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UNDERSTAND. European regions UNDER way
towards STANDard indicators for
benchmarking information society

Handbook lite Methodology Handbook light version

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Introduction to the Understand Project

The Understand project was launched in February 2004 with the remit of developing standard indicators for benchmarking the information society. Regional investment in the information society has increased dramatically in recent years and as a result adequate monitoring and evaluation tools are required. On a European level, while the e-Europe plan provides wider benchmarking guidance and directs policy making, at a regional level there is a distinct lack of basic data to help understand the regional situation and to evaluate the impact of policies. It is this data gap that the Understand project aims to address.

The specific objectives of the project are:

- To analyse the state of the art in terms of existing indicators for the information society at a regional level
- To evaluate the e-Europe indicators through the proactive involvement of regional policy makers
- To define common indicators and methodologies (the benchmarking tool kit/handbook) for at least 4 e-domains
- To create a network of regions that benchmark on the development of the Information Society and thereby provide policy makers in these regions with concrete support for investment decisions
- To design and establish a trans-regional database for uploading of regional IS indicators for analysis and benchmarking/benchlearning
- To build on hard data in order to detect how and why some regions perform better than others
- To disseminate guidelines, methodologies and tools among all EU regions in order to create a common standard of regional e-indicators
- To provide EC and member states with a regional perspective on benchmarking e-Europe.

The Understand project has identified that in order for data to be of use, both within regions and as a basis for comparison with other regions, a common methodology must be used. Partner regions have defined a Memorandum of Cooperation in which they agree to work towards common indicators, shared data and methodologies.

The project main objective is to compare and evaluate regional development of the Information Society by defining and applying a set of common regional e-indicators in 4 key areas:

- Social Infrastructure; Citizens
- Technical Infrastructure; Broadband
- E-Government

- E-Business

The complete handbook purpose is to define the core set of indicators in each of the four domains outlined above, and also to outline the methodologies for data collection.

The complete handbook is divided into four sections, one for each domain of interest. Within each section there is a page dedicated to each indicator (or group of indicators), followed by a definition of terms, rationale for the indicator and then an outline of the data collection method (including survey questions where these are required). There is also a clear outline at the start of each section outlining the full data collection and sampling methodology in each domain. Where the data is to be collected by questionnaire or survey questions, these are included at the end of each section.

The present “light version” is meant to be widely disseminated to non-partner regions and research centers, in order to collect their feedback for method validation, through a questionnaire on the project website (www.understand-eu.net)

The full handbook is freely available to non-partner regions, provided that they answer the feedback questionnaire available on the website www.understand-eu.net.

1. Social Infrastructure; Citizens

Domain definition

This section is concerned with outlining and defining the indicators and methodology in the area of Social Infrastructure. Social Infrastructure refers to levels and types of Internet access utilised by citizens.

Issues to measure

- Levels and type of Internet connection that citizens have within their homes
- If and how much they use the Internet in other locations
- What people access and buy on the Internet
- What services they use, including levels of usage of email and SMS
- Mobile phone ownership (particularly 3G)

The following indicators will be measured in the domain of Social Infrastructure:

1. % of individuals having access to the Internet
2. % of households with broadband access
3. % of population with broadband connection >2Mbps
4. % of individuals regularly using the Internet (breakdown by device and frequency of use)
5. % of population using the Internet at home/work/school/library/Internet cafe
6. % of Internet users who have used a PIAP
7. % of Internet users who have paid for goods and services online in the last 12 months
8. % of population using the Internet to order products and services in the last 12 months
9. % of Internet users who have bought transport tickets online in the last 12 months
10. % of Internet users who have used the Internet to conduct online banking
11. % of Internet users who have had any contact with public administration offices through the Internet
12. % of satisfied/dissatisfied eGovernment users
13. Use of email
 - % of Internet users who have sent SMS
 - % of Internet users that have used email in the last 12 months
14. % of population with a mobile phone
 - i. % of respondents who have a multimedia phone
15. % of the population who have used the Internet in the last 12

- months for private purposes to communicate with their own doctor/clinic in specific ways or for specific purposes
16. % of the population accessing health information on the Internet
 17. % of Internet users who have
 - got news about a region from the Internet
 - Checked for opening times, addresses or other practical information about a region
 - Visited the website of a regional neighbourhood charity, welfare or voluntary organisation
 - Visited the website of a regional political party, trade union, residents group or other civic or political organisation
 - Visited the website of the governing mayor or head of local government within the region.
 - % of Internet users that have used email in the last 12 months
 18. % of Internet users who have accessed traffic information online in the last 12 months
 19. % of Internet users searching for jobs online
 20. % of the population having engaged in an ICT training course

Data Collection Method

Randomly sampled interviews (either face-to-face or via CATI) to those members of the population who are aged over 16.

Sampling:

Confidence Level – 95%

Confidence Interval - + 4%

2. e-Business

Domain definition

This section is concerned with outlining and defining the indicators and methodologies in the area of e-business. E-business is the conducting of business processes supported by Internet technologies. It combines the resources of traditional information systems with the vast reach of an electronic medium such as the Internet. It not only includes buying and selling but also servicing customers, providing information, collaborating with business partners and automating internal processes. This section aims to provide indicators that will establish to what extent e-business is being used in the regions.

Issues to measure

- Infrastructure
- E-Procurement and Supply Chain
- Internal business process automation
- Marketing and Sales
- Security
- E-Government
- Regional aspects
- Innovation and e-culture
- Background data

Indicators to be measured in the domain of e-business are:

INFRASTRUCTURE

1. % employees working in enterprises that use a computer
2. % of employees working in enterprises that are connected to the Internet
3. % of employees working in enterprises that use
 - modem to access the internet
 - ISDN to access the internet
 - DSL (xDSL, ADSL, SDSL) <2 Mbit/s to access the internet
 - DSL (xDSL, ADSL, SDSL) >2 Mbit/s to access the internet
 - other broadband connections >2 Mbit/s to access the internet
 - wireless connections (e.g. satellite) to access the internet
4. 2. % of employees working in enterprises that use;
 - a Local Area Network (LAN)
 - a Voice over IP (VoIP)
 - remote access for employees
 - Wireless Local Area Network (W-LAN)

E-PROCUREMENT AND SUPPLY CHAIN

5. % of employees working in enterprises that buy online
6. % of employees working in enterprises in which the online order volume exceeds 5% of the overall order volume
7. % of employees working in enterprises that use supply chain management

INTERNAL BUSINESS PROCESS AUTOMATION

8. % of employees working in enterprises that use
 - an Intranet
 - an Extranet
 - Enterprise Resource Planning
9. % of employees working in enterprises that use online banking

MARKETING AND SALES

10. % of employees working in enterprises that use customer relationship management to organise data about your customers
11. % of employees working in enterprises that have a website
12. % of employees working in enterprises that receive orders via the internet (other than by e-mail)
13. % of employees working in enterprises in which the online turnover exceeds 5% of overall sales

SECURITY

14. % of employees working in enterprises that have already carried out secure online payments
15. % of employees working in enterprises that have already received secure online payments
16. % of employees working in enterprises that have safeguarded their corporate IT network by;
 - a firewall
 - antivirus software
 - intrusion detection software
 - Chipcard-based access
 - one-time-passwords
 - biometric access
17. % of employees working in enterprises that have updated at least two security tools in the last three months

E-GOVERNMENT

18. % of employees working in enterprises that use the internet to communicate with Public Administration

REGIONAL ASPECTS

19. % of employees working in enterprises that have more regional than national cooperation partners
20. % of employees working in enterprises that have more national than international cooperation partners

INNOVATION AND E-CULTURE

21. % of employees working in enterprises that jointly develop new or improved products with cooperation partners
22. % of employees working in enterprises that jointly develop new or improved products with cooperation partners via the internet
23. % of employees working in enterprises that encourage learning during and out of company hours
24. % of employees working in enterprises that offer ICT-training to their employees
25. % of employees working in enterprises that provide telephone conferencing as a standard meeting tool
26. % of employees working in enterprises that provide video conferencing as a standard meeting tool
27. % of employees working in enterprises that provide
 - whiteboarding as a standard meeting tool
 - discussion fora as a standard meeting tool
 - chat as a standard meeting tool

Data Collection Method

The survey method will be computer-assisted telephone interviews (CATI) directed to enterprises (rather than to establishments) with

10 or more employees in three main sectors (manufacture of machinery and equipment n.e.c, tourism and telecommunications/computer-related services) with respect to company size class.

Main data collection method in the area of e-Business is through survey questions directed at IT representatives.

Sampling:

confidence level: 92,5%

confidence interval: $\pm 7\%$

3. e-Government

Domain Definition

This section is concerned with outlining the indicators and methodology in the area of e-Government. e-Government is the transformation of internal and external business processes around the customer based upon service delivery opportunities offered by new communication technologies (such as web-based technologies). e-Government aims to enable the purposes of government to provide efficiency and effectiveness as well as fairness and equitability. The indicators in this domain aim to establish to what extent e-government is working within the regions.

Issues to measure

A number of key areas are covered:

- ICT systems
- Broadband connection
- organization and human resources
- online services
- usage of services

The following indicators will be measured in the e-Government domain:

1. % of municipalities/Local Authorities with broadband connection (by type)
2. Local authority ICT strategy (% who have one)
3. % of basic public services available online
4. % of municipalities/local authorities who use e-participation by mail and forums
5. % of municipality/local authority civil servants who have received ICT training in the last year
6. total number of employees dedicated to ICT functions
7. % of civil servants with a recognized digital signature to do their work
8. % of municipalities/local authorities with a website
9. number of visits to the local website
10. monitoring of citizen services by channel
11. % of municipalities/local authorities who use open source software (and attitudes to this)
12. % of initial budget destined to ICT, and % of ICT spending over the total budget
13. number of Internet connected PCs installed and functioning in the local administration
14. % of local authorities/municipalities that have access to an Intranet

15. % of municipalities/local authorities that use: classic electronic filing/electronic document handling/ electronic case administration systems
16. % of municipalities/local authorities who use: secure servers/firewalls/encryption/off site data backup/physically restricted access to critical ICT equipment/Backup power unit/current ICT training of employees
17. % of municipalities/local authorities with PIAPs
18. barriers to use of ICT (within administrations)

Data collection method

The level of analysis will be at the local level of government (municipalities/public administration), because it is the local administrative level which ensures best trans-national comparability.

The preferred method of data collection in the area of e-Government is through the use of online questionnaires or by written questionnaires sent by postal service to the Major or equivalent. If the questionnaire is not returned by the date requested a follow up telephone call will be made.

Sampling:

Confidence level 95%

Confidence Interval - + 5%

For category sizing up to 10.000 inhabitants:

Confidence level 95%

Confidence Interval +/- 10

4. Technical Infrastructure; Broadband

Domain Definition

This section is concerned with outlining and defining the indicators in the area of Technical Infrastructure. The primary concern is to measure the supply of broadband, that is the extent to which citizens and businesses can use broadband access if desired. The focus here is on availability rather than on take up, as this is covered in other sections, particularly in the section on Social Infrastructure.

As the definition of broadband is extremely variable it is important to establish a definition from the outset. The OCED definition has been used, of downstream services of at least 256Kbps, which includes the always on connection superior to traditional telephone line and ISDN. However, because higher bandwidth can provide real added value services we need to distinguish between different levels of access bandwidth. Therefore, where possible, the distinction above and below 2 Mbps is required.

Issues to measure

There are a number of issues that need to be measured:

- Broadband coverage
- Fibre endowment
- Research network
- Pan European networks
- Providers competition
- Policies
- Public access points
- WI-FI

The following indicators will be measured in the domain of technical infrastructure:

1. broadband availability (by different technology type) - % of population reached (households/businesses/public sector bodies)
2. % of municipalities reached wholly and partially by DSL
3. fibre street coverage in Km
4. connection to broadband National Research and Education Networks (NRENs): number of sites permanently connected to NRENs and highest minimum guaranteed speed.
5. presence of Pan-European networks: number of Pan-European networks having at least one PoP (MAN) in the regions
6. number of active providers for infrastructure services and access services
7. % of territory covered by at least two broadband access

- providers
8. incumbent market share for broadband connection
 9. presence of local public initiatives for building broadband infrastructure (for public sector use/for public access)
 10. number of public broadband access points per 1000 people
 11. number of Hot Spots WI-FI

Data Collection Method and Sampling

A multi-data collection strategy is required. Interviews will be conducted with the marketing referent of access providers within the relevant region about which municipalities are covered by each technology. Interviews with incumbent or national telecom regulators and with public authorities will also be conducted. Some data will be collected through desk based research, including website analysis. For the indicator concerning PIAPs a further question is added to the e-government questionnaire.

The methodology has been developed with the support of the Italian National Observatory on Broadband.

Glossary

ADSL - full rate *Asymmetrical DSL*: ADSL offers differing upload and download speeds and can be configured to deliver up to six megabits of data per second (6000K) from the network to the customer that is up to 120 times faster than dialup service and 100 times faster than ISDN. ADSL enables voice and high-speed data to be sent simultaneously over the existing telephone line. This type of DSL is the most predominant in commercial use for business and residential customers around the world. Good for general Internet access and for applications where downstream speed is most important, such as video-on-demand. ITU-T Recommendation G.992.1 and ANSI Standard T1.413-1998 specify full rate ADSL.

Bandwidth: The range of frequencies, expressed in Kilobits per second, that can pass over a given data transmission channel within a frame relay network. The bandwidth determines the rate at which information can be sent through a channel - the greater the bandwidth, the more information that can be sent in a given amount of time. Usually measured in bits-per-second.

CRM: Acronym for Customer Relationship Management. CRM is an industry term for software solutions that help enterprise businesses manage customer relationships in an organized way. An example of a CRM would be a database containing detailed customer information that management and salespeople can reference in order to match customer needs with products, inform customers of service requirements, etc.

DSL: (Digital Subscriber Line) -- A method for moving data over regular phone lines. A DSL circuit is much faster than a regular phone connection, and the wires coming into the subscriber's premises are the same (copper) wires used for regular phone service. A DSL circuit must be configured to connect two specific locations, similar to a leased line.

e-commerce: electronic commerce, also e-business, a term for all kinds of business that are established electronically especially over the Internet. This includes both electronic sale (internet shops) and B2B transactions, i.e. business between two companies.

e-Government: classified as being the same as 'contacting public administration office'.

e-Government services: Delivering local government service through electronic means. Electronic means include telephone and fax, and increasingly the Internet (whether accessed through a PC, digital TV, phone or other device). Electronic access may be direct, or mediated through call centres or front offices in which the operator has access to information electronically and can seek information or complete transactions on behalf of members of the public who prefer to conduct business face to face or by telephone

Encryption: A method of scrambling or encoding data to prevent unauthorized users from reading or tampering with the data. Only individuals with access to a password or key can decrypt and use the data. The data can include messages, files, folders, or disks.

e-participation: evidence of online channels in the local administration that facilitate citizen participation in public issues.

ERP: (enterprise resource planning) it is an industry term for the broad set of activities supported by multi-module application software that help a manufacturer or other business manage the important parts of its business, including product planning, parts purchasing, maintaining inventories, interacting with suppliers, providing customer service, and tracking orders.

European Website Standards: the Web Accessibility Initiative (WAI) consists of over 500 member organisations from 30 countries. They produced a set of guidelines and as part of the eEurope plan these are systematically being adopted and implemented at the European level. Public websites in the EU vary in size, design, structure, functionality and implementation and inevitably in their level of accessibility. The aim is to achieve AA conformance through a process of monitoring and updating sites accordingly. At present all countries agree on the overall decision to make their public websites at least compliant with the A rating. Further information can be found at www.euroaccessibility.org.

Extranet: An extranet is a private network that uses the Internet protocols and the public tele-communication system to share a business's information, data or operations with external suppliers, vendors or customers. An extranet can be viewed as the external part of a company's Intranet.

Firewalls: These are special computers that are set-up on a network to prevent intruders from stealing or destroying confidential files. This is done by a combination of hardware and software that separates a LAN into two or more parts.

HDSL - High data rate DSL: A variety created in the late 1980s delivers symmetric service at speeds up to 2.3 Mbps in both directions. Available at 1.5 or 2.3 Mbps, this symmetric fixed rate application does not provide standard telephone service over the same line and is already standardized through ETSI and ITU (International Telecommunications Union). Seen as an economical replacement for T1 or E1, it uses one, two or three twisted copper pairs.

ICT strategy: an official, written plan containing objectives and guidelines for acquisition or usage of ICT by the municipality.

ICT training course: ICT courses where a formal recognised qualification has been awarded at the conclusion. For example, the European Computer Driving License (ECDL) qualification.

Intranet: A private network inside a company or organization, which uses software like that used on the Internet, but is for internal use only, and is not accessible to the public. Companies use Intranets to manage projects, provide employee information, distribute data and information, etc.

IRU - Indefeasible Right of Use: In telecommunications, Indefeasible Right of Use (IRU) is the effective long-term lease (temporary ownership) of a portion of the capacity of an international cable. IRUs are specified in terms of a certain number of channels of a given bandwidth. IRU is granted by the company or consortium of companies that built the (usually optical fiber) cable. Some IRU legal agreements forbid resale of the capacity ownership. For at least one major international cable owner, an IRU ownership period is granted for 25 years. An IRU gives a large-scale Internet service provider (ISP) the ability to assure its own customers of international service on a long-term basis.

ISDN: (Integrated Services Digital Network) - Digital telephony scheme that allows a user to connect to the Internet over standard phone lines at speeds higher than a 56K modem allows.

LAN: a local computer network for communication between computers. Especially a network connecting computers and word processors and other electronic office equipment to create a communication system between offices.

LLU - Local loop unbundling: Is the process of allowing telecommunications operators to use the twisted-pair telephone connections from the telephone exchange's central office to the customer premises. This local loop is owned by the incumbent local exchange carrier (ILEC).

MAN - Metropolitan Area Network: A data network designed for a town or city. In terms of geographic breadth, MANs are larger than LAN and is usually characterized by very high-speed connections using fiber optical cable or other digital media.

Multimedia: Information presented in more than one format, such as text, audio, video, graphics, and images. In terms of mobile technology, multimedia is used to describe third generation or 3G mobile phones that have the ability to stream video, hold downloads and access the Internet.

NUTS: The Nomenclature of Territorial Units for Statistics (NUTS) was established by Eurostat more than 25 years ago in order to provide a single uniform breakdown of territorial units for the production of regional statistics for the European Union. NUTS is a three level hierarchical classification that subdivides each member state into a whole number of NUTS1 regions, each of which is in turn subdivided into a whole number of NUTS2 regions and so on.

Open Source Software: software for which the underlying programming code is available to the users so that they may read it, make changes to it, and build new versions of the software incorporating their changes

Pan-European Network: "KMI's definition of pan-European network includes those service providers that installed their own fiber optic cable in more than one European country"¹. It includes incumbent and alternative networks.

PIAP: Public Internet Access Points: this includes Internet cafes, access at the library, public kiosks.

POP - Point Of Presence: A physical site with Modems and Routers which allows a user to call in locally and gain Access to the Internet.

Public Administration Office: local government, local councils, municipal authorities, mayoral offices, town councils.

SCM: An electronic alternative to the traditional paper chain, providing companies with a smarter, faster, more efficient way to get the right product to the right customer at the right time and price. Combines the power of the Internet with the latest technology, enabling participating suppliers to access up-to-date company information and enabling companies to better manage and track supply and demand

Secure Server: A method of ensuring that information entered through your website is protected from prying eyes. Information submitted via a secure form is transmitted in an encrypted mode. SSL is most commonly used for credit card transactions.

SHDSL: Is state-of-the-art, industry standard symmetric DSL SHDSL equipment conforms to the ITU Recommendation G.991.2, also known as G.shdsl, approved by the ITU-T February 2001. SHDSL systems may operate at many bit-rates, from 192 kbps to 2.3 Mbps, thereby maximizing the bit-rate for each customer. G.shdsl specifies operation via one pair of wires, or for operation on longer loops, two pairs of wire may be used.

SMS: Short Message Service: available on digital GSM networks allowing text messages of up to 160 characters to be sent and received via the network operator's message centre to your mobile phone, or from the Internet, using a so-called "SMS gateway" website. If the phone is powered off or out of range, messages are stored in the network and are delivered at the next opportunity.

Visits: the number of times someone is connected to a website through an IP, in other words, we will count the number of times this IP (it does not consider user identity) visits the website. We don't want to measure "hits" in any case, because following a formal definition hits means: "How

¹ ESPON 1.2.2 Telecommunication Services and Networks: Territorial Trends and Basic Supply of Infrastructure for Territorial Cohesion . Third Interim Report August 2003

many times a resource has been accessed over the Internet. For example, the number of times people access a page, or its graphics, during a certain span of time. Differs from page views since a hit encompasses any element of a page. For example, if your page has 5 graphics, the page would receive 6 hits each time it is accessed, one for the page and five for the graphics".

W-LAN: a local area network that uses high frequency radio signals to transmit and receive data over distances of a few hundred feet; uses ethernet protocol

Website: A virtual location on the web. A URL that serves as the top-level address of a Web site will be said to point to that website's home page. That page serves as a reference point, containing pointers to additional HTML pages or links to other Web site and providing company information.

Wi-Fi hot spots are places where users can pop in and get connected to the Internet using standard IEEE 802.11 connection. Places include airport, bar, hotels, railway station, community network etc. Distinction has to be made between commercial and non-commercial networks.