formulated in two ways according to selected countries. Colombia asks for "Indicating if the enterprise uses mobile phones or personal communication services". Argentina and Uruguay ask for "Indicating the proportion of employees (excluding those working in the production line) using cellulars provided by the enterprise", both in their innovation surveys. **Question B-A3. How many personal computers (PCs) does the enterprise have?** On the part of the institutions of international reference this question is only being surveyed by Statistics Canada.[257] However, it is incorporated in various ICT surveys of the LAC region, such as the Chilean,[258] Colombian,[259] Peruvian, as well as Trinidad and Tobago's. Some countries like Mexico have asked for the utilization of computers but no for the quantity. Furthermore, question B-A3 has been proposed by the SITIC initiative,[260] since it is extremely important for the region. First of all, this can be illustrated by the PC penetration with Colombian micro-enterprises. This rate was as low as 5.5 percent.[261] In US small companies[262] PC penetration has been above 90 percent.[263] While these numbers are not perfectly comparable due to differences in the

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[251] cp. DGEEC (2003b)
[252] Statement of Nimia Torres (person in charge of Paraguay's Industrial Survey) during a working session on 04/12/2003 in Asunción
[253] cp. SECYT (2003), p. 63
[254] cp. DANE (2003b), pp. 167, 171 y 179
[255] cp. ITU (2003a), pp. 1 et seq. and ITU (2003c), pp. 1 et seq.
[256] cp. SECYT (2003), p. 64
[257] cp. Statistics Canada (2001), p. 50
[258] cp. Subsecretaría de Economía de Chile (2002), p. 7
[259] cp. DANE (2003b), pp. 167, 171 y 179
[260] cp. INEI (2003b), p. 29
[261] cp. DANE (2003b), p. 138
[262] A small business is defined as any company with less than 100 employees [cp. IDC Research (2003), p. 1]
[263] cp. IDC Research (2003), p. 2

definition of enterprise sizes,[264] even within the Colombian trade sector, where companies of all sizes were surveyed, the PC penetration had only reached 40.7 percent in 2001.[265]

Secondly, it is a useful variable, giving an indication of the status of ICT equipment with companies. Since business surveys always ask about the number of employees in a company, the number of PCs can, for instance, be measured in relation to the number of employees and give an important ratio about PC penetration among the company's employees.

Question B-A4. How many PCs did the enterprise buy or lease within the last year? The question about the number of PCs acquired within the last year is a question of the same nature as the previous one. It is not common in questionnaires of international institutions but is included in various ICT surveys in the LAC region, such as the Colombian,[266] Chilean,[267] and Mexican.[268] In the case of Colombia, the survey asks for the PCs acquired in the last 2.5 years. The question gives an idea of the quality of the equipment employed. Given Moore's law, according to which the power of a silicon chip doubles every 18 months, PCs become obsolete very quickly. Getting an idea of the age of PCs employed by a company is important in order to make a quality assessment. This variable, however, will only be useful after being surveyed for a few years, when a fluctuation rate can be established by relating the number of PCs and acquired PCs, in order to calculate PCs disposals and life-time.

Taking a first look at the data, for example, it can be observed that 41 percent of the PCs in Chilean SME,[269] 26.5 percent in Colombian trade enterprises[270] and 37 percent of the PCs in Mexican enterprises[271] in their respective latest survey were less than two years old.

Question B-A5. Does the enterprise use one of the following networks? This question is the union of at least two questions. One being "**Does the enterprise have an Internet connection?**" This question forms the cornerstone of many ICT related surveys, in institutions of international reference as well as in Latin America and the Caribbean. The second question would be "**Does the enterprise have a local network?** This question is part of OECD's model questionnaire for ICT and e-commerce measurement in businesses,[272] the eEurope benchmarking indicators[273] and the proposed Eurostat 2005 informal version for enterprises,[274] as well as various LAC countries, such as Argentina, Chile,[275] Colombia,[276] Mexico, Peru[277] and Trinidad and Tobago. Furthermore it has been proposed by the SITIC initiative.[278] Usually this question refers to Intra- and Extranet. Uruguay's innovation survey, for example, includes Internet and Intranet as options for an infrastructure question; Colombia's enterprises surveys ask them similar but including Intranet and Extranet. Mexico and Peru ask for the use of a local network but does not ask for details, while Trinidad and Tobago includes intranet and extranet as response options for the question about activities Internet is used for. To clarify and simplify the survey, it is proposed to ask this question with more common kinds of networks as response options. The other options proposed to be

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[264] The definition of the United States includes companies that are considerably bigger and bigger companies tend to have higher penetration rates of ICT. Colombian definition includes companies with less than 10 employees.
[265] cp. DANE (2003b), p. 58
[266] cp. DANE (2003b), pp. 167, 171 y 179
[267] cp. Subsecretaría de Economía de Chile (2002), p. 10
[268] cp. INEGI (2003b)
[269] cp. Subsecretaría de Economía de Chile (2002), p. 10
[270] cp. DANE (2003b), pp. 59, 65, 66
[271] cp. INEGI (2003b)
[272] cp. OECD (2001), p. 9
[273] cp. European Commission (2002a), p. 9
[274] cp. Eurostat (2004b), p.1
[275] cp. Subsecretaría de Economía de Chile (2002), p. 10
[276] cp. DANE (2003b), p. 167, 171, 179
[277] cp. INEI (2001b), p. 45
[278] cp. INEI (2003b), pp. 32 et seq.

included are LAN (Local Area Network) and WAN (Wide Area Network). Even that by definition, an intranet or an extranet may consist of many interlinked Local Area Networks and also use leased lines in the Wide Area Network[279] we propose these options as part of the same question to be more specific on the answer, but each country can reformulate it according to the structure of its survey. This proposal was approved during the Workshop on Information Society Measurement for Latin America and the Caribbean.

Question B-A6. What modes of access/bandwidth does the enterprise use for Internet access? The importance of this question has already been explained in indicator H-A6. As in the case of household surveys, it is already employed on a broad international basis. In institutions of international reference, it is part of OECD's core list of ICT indicators,[280] the eEurope initiative,[281] Statistics Canada's broadband survey[282] and the proposed Eurostat survey on ICT in enterprises 2005 informal version.[283] In Latin America and the Caribbean, Barbados, Chile,[284] Colombia,[285] Peru[286] and Trinidad and Tobago have incorporated this question in their business surveys. Again, the specific response options depend on the technologies available in a given country. The Brazilian survey only asks if the connexion is switched (dial-up) or dedicated. Chile is incorporating the same categories, but including the main types of access for each one. Table 3.36 shows the proposed items derived from the first two criteria of selection: International Reference and LAC Reference. It has not been necessary to employ the Relevance Analysis criterion.

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[279] See http://whatis.techtarget.com/
[280] cp. OCED (2003c), p. 7
[281] cp. European Commission (2002a), p. 9
[282] cp. Statistics Canada (2003b), pp. 10-16
[283] cp. Eurostat (2004b), p.1
[284] cp. Subsecretaría de Economía de Chile (2002), p. 10
[285] cp. DANE (2003b), pp. 168, 172, 179
[286] cp. INEI (2001b), p. 42

TABLE 3.36
RESPONSE OPTIONS FOR ACCESS MODES USED FOR INTERNET ACCESS

Modes of access/bandwidth used for Internet access	Criteria of Selection	
	International Reference	LAC Reference
Analogue moderm (dial-up)	O, ES	Bv, Cl, Co, Pe, TT
ISDN	O, ES	Bb, Cl, Co
Xdsl	C,E,O,ES	Bb, Cl, Co, Pe, TT
Cable	C,E,O,ES	Cl, Co
Mobile wireless	O, ES	-
Fixed wireless (Wi-Fi)	E,O	Bb, Co, Pe, TT
Satellite	O, ES	Co
Fiber optics	-	Co
Other	O	Bb, Cl, Co, TT

Source: Own elaboration based on European Commission, OECD, Statistics Canada, DANE, INE (Cl), INEI, NCST, NeCS

Question B-A7. Does the enterprise have a website? This question forms part of virtually every survey investigated that contained questions related to ICT, the ones of the institutions of international reference as well as the surveys within the LAC region. The question varies slightly in some countries, Argentina asks if the enterprise have a Web Site "with institutional information" and "with information on its products and services". Barbados asks the reasons for the creation of websites. Brazil asks for Web Site "with e-commerce" and "without e-commerce". Surveys as the Colombian, ask to register the complete name of the Web Site. Mexico's survey does not ask a specific question but has a space in the identification section to fill in the web site's name. Trinidad and Tobago gives two options: own website and third party website.

Questions B-A8. What is the share of the total number of employees using a PC in their normal work routine? and **B-A9. What is the share of the total number of employees using a PC connected to the Internet in their normal work routine?** In addition to the ratio which can be calculated with the number of employees and the answer of question B-A3 (number of PCs), question B-A8 goes beyond technological access readiness and asks about the actual usage of PCs in the normal work routine. Question B-A9 then goes further, asking about the usage of Internet. Both questions form part of the OECD's list of core indicators[287], the ICT and electronic commerce survey of Statistics Canada,[288] the proposed Eurostat 2005 informal version for enterprises[289] includes both questions but referred to "at least once a week", that could be not as exhaustive as "normal work routine". Question B-A9 forms part of the eEurope benchmarking indicators.[290] They are also prevalent in LAC surveys without emphasizing in the frequency of access. Argentina, Barbados, Colombia are already inquiring the percentage of employees using the Internet, while Trinidad and Tobago is making a question that allows to know if "none", "few" or "all" employees have access to the internet. Chile[291] and Uruguay employ both questions. Both questions form also part of the proposal by the SITIC initiative.[292] Chile has not incorporated these questions in its permanent survey to the enterprises, however, the 2002 ICT survey among SME included them. Due to this

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[287] cp. OECD (2003c), p. 7
[288] cp. Statistics Canada (2001), p. 47
[289] cp. Eurostat (2004b), p.1
[290] cp. European Commission (2002a), p. 5
[291] cp. Subsecretaría de Economía de Chile (2002), p. 10
[292] cp. INEI (2003b), pp. 36 and 38

widespread international presence, the two questions are also proposed to be part of the core questions.

Question B-A10. What services/activities does the enterprise use the Internet for [external focus]? B-A10 is one of the questions incorporated by the vast majority of business surveys investigated, which contain ICT questions. Particularly Chile, Colombia, Peru and Trinidad and Tobago have incorporated it. However, the focus of the question and its response options vary widely. Therefore, all questions touching the topic of activities and services the Internet is used for have been integrated into question B-A10. The remaining questions have been assigned to the Nice to Know/ Redundancy group of questions in section 0. These questions are B-C2, the activities a web site is used for, B-C3, whether the enterprise uses the Internet to purchase and/ or sell goods or services and B-C4, if an enterprise uses the Internet to deliver and pay their goods and services.

As in the case of this question in household surveys, there are a large number of response options in business surveys. The process to determine the response options for the set of core questions has been conducted in accordance with the first two criteria of selection (International Reference and LAC Reference). The Relevance Analysis criterion did not have to be applied. Table 3.37 displays the results of the entire selection and synthesis process.

TABLE 3.37
RESPONSE OPTIONS FOR SERVICES/ACTIVITIES ENTERPRISES USE THE INTERNET FOR

Services/activities a person uses Internet for	Criteria of Selection	
	International Reference	LAC Reference
Communication (e-mail, chat)	O	Cl, Co, Pe, S, TT
Information search	O	Pe, TT
Placing orders/Purchasing goods and services online	A, C, E, O	Cl, Co, Pe, TT
Receiving orders/Selling goods and services online	A, C, E, O	Cl, Co, TT
Financial/banking services	E, O, *ES*	Cl, Co
Communication/interaction with public authorities	O	Cl
Marketing activities (e.g. advertising or merchandising)	O	Cl, Co, Pe, S
Academic education, research or training	*ES*	Cl, Co, Pe

Source: Own elaboration based on ABS, European Commission, OECD, Statistics Canada, DANE, INE (Cl), INEI, NeCS, SITIC

The question is denominated "external focus" since it focuses on activities where the enterprise interacts with its external environment through digital channels. There will be a similar question focusing on the internal use of ICT, that is activities which the enterprise digitizes internal business and production processes (see B-B23 in the supplementary list).

Question B-A11. Value of Internet sales? and **B-A12. Value of Internet purchases?** The question on the value of sales via the Internet and/or the value spent in purchases is very common among the surveys of institutions of international reference. It is featured in OECD's

2002 publication "Measuring the Information Economy",[293] employed by Statistics Canada in their ICT and electronic commerce survey,[294] included in the proposed Eurostat 2005 informal version for enterprises[295] and —at least the value of sales— part of the eEurope[296] program. The question on the value of orders received as a percentage of the total annual turnover also figures among the OECD core indicators list.[297]

In Latin America and the Caribbean, Chile, Colombia as well as Trinidad and Tobago have used both questions but with some particularities. Argentina and Brazil have been using the question of the percentage represented by the Internet sales over the whole sales. Argentina is including this question in its innovation survey and Brazil in its commerce sector survey. Chile is asking for the amount of purchases and sales made throughout Internet. Besides, Chile makes a difference between the amount of the sales made to individuals and the sales to other businesses. Colombia is asking only for the existence of purchases and sales through Internet, but not for the percentage they represent. Trinidad and Tobago makes a question proportioning some percentage ranks as response options. They are examples of the necessary standardization of these questions.

3.5.3 Supplementary List

Following the concept introduced in the discussion of household surveys, the next block of questions deals with the supplementary list proposed for business surveys. This approach is suggested for questions of two types. The first type is of the same character as the core questions but without an international prevalence. The second type is related to questions surveying subjective perceptions, such as the barriers encountered in the adoption of e-commerce or ICT in general in an enterprise. As the OECD states, this information is not typically the field of research of official business surveys. It gives valuable indications for policy needs, though. Therefore, the OECD concludes, these kinds of questions would not necessarily have to be carried out on an annual basis.[298]

This set of questions, of course, could also be integrated in regular surveys. Decision about the additional incorporation of this kind of question in the regular business survey will have to be made by each country, based on the availability of financial resources.

Table 3.38 offers an overview of all questions proposed for the supplementary list. Abbreviations indicate which institution is already employing which questions. They are identical with the ones explained in 3.12 of section 3.4.2. The Relevance Analysis criterion did not have to be applied.

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[293] cp. OECD (2002), p. 65
[294] cp. Statistics Canada (2001), p. 52
[295] cp. Eurostat (2004b), p.3
[296] cp. European Commission (2002a), p. 9
[297] cp. OECD (2003c), p. 7
[298] cp. OECD (2003d), p. 78

TABLE 3.38
QUESTIONS AND RESPONSE OPTIONS FOR THE SUPPLEMENTARY LIST IN BUSINESSES

Question	Response Options	Selection Criteria	
		Intern. Reference	LAC Reference
B-B1. Does the enterprise use computer-mediated networks other than Internet (e.g. EDI, Minitel)?	Yes No	O, *ES*	-
B-B2. Have the persons using ICT received any kind of training/formation concerning the use?	Yes No % of employees using ICT who received training	E	Bb, Cl, Co, Mx
B-B3. Barriers to use of computers (Why does the enterprise not use PCs)? [For each answer item ask for level of importance: No importance Some importance Much importance Do not know]	ICT expenditure too high Level of ICT skills too low among the employed personnel Difficult to recruit qualified ICT personnel Existing personnel reluctant to use ICT Lack of perceived benefits Other	O	S
B-B4. Barriers to use of Internet (Why does the enterprise not have an Internet access)? [For each answer item ask for level of importance: No importance Some importance Much importance Do not know]	Costs too high Data communications too slow or unstable Lack of qualified personnel/know-how Lack of perceived benefits Lack of security (viruses, hackers) Other	C, O	Cl, Pe, S
B-B5. Barriers to e-commerce (Why did the enterprise not buy or sell over the Internet)? [For each answer item ask for level of importance: No importance Some importance Much importance Do not know]	The products of the enterprise not applicable for Internet sales Customers not ready to use Internet commerce Security problems concerning payments Uncertainty concerning contracts, terms of delivery and guarantees Cost of developing and maintaining an e-commerce system Logistical problems Considerations regarding existing channels of sales	C, O, *ES*	Bb, Cl, Pe, TT
B-B6. Does the enterprise intend to get connected to the Internet in …?	Year t Year t+1 No Do not know	O	Cl
B-B7. Does the enterprise intend to make use of e-commerce in …?	Year t Year t+1 No Do not know	-	Cl
B-B8. Does the enterprise intend to make use of computer-mediated networks other than Internet (e.g. EDI, Minitel, interactive telephone systems)?	Year t Year t+1 No Do not know	O	-
B-B9. For what reasons would the enterprise get connected to the Internet? [For each answer item ask for level of importance: No importance Some importance Much importance Do not know]	Business improvement Improvement of internal management and productivity More competitive costs associated to connectivity (prices of connection, PCs) Other (Higher security, among others)	-	Cl
B-B10. Motivations to make use of electronic commerce? [For each answer item ask for level of importance: No importance Some importance Much importance Do not know]	Reaching new/more customers Geographic expansion of market Improving efficiency Fear of losing market shares Cost reductions Speed of processing Simpler business processes	O	-
B-B11. What are the customer groups/destination of Internet sales?	1. Other enterprises % 2. Households % 3. Government % 4. Others (Please specify) % (1+2+3+4=100%) 5. Do not know	O, *ES*	Cl, Pe, TT

<div align="right">*(continuation Table 3.38)*</div>

B-B12. Where did you sell goods/services over the Internet?	Within the country (domestic market) Within Andean Region/Caribbean/Central America/Mercosur Within Latin American or the Caribbean region Outside LAC region	O, *ES*	-
B-B13. Where did you buy goods/services over the Internet?	Within the country (domestic market) Within Andean Region/Caribbean/Central America/Mercosur Within Latin American or the Caribbean region Outside LAC region	-	-
B-B14. Has the enterprise paid on-line[299] for products purchased on the Internet?	Yes No Do not know	O, *ES*	-
B-B15. Has the enterprise purchased products via specialized Internet market places[300] in year t?	Yes No Do not know	O, *ES*	-
B-B16. Has the enterprise received on-line[301] payments for Internet sales in the year t?	Yes No Do not know	O, *ES*	-
B-B17. Has the enterprise sold products via specialized Internet market places[302] in year t?	Yes No Do not know	O, *ES*	-
B-B18. What significance do the following motives have for purchasing via the Internet? (Multiple choice) [For each answer item ask for level of importance: No importance Some importance Much importance Do not know]	To simplify transactions To purchase goods or services at lower costs To increase access to, and awareness of, suppliers To speed up business processes	O	-
B-B19. What significance have the following motives for selling via the Internet? (Multiple choice) [For each answer item ask for level of importance: No importance Some importance Much importance Do not know]	Company image considerations To reduce business costs To speed up business processes To improve quality of services To expand beyond normal business hours To expand the market geographically To launch new products To keep pace with competitors	O, *ES*	-
B-B20. Has the enterprise in year t used EDI or other computer-mediated networks in relation to:	Customer Suppliers Banks/Financial institutions	O	-
B-B21. If the enterprise orders products via EDI, what percentage of total purchases (in monetary terms) does this represent in year t?	…% of total purchases Do not know	O, *ES*	-
B-B22. If the enterprise receives orders via EDI, what percentage of the total turnover (in monetary terms) does this represent in year t?	…% of total turnover Do not know	O, *ES*	-
B-B23. Use of ICT in internal business and production operations	*To be determined.*		

Source: Own elaboration based on institutions investigated

All questions of the supplementary list have also been grouped as *Readiness* and *Usage* indicators, according to the WPIIS Model. Questions B-B1 to B-B9 by this classification belong to the Readiness group, questions B-B10 to B-B22 to the Usage group. Again, no *Impact* indicators have been incorporated.

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[299] On-line is defined as an integrated ordering-payment transaction.

[300] More than one enterprise is represented at the website. The market sells either certain goods/services or is addressed to limited customer groups.

[301] See note 288.

[302] See note 289.

Question B-B1. Does the enterprise use computer-mediated networks other than Internet (e.g. EDI, Minitel, interactive telephone systems)? This question stems from the OECD's model survey.[303] Besides, it is included in the proposed Eurostat 2005 informal version for enterprises.[304] The Electronic Data Exchange (EDI) related questions have been added by the OECD to better monitor the development of new forms of sales. Therefore, activities such as e-commerce can be separated into activities carried out over the Internet and other computer-mediated networks.[305] This is important, since Internet systems are open networks, which, as some argue, show lower security features than closed systems like EDI networks. However, Internet systems are a lot cheaper than EDI systems. Therefore, large companies often deploy EDI networks, while small enterprises have to deal with the security risks of Internet based e-commerce.

Question B-B2: Have the persons using ICT received any kind of training/formation concerning this use? This question about training in the use of ICT is incorporated in the benchmarking indicators of the eEurope Plus initiative,[306] the Barbadian,[307] Chilean,[308] the Colombian[309] and the Mexican business surveys. The question is very important for the region, since there are significant disparities in the level of training companies of different sizes to grant their employees. In the 2001 Colombian trade survey, the number of employees who had received training amounted to 11 percent,[310] while this same number in the survey among services companies was 3 percent.[311] The questions proposed by Barbados, Colombia and Mexico ask for training to the total of employees, but it is recommended to ask the question also for the persons working with ICT in order to establish the efficiency of ICT usage. Following the example of Colombia, one can try to establish which would be the proportion of employees using ICT who received training. It would be about the 44.5 percent for trade companies and the 34.9 percent for services companies. These kinds of results can provide valuable information about the effectiveness of ICT usage at the firm level.

Question B-B3: barriers to use of computers? the question about existing barriers to the adoption of PCs within businesses is also part of OECD's electronic commerce in enterprises model questionnaire[312]. So far, it has only been included in one LAC initiative, namely the SITIC initiative.[313] It is, however, a very useful question since pc penetration rates in LAC companies —as it has been discussed in question B-A3— in many cases are fairly low. Since the response options of the SITIC initiative are identical with OECD's, these options have been adopted. they are displayed in Table 3.39.

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[303] cp. OECD (2001), pp. 9 et seq.
[304] cp. Eurostat (2004b), p. 4
[305] cp. OECD (2001), p. 4
[306] cp. European Commission (2001a), p. 16
[307] cp. NCST (2003), p. 45
[308] cp. Subsecretaría de Economía de Chile (2002), p. 35
[309] cp. DANE (2003b), pp. 168, 172 y 179
[310] cp. DANE (2003b), p. 74
[311] ibid, p. 123
[312] cp. OECD (2001), p. 15
[313] cp. INEI (2003b), p. 39

TABLE 3.39
RESPONSE OPTIONS TO BARRIERS OF PC USE

Barriers to PC use
ICT expenditure too high
Level of ICT skills too low among the employed personnel
Difficult to recruit qualified ICT personnel
Existing personnel reluctant to use ICT
Lack of perceived benefits
Other

Source: OECD (2003c), p. 10 and INEI (2003b), p. 39

Question B-B4. Barriers to the use of Internet? The barriers to the incorporation of the Internet by enterprises is the second part of the questions on ICT related barriers in OECD's core indicators list.[314] Furthermore, Statistics Canada has included the question in their ICT and electronic commerce survey. [315] In the countries investigated in the LAC region, Chile[316] and Peru have been the first to include this topic. Furthermore it has been proposed by the SITIC initiative.[317] The response options have been synthesized in the manner explained and used above. The proposed items are displayed in Table 3.40.

TABLE 3.40
RESPONSE OPTIONS TO BARRIERS THE USE OF THE INTERNET

Barriers to the use of Internet	Criteria of Selection	
	International Reference	LAC Reference
Costs too high	O	Cl, Pe, S
Data communications too slow or unstable	O	-
Lack of qualified personnel/know-how	O	Cl, S
Lack of perceived benefits	C, O	Cl, Pe, S
Lack of security (viruses, hackers)	C, O	Cl, S
Other	O	Cl

Source: OECD (2003c), p. 10

Question B-B5. Barriers to e-commerce? The question about perceived barriers to e-commerce is the most widely used one. It is part of the OECD model questionnaire,[318] Statistics Canada's ICT survey,[319] the proposed Eurostat 2005 informal version for enterprises,[320] at least concerning to sales. Moreover, it is included in the business ICT surveys of Barbados,[321] Chile,[322] Peru[323] and Trinidad and Tobago.

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[314] cp. OECD (2003c), p. 10
[315] cp. Statistics Canada (2001), p. 54
[316] cp. Subsecretaría de Economía de Chile (2002), p. 14
[317] cp. INEI (2003b), p. 40
[318] cp. OECD (2001), p. 16
[319] cp. Statistics Canada (2001), p. 54
[320] cp. Eurostat (2004b), p. 4
[321] cp. NCST (2003), p54
[322] cp. Subsecretaría de Economía de Chile (2002), p. 33
[323] cp. INEI (2001b), p. 8

The response options have been adopted from the OECD questionnaire. Alternative items of the other questionnaires can be integrated into those offered by the OECD. Furthermore, these items have been elaborated and tested over a two-year period of time by an international team of experts[324] and therefore international comparability and consistency within these items is ensured.

TABLE 3.41
RESPONSE OPTIONS TO BARRIERS TO INTERNET SALES

Barriers to Internet Sales
The products of the enterprise not applicable for Internet sales
Customers not ready to use Internet commerce
Security problems concerning payments
Uncertainty concerning contracts, terms of delivery and guarantees
Cost of developing and maintaining an e-commerce system
Logistical problems
Considerations regarding existing channels of sales

Source: OECD (2001), p. 16

Question B-B6. Does the enterprise intend to get connected to the Internet in …?: Question B-B6 also forms part of OECD's model questionnaire.[325] In the LAC region, Chile's Small, Medium-sized and Micro Enterprises (SMMEs) survey[326] and the Peruvian innovation survey[327] are the only where the question was incorporated in.

An issue that needs to be discussed in this question is the period for the intended connection. Chile is asking if the enterprise plans to get connected within a semester. For reasons of international comparability and comparability to the following question concerning the intended use of e-commerce, however, the OECD options are adopted. Table 3.42 shows these options.

TABLE 3.42
RESPONSE OPTIONS CONCERNING INTENTIONS TO GET CONNECTED TO THE INTERNET

Does the enterprise intend to use the Internet in …?
Year t
Year t+1
Do not know

Source: OECD (2001), p. 8

Question B-B7. Do you intend to make use of e-commerce in? This question, so far, has only been employed in the Chilean business surveys (trade, service, tourism). The proposed response options are identical to the ones of the anterior question displayed in Table 3.42.

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[324] cp. OECD (2001), p. 2
[325] cp. OECD (2001), p. 9
[326] cp. INE (2003b), p. 1
[327] cp. INEI (2001b), p.54

Table 3.42 **Question B-B8. Does the enterprise intend to make use of computer-mediated networks other than Internet (e.g. EDI, Minitel, interactive telephone systems)?** Question B-B8 also forms part of the OECD model survey for ICT and e-commerce measurement in enterprises.[328] The response options are identical to the ones of questions B-B6 and B-B7.

Question B-B9: For what reasons would the enterprise get connected to the Internet? This question does not figure among the surveys of the institutions of international reference. It forms part of Chile's ICT survey for businesses.[329] It could provide policy makers with important information for formulating and setting up incentive systems to get companies online. The response options to this question can be found in Table 3.43.

TABLE 3.43
RESPONSE OPTIONS CONCERNING REASONS FOR BUSINESSES TO GET CONNECTED TO THE INTERNET (IF THEY ARE NOT ALREADY)

Reason to get connected to the Internet
Business improvement
Improvement of internal management and productivity
More competitive costs associated to connectivity (prices of connection, PCs)
Other (Higher security, among others)

Source: Subsecretaría de Economía de Chile (2002), p. 16

B-B10: For what reasons would the enterprise make use of e-commerce? In its "Measuring the Information Economy",[330] the OECD has been asking a similar question as the anterior one. Instead of asking for motivations to use the Internet, the motivations to make use of e-commerce were surveyed. The response options are displayed in Table 3.44.

TABLE 3.44
RESPONSE OPTIONS CONCERNING THE MOTIVATIONS TO USE ELECTRONIC COMMERCE

Motivations to make use of electronic commerce
Business improvement
Improvement of internal management and productivity
More competitive costs associated to connectivity (prices of connection, PCs)
Other (Higher security, among others)

Source: OECD (2002), p. 70

Question B-B11. Customer groups/destination of Internet sales? In the institutions of international reference, this question is part of OECD's ICT and e-commerce model questionnaire.[331] In LAC, Peru,[332] Chile as well as Trinidad and Tobago are inquiring this type of information.

Response options have been adopted from OECD's model questionnaire and are distinguishing between B2B (business-to-business), B2C (business-to-customer) and other

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[328] cp. OECD (2001), pp. 9 et seq.
[329] cp. Subsecretaría de Economía de Chile (2002), p. 16
[330] cp. OECD (2002), p. 70
[331] cp. OECD (2001), p. 13

[332] cp. INEI (2001b), p. 48

items. It is proposed to include B2G (business-to-government) sales as well, since in many Latin American countries the government portal is the largest e-commerce interactor for enterprises. Besides, the proposed Eurostat 2005 informal version for enterprises,[333] includes B2B and B2G, at least in the same answer option, the other possibility is B2C. The alternative items from the Peruvian innovation survey and the Trinidad and Tobago's survey on e-commerce are similar to those proposed by OECD. Chile asks for the amount of sales to "Individuals (households)" and to "enterprises". OECD asks to specify "other" destinations than the offered ones. This approach allows the detection of important "other" items opening the way for this inclusion in future surveys (see Table 3.45).

TABLE 3.45
RESPONSE OPTIONS CUSTOMER GROUPS/DESTINATION OF INTERNET SALES

Customer groups/destination of Internet sales
1. Other enterprises (B2B)
2. Households (B2C)
3. Government (B2G)
4. Others (Please specify)
(1 + 2 + 3 + 4 = 100%)
5. Don't know

 Source: Adapted from OECD (2001), p. 13

Question B-B12. Where did you sell goods/services over the Internet? and **B-B13. Where did you buy goods/services over the Internet?** The first question already forms part of OECD's business survey model questionnaire[334] and the proposed Eurostat 2005 informal version for enterprises,[335] as well as Chile's 2002 ICT survey among SME.[336] The second was only included in Chile's survey.[337] The offered response options for the first question are "home market" or "exports", and "within the country", "outside the country" or "within the region", this option refers to the geographic or economic region from which the country is part. However, in this case a more detailed investigation seems appropriate. The result of this question could provide a valuable indication on the flow of goods and services into the region, among the different sub-regions and out of the region. It would be advisable, for example, to ask for the percentage of sales/purchases (either, among the existent options or over the total sales/purchases), in order to know the intensity in each case. The proposed response options are displayed in Table 3.46.

TABLE 3.46
RESPONSE OPTIONS CONCERNING THE GEOGRAPHIC ORIGIN AND DESTINATION OF GOODS AND SERVICES

Geographic origin and destination of goods and services
Within the country (domestic market)
Within Andean Region/Caribbean/Central America/Mercosur
Within Latin American or the Caribbean region
Outside LAC region

 Source: Adapted from OECD (2001), p. 13 and OECD (2002), p. 69

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[333] cp. Eurostat (2004b), p. 3
[334] cp. OECD (2001), p. 13
[335] cp. Eurostat (2004b), p. 3
[336] cp. Subsecretaría de Economía de Chile (2002), p. 32
[337] cp. Subsecretaría de Economía de Chile (2002), p. 29

Questions B-B14. Has the enterprise paid on-line for products purchased on the Internet? to B-B22. If the enterprise receives orders via EDI, what percentage of total turnover (in monetary terms) does this represent in year t? These questions have all been adopted in the OECD model survey for ICT and e-commerce measurements within enterprises.[338] Furthermore, most of them have been incorporated in the proposed Eurostat 2005 informal version for enterprises,[339] except B-B18 and B-B20. They are not part of LAC surveys yet. However, they provide additional rich information on online activities via the Internet, EDI and other computer-mediated networks.

B-B23. Use of ICT in internal business and production operations

This issue is of course very important in order to understand the functionality and the development of the digital economy. However, the issue is also very complex. The OECD Working Party WPIIS considered a new "electronic business" module proposed by OECD in its model enterprise questionnaire. It was discussed in the April 2004 meeting. This new module was the result of examining several business surveys from developed countries. General business operations, such as "Marketing and customers", "purchases/procurement/sales of goods and services" and "human resource management" are proposed topics to be included in the module. The use of ICT in production automatization is more complex, since production processes vary between enterprises from different industries. Future work will be needed to formulate adequate questions to measure the use of ICT in internal business and production operations.

These questions complete the catalogue of the supplementary list.

3.5.4 Nice to Know/Redundancy

In the case of business surveys —as it has been for household surveys— there are two possible reasons for a question to fall into this last category. The first is that the Relevance Analysis indicates that this question does not contribute much additional information. The second reason is that the question has already been integrated into another question.

TABLE 3.47
QUESTIONS OF THE CATEGORY NICE TO KNOW/REDUNDANCY

Nice to Know/Redundancy
B-C1. Are the PCs in possession also in use?
B-C2. Use of website
B-C3. Use the Internet for Purchasing and Selling
B-C4. Use the Internet for Delivering and Paying

Source: Own elaboration based on the institutions investigated

Question B-C1. Are the PCs in possession also in use? Colombia has included the question of whether the PCs in possession are also being used, in their business ICT survey as well as in its household survey. Most of the PCs that are owned by a company are also in use. In the case of the trade survey, this percentage is 94.5 percent.[340] As this percentage suggests that PC possession and usage are almost identical, the question has not been added to the supplementary list.

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[338] cp. OECD (2001), pp. 12-14
[339] cp. Eurostat (2004b), pp. 3,4
[340] cp. DANE (2003b), p. 64

Question B-C2. Use of website?: This question, asked by Colombia,[341] has been integrated in question B-A10, the services/activities an enterprise uses the Internet for.

Question B-C3. Does the enterprise use the Internet for purchasing and selling? This question, asked in the Chilean ICT survey for businesses,[342] among others, is also part of question B-A10. However, it may also be used as a filter question for later questions on the value of Internet purchases, etc. This has been done within the model questionnaire for ICT and e-commerce measurement proposed by the OECD.[343]

Question B-C4. Does the enterprise use the Internet to deliver and pay their goods and services? This last question of this block also proposed by the OECD model questionnaire[344] —as well as the two anterior questions— has been integrated in question B-A10.

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[341] cp. DANE (2003b), pp. 168, 172 y 179
[342] cp. Subsecretaría de Economía de Chile (2002), p. 31
[343] cp. OECD (2001), p. 11
[344] ibid.

IV.   Conclusion and Perspectives

The Information Society is a central paradigm of our times. Organized knowledge about this phenomenon is thus necessary and its development for the benefit of all requires substantial policies. Reliable statistic data and indicators regarding readiness, use and impact of Information and Communication Technologies (ICT) help policy makers to formulate policies and strategies for ICT-driven economic growth, social and political development and the prevention of a new form of socio-economic exclusion, termed the "digital divide". In order to obtain a comprehensive picture about information society development, ICT indicators will need to be mainstreamed into existing surveys of National Statistic Offices (NSOs). The integration of ICT indicators in Census, household and business surveys is indispensable to track the development of an information society.

ICT measurement in households and businesses, however, can only mark the beginning of a long path to develop a comprehensive measurement instrument of the information society, including all relevant aspects related to the information society at a given time. Other important issues, are introduced shortly in this study, but will need to be taken up later again, by a more detailed analysis.

Countries of the developed world possess a substantial head start concerning the statistic measurement of components constituting an information society. Even though the underlying conditions in Latin America and the Caribbean are not as favorable as they are in the developed world, the task of paramount importance is to commence this type of measurement in the region immediately. Only by doing so can policy makers be provided with objective information in order to design policies that can avoid the further broadening of the international as well as the domestic digital divide and ultimately to bridge this gap.

Considering the pioneer work of some institutions from the developed world, such as the OECD, the European Commission, Statistics Canada and the Australian Bureau of Statistics, their groundwork has been analyzed and compared with efforts of fifteen NSOs and other institutions from Latin America and the Caribbean, namely Argentina, Barbados, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Honduras, Jamaica, Mexico, Paraguay, Peru, Trinidad & Tobago, Uruguay and Venezuela. The objective of this exercise was to suggest a framework for a measurement instrument that satisfies the needs of comparability with international standards, respecting existing work already done in Latin America and the Caribbean and considering regional particularities of information society development.

This paper concludes that the harmonization of ICT indicators in national population and housing censuses is feasible, constituting a manageable challenge. Many Latin American and

Caribbean NSOs have already carried out its Census 2000-round, and a significant number of NSOs, such as Argentina, Chile, Paraguay and Jamaica, have already incorporated most proposed ICT indicators for a census. Peru and Colombia still have not carried out their 2000-round, but are expected to do so during 2005. The study underlines the importance for them to integrate the same ICT indicators as already done by other LAC censuses.

Regarding household and business surveys, proposed indicators focus on access and access barriers to ICTs, such as PCs and the Internet, and also on the use and usage barriers to ICTs. For now, propositions are restricted to readiness and usage indicators, while impact indicators are not yet included at this stage. 12 core questions and response options are proposed as core ICT household indicators (H-A1 to H-A12). 25 questions are proposed in the supplementary list of ICT related household survey questions (H-B1 to H-B25) and 10 questions are placed into the category "nice to know/ redundancy" (H-C1 to H-C10) and are therefore not proposed for consideration. For business surveys, 12 questions and answer items are proposed in the core list of ICT indicators (B-A1 to B-A12), 23 ICT related questions are proposed in the supplementary list (B-B1 to B-B23) and 4 questions are not urgently suggested for incorporation (B-C1 to B-C4).

The methodology used to reach the suggested harmonized priority rankings has been elaborated to satisfy the following requirements: keep it short and simple, ensure international comparability, capture regional particularities and unique development features, build on flexibility and adaptability, and exploit existing resources. In this process, it has been found that the harmonization of response options in each question is as important as the harmonization of the formulation of the question, in order to obtain comparable variables. It has also been found that the harmonization of non-ICT variables, like the socio-demographic ones that describe different dimensions of the digital divide, is as important as the harmonization of ICT indicators. While the work in this field is often much further advanced than the harmonization of ICT indicators, it needs to be recognized that this task is yet to be completed.

This leads to final considerations on future challenges for the development of an adequate instrument for information society measurement in Latin America and the Caribbean. The task of mainstreaming ICT statistics into existing statistic work has just begun. In an information society its core technology, ICT, is increasingly omnipresent thus demanding adequate measurement in all relevant sectors, where it is applied. The most pressing tasks ahead might be to mainstream ICT indicators into statistics about education and training (i.e. e-learning and ICT in schools), into statistics about public institutions on all levels, national, regional and local (i.e. e-government) and into special economic statistics, such as consumer surveys, investment reports and employment statistics. A similar analysis as this study has proposed for household and business surveys will need to be done for such sectors of society, in order to contribute to the completion of the large task ahead: to develop a comprehensive measurement instrument that can help countries to understand the transition toward the information society in all its complexity.

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VI. Annexes

ANNEX I. THE OECD DEFINITION OF THE ICT SECTOR

Offices	XVIII The OECD definition of the ICT sector
Background	In 1998, OECD member countries agreed to define the ICT sector as a combination of manufacturing and services industries that capture, transmit and display data and information electronically. This definition, based on an international standard classification of activities (ISIC Rev. 3), was considered to be a first step towards obtaining some initial measurements of ICT sector core indicators.
Principles underlying the definition	For *manufacturing* **industries**, the products of a candidate industry: • Must be intended to fulfill the function of information processing and communication including transmission and display. • Must use electronic processing to detect, measure and/or record physical phenomena or control a physical process. For *services* **industries**, the products of a candidate industry: • Must be intended to enable the function of information processing and communication by electronic means.
The ISIC Rev. 3 classes included in the definition are	**Manufacturing:** 3000 – Office, accounting and computing machinery; 3130 – Insulated wire and cable; 3210 – Electronic valves and tubes and other electronic components; 3220 – Television and radio transmitters and apparatus for line telephony and line telegraphy; 3230 – Television and radio receivers, sound or video recording or reproducing apparatus and associated goods; 3312 – Instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process equipment; 3313 – Industrial process equipment. **Services**: 5150 – Wholesaling of machinery, equipment and supplies (if possible only the wholesaling of ICT goods should be included); 7123 – Renting of office machinery and equipment (including computers); 6420 – Telecommunications; 72 – Computer and related activities.
Adaptations and next steps	The OECD's 1998 activity-based definition of ICT was reviewed in April 2002. It was decided that, although this definition gives only a first approximation of the ICT sector, it should not be changed at this stage; rather its implementation should be improved with the help of more detailed national classifications. This decision is subject to reconsideration at a later date and in the context of the major revision of ISIC to be undertaken in 2007. The only minor modification to the OECD ICT sector definition is to take into account the split of ISIC 5150 (Wholesaling of machinery, equipment and supplies) that was introduced in the ISIC Rev. 3.1 of 2002, *i.e.* class 5151, "Wholesale of computers, computer peripheral equipment and software", and class 5152, "Wholesale of electronic and telecommunication parts and equipment".

Source: OECD (2002), p. 81

ANNEX II. THE OECD DEFINITION OF ELECTRONIC COMMERCE TRANSACTIONS AND GUIDELINES FOR THEIR APPLICATION

E-commerce transactions	OECD definitions	Guidelines for the interpretation of the definitions (WPIIS proposal April 2001)
Broad definition	An electronic transaction is the sale or purchase of goods or services, whether between businesses, households, individuals, governments, and other public or private organisations, conducted over computer-mediated networks. The goods and services are ordered over those networks, but the payment and the ultimate delivery of the good or service may be conducted on or off-line.	Include: orders received or placed on any online application used in automated transactions such as Internet applications, EDI, Minitel or interactive telephone systems.
Narrow definition	An Internet transaction is the sale or purchase of goods or services, whether between businesses, households, individuals, governments, and other public or private organisations, conducted over the Internet. The goods and services are ordered over those networks, but the payment and the ultimate delivery of the good or service may be conducted on or off-line.	Include: orders received or placed on any Internet application used in automated transactions such as Web pages, Extranets and other applications that run over the Internet, such as EDI over the Internet, Minitel over the Internet, or over any other Web enable application regardless of how the Web is accessed (e.g. through a mobile or a TV set, etc.). Exclude: orders received or placed by telephone, facsimile or conventional e-mail.

Source: OECD (2003d), p. 44

ANNEX III
DEFINITION OF DIFFERENT LEVELS OF EDUCATION ESTABLISHED BY UNESCO

Definitions of levels of education

First level education	"Education whose main function is to provide basic instruction in the tools of learning (e.g., at elementary school, primary school). Its length may vary from 4 to 9 years, depending on the organization of the school system in each country."
Second level education	"Education based upon at least four years of previous instruction at the first level, and providing general or specialized instruction, or both (e.g., at middle school, secondary school, high school, ...)".
Third level education	"Education which requires, as a minimum condition of admission, the successful completion of education at the second level, or evidence of the attainment of an equivalent level of knowledge."

Source: CNTS (n.d.)

ANNEX IV
CONCLUSIONS ON THE WORKSHOP ON INFORMATION SOCIETY MEASUREMENT FOR LATIN AMERICA AND THE CARIBBEAN

Workshop on Information Society Measurement for Latin America and the Caribbean

Observatory for the Information Society in Latin America and the Caribbean

(OSILAC)

Economic Commission for Latin America and the Caribbean (ECLAC) / Institute for Connectivity in the Americas (ICA)

Santiago de Chile, 3 - 4 November 2004

The following conclusions were adopted at the Workshop on Information Society Measurement in Latin America and the Caribbean, held in Santiago de Chile, during 3-4 November 2004.

1.   The Observatory for the Information Society in Latin America and the Caribbean (OSILAC), which was created under the programme of international statistical work for Latin America and the Caribbean (July 2003-June 2005) of the Statistic Conference of the Americas (SCA-ECLAC), should be supported in its tasks to:

a. promote dialogue among all stakeholders and facilitate a constant inventory exercise to have updated information about current statistical work related to Information Society measurement the region;

b. continue working on the standardization of information and communication technology (ICT) definitions, develop common methods required in calculating indicators, strive for the harmonization of methodologies and the development of a list of questions for specific thematic ICT surveys (supplementary list of questions);

c. exchange information and data in order to benchmark international and regional policy agendas of Information Society development, such as the Plan of Action of the World Summit on the Information Society (WSIS); already existing statistical information on the subject should be fully exploited;

d. strengthen capabilities of national statistical systems in the field of statistics and measurement of Information Society through training and technical assistance.

e. convey the views of Latin American and Caribbean in national, regional and international events on Information Society measurement, including WSIS and related events.

2.   Cooperation and coordination among institutions producing statistics and administrative registries, including private and non-governmental entities active in this field, is essential to make best usage of scarce resources;

3.   Considering existing statisticalwork in and outside the region, the adoption of the proposed list of core ICT questions for regular surveys is recommended to the responsible authorities of the national statistics system, as attached;

4.   Besides the incorporation of the recommended core questions in regular surveys, the necessity of specific thematic ICT surveys for households, businesses and other sectors of the economy is recognized, in order to gain a better understanding of the development of the Information Society in the region. To facilitate the cross-analysis of regular and specific surveys, the design of both types of surveys should be coordinated with, or executed by National Statistical Organisms.

8 Core Questions for regular household surveys		Response Options	Criteria		
			Intern. Reference	LAC Reference	Observed Unit
H-1	Does this household have a fixed line telephone?	Yes No	C, E, O	ALL (20)	Household
H-2a	*Does this household have a mobile telephone?*	Yes No	A, C, O	19	Household
H-2b	How many members of the household have access to a mobile phone?	Number	-	-	Household
H-3	Does this household have TV?	Yes No	-	19	Household
H-4	Does this household have a computer (PC)?	Yes No	A, C, O, *ES*	ALL (20)	Household
H-5	Does this household have an Internet access at home?	Yes No	A, C, E, O, *ES*	ALL (20)	Household
H-6	Where did you use the Internet most frequently in the last 3 months? *(tick all that apply)*	Did not access At Home At Work Educational Facility Free public access center (specific denomination depends on national practices) Commercial public access center (specific denomination depends on national practices) House of friend or neighbor Others	C, E, O, *ES*	Bb, Cl, Co, Cr, Mx, TT	Individual(s) of the household[345]

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[345] Regarding methodological implementation, the method of selecting the individual(s) in the household needs to be considered.

H-7a	How often did you usually access the Internet in the last 3 months? *(tick one)*	At least once a day At least once a week, but not every day At least once a month, but not every week Less than once a month Do not know	C, E, O, *ES*	Bb, Co, Mx, TT	Individual(s) of the household that use the Internet[345]
H-7b	How many hours did you usually access the Internet weekly over the last 3 months?	Number of hours per week Do not know	-	-	Individual(s) of the household that use the Internet[345]
H-8	For what services/activities did you use the Internet in the last 3 months? *(tick all that apply)*	Communication (e-mail, chat) Information search Purchasing/ordering goods or services Health related activities Education, research and related activities Transactions with public authorities Using electronic banking or other financial services Reading/downloading online newspapers/news magazines Playing/downloading games, music, software Other	A, C, E, O, *ES*	Bb, Cl, Co, Cr, Mx, TT	Individual(s) of the household that use the Internet[346]

5 Core Questions for regular business surveys[346]		Response Options	Criteria		Observed Unit
			Intern. Reference	LAC Reference	
B-1	How many computers does the enterprise have?	None Number Do not know	C	Cl, Co, Pe, TT	Enterprise
B-2	Does the enterprise use one of the following networks? *(tick all that apply)*	Internet Intranet Extranet LAN WAN	A, C, E, O, *ES*	Ar, Bb, Br, Bz, Cl, Co, Cr, Mx, Pa, Pe, S, TT, Uy	Enterprise
B-3	Does the enterprise have a website?	Yes No In construction	A, C, E, O, *ES*	Ar, Bb, Br, Cl, Co, Mx, Pe, TT, Uy	Enterprise
B-4	What is the share of the total number of employees using a computer connected to the Internet in their normal work routine?	% of total employees Do not know	C, E, O, *ES*	Ar, Cl, Co, TT, Uy	Enterprise with Internet access
B-5	What services/activities does the enterprise use the Internet for [external focus]? *(tick all that apply)*	Communication (e-mail, chat) Information search Placing orders Receiving orders Financial and banking services Transactions with public authorities Marketing or client support Education, research or training Other	C, E, O, *ES*	Cl, Co, Pe, TT	Enterprise with Internet access

The following organisms participated in the workshop: INDEC (Argentina), BARSTATS (Barbados), CSO (Belize), INE (Bolivia), IBGE (Brazil), INE and Subsecretaría de Economía (Chile), DANE (Colombia), INEC (Ecuador), DIGESTYC (El Salvador), STATIN (Jamaica), INEGI (Mexico), DGEEC (Paraguay), INEI (Peru), ONE (Dominican Republican), INE (Uruguay), INE (Venezuela), National E-Commerce Secretariat (Trinidad and Tobago), OECD, ITU, RICYT, UNESCO, ICA y CEPAL, having the presence of Comitê Gestor da Internet no Brasil, LACNIC and Social Watch.

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[346] In accordance with point 1b and 4 of the foregone conclusions, specific thematic surveys are of special interest for the business sector.