Is Norway an Information Society?

Reggie Davidrajuh

Dept. Electrical & Computer Engineering
University of Stavanger,
Stavanger, Norway
e-mail: reggie.davidrajuh@uis.no

Abstract—Information Society can be loosely defined as a society integrated by complex communication networks that rapidly develop and exchange information. Information society is becoming an earthly phenomenon and the goal of every country is to ensure that their people achieve the status of information society. Norway is one of the richest countries in the world. But, is Norway also an information society? If so, to what extend? Analyzing these two questions is the scope of this paper. This paper first develops a simple measuring tool and then uses the tool to measure the strength of Norway as an information society. The paper shows that Norway has achieved mixed results in ensuring that its people achieve the status of the digital citizens of an information society.

Keywords-component; information society; Norway; Internet; knowledge industry

I. INTRODUCTION

Information Society can be loosely defined as a society integrated by complex communication networks that rapidly develop and exchange information. Information society is becoming an earthly phenomenon and goal of every country is to ensure that their people achieve the status of information society.

Norway is a very rich country: Among the 182 countries were ranked according to the quality of life their citizens experienced, the United Nations ranked Norway as the best place to live, based on the criteria such as life expectancy, literacy rates, school enrolment and country economies [21]. Norway has a GDP per capita (PPP) of USD 58600, which is the fifth highest in the world [23].

Norway for sure is a 'money' rich country; but is it also 'information' rich? Is Norway an information society? If so, to what extend? Analyzing these two questions is the scope of this paper.

A. Definitions

Definitions for some of the key terms used in this paper are given below:

An *information society* is a society in which creation, distribution, diffusion, use, integration and manipulation of information is a significant economic, political, and cultural activity; the knowledge economy is the economic counterpart of information society whereby wealth is created through the economic exploitation of understanding [22].

The *ICT (Information and communication technology) sector* is defined as the industries that produce goods and services for the information society (ICT industry, ICT wholesale and retail trade, ICT consultancy services, and telecommunication); the content sector is defined as the industries that produce content such as text, sound and images for the information society (publishers, information service providers, radio and television, film and video). Finally, the Information sector is the ICT sector and the content sector put together [6].

II.   II. LITERATURE REVIEW ON INFORMATION SOCIETY

Several terms that are used for information society, such as network society, post- network society, and postmodern society [2][3][10]. What are the characteristics of Information society defined by the literature?

A.   Characteristics of Information Society

Reference [3] presents the following characteristics of an Information Society:
- Distribution of high intellectual technologies on the basis of computer information technologies in all economic and social activities,
- High employment in the services sphere - over 50% of all working population,
- Sharp increase of the amount of the data exchanged whose mastering by traditional means only is impossible,
- De-popularization of specific social and economic processes   - small series production, market segmentation, disintegration of part of the big industrial companies, etc.
- Increasing the role of the individual - the changes in the labor nature and in the management increase the individual's responsibility,
- Support of the qualification level in the dynamically changing world which requires from the people in IS to get educated and self-educated during their whole life,
- Globalization, economic and social cohesion - conditions are established for building "borderless society", elimination of the "distance" factor, movement to social homogeneity,
- Ensuring equal rights for access to the information resources, Provision of diversity in the information content, preserving the cultural and linguistic differences, and
- Admitting the necessity of global cooperation and special attention to the less developed countries.

Reference [12] identifies the following characteristics:
- Possess connectivity of networks – human, infrastructure and virtual,
- Use on line connectivity and real time interactivity products and services for information,
- Exercise culture of learning,
- Have equitable access to information – within and across geographical boundaries, and
- Possess ICT literacy, and have information literacy.

B.   Pillars of Information Society

From the characteristics mentioned in the literature stated above, it can be summarized that there are three pillars that are foundation for an information society (figure-1):
- *People ("Digital citizens"):* Distribution of high intellectual technologies among the digital citizens must be even, fair, and that the digital citizens must be capable of using the technologies
- *Infrastructure and public administration ("Digital administration"):* Use on line connectivity and real time interactivity products and services for information,
- *ICT industries ("Digital industry"):* High ratio of employment in the services sphere, and ICT economy must be dominant economic processes
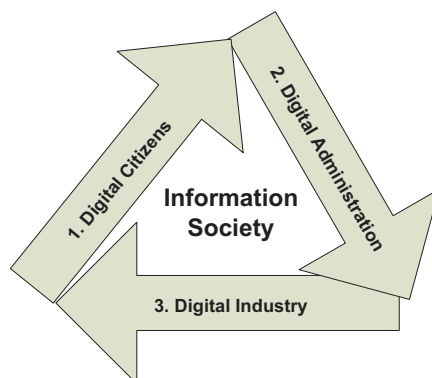

Figure 1.   The three pillars of an information society.

In the following sections, this paper analyses how Norway is performing as an information society by checking the performance of the three pillars namely "Digital citizens", "Digital administration", and "Digital industry".

III.   III DIGITAL CITIZENS

In the early 1990s, use of the Internet by the public became common in Norway. Today, surfing the net and e- mailing are part of everyday lives of Norwegians. In 2009, 88% of the homes had a PC, 98% of these household PCs had Internet access, whereas 89% of the Internet connections were high speed broadband connection [18].

A.   *Domestic Digital Divide*

The term digital divide refers to the different competitive strengths of establishments and nations, the different quality of training and educational establishments, individual, local, national and global divides linked to access to and use of ICT [7]. Domestic digital divide is the gap between citizens of a country in knowledge, access, usage, and mastery of ICT and the Internet [5]. The domestic digital divide is often interpreted as new forms of social, economic or regional differences. Thus, it is important to measure domestic digital divide, just to verify whether all the citizens of a country enjoy the benefits of being part of the information society.

Effect of income:

Though on average 88% of the Norwegian homes had PC in 2009, almost 100% of the households with children had PC (whereas share of households with no children was 82%).
In households with children, 98% of the PCs had Internet connections [18]. Household income had little effect on owning PC at home.

However, poor families (those with annual income less than EUR 25000) tend to subscribe cheaper (and slower) dialed Internet connection. Figure-2 shows share of households with Broadband Internet access versus household income. Figure-2 indicates that 90% of households with high incomes used Broadband whereas only about 60% of the poor families opted for this connection.
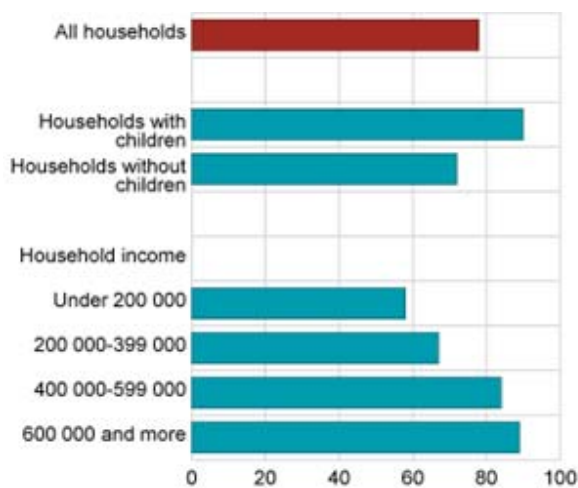

Figure 2.   Broadband Internet access versus household income [11].

Effect of geography:

Figure-3 shows some regional differences in the use of ICT. Norway is divided into 19 administrative regions called counties; out of the 19 counties, there is less ICT jobs in four
counties (Sogn og Fjordane and Møre of Romsdal in the West, Hedemark in the East, and Nor Trøndelag and Nordland in the North); four counties (such as Østfold, Akershus, and Oslo in the South, and Sør Trøndlag in the Middle) had high availability of ICT jobs.
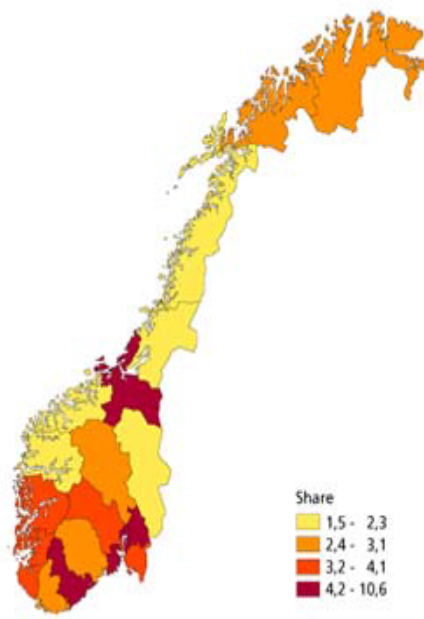
Figure 3. Geographical dispersion of ICT jobs [15].

Effect of gender:

There is no report indicating digital divide among the sexes. However, some reports (e.g. reference [18]) indicate that older women are left outside the digital world; and some report high use of Internet (or rather social media) among girls than boys [9].

IV.   DIGITAL GOVERNING AND ADMINISTRATION

Norway has a unique agency which aims to strengthen the use of ICT in public administration; the agency, known as the Agency for Public Management and eGovernment (Difi), generally aims to improve the efficiency of government administration. This agency provides consulting on digital administration to the ministries, departments, and local governments.

A. Local Governments

Norway's 19 administrative regions (counties) are further divided into 430 municipalities. Municipalities are the atomic unit of local government in Norway and are responsible for primary education (until 10th grade), outpatient health services, senior citizen services, unemployment and other social services, zoning, economic development, and municipal roads [22].

Local governments (municipalities) in Norway adopt varying degree of digital administration. Only half of Norway's municipalities and county municipalities have an ICT strategy that has been updated in the last two years; among those with a strategy, usage of ICT in schools is most commonly included; infrastructure and safety are also included by most municipalities [19].

Electronic customer case handling and communication:

Figure-4 shows that about 84% of the municipalities and 94% of the county municipalities use electronic case handling. On average, two out of three relevant cases are handled electronically in municipalities and county municipalities [16].
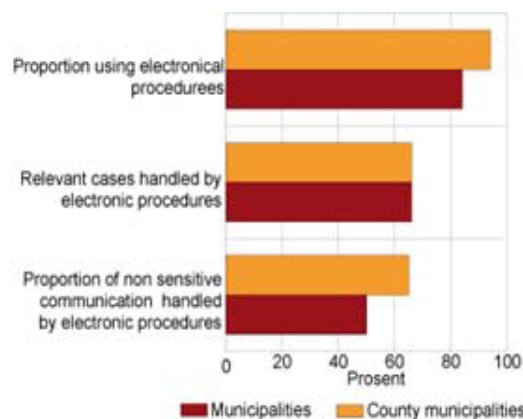

Figure 4.   Proportion of relevant customer cases handled electronically [16].

Electronic inter-municipality communication:

About 98% of the municipalities communicated electronically and on average about half of all non-sensitive communication is carried out electronically; see figure-4. All county municipalities have electronic communication and, on average, about 65% of all non-sensitive communication is carried out in this way [11].

B. *Public Administration*

In Norway, public administration is defined as enterprises within state and social administration, state business management, lenders of the state, state enterprises (wholly-owned by the state) and the Central Bank ('Norges Bank'). Slightly more than 600 enterprises were covered by this definition in 2008.

E-procurement:

About 40% of total purchases in public enterprises were done completely or partially by electronic business processes in 2008. Three out of four enterprises handle invoices electronically and use the national database for public purchasing, while three out of ten state that they use eInvoice. Also, about 72% of the enterprises in public administration state that they are responsible for purchasing products and services. For the rest, the purchasing is done by a superior public enterprise.

Electronic processing:

Almost two out of three public enterprises have forms intended for filling by companies or private individuals, and about 30% of these forms are available for electronic downloading filling and submission. The enterprises state that between 30% to 40% of the users make use of systems for the electronic submission.

V. DIGITAL INDUSTRIES

Digital industries are the industries that contribute to the making of the products or product groups like audio and video equipment, computers and related equipment, electronic components, telecommunication equipment and other ICT goods [13].

The following facts reveal the strength of ICT sector on Norwegian economy:

- The information sector had 112 000 employees in 2007 [15]. Given that the total number of employees in Norway is approximately 2 300 000, this ICT sector provided 4.8% employment [8].
- In 2008, ICT exports rose by 18 per cent, amounting to NOK 18 billion [17]; Norway exported an estimated NOK $840 billion worth of goods in 2007 [20]; thus ICT exports amounted to about 2.1% of the total exports.
- In 2008, Norway's ICT imports remained at NOK 39.2 billion, which is about 8.5% of the total imports [17][20].

VI. VI. CONCLUSION

From the analysis stated in the previous section, it can be concluded that:

- *People ("Digital citizens"):* Norwegians has access to, and even distribution of, ICT hardware, software, and services. However, there is considerable digital divide due based on household income and geographical location. Nevertheless, gender based (and other discriminatory issues like race, ethnicity) does not exist.
- *Infrastructure and public administration ("Digital administration"):* High use ICT based services and electronic processing is available. Though secure ICT hardware and software is prevalent, there is considerable mistrust exist on using electronic formats when sensitive materials are communicated.
- *ICT industries ("Digital industry"):* The ratio of employment is low (about 10%), in the ICT sector and services sphere where ICT is dominant. Approximate ratio of ICT on Norwegian exports and imports is also low, 2.1% and 8.5% respectively.

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