



BISER

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Benchmarking the Information Society:
e-Europe Indicators for European Regions

BISER – Workpackage 2: e-Europe Regions Indicator Baseline

Deliverable D2.1a

BISER Domains

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Executive summary

This deliverable sets out to introduce the revised set of Domains to be used by the BISER project to benchmark the development of the Information Society across European regions.

The Domains have been classified under a regional development framework, developed in work package one, that captures the wide range of policy and development issues related to regional economic development and ICT. The framework includes eEntity, eEconomy, eEquity, eEnvironment, and eTechnology. These overarching fields are broken down into key domains that will be the main focus of work package two.

This deliverable briefly reviews the regional framework and then introduces the overarching fields of interest with a focus on introducing the key Domains. A summary is provided in chart format that attempts to capture the Information Society drivers, potential outcomes and a sample of the type of indicators and indices associated with each Domain.

This deliverable is being resubmitted on the back of review by external expert panel and final discussions from project consortium meetings. A summary of the external expert comments have also been included.

Main deliverable

1 Introduction

This is the first Deliverable from work package two, of which there are three deliverables, ending in month 7 of the project. This work package will identify and define in detail the key Domains for benchmarking the Information Society across European regions and set out the framework and process for identifying, collecting and assessing potential indicator and indices creation to be finalised in following work packages.

1.1 Work Package 2: e-Europe Regions Indicator Baseline

The regional development model from WP1 is applied in this WP to delimit a set of domains in which subsequent analytic and survey work is clustered and to draw up an initial set of appropriate indicators for all the key constructs in the model. This then guides the work of discovering existing sources of data for building the defined indices at regional level, at the conclusion of which the requirements for new primary data are fixed, specifying the gaps to be filled by empirical survey work.

Accordingly, and based on the work in WP1, especially the work on the analysis of current and emerging statistical measures for inclusion in e-Europe Regions Indicators, WP2 will define the required extensive set of statistical indicators but also indices, i.e. theoretically founded aggregations of statistical data from one or a number of sources to appropriately describe complex concepts like Information Society participation/ exclusion, preparedness for future IS developments etc. along the lines of the e-Europe Initiative objectives.

The objectives of workpackage 2 are to:

- confirm issue and domain allocation to contractors;
- define, elaborate, study and report on the key domains and issues of the Information Society for which new statistical indicators are to be developed, piloted and tested;
- generate topic reports covering Information Society subjects with current political relevance (first wave);
- assess current and forthcoming statistical measures for inclusion in eEurope Regions Indicators;
- define data deficiencies and hence the scope of the survey work.

1.2 The purpose of deliverable D2.1a

Deliverable D2.1a sets out to introduce the preliminary delimitation of domains in the light of the results of WP1.

This deliverable acts as a brief introduction to the domains selected by BISER and as a guide for further in-depth domain reports including WT2.2 Indicator Definition. The next deliverable D2.1b will produce a complete outline of each BISER Domain. In D2.1b and D2.2 Domain Indicators will be identified and defined to cover all the relevant issues relating to IS development and those to chart the development of intermediate factors relevant for IS

outcomes. This set of indicator definitions is provisional and contingent on the measurement proving feasible.

2 BISER Domains

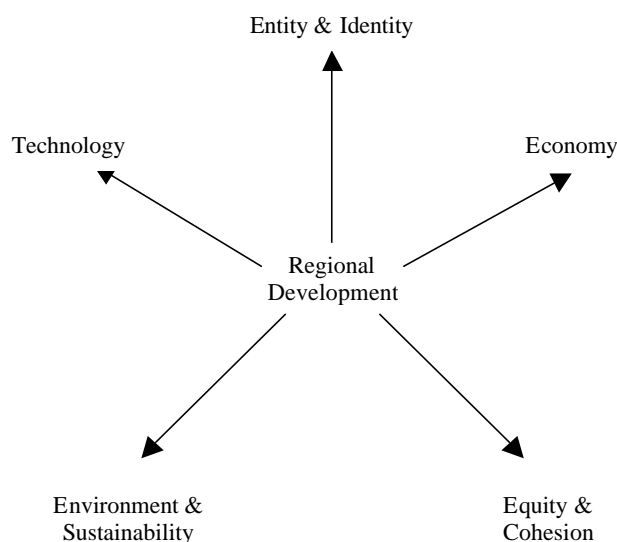
2.1 Regional Development Framework

BISER has adopted a policy driven approach which breaks down the main components of regional development and provides a framework model for analysis to evaluate the regional characteristics of development in an Information Society / Knowledge Economy context. (This draws on BISER deliverable D1.1 and is explained in detail in deliverable D1.3).

The regional framework suggests five overarching policy fields of interest for BISER, providing a structure for further selection, focus and refinement, but does not imply at this stage equal weight, importance or any relationship. The framework enables each field to be further specified and researched on the basis of relevance and down to indicator level depending on defined need and purpose.

The regional development framework is depicted in a five-pronged radar diagram:

Regional framework for e-Europe regions development model



Most regions will, in practice, experience trade-offs between one or more policy fields. The ideal goal of regional development is to minimise trade-offs whilst maximising development within each policy area. ICT could under certain circumstances provide a tool to make some progress towards this goal. Two of the objectives of BISER are to identify indicators for measuring this and to identify regions or regional types where it has or can be achieved. This would then feed into policy specification and implementation.

The framework enables BISER to develop relevant domains for research and, based on these, indicators and indices for measuring regions in an e-Europe context. It enables a variety of sets of different indicators and indices to be developed, in relation to needs defined, and for regions to be subsequently compared dependent on these indices.

2.2 Key Domains

Based on the regional development framework, ten key domains have been identified and are listed below. These domains will become the main focus for further research and indicator creation in subsequent deliverables and work packages.

Key BISER domains:

- [1] Government/Public Administrations
- [2] Transport and the Environment
- [3] Health and Care
- [4] Regional Identity
- [5] Business Enterprise
- [6] Innovation and R&D
- [7] Work and Labour Market
- [8] Education, Training and Skills
- [9] Social Cohesion
- [10] ICT Infrastructure

2.2.1 Domain Introductions

[1] Government/Public Administration

The role of public administrations have been undergoing significant change with some functions or services being privatised and semi-privatised (the creation of Public Private Partnerships). Administrations have also seen rapid change in the organisation and delivery of public services; this has been primarily due to the adoption and implementation of Information Communication Technologies.

The restructuring of public administrations facilitated by the adoption of ICTs is being driven by Information Society drivers including eGovernment (intra-governmental, G2C, G2B) including interactive communication with the public, inter and intra public administration networks and communication channels, e-procurement and knowledge management systems. The adoption and delivery of improved and new services has enabled public administrations to be more efficient, provide higher levels of service, minimise red tape and improve the quality of communication and interaction with the public.

The quality and nature of the network between administration, business, individual citizens and the wider community and social networks is integral to the development of a cohesive and inclusive regional network. The growing connection between administration and the public (business and citizen), which often takes place at the local and regional level through lower tier government agencies and bodies, provides the mechanism for bottom-up or grass root initiatives to inform government planning and decision making processes.

Measuring the degree to which European regions are building new and improving existing links with the local community and business through interactive e-government services and breaking down access barriers and improving the efficiency of their government to citizen and government to government relationships will be fundamental to the growth and support of regional development (economic and social) and for developing a regional identity.

[2] Transport and the Environment

Europe today runs on 'wheels and wires' - transport and telecommunications networks. While e-Europe networks grow at a phenomenal rate, transport networks are becoming unsustainable in terms of sheer absorptive capacity and the rising economic, social and environmental costs of traffic congestion.

It is widely recognised that current transport policy is unable to cope with growing demand for mobility. Policy in many European countries is shifting towards the better and efficient use of the existing transport infrastructure, rather than the widespread building of new road infrastructure (the so called 'predict and provide' policy), Intelligent Transport Systems, or "ITS", are seen as providing key tools and services to achieve this.

Intelligent Transport Systems are the marriage of information and communication technologies (ICT) with the vehicles and networks that move people and goods. "Intelligent", because they bring extra knowledge to travellers and operators. In cars, ITS systems help drivers navigate, avoid traffic hold-ups and avoid collisions. On trains and buses, they let managers optimise fleet operation and offer passengers automatic ticketing and real-time running information. On the road network, ITS systems co-ordinate traffic signals, detect and manage incidents and display information, guidance and instructions to drivers.

ITS will play a vital role in the development of a strong and efficient economy, an inclusive and equal society and in environmental sustainability. This is especially important for regional development as transportation networks and systems induce gains in economic efficiency as it facilitates the increasing integration of global markets, disperses economic activity, provides the opportunity for a mobile work force and provides access to local and regional services and amenities. Transportation also strengthens the interconnectedness of major urban centres and can bridge mobility and service gaps between rural and urban areas. The efficiency of and access to transport systems can be greatly improved through e-transport innovations; e-transport is fundamental for developing regional systems, economic and social. (Pickavance, 2001)

[3] Health and Care

Developments in the area of health and healthcare are being driven by wider social changes – including a demographic shift to an ageing society and the rise of the wellness and leisure society. The Health industry is also currently driven by extensive research and development in the Life Sciences including biogenetics, human genome mapping and by the pharmaceutical industry. Within these wider trends the health industry and health services are seeing advancements in the quality and access to health services and information as a direct result of the application of new technologies.

The access and quality of health services are being improved through remote diagnoses and tele-medicine, for example, NHS Direct in the UK. Health services are also being improved through the increased access to health information through on-line services and web sites that provide a range of self-diagnosis manuals and other emergency and treatment information. The access to health information is benefiting both doctors and patients alike by reducing waiting lists and times and through improved co-operation between care-providers and hospitals through electronic data exchange.

There are limitations to the uptake and use of ICT applications for health services. In Europe the sale of medical aid and medicines via the internet is still small-scale, this is often due to the regulations monitoring and restricting the sale of medical goods due to the nature of the material (i.e. prescription drugs). Privacy of information is also a barrier and can be seen in the general public's scepticism with using smartcards, which stems from the opaque rules relating to access rights to different types of information. Additionally, the existence of a dedicated national electronic health network takes significant resources to develop. However,

as illustrated in chart 1 below, the level of ICT use in health sector is rising, for example, in Denmark, all hospitals and 75% of GPs are connected to the internet.

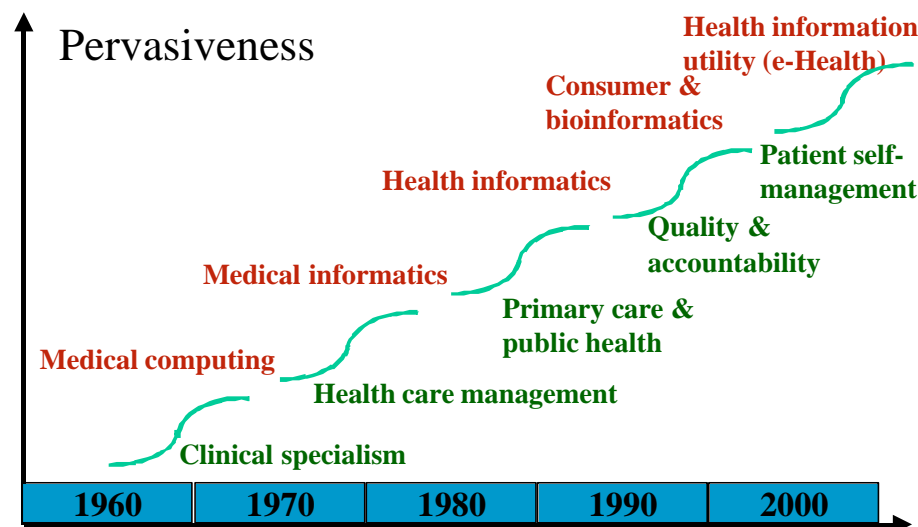


Chart 1: Pervasiveness of computing in healthcare (ICT and healthcare focus)

[4] Regional Identity

The role of community and regional networks and the existence and adherence of civic norms is commonly referred to as Social Capital. Social Capital acts as part of the formal and informal regional community and identity – these networks, provide the foundation for creating place identity and a sense of community, it generates a level of trust that is inherent in, but varied according to regional cultures. Theoretical research draws the link between the level of trust in a culture or society as a condition of prosperity for democracy as well as economic competitiveness.

Social Capital has established a relationship with the outcomes policy makers are concerned with namely economic growth, social inclusion improved health and more effective government.

Regional and community networks and civic norms include social relations, formal and informal social networks, group membership, trust, reciprocity and civic engagement. These attributes are generally considered to be the property of the group not the individual. Measuring social capital can include the development of indices including measures of community organisational life, measures of engagements in public affairs, measure of community volunteerism, measures of informal sociability and measures of trust.

The role of Social Capital in regional economic development is fundamental to the development and support of the knowledge economy. The knowledge economy is driven by a mobile and highly skilled and educated work force, the ability to attract and exchange knowledge (shared across knowledge workers) in a value added manner, hinges on the existence of trust, social and industry norms, and 'community' identity.

Since the Knowledge Economy is largely urban focused there is a need to measure the urban and rural structures for the role of city-region networks as the conduit for knowledge transfer. Similarly, how regions build the trust and community drive to prosper and be competitive can be supported by the development of the information society – this includes real and virtual networks, location marketing, place related websites, and place branding - these factors combine as part of the social capital pool that creates regional advantages and is highly valuable in the attraction of inward investment.

We are interested in how technology follows regional lines - is it being used to create regional alliances across countries and internationally or is it breaking down regional identity, does it force regions to club together to attain critical mass?

[5] Business Enterprise

The information society and knowledge economy is touching down across Europe with varying results. This variation in the development of the information society is directly related to the business base and industrial structure of European regions – this can be described and measured by industry sector, type of company and market orientation.

Sectors range from low value to high value industries, for example, low value agricultural sectors versus high value financial services. These sectors can also be classified according to their geographical location and market orientation (export or local consumer market). Depending on the sector profile the uptake and penetration of ICT will vary. The variation in ICT use is related to the changing level of technology and knowledge intensity of the sector – that is to say, as sectors become higher value added they tend to be more technology and knowledge intensive.

The type of company in relation to its size or scale also directly affects the uptake and use of ICT applications, but also will partially determine the type of applications required. The number of start-up and micro companies in relation to Small and Medium Sized companies (SMEs) to large companies will define a level of regional complexity required for ICT applications and services, creating a varying ICT demand map. The application of ICT across these company types will also reflect the nature of the company – a fast paced, high growth start-up or micro enterprise, an established and moderate growth SME, or a large and mature slow growth company.

The third factor for measuring the industrial structure is the market orientation of the regional business stock – are they operating in the export market or do they serve local consumption and service needs. This will influence the scale of the market for technology, including the provision of ICT infrastructure such as broadband. Market orientation will also reflect the vertical integration of a company – are they forward or backward linked, where are they in the supply chain?

Equally important for the industry sector and company size is its geography – is it urban or rural, rural traditional, traditional industrial urban, new industrial urban? Does the industry and company need to be in a city-region? The comparative scale of the public and private sector is also important in breaking down the industrial classification and thus ICT demand.

[6] Innovation and R&D

Innovation and entrepreneurship are important sources of regional growth. Regional Innovation Systems (RIS) are the structures or networks that support knowledge and technology transfers, crucial to business formation and innovation.

Key to RISs are the softer aspects of social capital. Human capital (the individual) and social capital (the community or group) is not only a function of the formal education and training received through secondary and post-secondary institutions but also harder to measure tacit knowledge. Tacit knowledge is the driver behind turning knowledge into innovation. This is attained through a value-added knowledge transfer process enabled through the use of learnt norms and conventions among people, researchers, companies and government. These 'intangible assets' range from know-how (managerial, scientific, technical, logistical, etc) to networks, trust and goodwill that are valuable but difficult to measure.

This tacit knowledge is key to the flow of knowledge through universities, technology institutes, industry clusters, and research and development centres. This knowledge transfer results in the creation of spin-offs and new business start-ups and provides the ingredients for the formation of an entrepreneurial culture.

In fostering long-term growth effort has also focused on the framework conditions for fostering new enterprise formation and growth of Small and Medium size Enterprises (SME). Start-up firms have gained significant attention in the innovation process as they represent rich sources of new ideas. The number of new start-ups in a region is often used as a proxy measure for the level of innovation and long-term economic growth – as SMEs in theory will become larger organisations with a growing economic multiplier. The formation of SMEs can result from spin-offs from larger corporations or from other centres of research such as universities and colleges and through developing an enterprise culture that supports potential entrepreneurs with the right mix of business support services, business incentives and financing (venture capital) and skilled workforce.

Measures of the number of higher education centres, university institutes, industry clusters and the number of new business formation rates and patent registrations have traditionally been used as measures of the level of entrepreneurialism and innovation capacity in a region.

[7] Work and Labour Market

Work can be classified and measured across a range of categories, the analysis of which will provide a description of the main types and forms of work. Measures could include broad industry types including production, industrial, or service sector to various measures of the occupation structure – paid, volunteer, professional, pay levels, part time or full time, gender splits, public versus private sector etc.

The labour market is generally described in terms of employment and earnings with the aim to maximise levels of both. The labour market operates in relation to supply and demand curves. The supply curve measures the skills level, qualifications and education of the workforce – the regional human capital. This describes the knowledge and skills base of a region. The demand curve is a measure of the jobs on offer – or what the employers are looking for. This could be flexible or part time work or seasonal in the case of agricultural industries. The match, or mismatch of the two will give a picture of the labour market profile for a region.

The knowledge economy is based on innovation and change and thus requires a flexible labour market. The knowledge economy innovates through rapid change in business and organisational structures and consequently, work and the labour market need to be flexible in response, which ultimately, requires people to be adaptable. People now need to shift between jobs and industries, they need to be multi-skilled and adaptable to changing styles of work – team based, partnerships and virtual work. Time frames have shrunk and workers need to be mobile so that they can work abroad and travel more to meet clients face to face. This will require life long learning as a way to move between jobs and sectors, workers will have to become accustomed to the e-economy and learn to work in virtual teams to overcome mobility barriers. Telework, e-mobility, and a mobile work force will help to increase labour productivity.

ICT is benefiting the development of both the supply and demand side of labour market. There has recently been a rise in the number of e-learning and e-training initiatives and technology focused university and college programmes. New styles and patterns of work are also being introduced including e-work, group-ware applications and teleconferencing and satellite office networking. These new forms of work and learning provide more options to both the job seeker and employer.

[8] Education, Training and Skills

A main stream of economic development today has moved towards the role of education and skills - human capital models of development. The Information Society places new and ever-changing requirements on skills and training with life-long learning principles at the core to creating and maintaining the skills base of a region. To be competitive now entails an element of adaptability – the workforce must be able to learn, relearn and de-learn.

This adaptability is essential to survive in the fast paced environment associated with high education sectors, defined as sectors with more than 40% of workers having tertiary education.

The high education sectors also have the fastest pace of employment generation and a growing share of total employment in advanced countries in comparison to the least advanced countries – 34.4% and 18.7% respectively; the EU average is 24.9% (Employment in Europe, 2000). The highest educated sectors, with some variation, often include: research and development, education, computers, high-tech manufacturing, business services, health and social services and membership organisations (ibid).

Research on local human capital has demonstrated a strong connection between growth and the initial skills in an area -- this connection is also getting stronger over time (See Glaeser, 1994; Simon and Nardinelli 1996 & 1998). Two interpretations of this connection relate to: first, the geographical concentration of skills may increase new ideas and secondly, human capital spillovers result in knowledge diffusion to the benefit of the region (Glaeser, 2000). The application of skills (knowledge), according to industrial structure, illustrates the potential for innovation.

Some key indicators used to capture the educational attainment and skills in a region – a region's human capital – include: the adaptability of the workforce, share of workers employed in sectors requiring the highest education levels, completion of tertiary education, participation in continuing education and training among the adult population, labour force participation by level of educational attainment, earnings and educational attainment, and patents.

[9] Social Cohesion

“The digital divide isn't just a pressing issue of social equity. It's fundamental to our ability to innovate, stay competitive, and generate economic wealth...but many people are being left behind as the move to a high-tech knowledge economy reinforces long-standing social and economic cleavages” (Florida, 2001).

The digital divide can be described in terms of access, the existence of infrastructure such as broadband connection; affordability, the cost of purchasing a personal computer or subscribing to Internet services, and; the ability to leverage value. These factors manifest themselves across social groups, generational groups (old versus young), geography, businesses and educational levels.

The social structure acts on the digital divide in two ways affecting the access, affordability and leveraging capability of the user. First, those who are less well off cannot afford to purchase personal computers or pay for Internet services and second, their occupations normally do not utilise ICT, reinforcing the lack of access and exposure to the information society. Consequently, there is a significant distance between what the Internet offers and the level of access and consequently know-how for utilising the Internet and other ICTs.

The digital divide is also evident across rural-urban divides and in the less favoured, rural and remote areas of Europe. This divide follows the lines of old industrial, new urban and agricultural economies. Rural and less favoured regions lack the same access and supply of information communication technologies including Internet access or broadband connections. Consequently, those who reside in these areas face the prospect of falling further behind those areas with Internet access or those who are able to capitalise on the supply of ICT to participate in the economy and society.

Businesses are also divided. Large organisations are able to adopt and utilise ICT more effectively as they can absorb the IT costs and possess the manpower to handle implementation, whereas small firms and start ups require business and financial support services. These barriers can be multiplied by geography through the lack of infrastructure access for specialised services or capacity levels to support high order applications related with e-business or information exchange.

E-inclusion also relates to the level of digital-literacy. Simply providing access to those areas or individuals does not solve the digital divide – these areas and individuals still need to possess basic numeracy and literacy and develop a basic digital literacy to be able to leverage the power of ICT. This is especially true across ethnic lines – the Internet is text based, an English Language medium, and consequently favours any English speaking individual. This is slowly changing but at present represents a significant barrier.

[10] ICT Infrastructure

ICT is at the core of economic development policies. ICT's share of capital stock has been on the rise throughout the 1990s - even with the dot-com bubble bursting, investment and the application of ICT is still growing. However, ICT expenditures vary across Europe. Sweden and the UK lead with about 8% of GDP in 1999, followed by the Netherlands, Denmark at around 7% of GDP. France, Germany, Italy and Spain are all grouped around the EU average of 5.6%. However the European average is nearly one third lower than in the US (European Commission, 2001a).

The role of ICT in raising productivity levels is much debated and is now referred to as the "productivity paradox" – rapid levels of technological innovation with slow gains in productivity growth. However, it is still considered that technology is core to product and process innovation and the diffusion of innovation and technology transfer are related to new firm formation and regional growth and development.

ICT technologies are most effective when associated with organisational change, improvements in the skills and education of the labour force, and as a condition encouraging innovation. An example of the benefits of ICT and economic development in this context is the role of ICT in the development and support of SMEs. The uptake, use and access of ICT infrastructure as briefly described here only relates to the supply side; BISER will attempt to develop a range of indicators or indices that will also capture the demand side.

The demand for ICT technologies (including applications) and infrastructure remains a much sought after measurement – this will provide insight in to the market demand for a range of public and private services, a better understanding of which would greatly help the development and roll-out of ICT across Europe. Capturing "use" data will go part way to understanding the geography of demand for e-government and private sector services.

2.3 Key Domain Summary

The key domains are summarised in the charts below. The summary breaks down each sub-domain by its associated Information Society drivers, policy objectives and then uses the following structure to identify the potential indicators and indices to capture and measure each domain.

- *Contextual indicators* - all relevant indicators that capture the regional profile (the basic criteria) for a Domain in relation to regional development. Examples include GDP, sector structure, household incomes, population density, etc.
- *Intermediate indicators* – these are measures of catalysts and/or enablers for the development of a domain in general but also with a focus in relation to the adoption and use of ICT within the domain. Examples include R&D activities, share of employment in business services, share of work force with a university degree, health indicators, etc.
- *E-Innovation* – indicators directly measuring ICT-related phenomena such as adoption and use of ICT and ICT-related new processes, services and applications and their outcomes. Supply as well as demand factors are to be covered.

Other important criteria for the selection of indicators is whether they can be applied across different types of regions and whether it can be shown that the issues to be measured really make a difference from a regional development perspective. This does not necessarily mean that only ICT applications, for example, which have been proven to be beneficial for regional development will be selected, but the possible positive and negative impacts on regional development have to be discussed, answering the question: under which conditions can a technology or innovation prove beneficial or at least strongly influential for a region?

This summary will act as the organising framework for further research and indicator creation and will be further developed in the domain specific reports in Deliverable D2.1b and D2.2.

Domain	Information Society Drivers	Policy objectives	Indicators
[1] Government/Public Administration	eGovernment (intra-governmental, G2C, G2B) including interactive communication with public, inter and intra public administration networks/ communication, e-procurement, knowledge management, etc.	Life event focus, government portals, interactive communication, transaction based services, new information services, less red tape, etc.	Contextual – Social structure, human capital profile, institutional framework, organisational structure, etc.
			Intermediate – level of internet penetration, public internet access points, internet usage rates
			e-Indicators – on-line services, e-procurement, e-democracy and other B2C and B2B interaction
[2] Transport and the Environment	New 'supply' technologies (e-transport) including integrated systems; new 'demand' (caused by e-commerce; IT-related changes in transport patterns etc.)	Improved (or stabilised) mobility, better access to public services, increased economic opportunity for citizens and business; increased sustainability; social and economic cohesion; closing rural-urban divides.	Contextual – Technological framework for interoperable systems and standards, transport trends and policy i.e. sustainable mobility
			Intermediate – measures of wired roads, CCTV, Smart Cards, Green Light Initiatives, public information systems, congestion charging, multi-modal transport initiatives, JIT, traffic management systems, VMS, route planning systems, logistics, etc.
			e-Indicators – e-informed travel(use of public information systems), e-enabled travel(smart card usage, integrated ticketing, etc), e-managed travel (access control systems, CCTV, demand management)

Sub-domain	Information Society Drivers	Policy objectives	Indicators
[3] Health and Care	ICT applications in health (e-health) - remote diagnosis (i.e. NHS direct), information systems. Also R&D and biogenetics, pharmaceuticals, etc. ICT-related health impairments.	Healthy workforce/population Employment generation (R&D life sciences etc)	Contextual – ICT infrastructure access (broadband), policy environment, demographics
			Intermediate – wired hospitals, on-line services, monitoring and assessment, remote diagnosis, electronic medical records, health informatics, smart cards
			e-Indicators – telemedicine (24 hr service), Health and medical informatics services, etc.
[4] Regional Identity	ICT applications to increase sense of identity, of place and belonging. New possibilities for network formation and new forms of communication (virtual networks), community structures and activities, global communities	Increase sense of identity, of place and belonging. Participation for all, social inclusion and cohesion	Contextual – governance systems, social capital, human capital, cultural and political environment, etc.
			Intermediate - number and size of networks (civic associations), extent of partnerships, etc.
			e-Indicators – virtual networks, regional e-information systems, etc.

Sub-domain	Information Society Drivers	Policy objectives	Indicators
[5] Business Enterprise	Changes in the industrial structure (share of output/employment); ICT applications across all sectors change processes, products, distribution, management;	Modernisation of old industry, new services and products, sector growth i.e. new media growth	Contextual – company type and market orientation, industrial structure
			Intermediate – ICT uptake in old economy, New economy sector growth, ICT and export market growth, ICT supply, etc.
			e-Indicators –e-commerce, knowledge management, etc (modernisation, globalisation)
[6] Innovation & R&D	globalisation, R&D, technology transfer, etc.	Regional competitiveness, enterprise culture	Contextual – Industrial structure, clusters, Human capital, technological infrastructure
			Intermediate - Start ups, wired businesses, ICT driven organisational change - %businesses with web sites, %businesses with B2B or B2C, etc.
			e-Indicators – e-research networks, product and process innovation, etc.

Sub-domain	Information Society Drivers	Policy objectives	Indicators
[7] Work and Labour Market	ICT-related new ways of work organisation (time, place, contract, contents); flexibility requirements.	Employment: quantity of jobs, labour market participation, quality of employment, job security, competitiveness of EU labour markets	Contextual – demography, labour force participation rates, sector structures, etc.
			Intermediate – ICT infrastructure at home, at work and in public, ICT education and training, etc.
			e-Indicators – employment in ICT sectors, ICT skills on the labour market, telework, e-lancing, etc.
[8] Education, Training and Skills	New (IT-related) skill requirements plus Lifelong Learning requirements, with the aim to develop a skilled workforce that is IT literate.	Qualified and educated workforce for the future by improving the skills portfolio/structure – key skills, IT skills, sector specific skills to increase labour productivity	Contextual – Human capital, educational infrastructure, demographics
			Intermediate - % of schools with Internet, PCs, (Wired schools), teachers with IT training/skills, tertiary education levels by industrial structure, life long learning, etc.
			e-Indicators – e-learning, supply of ICT knowledge in education programmes

Sub-domain	Information Society Drivers	Policy objectives	Indicators
[9] Social Cohesion	<i>Includes all drivers mentioned in other sub-domains</i>	Closing the digital divide and rural-urban divide; ensuring digital literacy for all	<p>Contextual – ICT infrastructure supply and access, digital literacy, Industrial structure, labour market, human capital, etc.</p> <p>Intermediate – Penetration and usage rates by business size, ethnic and social groupings, geography, etc.</p> <p>e-Indicators – online government services, e-learning, e-democracy, ICT training, information gateways</p>
[10] ICT Infrastructure	Progress in development and availability of information and communication technologies	universal access, ubiquitous ICT; New products and services i.e. WAP, i-mode; new modes of work (tele-work); regional access, etc.	<p>Contextual – ICT supply and access, cost/affordability of Broadband, mobile, wired houses, wired businesses, etc.</p> <p>Intermediate – uptake and use, use by sector/industry, penetration rates, ownership rates, secure servers, etc.</p> <p>e-Indicators – ICT diffusion, e-application development, e-services, etc.</p>

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