

## **Ecommerce Report**

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## List of Abbreviations and Definitions<sup>1</sup>

**B2B** Business-to-Business transactions conducted over Internet Protocol (IP)-based networks and over other computer-mediated networks.

**B2C** Transactions conducted between Business and private Consumers over IP-based networks and over other computer-mediated networks.

**Computer-mediated networks other than the Internet (e.g. Minitel or interactive telephone systems)** Networks that are employed for communication between computers, but which are not publicly accessible Wide Area Networks such as the Internet. They are usually proprietary networks made up of leased lines and can cover local and interactive telephone systems. They exclude all IP-based networks (www, Extranet, EDI over Internet, virtual private network over Internet, Internet-enabled mobile phones).

**EDI** Electronic Data Interchange (EDI) is the computer-to-computer exchange of business data in standard formats. In EDI, information is organized according to a specified format set by both parties, allowing a "hands-off" computer transaction that requires no human intervention or rekeying on either end. All information contained in an EDI transaction set is, for the most part, the same as on a conventionally printed document.<sup>2</sup>

**Extranet** A secure extension of an Intranet that allows external users to access some parts of an organization's Intranet.

**E-Commerce** Transactions conducted over IP-based networks and over other 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. According to the OECD's Working Party on Indicators for the Information Society (WPIIS), orders received via telephone, facsimile, or manually typed e-mails are not counted as electronic.

**HS** Harmonized System (World Customs Organization)

**ICT** Information and Communication Technology

**Intranet** An internal company communications network using the same protocol as the Internet allowing communication within an organization. They are typically set up behind a firewall to control access to the corporate information.

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<sup>1</sup> Definitions taken from Data Interchange Standards Association (<http://www.disa.org>) and Statistics Canada's *Electronic Commerce and Technology Survey*, 2007

**Internet** The Internet is the most common form of electronic network, using IP-based networks (www, Extranet over the Internet, EDI over the Internet, Internet-enabled mobile phones).

**IP** Internet protocol

**ISIC** International Standard Industrial Classification of All Economic Activities (UN)

**ISP** Internet Service Provider

**LAN** Local Area Network

**NSO** National Statistics Office

**OECD** Organisation for Economic Cooperation and Development

**Partnership** Partnership on Measuring ICT for Development

**SNA** System of National Accounts

**UNCTAD** United Nations Conference on Trade and Development

**UNDP** United Nations Development Programme

**UNESCWA** United Nations Economic and Social Commission for Western Asia

**UNSD** United Nations Statistics Division

**WCO** World Customs Organization

**WPIIS** Working Party on Indicators for the Information Society (OECD)

**WWW** World Wide Web

## EXECUTIVE SUMMARY

In recent years, as national governments have supported the development of Information and Communication Technology (ICT) to promote economic development, increasing emphasis has been placed on creating a body of indicators to provide an improved understanding of the impacts of ICT, including their effects on the competitive position of national economies in the international marketplace.

As the computer has changed the way we live, so e-commerce has transformed the way companies and consumers do business. The widespread adoption of computers both at home and in the workplace, together with the development of a broad range of sophisticated software, have given rise to the rapid growth of E-Commerce. Data from the OECD, the United States and Canada indicate that E-Commerce has exhibited rapid growth, although it still represents a relatively small proportion of total sales.

Over the past decade, a concerted effort has been made by national statistics offices (NSOs) to develop relevant, timely and internationally comparable data on the production and use of ICTs. A range of indicators has been proposed, and significant headway has been made, so that “a comparable set of (ICT) statistics is (now) available for most OECD countries. However, in developing economies, the availability of ICT indicators is still scarce (and) many developing economies are preparing ICT-related policies and strategies without the guidance of statistical evidence.”<sup>3</sup>

This report was prepared to examine the issues related to the measurement of E-Commerce for discussion at an ESCWA Workshop held in Dubai from March 30 to April 1, 2009, and to facilitate the adoption of appropriate methodologies in keeping with member countries’ statistical systems and resources. The principal findings and recommendations are summarized below:

### Benefits and Costs of E-Commerce

By transcending national boundaries, E-Commerce enables producers to market their products worldwide without having to establish an international sales organization. As well, companies can restructure existing marketing arrangements to lower costs, improve efficiency and increase productivity. For consumers, E-Commerce greatly expands the marketplace both in terms of the range of products available, and prices for the same product from different suppliers. E-Commerce tends to enhance the efficiency of market mechanisms by increasing competitiveness

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<sup>3</sup> UNCTAD, *Manual for the Production of Statistics on the Information Economy*, Revised Edition, New York and Geneva, 2009, page 6

and exerting downward pressure on prices for a broad range of commodities. However, there could be downside risks for local businesses if downward pressure on prices and profits squeezes profit margins and encourages imports.

## Data sources

International merchandise trade data are normally derived from Customs data, the international transactions reporting systems (ITRS) of central banks, and enterprise surveys. There are a number of difficulties associated with the use of Customs data and the ITRS as sources of E-Commerce data, however, whereas enterprise surveys are employed by a number of countries to produce information on E-Commerce.

Model questionnaires covering a range of ICTs have been developed under the auspices of UNCTAD, the OECD and Eurostat, and are reviewed in this report with respect to E-Commerce. Practices in Canada and the United States are also noted. To meet the needs of ESCWA member countries, it is proposed that a questionnaire be adopted that is compatible with the recommendations of international agencies, but which seeks additional information concerning the values of E-Commerce imports, exports, and the principal countries of origin and destination.

Significant overlaps exist between different data sources. Enterprise surveys developed by OECD countries provide overall estimates of E-Commerce, but do not provide precise estimates of the undercoverage of conventional data sources of international merchandise trade statistics.

## Definitions and Concepts

The defining characteristic of E-Commerce is the placing of an order over a computer-mediated network,<sup>4</sup> not the mode of payment or channel of delivery. Today, it is generally accepted that sales resulting from orders placed through e-mail is included in E-Commerce, but orders placed by telephone or fax are not. This is the definition adopted by the *Partnership on Measuring ICT for Development* (hereafter referred to as *the Partnership*), a consortium of international agencies, including the ITU, OECD, UNCTAD, the UNESCO Institute for Statistics, the World Bank, the UN Regional Commissions (UNECLAC, UNESCWA, UNESCAP, UNECA), and EUROSTAT.

Earlier definitions were developed by the OECD's Working Party on Indicators for the Information Society (WPIIS). Those definitions, which excluded e-mail purchases as part of E-Commerce, are also examined in this report. In addition, the report looks at international

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<sup>4</sup> Computer-mediated networks include, in addition to the internet, networks employed for communication between computers but which are not publicly accessible Wide Area Networks. They are usually proprietary networks made up of leased lines and can cover local and interactive telephone systems.



practices and survey methods as a guide to the development of E-Commerce data in ESCWA member countries.

## **Good practices**

E-Commerce is not a stand-alone technology, but depends on enabling ICTs and the communications infrastructure across a range of industries. There have been extensive discussions at the international level concerning the development of a statistical framework, resulting in a broad array of potential measures. The starting point for this report is a list of core ICT indicators put forward by *the Partnership*. Recognizing that it would be beyond the statistical capacity of many countries to produce a complete set of data, *the Partnership* recommends a piece-meal approach to the collection of ICT statistics, as resources and data sources permit.

## **Coordination and Institutional Arrangements**

At the national level, NSOs will assume a central role in assembling E-Commerce data collected through surveys or administrative sources such as Customs data and the international transactions reporting systems (ITRS) of central banks. It is recommended that NSO's play a critical role in establishing an inter-agency committee to assess the options and development plans for the compilation of E-Commerce data. At the regional and international level, ESCWA will maintain close liaison with NSOs while acting as a regional advocate in discussions with other national and international agencies. ESCWA will have a key role in convening Workshops for the exchange of information and obtaining agreement with all statistical sources on data issues, and can assist in the process of gaining institutional support from policy departments for a coordinated international survey. In addition to its coordinating role, ESCWA will have an important role in the provision of continuing technical assistance, software development, database management, and data analysis and dissemination.

## **Methodology**

The report notes the various steps involved in developing a database on E-Commerce affecting international merchandise trade. They include:

- Identifying data requirements, involving discussions with data users (policy departments, business sector);
- Assessing potential data sources, including Customs data, , household surveys, internal government records, the ITRS of central banks, and enterprise surveys;
- Creating data collection instruments to meet survey objectives, with reference to international standards, and the development of an ESCWA model questionnaire;
- Obtaining feedback from respondents, involving detailed testing of proposed questionnaires and survey methods;

- Developing an information program to obtain cooperation from survey respondents by explaining the need for the data in the context of national programs and priorities;
- Developing appropriate survey methodology, giving due consideration to the Business Register for enterprise surveys, statistical sampling techniques, and data quality controls at both the macro- and the micro-level;
- Developing a data analysis and dissemination strategy to highlight key findings and disseminate the data to a range of users;
- As a lower priority, assessing the feasibility of undertaking a Household Survey to measure the use of E-Commerce by households.

# 1. INTRODUCTION

## 1. Background

In recent years, as national governments have supported the development of ICT to promote economic development, increasing emphasis has been placed on creating a body of indicators to improve our understanding of the impacts of ICT, including their effects on the competitive position of national economies in the international marketplace.

As the computer has changed the way we live, so e-commerce has transformed the way companies and consumers do business. The widespread adoption of computers both at home and in the workplace, together with the development of a broad range of sophisticated software, has given rise to the rapid growth of E-Commerce.

Over the past decade, a concerted effort has been made by national statistics offices (NSOs) to develop relevant, timely and internationally comparable data on the production and use of ICTs. A range of indicators has been proposed, including data on the extent and growth of E-Commerce.

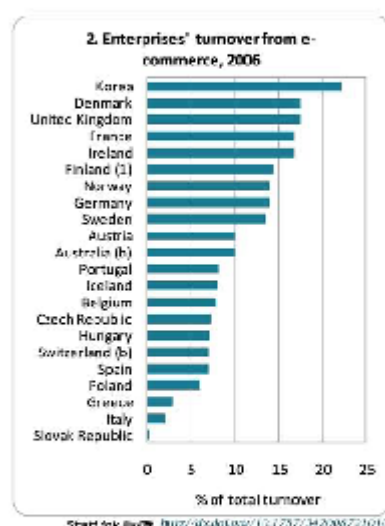
Significant headway has been made, enabling the impact of E-Commerce to be measured with some consistency for major economies. The OECD has produced a statistical summary documenting the extent and growth of ICTs, including the proportion of businesses selling goods on-line, total turnover from E-Commerce, and the rate of increase in E-Commerce. The analysis indicates that despite the rapid expansion of E-Commerce, it still represents a relatively small proportion of total sales (see Box 1).

In the United States, survey data (shown in Table 1) indicate that E-Commerce grew roughly twice as fast as economic activity in 2006, but represented only 14% of total turnover. The bulk of E-Commerce – over 90% – represented Business-to-Business (B2B) transactions, although the fastest growth was in the Business-to-Consumer (B2C) segment.

## Box 1. OECD Report on Trends in E-Commerce

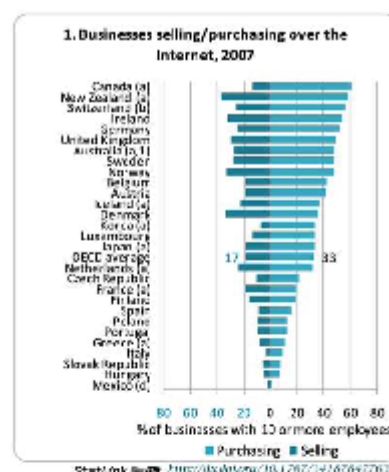
*A growing number of businesses in OECD countries purchase and sell goods and services via the Internet.*

In 2007, on average, one third of all businesses with 10 or more employees used the Internet for purchasing and 17% for selling goods or services.



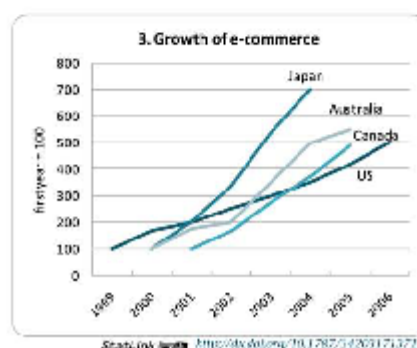
Despite its small size, e-commerce has shown a significant increase in many OECD countries.

*In Australia, Canada, Japan, and the US, e-commerce has increased by five to seven times from the late 1990's to the mid 2000's.*



In most OECD countries, e-commerce still represents a small share of total sales.

*In 2006, e-commerce was above 15% of total turnover in Korea, Denmark, the United Kingdom, France and Ireland.*



Source: OECD, *The Future of the Internet Economy: A Statistical Profile*, Paris, June 2008, page 25

<b>Table 1. U.S. Shipments, Sales, Revenues and E-commerce: 2006 and 2005</b>								
<i>Shipments, sales and revenues are in billions of dollars.</i>								
Description	Value of Shipments, Sales, or Revenue				Year to Year Percent Change		% Distribution of E-commerce	
	2006		2005		Total	E-commerce	2006	2005
	Total	E-commerce	Total	E-commerce				
<b>Total *</b>	<b>20,912</b>	<b>2,937</b>	<b>19,583</b>	<b>2,579</b>	<b>6.8</b>	<b>13.9</b>	<b>100.0</b>	<b>100.0</b>
<b>B-to-B*</b>	<b>10,605</b>	<b>2,716</b>	<b>9,924</b>	<b>2,393</b>	<b>6.9</b>	<b>13.5</b>	<b>92.5</b>	<b>92.8</b>
Manufacturing	5,020	1,568	4,742	1,344	5.9	16.7	53.4	52.1
Wholesale Merchant	5,585	1,148	5,181	1,049	7.8	9.4	39.1	40.7
Excluding MSBOs <sup>1</sup>	3,909	613	3,586	551	9.0	11.3	20.9	21.4
MSBOs	1,676	535	1,596	498	5.0	7.3	18.2	19.3
<b>B-to-C*</b>	<b>10,307</b>	<b>221</b>	<b>9,659</b>	<b>186</b>	<b>6.7</b>	<b>18.8</b>	<b>7.5</b>	<b>7.2</b>
Retail	3,887	107	3,688	87	5.4	22.0	3.6	3.4
Selected Services	6,420	114	5,971	99	7.5	14.9	3.9	3.8

Source: U.S. Census Bureau, *2006 E-commerce Multi-sector Report* (Internet Edition), May 16, 2008  
(<http://www.census.gov/eos/www/ebusiness614.htm>)

In Canada, the latest E-Commerce data are for 2007, when on-line sales increased at a double-digit pace for the sixth consecutive year. Internet sales rose 26% from their level in 2006, but constituted less than 2% of total operating revenue of reporting companies. Nevertheless, this was double the proportion they represented five years earlier.

As noted by UNCTAD, although “a comparable set of (ICT) statistics is (now) available for most OECD countries,...in developing economies the availability of ICT indicators is still scarce...Therefore, many developing economies are preparing ICT-related policies and strategies without the guidance of statistical evidence.”<sup>5</sup>

This report examines the issues related to the measurement of E-Commerce. It was prepared as a basis for discussion at an ESCWA Workshop held in Dubai from March 30 to April 1, 2009, and to facilitate the adoption of appropriate methodologies in keeping with member countries’ statistical systems and resources.

## 2. Objectives

The overall objective of this report is to enable member countries to develop appropriate systems for the compilation of E-Commerce statistics in the context of international merchandise

<sup>5</sup> UNCTAD, *Manual for the Production of Statistics on the Information Economy*, New York, 2009, page 6

trade, and to provide a better understanding of the role of ICT and E-Commerce in facilitating the export and import of goods.

### **3. Organization of the report**

The report is divided into eight parts. Part 1 outlines the background, objectives and structure of the report. Part 2 defines relevant concepts associated with E-Commerce. Part 3 puts E-Commerce into perspective by reference to supporting and enabling ICTs. Part 4 describes data sources and survey methods developed for the compilation of E-Commerce and related statistics. Part 5 outlines key issues affecting the measurement of international E-Commerce. Part 6 provides observations made by member countries at the Dubai Workshop. Part 7 notes capacity-building issues associated with the development of E-Commerce surveys, while Part 8 contains findings and recommendations.

## 2. CONCEPTS AND DEFINITIONS

### 1 Concepts

#### 1.1 E-Commerce

E-Commerce is a visible manifestation of the vast, unseen body of ICTs, which have come to permeate business, government and the household sector. As a key interface between supply and demand, E-Commerce constitutes an increasingly important component of markets, supported by a vast network of infrastructure and enabling technologies.

E-Commerce is a form of marketing which applies to virtually all sectors of the economy. A product may be sold through a retailer in a conventional shop or store; or it can be marketed on-line by the manufacturer or a sales agent. Moreover, the sale of a product can be recorded at different points in the distribution process: by a manufacturer, by a wholesaler, or by a retailer. A transaction may take a conventional route involving the sale by a manufacturer to a wholesaler, who in turn sells the product to a retailer, who makes the final sale to a consumer. Any or all of these transactions could take the form of, and be recorded in the statistics, as E-Commerce.

E-Commerce has evolved rapidly. In today's world, not only are products offered and orders received on-line, but secure means of electronic payment exist to guarantee payment for goods shipped. The offering of goods, placement of orders, and payment arrangements involve an extensive array of sophisticated technologies which are critical to the conduct of E-Commerce. While the Internet is a central element, the process could not function without the prior existence and development of the telecommunications infrastructure and the range of services and software that have turned the Internet into a heavily used electronic highway and interactive communications medium.

The definition of E-Commerce has evolved since the associated concepts and data were first developed in the late 1990s. In the process, a number of issues have arisen: are all electronic media, including e-mail, telephone and fax communication, to be included? Is the comparison and selection of products on-line that results in an in-store sale to be included as E-Commerce? Is electronic payment an essential aspect of e-commerce? And is electronic communication a sufficient basis for a valid, legally binding, contract?

In examining these questions, different organizations have, at different times, produced recommendations for the measurement of E-Commerce. The OECD established the *Working Party on Indicators for the Information Society (WPIIS)* in 1999, whose mandate included the development of definitions and guidelines with respect to the use of ICTs, including E-Commerce. The OECD made a distinction between "internet transactions" – transactions for

which orders were placed on the internet – and “electronic transactions”, which include, in addition to internet transactions, transactions effected through other computer-mediated networks.<sup>6</sup> The OECD definitions also excluded transactions effected through e-mail, telephone, or fax transmissions.<sup>7</sup>

More recently, a consortium of international agencies known as the *Partnership on Measuring ICT for Development*, (subsequently referred to in this report as *the Partnership*)<sup>8</sup> was formed to establish guidelines for the development of a body of indicators applicable not just to highly industrialized (OECD) countries, but of global application. In its work, *the Partnership* slightly modified the earlier OECD definition of E-Commerce to take account of prevailing conditions in developing as well as OECD countries to include only E-Commerce placed through the Internet (including e-mail but excluding telephone and fax-based transactions), and to exclude transactions through other (non-Internet) computer-mediated networks.

**Definition of E-Commerce proposed by ESCWA:** The definition of E-Commerce proposed by ESCWA is consistent with *the Partnership’s* definition. That is, E-Commerce is the sale or purchase of goods or services ordered over the Internet, including orders placed by e-mail, but excluding orders placed by telephone or fax. The method of payment or ultimate delivery of the goods and services are not determining factors in the definition of E-Commerce: payment or delivery may be made on- or off-line.

The *Partnership* stresses the need for international comparability of data, so as to facilitate international comparisons and benchmarks. In this context, the definitions produced by the *Partnership* and the OECD are shown in Box 2 (below). In all cases, E-Commerce has been defined as the purchase or sale of goods on-line. As experience has been gained over a period of time, a growing consensus has emerged over the key concepts, definitions and measures.

## 1.2 E-Auctions

Online auctions – such as E-Bay – provide a facility for goods to be auctioned electronically. Goods are advertised for sale (at a scheduled time and date) to the highest bidder. Goods may be listed for sale subject to a reserve – that is, the lowest price acceptable to the seller – and they may also be offered for prior sale at a specified price. E-Auctions are a significant form of E-Commerce. They facilitate selling and buying by individuals, but they may also be used by

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<sup>6</sup> Computer-mediated networks include, in addition to the internet, networks employed for communication between computers but which are not publicly accessible Wide Area Networks. They are usually proprietary networks made up of leased lines and can cover local and interactive telephone systems.

<sup>7</sup> It should be noted that some OECD members include e-mail, telephone and/or facsimile transmissions in their E-Commerce data and definitions

<sup>8</sup> The *Partnership* includes representatives from the ITU, OECD, UNCTAD, the UNESCO Institute for Statistics, the World Bank, the UN Regional Commissions (UNECLAC, UNESCWA, UNESCAP, UNECA), and EUROSTAT



smaller merchants as retail outlets through the creation of links between the merchants' and the auction's websites.

BOX 2: DEFINITIONS OF E-COMMERCE
<b><i>OECD BROAD definition of E-Commerce Transactions</i></b>
<p>An <b>electronic transaction</b> is the sale or purchase of goods or services, whether between businesses, households, individuals, governments, and other public or private organisations, conducted <b>over computer-mediated networks</b>. 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.</p> <p><i>Interpretation guideline:</i> Include: orders received or placed on any on-line application used in automated transactions such as Internet applications, EDI, Minitel or interactive telephone systems.</p>
<b><i>OECD NARROW definition of E-Commerce Transactions</i></b>
<p>An <b>Internet transaction</b> is the sale or purchase of goods or services, whether between businesses, households, individuals, governments, and other public or private organisations, conducted <b>over the Internet</b>. The goods and services are ordered over the Internet, but the payment and the ultimate delivery of the good or service may be conducted on- or off-line.</p> <p><i>Interpretation guideline:</i> 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 enabled 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.</p>
<b>Definition</b> proposed by ESCWA (consistent with <i>the Partnership</i> definition)
<p>E-Commerce is the sale or purchase of goods or services ordered over the internet, including orders placed by e-mail. The method of payment or ultimate delivery of the goods and services are not determining factors in the definition of E-Commerce, however, and payment or delivery may be made on- or off-line.</p>

### 1.3 Computer-mediated networks

To be considered E-Commerce, a transaction must be associated with an order placed over a computer-mediated network. For the most part, this refers to the Internet (www.). However,

there are also a number of other networks, some of which do not qualify as a basis for E-Commerce. Key networks and supporting technologies are described below:

### **Internet**

More precisely termed Internet Protocol (IP)-based networks, the Internet is the most common form of electronic network. In addition to websites identified through the *www* prefix, IP-based networks include the Extranet over the Internet, EDI over the Internet, and Internet-enabled mobile phones.

### **Electronic Data Interchange (EDI)**

EDI is the computer-to-computer exchange of business data in standard formats. In EDI, information is organized according to a specified format set by both parties, allowing a "hands-off" computer transaction that requires no human intervention or re-keying at either end. All information contained in an EDI transaction set is, for the most part, the same as on a conventionally printed document.<sup>9</sup>

### **Intranet**

An Intranet is an internal company communications network using the same protocol as the Internet allowing communication within an organization. An Intranet is typically set up behind a firewall to control access to the corporate information.

### **Extranet**

An Extranet is a secure extension of an Intranet that allows external users to access some parts of an organization's Intranet.

### **Computer-mediated networks other than the Internet**

These consist of Minitel (a computerised service provided through the French telephone system that pre-dated the Internet), and other interactive telephone systems; also, networks that are employed for communication between computers but that are not publicly accessible Wide Area Networks. They are usually proprietary networks made up of leased lines and can cover local and interactive telephone systems. (They exclude all IP/Internet Protocol-based networks, such as *www*, Extranet, EDI over Internet, virtual private network over Internet, and internet enabled mobile phones.)

## **2. Working Definitions**

A standard definition is, of course, essential to development of a comparable international database. In addition to a consistent definition, information needs to be collected in response to questions that put the definition into measurable form. Accordingly, it is instructive to examine the questions or definitions incorporated in questionnaires related to E-Commerce. Box 3,

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<sup>9</sup> Data Interchange Standards Association definition (<http://www.disa.org>)

entitled “Working Definitions of E-Commerce,” shows how questions are actually worded or terms defined in the questionnaires prepared by a number of international organizations and countries.

<b>Box 3. Working Definitions of E-Commerce*</b>	
<i>Source</i>	<i>Definition (or equivalent)</i>
UNCTAD model questionnaire <sup>10</sup>	Did your business receive orders for goods or services (that is, make sales) via the Internet during <reference period>? <i>Orders received include orders received via the Internet whether or not payment was made online. They include orders received via websites, specialized Internet marketplaces, extranets, EDI over the Internet, Internet-enabled mobile phones and email. They also include orders received on behalf of other organizations – and orders received by other organizations on behalf of the business. They exclude orders which were cancelled or not completed.</i>
OECD model questionnaire <sup>11</sup>	Did your business receive orders (make sales) for goods or services via the Internet during <period>? Including: via Web sites, specialised Internet marketplaces, extranets, EDI over the Internet, Internet-enabled mobile phones but excluding orders submitted via conventional e-mail. Include: orders received on behalf of other organisations and orders received by other organisations on behalf of your business
Eurostat model ICT questionnaire <sup>12</sup>	Transactions conducted over IP-based networks and over other 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. Orders received via telephone, facsimile, or manually typed e-mails are not counted as electronic commerce.
U.S.A. <sup>13</sup>	E-commerce sales and other operating receipts are sales of goods and services where an order is placed by the buyer; or price and terms of the sale are negotiated over an Internet, extranet, EDI network, electronic mail, or other online system. Payment may or may not be made online. NOTE: If AUTOMOTIVE, also INCLUDE sales of cars where a binding sales price is established online through the dealer’s or a third party’s web site. EXCLUDE leads.
Canada <sup>14</sup>	E-commerce includes the value of an organization’s goods or services where the order is received, and the commitment to purchase is made via the Internet, with or without on-line payment. This includes all orders that were placed over the Internet and paid for using the following: the Internet, telephone, facsimile or another technology. Include orders placed: by E-mail, on your website, by EDI over the Internet, using Extranets on the Internet and other methods of receiving orders via the Internet. Include only goods and services that were sold directly by your organization and exclude sales that were done over the Internet on your behalf by another organization.

*\* questions or guides incorporated in questionnaires underlying E-Commerce measures*

Note that the UNCTAD, OECD and Canadian questionnaires ask for transactions conducted via the Internet; Eurostat refers to the Internet and “other computer-mediated networks”; and the United States asks for orders or “terms of sale” placed over the Internet or “other online system.” Note, moreover, that the UNCTAD, U.S. and Canadian questionnaires call for the inclusion of E-Mail-based transactions, while the OECD and Eurostat<sup>15</sup> questionnaires exclude them.

### 3 Benefits and Costs of E-Commerce

E-commerce is a relatively low-cost form of marketing that can reach a broad – even global – market. However, it lacks the immediacy and personal contact of more conventional marketing through local media, direct mail and person-to-person selling. The salient effects for buyers and sellers are listed below.

#### *For producers*

By connecting with markets that transcend national boundaries, E-Commerce enables producers to market their products worldwide without having to establish an international sales organization. By the same token, companies can restructure existing marketing arrangements to take advantage of the internet’s ease of communications, thereby lowering costs, improving efficiency, and increasing productivity. For companies that already have web sites, incorporating e-commerce capabilities provides a cost-effective way of creating value added.

#### *For consumers*

For consumers, E-Commerce greatly expands the marketplace both in terms of the range of products available, and prices for the same product in different places. By increasing knowledge about prices of comparable products, E-Commerce makes markets more efficient: it serves to increase price competitiveness for a broad range of commodities, and exerts downward pressure on prices.

As noted by UNCTAD, “By bringing together large numbers of producers and buyers, e-markets reveal market prices and other transaction information to all parties. By contrast, accessing information in offline markets is costly, and channelling it through various intermediaries may distort information on prices and other trade data. Increased price transparency reduces price differences prevailing in the marketplace. It also allows buyers to compare prices and make more informed purchasing decisions.”<sup>16</sup>

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<sup>10</sup> UNCTAD, *Manual for the Production of Statistics on the Information Economy- Annex 1*, New York, 2007, page 109

<sup>11</sup> OECD, *Guide To Measuring ICT*, Paris, 2005, page 116

<sup>12</sup> UNCTAD, *op. cit.*, page 126

<sup>13</sup> U.S. Census Bureau, *2006 E-commerce Multi-sector Report* (Internet Edition), May 16, 2008

<sup>14</sup> Statistics Canada, *Electronic Commerce and Technology Survey 2007*, Ottawa

<sup>15</sup> Eurostat is the coordinating statistical office for the European Community

<sup>16</sup> UNCTAD, *E-Commerce and Development Report*, New York, 2003, page 163

As an example, markets for many agricultural commodities are characterized by large numbers of producers and buyers brought together by traders, who act as middlemen. The power of the Internet greatly strengthens the ability to bring all the parties together into a single trading community.

The UNCTAD report goes on to observe that, “the Internet can reduce the use of intermediaries in the traditional supply chain by enabling producers to interact and transact directly with buyers. This is largely because producers and buyers can obtain trade information from each other and can carry out transactions at a much lower cost than in an offline supply chain with multiple intermediaries. Use of the Internet can also increase the efficiency of existing intermediaries to the extent that they adopt the new information technologies. Also, e-markets can be viewed as new intermediaries that can replace traditional off-line (ones).”<sup>17</sup>

While the Internet can be of benefit to both sellers and buyers, it can be either a benefit or a detriment to traders. They can use it to broaden their market; or they might find that it poses unwelcome competition from the direct contacts it facilitates between buyers and sellers.

#### *Costs*

While there are many benefits for consumers and producers, there are also downside risks for local businesses. The increased choice for consumers from the range of products available in e-markets could be at the expense of local producers and retailers. Competitive forces are likely to exert downward pressure on prices and profits, reducing profit margins for businesses engaged in production and distribution, and encouraging imports.

### **3. INFORMATION & COMMUNICATION TECHNOLOGY (ICT)**

E-Commerce is not a stand-alone technology, but depends on enabling technologies across a range of industries, and a communications infrastructure consisting of a network of internet providers and telecommunications utility companies. This section of the report provides a brief overview of the different applications of ICT in business processes (known as E-business), before going on to examine in some depth proposed statistical frameworks.

#### **1. E-business**

E-Business refers to the whole panoply of ICTs employed in business processes not merely by corporations, but by all institutions engaged in productive activities. Although the term is of fairly recent origin, E-Business itself is not new. Computers have been an integral part of the workplace for more than 40 years, with mainframe computers performing large-scale processing operations such as payrolls, accounting, banking, inventory control, production processes, and many other functions. In today’s world, E-Business is virtually all-encompassing. With the

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<sup>17</sup> *ibid*, page 163

migration of records systems to electronic processes, the use of ICTs affects all areas (see Box 3), while its impact in stimulating E-Commerce has been profound.

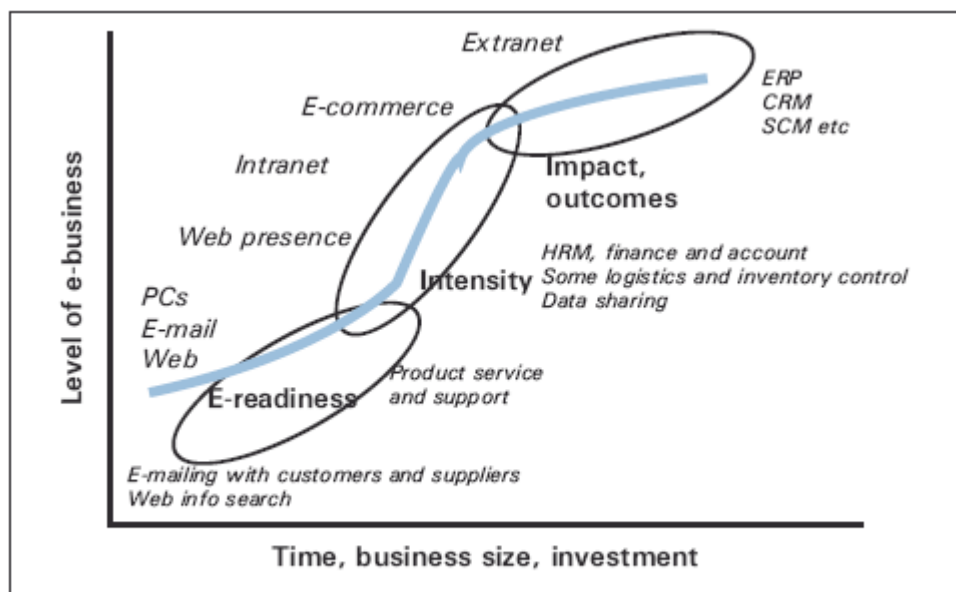
<b>Box 4. Types of E-business processes</b>	
Customer acquisition and retention	Customer relationship management (CRM); marketing campaign management, planning and execution; database marketing, direct marketing and telemarketing; electronic catalogues; web activity analysis and web advertising; call centres; arranging repairs and maintenance; handling customer complaints
E-commerce	Sale or purchase/procurement of goods or services (includes getting estimates, negotiating, ordering, arranging contracts); EDI; mobile commerce; integration of ordering system with that of customers/ suppliers; integrated invoicing and payment by customers; full integration with back-end systems; use of an extranet; secure transactions; automated payment of suppliers
Order fulfilment and order tracking	Order control, product control, order tracking; data processing that relates to order fulfilment or tracking; sales force automation
Logistics (inbound & outbound) and inventory control	Supply chain management (SCM); production and inventory control (including of raw materials, parts, finished goods), distribution control, management of inventory, management of customers' inventory, transportation and shipping, automated warehouse; arranging and managing transport, dispatch of goods, tracking, provision of services
Finance, budget and account management	Enterprise resource planning (ERP); managing, planning and evaluating finance; invoicing and payment systems; software systems
Human resource management	External and internal recruitment, on-line job applications; automation of administrative tasks such as time reporting, payment of salaries and pension schemes, travel reimbursement, tracking working hours and production time; training; tele-working
Product service and support	Website support, frequently asked questions (FAQ), downloadable manuals; on-line queries; after-sales support
Research and development	Research, development and design of products, services or processes; computer-aided design (CAD), computer-aided manufacturing (CAM) and collaborative design
Knowledge management	Systematically aggregating and disseminating information and knowledge within the business; content management system; e-learning

Source: UNCTAD, *Manual for the Production of Statistics on the Information Economy*, New York, 2009, page 17

The increasing intensity of ICT use by businesses, from a relatively low level of internet access to progressive adoption of e-business processes, has been illustrated in the form of an S-curve (see Chart 1). The development of an ICT database provides insights into the growing use of information and communication technologies by businesses and its impact on the expansion of global markets. For policymakers, the growing volumes of E-Commerce are of critical importance in creating an investment climate conducive to economic development.



Chart 1. Intensity of ICT Use and Adoption of E-Business Processes (S-Curve)



Source: adapted from E-Commerce and Development Report (UNCTAD, 2004) and Industry Canada (1999).

The impact of ICT is not confined to the economic sphere, however, but affects all facets of daily life. According to the OECD,

“The Internet is quickly permeating all economic and social domains, and most public policy areas. For instance, e-government has become the prime tool for supporting government functions and interaction with citizens and businesses. Healthcare systems are increasingly making use of the Internet and online networks to increase affordability, quality and efficiency, through electronic patient record systems, remote patient monitoring and healthcare delivery, along with improved diagnostics and imaging technologies. Educational performance is found to be correlated with home access to, and use of, computers – all other things being equal. Moreover, environmentally-friendly technologies based on the Internet in buildings and transport systems and alternative power generating systems can help address climate change and improve energy efficiency.”<sup>18</sup>

In short, the internet provides access to a broad range of information across the entire spectrum of the social, economic and cultural spheres. Another innovation, in everyday use, particularly in developing countries, is the use of mobile phones and text messaging (SMS) as communications tools that bring together converging ICT technologies. It is only in recent years, however, with

<sup>18</sup> OECD, *Policy Brief: The Future of the Internet Economy*, Paris, page 2

widespread ownership of personal computers (PCs), vastly improved communications networks, and virtually universal access to the internet and IP-enabled devices, that E-Commerce has come into its own.

## 2. International Standards: Framework for Compilation and Dissemination

Although the focus of this report is on E-Commerce, there have been extensive discussions at the international level concerning the development of a broad statistical framework encompassing the different aspects of the production and use of ICT.

- Measurement of economic phenomena is frequently not straightforward, and measurement of ICT is no exception. The 1993 revisions to the System of National Accounts (SNA) provide a generalized framework, known as satellite accounting, for the measurement of economic phenomena that cut across conventional classification systems. Satellite accounts use SNA concepts of supply and use to reflect the economic impacts of activities such as tourism, health, or high technology. For example, Australia has produced satellite accounts for the ICT sector which include estimates of the value added of major ICT related industries (such as ICT manufacturing and computer services) resulting from ICT activity; imports of ICT products; total household and government consumption of ICT by type of product; capital expenditure on ICT products by industry; exports of ICT products; compensation of employees in ICT 'industries'; and gross operating surplus and gross mixed income in ICT 'industries'.<sup>19</sup>

A prime focus of the OECD's WPIIS has been the development of a broad statistical database for the ICT sector. A number of elements have been identified, including:<sup>20</sup>

- *ICT products* – definitions and classifications relating to ICT goods and services, measurement of international trade in ICT goods, and the price and quality of ICT products.
- *ICT infrastructure* – the infrastructure of the information society – access services, their quality, investment in such services, and tariffs.
- *ICT supply* – the supply side of ICT, namely the ICT sector, its impacts, other ICT-producing entities, and ICT patenting activity.
- *ICT demand by businesses* – based on the OECD model survey of ICT use by businesses, consisting of statistical standards for e-business and ecommerce, ICT

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<sup>19</sup> See “Australian National Accounts - Information and Communication Technology Satellite Account”, taken from: <http://www.abs.gov.au/Ausstats/abs@.nsf/0/9AB6AB31699718F4CA256CDF00790444?Open>

<sup>20</sup> OECD, *Guide to Measuring the Information Society*, Paris, 2007  
([http://www.oecd.org/document/22/0,3343,en\\_2649\\_34449\\_34508886\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/22/0,3343,en_2649_34449_34508886_1_1_1_1,00.html))



- investment and expenditure by business, and the economic impacts of ICT investment and use.
- *ICT demand by households and individuals* – based on the OECD model survey of ICT access and use by households and individuals, e-commerce, and the social and economic impacts of ICT use by households and individuals.
  - *Content* – statistical issues relating to information and electronic content and recent work on defining a “Content and media” sector and its products.
  - *Cross-cutting topics in information society measurement*, such as e-government, trust in the online environment and the digital divide, ICT skills, ICT in education, and a broader view of ICT within a social, economic and environmental context.
  - *The road ahead* – examination of the international scene and future challenges.

A comprehensive list of core ICT indicators has also been put forward by *the Partnership*. The list of indicators is extensive, with elements covering:

- ICT infrastructure and access
- access to, and use of, ICT by households and individuals
- use of ICT by businesses
- ICT sector and trade in ICT goods.

Most of ICT indicators are beyond the purview of this report, however, and we shall focus on the latter two categories, which include elements related to international trade and E-Commerce (see Box 4). The indicators take account not only of the OECD recommendations, but also the needs and capacities of developing countries. Recognizing that it would be beyond the statistical capacity of many countries to produce a complete set of data, UNCTAD proposes that the *List* be treated as a starting point for the collection of ICT statistics in accordance with each country’s needs and statistical capacity.

## 2.3 Application of standards to E-Commerce surveys

In this report, the emphasis is on the measurement of E-Commerce in the marketplace, taking elements of both the supply and the demand sides, and with specific reference to international trade. Data collected by OECD countries suggest that the bulk of transactions take the form of Business-to-Business (B2B) transactions conducted over IP-based networks, while Business-to-Consumer (B2C) transactions are of much less magnitude. For the purposes of this study, the emphasis will be on B2B transactions conducted over the Internet. And with respect to *the Partnership’s* list of core indicators, it should also be noted that the principal emphasis of this report is not on ICT goods (reflected in indicators ICT3 and ICT4), but on E-Commerce in all types of exported and imported goods.

### Box 5. Selected List of ICT Indicators

Use of ICT by businesses	
Code	Core indicator
B1	Proportion of businesses using computers
B2	Proportion of persons employed routinely using computers <sup>1</sup>
B3	Proportion of businesses using the Internet
B4	Proportion of persons employed routinely using the Internet <sup>2</sup>
B5	Proportion of businesses with a web presence
B6	Proportion of businesses with an intranet
B7	Proportion of businesses receiving orders over the Internet
B8	Proportion of businesses placing orders over the Internet
B9	Proportion of businesses using the Internet by type of access (narrowband, broadband (fixed, mobile)) <i>Response categories:</i> <ul style="list-style-type: none"> <li>- Narrowband</li> <li>- Fixed broadband</li> <li>- Mobile broadband</li> </ul>
B10	Proportion of businesses with a local area network (LAN)
B11	Proportion of businesses with an extranet
B12	Proportion of businesses using the Internet by type of activity <i>Response categories:</i> <ul style="list-style-type: none"> <li>- Sending or receiving e-mail</li> <li>- Telephoning over the Internet/VoIP, or using video conferencing</li> <li>- Use of instant messaging, bulletin boards</li> <li>- Getting information about goods or services</li> <li>- Getting information from general government organizations</li> <li>- Interacting with general government organizations</li> <li>- Internet banking</li> <li>- Accessing other financial services</li> <li>- Providing customer services</li> <li>- Delivering products on line</li> <li>- Internal or external recruitment</li> <li>- Staff training</li> </ul>
ICT sector and international trade in ICT goods	
Code	Core indicator
ICT1	Proportion of total business sector workforce involved in the ICT sector (expressed as a percentage)
ICT2	ICT sector share of gross value added (expressed as a percentage of total business sector gross value added).
ICT3	ICT goods imports as a percentage of total imports
ICT4	ICT goods exports as a percentage of total exports

<sup>1</sup> Note that this indicator is not equivalent to the employment weighted indicator 'proportion of persons employed working in businesses with a computer'.

<sup>2</sup> Note that this indicator is not equivalent to the employment weighted indicator 'proportion of persons employed working in businesses with Internet access'.

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# DATA SOURCES AND METHODS

## 1 Data Sources

UNCTAD, the OECD and Eurostat have all designed model special-purpose questionnaires as guides for the measurement of ICT use, including E-Commerce.<sup>21</sup> The United States has taken a different approach, adapting existing economy-wide surveys to collect E-Commerce data. These and a Canadian questionnaire are included as Appendices to this report to illustrate approaches currently employed for the measurement of E-Commerce. Relevant parts of these questionnaires are examined below.

To facilitate response and minimize the reporting burden, a number of these questionnaires contain questions that require a “Yes” or “No” answer, rather than quantitative (i.e. monetary) values. In some cases, however, monetary values (or their equivalent) are also called for.

None of the above questionnaires is solely concerned with the measurement of E-Commerce. The UNCTAD, OECD, Eurostat and Canadian questionnaires focus on the use of a range of ICTs by businesses, while the United States economy-wide surveys ask for a broad range of production and cost data.

### 1.1 UNCTAD model questionnaire

Key questions from the UNCTAD model questionnaire are shown in Box 5. Note that the only questions asked about E-Commerce in the UNCTAD survey are whether the reporting company used the internet to order, or receive orders for, goods during the reference period (Questions B6 and B7). Although providing a wide range of data, therefore, it is not possible to determine the actual value of E-Commerce from the UNCTAD questionnaire alone.

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<sup>21</sup> The UNCTAD *Manual for the Production of Statistics on the Information Economy* also discusses the addition of data modules to existing surveys (*op. cit.* page 42)

## **Box 6. Extracts from UNCTAD model questionnaire for core indicators on the use of ICT by businesses**

### **Module A: General Information about use of ICT by your business**

- A1. Did your business use computer/s during <reference period>?
- A2. What percentage of persons employed in your business routinely used a computer at work during <reference period>? (Answer in %)
- A3. Did your business have in use an internal home page (intranet) as at <reference date>?
- A4. Did your business have a local area network (LAN) as at <reference date>?
- A5. Did your business have an extranet (a website or an extension of the Intranet with access restricted to business partners) as at <reference date>?

### **Module B: How your business uses the Internet in its operations**

- B1. Did your business use the Internet during <reference period>?
- B2. Where did your business use the Internet during <reference period>?
  - ☐ Inside the business premises
  - ☐ Outside the business premises) – Go to B5
  - ☐ Both of the above
- B3. What percentage of persons employed in your business routinely used the Internet at work during <reference period>? (Answer in %)
- B4. How did your business connect to the Internet during <reference period>? Multiple responses allowed
  - Analogue modem (dial-up via phone line)
  - <Other narrowband>c
  - < Broadband>d
  - Do not know
- B5. Did your business have a web presence as at <reference date>?
- B6. Did your business receive orders for goods or services (that is, make sales) via the Internet during <reference period>?\*
- B7. Did your business place orders for goods or services (that is, make purchases) via the Internet during <reference period>?\*
- B8. For which of the following activities did your business use the Internet during <reference period>? (Multiple responses allowed):
  - For getting information about goods or services
  - For getting information from government organizations/public authorities
  - For other information searches or research activities
  - For sending or receiving emails
  - For interacting with government organizations/public authorities
  - For providing customer services
  - For delivering products online\*

### **Module D: Other information about your business**

- D1. Main activity of your business (please describe)
- D2. Number of persons employed at <reference date>
- D3. Book value of fixed assets at <reference date>
- D4. Total turnover (in value terms, excluding VAT) at <reference date>

\* *E-Commerce-related questions*

*For more details about this document, please contact Ms. Fathia AbdelFadil, UNESCWA, the Project Manager of the Trade project in ESCWA, at: [abdelfadil@un.org](mailto:abdelfadil@un.org)*

## 1.2 OECD Model Questionnaire

The OECD questionnaire asks questions on the use of a range of ICTs. Compared to the UNCTAD return, however, it asks for additional information on E-Commerce, including percentage breakdowns of total sales for goods ordered through electronic networks (see Box 6). The additional questions allow approximate values to be calculated for on-line sales (e-commerce), split between physical products, digitized products (i.e. products not only ordered but also delivered on-line), and services. Other questions ask about the nature of the electronic network involved (Internet, EDI, etc.), the type of customer, and the destination of the goods sold – whether domestic or exported. However, there are no questions about the nature of the goods in question, and only the most rudimentary information is obtained on the destination of the goods sold. No information at all is asked about goods *purchased* on-line by the reporting companies.

<b>Box 7. Extracts from OECD Model Questionnaire</b>	
What proportion of your business' total turnover during <period> (excluding value added taxes) did those Internet orders (sales) represent? %	
<i>Please provide percentage breakdowns of the value of those Internet orders (sales), by types of products your business sold:</i>	
Physical products (ordered on line and delivered off line).....	%
Digitised products (downloaded or accessed on line).....	%
Services which are ordered on line but delivered off line.....	%
	100%
<i>How orders were received</i>	
Via an on-line web site...	...%
Through another Web site (e.g. specialised Internet marketplace or an agent's site).....	%
Via EDI over the Internet.....	%
Via other internet technologies (please specify).....	%
	100%
<i>Types of customers your business sold to</i>	
Other businesses (including related businesses).....	%
Individual consumers.....	%
Government and other non-business organizations.....	%
	100%
<i>Please provide percentage breakdowns of the value of those Internet orders (sales), by the location of customers your business sold to:</i>	
Customers within your country...	..... %
Customers outside your country	..... %
	100%

### 1.3 Eurostat Model Questionnaire

The Eurostat questionnaire (see Box 7) varies slightly from the OECD model. Firstly, it asks for on-line purchases as well as sales. And secondly, it gives respondents the option of providing estimates of internet (and non-internet) purchases as a monetary value or in percentage bands of the total value of purchases. Again, however, no information is obtained on the precise types of goods sold or purchased, or the countries of origin and destination. Note that e-mail transactions are to be excluded.

<b>Box 8. Extracts from Eurostat Model Questionnaire</b>
Orders placed via the Internet (Purchases): Did your enterprise order products/services via the Internet, during 2006 (excluding manually typed e-mails)? (Filter question) Yes / No
Please indicate for 2006 the percentage of the Internet orders in relation to the total purchases (in monetary terms, excluding VAT). <ul style="list-style-type: none"> <li>- Less than 1%</li> <li>- 1% or more and less than 5%</li> <li>- 5% or more and less than 10%</li> <li>- 10% or more and less than 25%</li> <li>- 25% or more</li> </ul>
Alternative Question: Please state the value of the purchases resulting from orders placed via the Internet (in monetary terms, excluding VAT), in 2006. (National Currency)
If you can't provide this value, please indicate an estimate of the percentage of the total purchases resulting from orders placed via the Internet, in 2006. Orders received via the Internet (Sales)
Did your enterprise receive orders via the internet, during 2006 (excluding manually typed e-mails)? (Filter question) Yes / No Please state the value of the turnover resulting from orders received via the Internet (in monetary terms, excluding VAT), in 2006. (National Currency)
If you can't provide this value, please indicate an estimate of the percentage of the total turnover resulting from orders received via the Internet, in 2006

### 1.4 Canadian Survey

The Canadian survey on *Electronic Commerce and Technology* (see Box 8) also provides a broad array of ICT-related data, such as the number of employees with Internet access, security information, bandwidth, etc. It contains a limited amount of information on E-Commerce, asking for the actual value of companies' sales through the Internet, what proportion was to households, and how much was exported. It also asks if goods were purchased through the Internet, but does not ask for the amount. No information is collected on the types of goods sold or the destination of exports.



<b>Box 9. Extracts from Canadian Questionnaire</b>
<b>Section B. Internet Use</b>
4. What were your organization's <b>gross sales, conducted over the Internet with or without on-line payment in 2007?</b> .....
5. What percentage of your organization's Internet sales was to households ( <b>end-consumer</b> )?..... (Check here if no Internet sales were made to households.....)
6. What percentage of your organization's Internet sales was to customers located outside of <b>Canada?</b> ..... ( <b>Check here if no Internet sales were made to customers located outside of Canada. . . . .</b> )
7. Does your organization use the Internet to purchase goods or services with or without on-line payment? (e.g. office supplies, software, airline tickets, etc.). . . . . Yes..... No.....

## 1.5 U.S. Surveys

In contrast to the foregoing questionnaires, which are solely concerned with ICT use by businesses, the United States adapted existing economy-wide surveys for the measurement of E-Commerce. The United States uses its economy-wide surveys (previously called Censuses but now, with the application of statistical sampling techniques, re-named Annual Surveys) to record the production activities of U.S. companies engaged in manufacturing, wholesale trade, retail trade, and selected services. A question has been added to the surveys to obtain information for on-line sales (termed "E-Shipments"). However, no information is requested for on-line purchases. With very minor exceptions, the same concepts and wording are used for each of the Annual Surveys.

The U.S. surveys provide broad estimates of shipments resulting from e-commerce; however, they lack detailed information on specific types of goods sold, whether the goods were exported, and the country of destination. Despite the absence of questions concerning the description of the products shipped, the Annual Survey of Manufactures

Box 9 Extracts from U.S. Annual Survey of Manufactures, 2006		
<b>E-SHIPMENTS</b>		
A. Did this plant use any electronic network to control or coordinate the flow of any of the shipments of goods reported in Question 5, line A (i.e. Total value of products shipped)? Or were the orders for any of the shipments reported in Question 5, line A received over an electronic network?		
Electronic networks include:		
<input type="checkbox"/>	Electronic Data Interchange (EDI)	
<input type="checkbox"/>	Extranet	
<input type="checkbox"/>	E-mail	
<input type="checkbox"/>	Other online systems	
<input type="checkbox"/>	Internet	
If Yes - Go to line B		If No - Go to Question 77
B. Percent of total reported in Question 5, line A that were ordered, or whose movement was controlled or coordinated over electronic networks (Report whole percents. Estimates are acceptable.)		
	2006.....%	2005.....%

(ASM) enables fairly detailed industry data to be produced. In this context, it is useful to consider the methodologies that underlie the relatively high level of industrial detail produced, and the characteristics associated with different types of surveys and records systems that can affect the compilation of E-Commerce data.

## 2. Survey Methods

### 2.1 Establishment surveys

The industrial detail available from the U.S. surveys is attributable to the use of Establishment (as opposed to higher-level Enterprise) surveys. Establishment surveys are particularly significant where an enterprise produces multiple products in multiple locations. Consider, for example, Korea's Hyundai Corporation, which produces a wide variety of products including ocean-going vessels, plants and machinery, automobiles, steel and chemical products, electronic products and general commodities. Hyundai also maintains investments in oil and LNG projects, and is diversifying into information and communication technologies.

To minimize the distortions that would result if all production from a business were allocated to a single industry code – as is normally the case for business surveys – statistical offices often survey complex businesses at the level of the individual establishment. An establishment is defined as the smallest unit of economic activity for which a business maintains a separate record of accounts. It typically consists of an individual plant, and often produces a single product, for which records of the associated revenues and costs are maintained. In the case of Hyundai, therefore, an establishment survey would involve sending each of its plants a separate questionnaire, so that each establishment would be allocated to the industry associated with its principal product.



Although less precise than commodity statistics based on the HS (such as international merchandise trade statistics), establishment-based industry data are capable of generating significant detail. Because the United States surveys are establishment-based and cover a highly diversified economy, they are capable of generating data at a 2-, 3-, 4-, and in some cases 5-digit level of industry detail. The data, moreover, can be compared with related statistics such as gross output, value added, and employment.

While establishment surveys are valuable for generating detailed industry data, they tend to be complex to administer. The focal point for establishment surveys is a detailed Business Register which, as well as being a list of all businesses in the survey frame, documents the structure of large enterprises.

## **2.2 Business Registers**

A Business Register is, at a basic level, a list of companies being surveyed. However, the development of advanced analytical tools, such as Input-Output accounts, has called for detailed industry and commodity data, with an accompanying need for complex Business Registers as a control and planning mechanism.

For statistical operations, a Business Register (BR) provides a list of the known survey universe – all the active businesses that need to be covered by a specific survey. If significant companies are excluded from the BR, serious gaps can arise in the survey coverage. A comprehensive listing of active businesses is therefore required to ensure data quality, and the more complete the BR, the better will be the basis for the survey.

Businesses, and the business universe, are neither static nor simple. In some respects they are similar to the human universe. Businesses consist not only of individuals, but of families of companies. Like families, businesses contain heads of enterprises, sons and daughters (subsidiary companies), and brothers, sisters, uncles and aunts (affiliates). Taken together, the members of a business enterprise are known as ‘related’ companies. They do not remain static. Businesses can merge or acquire companies, and they can dispose of others. New companies are, in a sense, ‘born’, while other companies may ‘die’ by winding up their affairs. Unlike mere mortals, however, some companies survive indefinitely. Some of the oldest companies trace their roots back 400 years or more.

Sources for building a BR include the administrative/legal system underlying the creation (incorporation) and licensing of businesses. Information on existing and new businesses or business licenses is an important source of data for the BR. Another important source of information is, in principle, company name and address information maintained by the taxation authorities for the collection of taxes. However, in some countries, confidentiality safeguards prevent the transmission of information by the taxation authorities to the NSO.

An obstacle to the use of administrative information for the BR is the tendency for erroneous or misleading information to accumulate over a period of time. As a rule, it is easier to add new information than to delete outdated information. For example, companies might go out of business for a variety of reasons – financial failure, mergers and takeovers, competitive reasons, etc. – but the company is unlikely to give public notice of its discontinuation. In this situation, it is likely that the BR will continue to maintain a record of the business in question, and questionnaires will continue to be sent to it until the situation is rectified through information being obtained on the company's changed status – a process that can persist for many months (or years).

Similarly, a company might cease operations, but rather than winding up its affairs it becomes 'dormant' (asleep). This can often happen where the company is an element of a larger enterprise, which chooses to maintain the legal existence of the dormant corporation in case it wishes to create a new business operation at some time in the future under the name of the dormant company. In this way, the larger enterprise can save costs and the administrative processes associated with winding up a corporation or establishing a new one. From a statistical standpoint, however, dormant companies need to be identified and their status noted so that they can be excluded from surveys of active companies.

Another difficulty is associated with the treatment of 'shell' or 'special purpose' corporations. These are corporations which exist in the accounts of an enterprise (i.e. it has revenues and/or expenses), but which have no employees. Such corporations may consist of a set of accounts (e.g. in the form of computer programs) but have no tangible assets. An example of a special purpose company would be a financing vehicle for a large enterprise; frequently, such companies are incorporated in a low-taxation economy, with the sole purpose of channelling funds from one source (e.g. capital markets) to another (e.g. operating companies for which the financing was obtained).

In an evolving economy, where businesses are increasingly flexible and capable of changing their corporate structure for a variety of reasons, it is increasingly difficult to track changes in the internal structures of enterprises. For cost reasons, moreover, survey data tailored to statistical needs are in some cases being replaced by standard financial data produced by corporations. (Canada is one country where annual survey data for smaller companies have been replaced by data obtained from tax returns.) Moreover, 'virtual corporations', which exist without a physical presence or without being legally incorporated, are increasingly common, creating difficulties for survey-taking and Business Registers.

Business Registers in industrial economies have tended to become complex and costly records systems. It is possible, however, to reduce the complexity of Business Registers by surveying at a higher, less detailed, level. While establishment surveys provide valuable amounts of industry and commodity detail, statistical information may be obtained at a more aggregate level for certain types of data, such as financial data. In this case, the data reflect financial operations for

an entire family of related companies – known as ‘enterprises’. This is justified by the fact that financial management and the related financial decisions are typically centralized within the overall enterprise.

Information on E-Commerce is likely to be centralized within the marketing or purchasing department of a corporation rather than decentralized to individual plants. The appropriate level for obtaining E-Commerce data therefore tends to be the Enterprise level rather than the individual Establishment. This means that a Business Register for a survey of E-Commerce should, as a rule, focus on the higher-level Enterprise groups rather than individual Establishments.

## **2.3 Sampling procedures**

Usually, for reasons of cost and timeliness, surveys are designed to collect data from a sample of respondents rather than by surveying the total population. In principle, a sample selects a relatively small number of units as being representative of the entire population, or universe. *Weights* are assigned that reflect the number of population units represented by each sample unit, and inflation techniques employed to aggregate the data from the sampled units to universe proportions. For business surveys, where there is significant disparity in the size of individual businesses, *stratified sampling* is frequently used. Under stratified sampling, the population (or survey frame) is divided into *strata* (layers), with each stratum composed of firms of comparable size and operating characteristics. The largest businesses may need to be exhaustively sampled (that is, all survey units are selected), as each of these businesses is so large that it cannot be considered representative of other firms. Other strata would consist of large numbers of smaller firms, which would be sampled on a random basis.

A fully functioning Business Register is a vital tool for conducting sample surveys. It not only identifies the survey frame – the total population for which samples must be drawn – but also reflects key characteristics of corporations (sales, employment, industry, location, etc.) which determine which businesses should be assigned to each stratum, and whether individual strata should be exhaustively or randomly sampled. Using sampling techniques can reduce the size of a survey significantly – by as much as 90% if the weighting calls for one in ten businesses to be surveyed.

## **2.4 Household Surveys**

An additional source of E-Commerce data consists of household surveys. Household surveys can take the form of a Household Expenditure Survey, which calls for a representative sample of households to maintain a record of everyday expenditures over a period of time – typically a week or two – and to recall annual expenditures of major items. In Canada, a household survey asks questions (by telephone) on the use of computers, including purchases by means of E-Commerce, distinguishing between digitized and non-digitized products (see Box 10).

Given the cost of household surveys, they are usually conducted relatively infrequently, often following a Census of Population, which provides a basis for the samples to be used. Because E-Commerce conducted by individuals is significantly less than E-Commerce by businesses, the emphasis in this report is on enterprise surveys.

<b>Box 10 Canada – Extracts from Telephone Survey on Internet Use by Households</b>
<b>Section: Electronic commerce (EC)</b>
<b>EC_R01 The next few questions are about the Internet and its influence on purchases of goods and services. The questions relate to orders you made during the past 12 months for personal or household consumption only. You may or may not have paid for these goods or services over the Internet. Do not include purchases for a business.</b>
<b>EC_Q01 During the past 12 months, have you ordered a good or service over the Internet? (For your personal or household use, not business use.) Yes..... No.....</b>
<b>EC_Q02 During the past 12 months, what types of goods or services were ordered?</b> 01 Computer software 02 Computer hardware 03 Music (e.g., CDs, tapes, MP3) 04 Books, magazines, on-line newspapers 05 Videos, digital video disc (DVD discs) 06 Other entertainment products (concert, theatre tickets) 07 Food, condiments, beverages 08 Prescription drugs 09 Other health, beauty, vitamins 10 Clothing, jewellery and accessories 11 Housewares (e.g., large appliances, furniture) 12 Consumer electronics (e.g., camera, computer, stereo, TV, DVD player, VCR) 13 Automotive (e.g., cars, trucks, recreational vehicles or products) 14 Travel arrangements (e.g., hotel reservations, travel tickets, rental cars) 15 Flowers - gifts 16 Sports equipment 17 Toys and games 18 Real Estate 19 Other - Specify.....
<b>EC_S02 What other type of goods or services were ordered?</b>
<b>EC_Q03 During the past 12 months, how many separate orders for goods or services did you place over the Internet?</b>
<b>EC_Q04 During the past 12 months, what was the estimated total cost, in Canadian dollars, of the goods and services you ordered over the Internet?</b>
<b>EC_Q05 Of the total number of separate orders placed over the Internet, how many of these orders were from companies in Canada?</b>
<b>EC_Q06 Of the total amount spent on goods or services ordered over the Internet, how much was spent on goods and services from companies in Canada?</b>

<p><b>EC_Q07 During the past 12 months, how did you pay for these goods or services ordered over the Internet?</b></p> <p>1 Paid directly over the Internet (with a credit or debit card)</p> <p>2 Credit card over the telephone</p> <p>3 Payment on delivery (COD)</p> <p>4 By cheque</p> <p>5 Other</p>
<p><b>EC_Q08 Have you used the Internet to 'Window Shop' for personal or household products or services? That is, have you used the Internet during the past 12 months to narrow down the search for goods or services without placing an order directly over the Internet?</b></p>
<p><b>EC_Q09 What types of goods or services were these?</b></p> <p>01 Computer software</p> <p>02 Computer hardware</p> <p>03 Music (e.g., CDs, tapes, MP3)</p> <p>04 Books, magazines, on-line newspapers</p> <p>05 Videos, digital video disc (DVD discs)</p> <p>06 Other entertainment products (concert, theatre tickets)</p> <p>07 Food, condiments, beverages</p> <p>08 Prescription drugs</p> <p>09 Other health, beauty, vitamins</p> <p>10 Clothing, jewellery and accessories</p> <p>11 Housewares (e.g., large appliances, furniture)</p> <p>12 Consumer electronics (e.g., camera, computer, stereo, TV, DVD player, VCR)</p> <p>13 Automotive (e.g., cars, trucks, recreational vehicles or products)</p> <p>14 Travel arrangements (e.g., hotel reservations, travel tickets, rental cars)</p> <p>15 Flowers - gifts</p> <p>16 Sports equipment</p> <p>17 Toys and games</p> <p>18 Real Estate</p> <p>19 Other - Specify.....</p>
<p><b>EC_S09 What other type of goods or services were these?</b></p>
<p><b>EC_Q10 Did the search for goods and services using the Internet, 'Window Shopping', later result in a direct purchase from a retailer? That is, a purchase that did not involve the ordering or payment of a good or service over the Internet.</b></p>
<p><b>EC_END</b> End of Section</p>

## 5. CHALLENGES OF MEASURING INTERNATIONAL E-COMMERCE

International merchandise trade data are normally derived from:

- a) administrative sources reflecting imports and exports (Customs data)
- b) foreign exchange records based on the international transactions reporting systems (ITRS) of central banks; and
- c) enterprise surveys.

### 1. Customs data

Customs data, based on information supplied by exporters and importers or their agents, reflect the physical movement of goods into or out of the country. They are a rich source of information for each shipment of goods entering or leaving the country, containing commodity characteristics, countries of origin and destination, the volume and value of goods, duty paid, etc., as shown in Boxes 11 and 12.

#### **Box 11 Customs Documents: Mandatory Data Fields in the Single Administrative Document (SAD)**

- Reference No. (Lodgement)
- Place of issue
- Date of issue
- Manifest No.
- Transport document No.
- Exporter / Consignor
- Consignee
- Declarant
- Country of Origin
- Number of packages
- Marks & numbers
- Type of packages
- Description of goods
- Commodity code
- Gross weight
- Net weight
- Customs value
- Means of transport
- Country where consigned
- Country of destination
- Documents attached
- Bank (optional)
- Import Licence No. (optional)
- Export Licence No. (optional)
- Invoice date (optional)
- Invoice No. (optional)



## BOX 12 SAMPLE CUSTOMS DOCUMENT

1 رقم البيان		2 تاريخ البيان		3 نوع البيان		4 نوع المنشأ		Port Type	
بيان جمركي									

5 رقم إذن التسليم		6 المستورد / المصدر		7 الوزن الصافي		8 الناقل / القبطان / السائق		9 الشركة الوسيطة	
Delivery Order No.		Importer/Exporter		Net Weight		Carrier \ Captain \ Driver		Intercessor Co.	
10 الوزن القائم		11 اسم الناقل		12 رقم السجل التجاري		13 القياس		14 رقم الرحلة	
Gross Weight		Carrier's Name		Commercial Reg. No.		Measurement		Voyage / Flight No.	
15 المصدر اليه		16 عدد الطرود		17 رقم البوليصا / المناقصة		18 ميناء الشحن		19 الامتلاء والأرقام	
Exported To		Nc. of Packages		BL-AWB No. / Manif.		Port of Loading		Marks & Numbers	
20 ميناء التفريغ		21 جهة المقصد		22 بلد المنشأ		23 وصف البضاعة		24 القيمة بالعملة الأجنبية	
Destination		Port of Discharge		H.T. Code		Goods Description		Foreign Value	
25 العملة		26 النوع		27 السعر		28 القيمة بالعملة المحلية		29 فئة الرسم	
Currency		Type		Rate		CIF Local Value		D. Rate	
30 نوع الإيراد		31 إجمالي الرسوم		32 الكمية		33 النوع		34 الكمية	
Income Type		Total Duty QR.		Weight		Item		Packages	
35 المصنف		36 الوزن		37 الوزن القائم		38 الوزن الصافي		39 وحدة	
Exemption of Duty		Beneficiary		Gross		Net		Unit	
40 القيود الجمركية		41 مرجع الفسخ		42 الجبهة		43 المصدر		44 المستفيد	
Customs Restrictions		Release Ref.		Agency		Sources		Code	
45 أسباب عدم الفسخ		46 المعائن		47 رئيس المجموعة		48 ملاحظات أخرى		49 تاريخ الفسخ	
Reasons For Not Releasing		Inspector		Group Supervisor		Other Remarks		Release Date	
50 خط السير		51 جمرات الخروج		52 قيد الخروج		53 تاريخه		54 موظف أمن	
Transit		Exit Port		Exit Transaction No.		Date		Security Officer	
Route		55 مراقب ترانزيت		56 طريقة الدفع		57 رقم		58 تاريخ	
Transit Inspector		Payment Method		No.		Date		Bank	
59 رقم إيصال الدفع		60 قسمة		61 تأمين		62 TOTAL FEE		63 رقم إيصال الدفع	
Receipt No.		Definite		Insured		Payment Method		No.	
Date		64 تاريخ		65 بنك		66 رقم إيصال الدفع		67 تاريخ	
Bank		68 بنك		69 تاريخ		70 بنك		71 تاريخ	
72 تاريخ		73 تاريخ		74 تاريخ		75 تاريخ		76 تاريخ	

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It might appear logical that E-Commerce data could be obtained by adding relevant data fields to the Customs input form. While Customs documents are a unique and richly detailed data source, however, they are also the product of many years of development involving broad international agreement. Traditionally, Customs data have been compiled by the Customs authorities, but increasingly the source data are supplied to the Customs authorities in electronic form by importers, exporters, shippers, or their agents.

However, Customs documents are not likely to be easily modified to enable them to become the source for E-Commerce data. A specific is the fact that the method of ordering goods, which is a defining characteristic of E-Commerce, is not reflected in the Customs form. As well, the import or export of digitised products (i.e. goods which are not only ordered but are also delivered on-line), is not recorded through Customs processes, which are based on the physical movement of goods into or out of the country.

A further problem associated with the use of Customs data is that it is increasingly prepared in computer-readable form by Customs brokers, who submit the information to the Customs authority. The Customs brokers are not exporters, importers, or shippers; rather, they are agents facilitating the clearance of goods passing through Customs. As such, Customs brokers are not privy to information on whether goods were ordered on-line, and would not be in a position to report such information to the Customs authority.

### **Implications of E-Commerce on Customs and WTO/GATT Arrangements**

Over the years, the arrangements for processing and recording movements of goods through Customs have become increasingly streamlined, particularly under the influence of the WTO and its predecessor agency, the GATT.

A major initiative towards standardizing operations was the development through the World Customs Organization of a computerized system, known as ASYCUDA, to facilitate trade processing by developing member countries. Many countries now use ASYCUDA for their Customs operations.

The architecture of ASYCUDA is modular, which means that “new or advanced programs (modules) can be added on at any time to suit the needs of a given country.”<sup>22</sup> While add-on modules can cover Customs functions such as risk management, transit operations or new security standards, the priorities for the Customs authorities are to protect fiscal revenue, detect fraud and smuggling, and ensure secure trade. Indeed, “the revised Kyoto Convention requires Customs administrations to request as few data as necessary to ensure compliance with Customs laws. Customs administrations concerned will therefore require only the data elements they have

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<sup>22</sup> UNCTAD Trust Fund for Trade Facilitation Negotiations, *Technical Note No. 21 - ASYCUDA*, January 2008, page 2



listed for each customs procedure in the respective data sets. These self-imposed limits discourage future increases in data requirements.”<sup>23</sup>

Although the principal objectives for Customs are revenue collection and security, Customs data are normally shared with the statistical authorities for the production of merchandise trade data. Since data collection is administered by the Customs authority, however, changes in the data specifications or collection arrangements involve coordination and agreement with a broad number of agencies under the leadership of the Customs authority.

If Customs documentation is to be modified to generate E-Commerce data, certain conditions will need to be met regarding the arrangements for data collection and sharing:

- the Customs authorities must agree to add a data field indicating if a shipment should be considered e-commerce;
- given the coordinating mechanisms that have been put in place over the years through the WTO and GATT – and particularly since the development of the ASYCUDA trade processing system – the modification of trade documents might need to receive international agreement through the WTO;
- the parties to the transaction (including the Customs brokers who often provide the information to the Customs authorities) must be capable of knowing whether or not specific shipments of goods were ordered on-line;
- the statistical software and data outputs must be modified to take account of the new data inputs.

Unless these conditions are fulfilled, Customs data will be incapable of generating reliable e-commerce data. The desire on the part of policymakers to generate E-Commerce data from Customs documents would therefore call for discussion with and agreement from the Customs authorities at an early stage of the process.

It should be noted, moreover, that with pressure through organizations such as the World Trade Organization (WTO) to liberalize trading arrangements, and the formation of trading areas such as the European Union (EU), the North American Free Trade Area (NAFTA), and the Gulf Cooperation Council (GCC), there has been a tendency to reduce the paperwork associated with trade transactions. This trend has already been observed in the EU and NAFTA, where businesses increasingly have the option of submitting periodic (e.g. monthly, quarterly) Customs declarations, instead of documenting individual shipments of goods. In light of these issues, it is questionable whether the use of Customs data as a source for the measurement of E-Commerce is feasible.

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<sup>23</sup> *The WCO Customs Data Model*, World Customs Organization Fact Sheet

## **2. International Transactions Reporting Systems (ITRS)**

ITRS systems are used to record foreign exchange transactions through the banking system in a number of countries. Originally a part of foreign exchange controls, ITRS systems continue to provide information and analysis on foreign exchange transactions in many countries, even though foreign exchange controls themselves may have been lifted.

ITRS data are fairly comprehensive, but they pose some significant problems for the estimation of E-Commerce. Foreign exchange transactions recorded in the ITRS do not necessarily correspond to individual shipments of goods. Typically, foreign exchange transactions by businesses are required for the settlement of company accounts. Where companies maintain an ongoing trading relationship, settlements may take place on a regular (e.g. monthly) basis for accumulated transactions, and cover a range of different types of transactions. For example, a payment to IBM could cover the cost of computer services as well as equipment. Furthermore, particularly where transactions take place between related companies, settlements might reflect offsetting transactions. Accordingly, the receipt of funds for the export of goods may be reduced by a charge for bookkeeping or other administrative services provided by a foreign parent company.

In many countries, the ITRS includes a separate questionnaire to be completed by companies to provide information on transactions with other countries that do not pass through the domestic banking system (e.g. inter-company accounts receivable or payable). For some countries, this might be a viable means of collecting E-Commerce data.

While the banks' ITRS data are closely linked to foreign exchange transactions, therefore, they tend to omit significant amounts as a result of the netting of offsetting transactions; they provide only limited detail on the underlying nature of the transactions or geographic information; and they provide no information on the mode of transaction (i.e. E-Commerce). Except for the modification of supplementary surveys, therefore, the ITRS is not seen as a good potential source of information for the production of E-Commerce data.

It should be noted, moreover, that revisions to the ITRS to identify E-Commerce transactions would require the cooperation not only of the monetary authorities, but also the commercial banks that are the front-line agencies engaged in administering the system, and this could be an obstacle to using the ITRS as a statistical source for E-Commerce.

## **3. Enterprise surveys**

Enterprise surveys are, from a statistical standpoint, a relatively flexible source of data structured on a uniform basis to provide information required for policy or other purposes. Following the development of model questionnaires by the OECD, UNCTAD and Eurostat, enterprise surveys have been conducted by a number of countries using a generally similar design and methodology. As they are administered by statistical authorities, moreover, enterprise surveys do not normally call for extensive inter-agency agreement.

However, there are limits to the amount of information companies can provide. The reporting burden is a major concern both for data providers (i.e. reporting companies) and the national authorities, which tend to give high priority to creating a business-friendly environment. Moreover, there are limits to the amount of information that corporations store in their electronic data banks, and that they can retrieve at reasonable cost for statistical surveys.

Enterprise surveys also exhibit certain limitations for the collection of e-commerce data. They tend to provide information on purchases and sales in the aggregate rather than at a detailed commodity level; and the internal records systems of enterprises (on which enterprise surveys depend) do not always indicate the method (e-commerce or not) used for ordering goods.

It should be noted that, based on the international experience with E-Commerce surveys, there are substantial overlaps between different data sources. The surveys tend to reflect overall sales by firms, rather than the proportion of trade not covered by other data sources (such as exports and imports). It should also be noted that a foreign firm might establish a domestic subsidiary (or other affiliate) with warehousing capacity to fill orders received on-line. In such a situation, the domestic subsidiary (or affiliate) might import goods and store them in its warehouse until it receives an order from a domestic customer through an on-line sale. As a result, the import of goods might take place in a different time period from the period when the final sale occurs. While enterprise surveys can provide overall estimates of E-Commerce, therefore, marketing arrangements and inter-corporate links can be serious obstacles preventing the production of precise estimates of the undercoverage of international merchandise trade statistics due to E-Commerce.

Nevertheless, there is strong justification for conducting enterprise surveys of E-Commerce: enterprise surveys are completed by the principals engaged in exporting and importing goods; they have access to the data required to determine whether or not transactions resulted from orders placed on-line (and thus constituted E-Commerce); and they have been successfully conducted by a number of countries in recent years. In brief, enterprise surveys appear to offer greater potential for generating data on E-Commerce than other sources of information.

## 6. OBSERVATIONS BY MEMBER COUNTRIES

There was a wide-ranging discussion concerning the need for and methods of producing E-Commerce data. Delegates noted that there were a number of problems associated with the collection of E-Commerce data. Nevertheless, considerable interest was expressed in the production of E-Commerce data to supplement Customs data and other business information. In this context, there was a need for close consultation among key agencies, including Customs authorities, monetary authorities, telecommunications agencies and NSOs, to assess options and develop plans. For NSOs, this would involve, in some cases, the need for approval within longer-term (e.g. 5-year) statistical frameworks. Discussions ensued which are summarized below under the principal topic areas.

**Definition of E-Commerce:** There was considerable discussion concerning the definition of E-Commerce. At the request of the Chair, the UNCTAD expert provided an update on current definitions and procedures. She indicated that the key factor in the determination of E-Commerce was the placing or receipt of an order on-line, irrespective of the payment arrangements. With respect to specific questions that had arisen, the international standards treated E-mail transactions as part of E-Commerce, but not orders placed by telephone or fax.

**Customs data:** It was noted that Customs documents for GCC countries were unified, and any change in the input documents would require legislative amendments in all countries. A number of delegates indicated that the current Customs data systems were incapable of identifying E-Commerce transactions, and that it would be difficult to overcome this problem, particularly in view of the unified Customs data systems. Moreover, there some doubt about the quality of data Customs declarations completed by Customs brokers, who would be unlikely to know if a transaction had been initiated through the internet, but nevertheless would be motivated to submit documents without delay. In other words, while it might appear easy to add a data field (box) to the Customs form, it was of no value if the form was completed by persons (e.g. Customs brokers) without knowledge whether goods had been ordered on-line or not. There was general agreement that close liaison would be required between the Customs and statistical authorities both within and among countries.

**ITRS:** Compilation of E-Commerce data from ITRS records was also discussed. Credit card information was already obtained by the central banks of a number of countries, but this information did not indicate the nature of the transaction (i.e. E-Commerce or not). Some delegates thought that the 6<sup>th</sup> edition of the Balance of Payments Manual (BPM6) provided sufficient flexibility to enable the ITRS to be used as a data source for E-Commerce, particularly where supplementary business questionnaires were involved. In the absence of a demonstrated methodology, however, it was felt that this option would need to be explored further before it could be specifically recommended by ESCWA.

**Enterprise surveys:** Support was expressed for the use of enterprise surveys for the production of E-Commerce data. Given the significant delays in the compilation of household data and economic censuses – typically on a 5-year cycle – a special survey for E-Commerce data was considered a more timely solution. Enterprise surveys were seen as a pragmatic way for the NSO to obtain data in line with international standards. However, there was concern over their cost, and the need for consistent methodologies and working manuals and procedures.

**E-Commerce Manual:** There was general agreement over the need for a clear and comprehensive manual or compilation guide. In this context, the Chair undertook to circulate a revised version of the Consultant's Report and to give delegates the opportunity to provide feedback. The objective was to provide a practical set of recommendations for the collection of E-Commerce data, for which the revised Consultant's Report could constitute a valuable starting point.

## 7. CAPACITY-BUILDING ISSUES

E-Commerce is a rapidly growing form of marketing for both consumer and business demand. E-Commerce has risen between five and seven times in Australia, Canada, Japan and the United States since the late 1990s - significantly faster than the growth in total trade.<sup>24</sup> It is reasonable to suppose that rapid growth in E-Commerce has also been experienced in ESCWA countries, but very little statistical information currently exists to confirm this. Strengthening the statistics calls for a number of conditions, listed below, to be met.

### 1. Statistical Strengthening

ESCWA is coordinating a regional program to enhance the understanding of the extent and impact of E-Commerce on international merchandise trade statistics within the region. Key aspects of the program will include the development or modification of survey instruments or other statistical collections appropriate to each country's needs, and in light of each country's statistical programs and capacities. In this context, there is a need to ensure the adoption of sound practices, including assessing the adequacy of Business Registers, possibly developing new survey instruments, employing sound survey techniques, developing effective data analysis, and providing timely, user-oriented dissemination.

Specific initiatives should include:

- *Identifying data requirements, involving discussions with data users (policy departments, business sector)*

E-Commerce is a visible manifestation of ICTs permeating all segments of society. The extent of E-Commerce has been monitored by a number of industrial countries as a key indicator of ICT use. The development of corresponding data in ESCWA countries will call for support from senior officials of policy departments, business planners, investment analysts, etc. to obtain agreement and support from stakeholders. In this context, there will be a need for close consultation, possibly through an inter-agency committee, of key agencies including (but not restricted to) Customs authorities, central banks, telecommunications agencies and NSOs.

- *Assessing potential data sources, with particular reference to Enterprise surveys*

This report has reviewed potential data sources, and recommends adoption of Enterprise surveys in broad conformity with the recommendations of UNCTAD, the OECD and Eurostat. NSOs will need to assess the most suitable methods of data collection and compilation in the context of their own statistical frameworks, capacities and resource constraints.

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<sup>24</sup> OECD, *The Future of the Internet Economy: A Statistical Profile*, Paris, June 2008, page 25

- *Creating data collection instruments to meet survey objectives, with reference to international standards, including the ESCWA model questionnaire)*  
Once the broad objectives and methods have been determined, it is important that any new data collection instrument be clear, unambiguous, and, to the extent possible, easily completed by respondents; a form that is unclear and complex is likely to result in poor quality data. In this context, a model questionnaire has been prepared in conjunction with this report (see Box 13 and).
- *Obtaining feedback on proposed new survey initiatives from respondents, involving detailed testing of proposed questionnaires*  
Before a new questionnaire is introduced, it should be tested with selected respondents. As noted above, if the data requested are difficult to provide, the quality of the statistics is likely to be poor. Accordingly, establishing a good working relationship with respondents should be given high priority.
- *Developing an information program to obtain cooperation from survey respondents*  
A successful outcome for survey operations calls for cooperation from respondents. To this end, an information program is required to explain the need for the data in the context of strengthening economic development and employment growth. A good example is provided by Oman's *Foreign Investment Survey*, which was preceded by the preparation of a high-profile brochure and a reception for business leaders hosted by the ministry's Secretary and the Governor of the Central Bank.
- *Developing appropriate survey methodology, giving due consideration to the Business Register, statistical sampling, and data analysis at both the macro- and the micro-level*  
A new survey will call for an appropriate survey design, including all aspects of methodology and implementation. Key elements will include ensuring the adequacy of the Business Register for establishing the survey frame, clear and effective questionnaire design, decisions concerning the need to employ statistical sampling techniques, effective collection methods to achieve a good response rate, and data analysis at both the micro- and the macro-level to identify statistical outliers or other questionable data.
- *Developing a data analysis and dissemination strategy to highlight key findings from the data, put the data in context, and provide timely data access to a range of users*  
A strategy for data analysis and dissemination is required for the interpretation of the data as an important indicator of ICT use; and to assist in its application not only by government departments but also by the private sector. Working closely with ESCWA, NSOs are in a unique position to highlight not only the volumes but also the trends in E-Commerce, including international comparisons with other countries in the region.
- *Assessing the feasibility of conducting a Household Survey to measure the use of E-Commerce by households*



Consideration should also be given to the use of Household Surveys to measure the impact of E-Commerce among households. Household Surveys are often undertaken following a Census of Population, and questions on E-Commerce could be incorporated as an element of a more comprehensive survey, such as a Household Expenditure Survey.

## **2. Coordination at the national level**

There will be a need for widespread coordination and consultation to assess options and develop plans. Such consultation should include the Customs authorities, central banks (where the ITRS is seen as a possible data source), telecommunications agencies, as well as statistical offices. In addition, NSOs will have a critical role in the coordination of data collection activities within the overall statistical program, with input by senior government officials, and the development of information programs to obtain cooperation from business leaders.

## **3 Regional and international cooperation**

ESCWA has an important role in ensuring that the program meets regional objectives, calling for coordination of a working group to obtain the support and cooperation of member countries. This will require input by relevant national agencies so as to facilitate statistical compilation by NSOs, and bring the project to a successful outcome.

ESCWA will be a key intermediary as a regional spokesperson and advocate in discussions with other international agencies involved in the project, such as UNCTAD, the WTO and the UNDP. ESCWA's leadership role will also involve close liaison with NSOs to monitor progress in developing and implementing coordinated statistical programs.

To these ends, ESCWA should undertake a number of initiatives, including the convening of Workshops for the exchange of information, and reaching broad agreement on data requirements, definitions, methodologies, and dissemination.

## 8. CONCLUSIONS AND RECOMMENDATIONS

There is a growing need for reliable data on E-Commerce, given its importance to domestic and international trade. Given the particularly rapid growth of E-Commerce in Australia, Canada, Japan and the United States, there is a need for reliable measures of E-Commerce in ESCWA member countries.

### 1. Benefits and Costs of E-Commerce

By transcending national boundaries, E-Commerce enables producers to market their products worldwide without having to establish an international sales organization. As well, companies can restructure existing marketing arrangements to take advantage of the internet's ease of communications, thereby lowering costs, improving efficiency, and increasing productivity. For consumers, E-Commerce greatly expands the marketplace both in terms of the range of products available, and prices for the same product in different places. By increasing knowledge about prices of comparable products, E-Commerce makes markets more efficient: it serves to increase price competitiveness for a broad range of commodities, and exerts downward pressure on prices. However, there could be downside risks for local businesses if E-Commerce results in downward pressure on prices and profits, reduced profit margins, and higher imports.

### 2. Data gaps and the impact on total trade

As noted by UNCTAD, "a comparable set of (ICT) statistics is available for most OECD countries. However, in developing economies, the availability of ICT indicators is still scarce... Therefore, many developing economies are preparing ICT-related policies and strategies without the guidance of statistical evidence."<sup>25</sup>

To strengthen statistical capacity, it is recommended that ESCWA provide ongoing support to NSOs for the development of an internationally coordinated program of statistics on E-Commerce and its contribution to international merchandise trade. Key elements should include support for convening national and international Working Groups composed of key agencies involved in the measurement of E-Commerce; the adoption of international standards for measuring E-Commerce; and ensuring that survey design and statistical output respond to regional needs.

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<sup>25</sup> UNCTAD Trust Fund for Trade Facilitation Negotiations, *Technical Note No. 21 - ASYCUDA*, January 2008, page 2

<sup>25</sup> *The WCO Customs Data Model*, World Customs Organization Fact Sheet

<sup>25</sup> UNCTAD, *Manual for the Production of Statistics on the Information Economy*, New York, 2007, page 6

### 3. International standards and frameworks

This report provides guidance on key concepts, potential data sources, and survey methodology. There have been extensive discussions at the international level, resulting in a number of options for the development of a broad statistical framework. The starting point for this report is the recommendations of the *Partnership on Measuring ICT for Development* and UNCTAD.

### 4. Concepts and Definitions

E-Commerce is defined as a sale or purchase resulting from an order placed over the Internet. A critical characteristic of E-Commerce is the method by which the order is placed or received, not the mode of payment or channel of delivery. This report proposes that the definition of E-Commerce adopted by ESCWA member countries be compatible with practices employed by most of the countries conducting E-Commerce surveys, but with the addition of critical items required to meet regional needs. A model questionnaire has been developed to help guide ESCWA member countries.

### 5. Data sources

Among the potential data sources, serious shortcomings for the measurement of E-Commerce have been noted with respect to Customs data, which are incapable of covering transactions in digitized products, and appear to be incapable of generating information on goods ordered on-line (i.e. the defining characteristic of E-Commerce). In many countries, the ITRS maintained by banks records foreign exchange transactions, and is often used as the basis for estimating merchandise trade in a country's balance of payments. As a data source for E-Commerce, however, the ITRS exhibits certain weaknesses.

For these reasons, and given the experience of countries conducting E-Commerce surveys, it is concluded that Enterprise surveys are a more feasible source of E-Commerce data.

Household surveys are also a potential source of E-Commerce data, but they tend to be costly to administer while, on the basis of available evidence, households appear to account for a much smaller share of total E-Commerce than B2B transactions. While consideration should be given to the development of a Household Survey (possibly as part of a Household Expenditure Survey), it is recommended that priority be given to a business survey of E-Commerce.

### 6. Good practices

As the availability of data on the impact of E-Commerce in ESCWA member countries is currently quite limited, the coordinated international program conducted through ESCWA represents an important step in assisting member countries to develop surveys of E-Commerce on international merchandise trade. In this regard, a model questionnaire is proposed that uses similar techniques to those developed internationally, but seeks a somewhat broader range of trade-specific data to reflect regional requirements (see Box 13).

Working towards the development of indicators of E-Commerce and ICT will involve building on the existing statistical infrastructure or, in some cases, strengthening it. In this context, there will be a need to ensure the capacity to conduct enterprise surveys, involving the use of Business Registers to identify the survey universe, apply sampling techniques (if appropriate), develop information programs to heighten awareness on the part of reporting companies of the need for the data, the definition of relevant concepts, and the importance of providing accurate data.

As noted in the previous section of the report, it is recommended that NSOs:

- Identify data requirements, involving discussions with data users (policy departments, business sector)
- Assess potential data sources, including Customs data, enterprise surveys, and household surveys
- Create data collection instruments to meet survey objectives, with reference to international standards, including the ESCWA model questionnaire
- Obtain feedback on proposed new survey initiatives from respondents, involving detailed testing of proposed questionnaires
- Develop information material to explain the need for the data in the context of national and regional programs to strengthen economic development and employment growth, so as to obtain cooperation from survey respondents
- Develop appropriate survey methodology, giving due consideration to the Business Register, statistical sampling techniques, and data analysis at both the macro- and the micro-level
- Develop a data analysis and dissemination strategy to highlight key findings from the data, put the data in context, and develop effective dissemination to a range of users
- Assess the feasibility of undertaking a Household Survey to measure the use of E-Commerce by households.

## **7. Institutional Arrangements**

In addition to liaising with NSOs and other international agencies, ESCWA will have an important role in providing continuing technical assistance. As well as support in the design stages, ESCWA should consider assuming responsibility for software development, database management, and data analysis and dissemination.

## **8. Proposed ESCWA Model Questionnaire**

As part of this study, a model questionnaire was developed as a guide to ESCWA member countries for the measurement of E-Commerce in accordance with international standards and practices.

The questionnaire (see Box 13) follows UNCTAD recommendations by defining E-Commerce as consisting of transactions via the Internet, including e-mail, but excluding transactions through other computer-mediated networks. In line with international practices, the questionnaire asks for E-Commerce to be reported either as actual values or the percentages of total sales or purchases. In addition, to meet regional needs on the international dimension of E-Commerce, details are requested on the five largest commodities and countries of origin (or destination) involved.

A symmetrical approach is taken for the measurement of both sales and purchases. It is recognized, however, that it might be more difficult to obtain information on internet purchases than internet sales. For this reason, in particular, as well as the feasibility for companies to provide other elements of the data, it is important that NSOs conduct discussions and field-testing of questionnaires before a survey is implemented.

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