# The Digital Divide at the Dawn of the 21st Century: Early Definition and Analysis

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**Abstract:** *This paper, part of my MPhil research, introduces, defines and presents the theoretical background to the term digital divide drawing on literature and sources available at the early years of 2000. It draws on 3 analytical tools for relevant policy-making that addresses the digital divide: e-economy, e-education and e-government. The paper concludes with a brief synopsis of EU's early 2000 political response to the challenge presented by the digital divide that follows exactly this three-fold approach.*

**Keywords:** digital divide, information society, ICTs, EU

## 1. Introduction

This paper introduces, defines and explores the theoretical background to the term ' digital divide' by drawing upon a vast and expanding literature available at the beginning of the 21st century. It presents theoretical models that claim to explain the nature of the digital divide. Finally it presents a three-fold analytical framework in order to define and to review how to address the digital divide issue: e-economy, e-education and e-government as also applied in early EU's relevant policy-making. The period under study is that of circa 1990s to 2004 while field research took place from 2003 to early 2005. The methodology for this paper is based on qualitative and/or secondary research.

## 2. Digital Divide: Definitions and Theoretical Background

Since the late nineties the arrival of the era of ICT (Information & Communication Technology) had been announced and analysed in all its complexities. But this new global economy and society premised on the convergence of Information Technology, Telecommunications and Networking was in many ways foreseen by Marx and Engels in 1848[1]. In our so-called era of 'C2 I2' (command, control, communications, computing and information-intelligence)[2], the social implications of this transformation have been a controversial subject for academics. There are parts of the Earth's population that enjoy the full advantages of digitisation and there are whole societies that seem to sit 'below the salt' at this global table. This inequality of access and resources has been described as 'the digital divide'. The actual origins of the term are uncertain. Some attribute it to Al Gore and the Clinton Administration in 1995-1996, others believe it is an invention of the US mass media. In any case, the origins do appear to be American[3].

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[1] In the Communist Manifesto they argue 'that the union of the workers...is helped on by the improved means of communication that are created by modern industry and that place the workers of different localities in contact with one another...'. In Forestier et al. 2002

[2] Dutton 1984 in Finnegan et al 1987.

[3] An interesting discussion on the matter is hosted at the digital divide news group of the Benton Foundation.

There are as many definitions for it as there are divides. Drawing on some of the myriad definitions used to denote the phenomenon, a comprehensive and all encompassing definition is offered by Gourova, who prepared a report for the Digital Opportunity Initiative on behalf of Joint Research Centre of the European Commission:

> ...the 'Digital Divide' is defined as the gap between nations which can and cannot afford the technology, between the businesses and consumers enjoying the advantages of the Information age and those still awaiting its benefits, as the divide which separates the haves from the have-nots in the sphere of information, or as the exclusion of those who are poor, illiterate, rural or non-English speaking. (Gourova et al., 2001,p.8)

Manuel Castells (2001) simply defines it as the 'inequality of access to the Internet', while Pippa Norris identifies three types of divide: the global, the social and the democratic.

> The global refers to the divergence of Internet access between industrialized and developing societies. The social is the gap between information rich and poor in each nation and, lastly, democratic is the difference between those who do and do not use the panoply of digital resources to engage, mobilize and participate in public life.(Norris 2001 p.4)

This paper adopts Castell's definition and argues that the digital divide shouldn't be studied in a historical vacuum. The digital divide theoretically is an evolution of the theory of the 'knowledge gap' developed by Tichenor and Donohue that claims the following:

> As the infusion of mass media information into a social system increases, segments of the population with higher socioeconomic status tend to acquire this information at a faster rate than the lower status segments, so that the gap in knowledge between these segments tends to increase rather than decrease. (Tichenor et al. 1970, pp.159 -160)

It is also closely related to the theory of 'communication potential', developed in the middle 1970s by a Swedish

research group (Nowak et al)[4] and it has much in common with the 'Matthew Effect' theory (R. Merton, 1973)[5]. An interesting review and analysis of the above is included in Bonfadelli's work (2002) that analyses the background of the knowledge gap and how it affects online communication with reference to the Swiss digital divide.

## 3. The Determinants of the Digital Divide

The Internet doubled in size in 1994 and has done so every year since 1998 - it is the fastest growing communications medium ever. Even taking into account the increased population of the world, even in the 1990s the growth in actual numbers of users was impressive. In comparison to previous technologies, the telephone took close to 75 years to reach 50 million users world-wide, the TV took 13 years but it took only 4 years for the Internet to reach the same number (Norris, 2001).

But what determinants are crucial to Internet usage? The literature on the subject seems to concur although the description may slightly vary.

Warschauer identifies four types of resources engaged in ICT access: 'the physical (access to PC and telecom connections), the digital (digital material available online), the human (literacy and education) and the social (community, institutional and social structures that support access to ICT)' (Warschauer 2003,p.47). He also refers to Dimaggio's (2001) and Hargittai's (1999,2002) sociological analysis of the Internet which reveals the following determinants: the technical means (inequality of bandwidth), autonomy (whether they surf at home/work, monitored or not, limited times or at will), skill (knowledge of how to navigate, technically 'savvy' users), social support (access to advice from more experienced users), purpose (why they use the Internet).

A similar approach can be found in the Bridges.org report (2001). The above theoretical propositions found ground in A. Wilhelm's (1994) study in the USA, which proved that income, education, race and ethnicity but also gender were the chief factors of stratification. This was also the conclusion of Hoffman and Novak's study (1999) on computer ownership and Internet use also in the USA.

A 2000 OECD report lists the categories of the population where lack of ICT access is most evident.
a) Those with special needs or physical ability

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[4]Their approach, argued that there were various personal characteristics and elements that offered the possibility to transmit and receive information. Theseelementsaregrouped in 3 categories:
a) those relative to individual and personal characteristics
b) those that depend on the social role/status of the person
c) those relative to the social structure where the person is inserted.
Thus, the form and applicability of the communication potential depend on the above characteristics. (McQuail&Windahl S.,1993 p126).
[5] According to this theory, 'mass media reinforce knowledge gaps already existing and thus the same would happen with the advent of IT (Information Technology)' In McQuail&Windahl S., 1993.

b) The socially and economicallyunderprivileged
c) Linguistic and ethnicminorities
d) The geographicallyisolated
e) The oldercitizens
f) The technologically alienated or apathetic (Oecd, 2000, p.53)

As Norris discussion notes, geographically, digital inequality spreads as follows:

At the forefront, on the global scale, are:
a) Smaller Nordic social democratic welfare states (Sweden, Finland, Norway, Iceland)
b) Larger Anglo-American and English-speaking nations (the UK, the USA, Canada , Australia)
c) Asian tiger economies (Singapore, South Korea, Taiwan, Japan)
d) Several smaller European nations (the Netherlands, Belgium, Switzerland, Slovenia and Estonia)

Lagging behind are the poor countries of Sub-Saharan Africa (except for South Africa), the Middle East, States in Central Europe, Asia, and Latin America. (Norris, 2001, pp.45-47)

## 4. Models

Drawing on just a selection of the voluminous literature that has been generated by the issue of the digital divide, it is apparent upon closer examination that there are several models that attempt to offer an explanatory basis for the digital inequality. These models derive from the earlier model of mass media development, noted by Papathanassopoulos (2004). This author suggests that three factors account for the development of the mass media in a given society: cultural and demographic characteristics, geographical factors, and the politico-economic system.

More specifically, the first factor refers to the size of the population, urbanism, the languages spoken, education and living standards. For example the Netherlands that have a highly literate population, have consequently a high Press circulation. The second suggests the size and physiology of a country that can act as natural obstacles to communication. Norway could set the example of a mountainous country that has seen a reduction in Press circulation in Oslo but a growth of the regional Press. The third factor refers to the economic system within which mass media operate and the political structure and form that exist in a given society; this is based on the argument that control on media is determined by the nature of the governing authority, and laws and regulations under which media operate are determined by the political forces (Papathanassopoulos, 2004,p.27-30).

If we turn to models of the digital divide: the first model of economic- industrial development argues that prosperity expressed in terms of economic indicators such as GDP growth, income per capita, infrastructure and other economic quantitative data account for and result in the dichotomy between the information 'rich' and 'poor'. According to this approach, the digital divide is merely

another aspect of issues surrounding development and the study of the income gap between rich and poor nations, developed and underdeveloped countries[6]. Research has shown that income per capita is correlated with telephone and Internet access and also that telecommunications growth spur market growth (Forestier 2002). Norris (2001) deployed regression analysis to show that the relationship between Internet usage and economic development, measured by per capita GNP in 1997, was strong and significant. Also, Youngsoo Lee's et al. (2002) study demonstrates the cumulative relationship between IT investment and economic growth and examines whether this has deepened the differences in economic growth among OECD countries.

Another method is the investigation of socio-cultural factors, theoretically linked with social constructivism and social determinism[7]. Such a stance would suggest that a culture of innovation found in the Nordic counties would account for the high digitalisation of the Scandinavian countries, while Mediterranean societies, that are assumed to be more conservative and techno-phobic, present lower take-up levels of Internet take-up. Thus this model might explain to some extent Estonia's excellent performance in the IS field, regardless of its level of economic development. Or it might explain the lateness of French adoption of the Internet on the persistence of French industrial nationalism embodied in Minitel, part of their NII (National Information Infrastructure) project. An optimistic ethnographic view is presented by Miller and Slater (2000) whose case study in Trinidad concludes that access and use of the Internet is much more widespread than might have been expected in this small developing rural country.

> These examples also echo the models insisting on the 'social determination of technology', which argues that
> what matters is not technology itself but the social and economic system in which it is embedded...this view provides an antidote to naive technological determinism- the idea that technology develops as the sole result of an internal dynamic and then, unmediated by any other influence, moulds society to fit its patterns (Winner, 1986, p.13).

Another sociological approach emphasizes aspects of social exclusion, correlating the digital divide to pre-existing social inequalities (Burchard et al 1999, Hills 1997, Selwyn 2002, Silverstone and Haddon 1997,8). Feminist accounts highlight approaches, which are critical of the way that new communication technologies are gendered and argue that they constitute a male domain (Shade 2002, Wajcman 1991, Turkle 1984). This theoretical basis is critical of optimistic

approaches, which see ICTs as tools of social integration[8]. And highlights the debate (Berghman 1995) between so-called 'techno- utopians' and 'techno- dystopians'[9].

Finally there is a school of thought, which argues that the digital divide is caused by politics. This model contests the autonomy of technology[10](Ellul 1964, Marcuse 1968) or technological determinism[11](Freeman 1987, de Pool 1990, Bell 1973). This model emphasizes political choice and argues that politics determine the use of technology rather than vice-versa (Winner 1986, Rosenberg 1981) and that technological progress is chiefly a political phenomenon (Goldhaber 1986).

The ways the state is involved in shaping technology are discussed by Street (1992). He argues that firstly it can be a regulator as in the case of the radio and mass media communication where regulation, when technology is publicly owned, establishes management structures and codes of practice; in the private sector it deals with the establishment of property rights that legitimate control. Street highlights the example of the commercial American model against the British public service ethos. Secondly, the state can be regarded as a customer: the government makes use of the available technology to achieve a better public administration for instance. Thirdly, the state is a potential underwriter in that it offers funding and resources and subsidizes the development of technology, for instance, with R&D.

The importance of policies is stressed in Hargittai's (1999) work, which shows that Finland was the most wired nation in the world in 1998-9 although it had almost the same per capita GDP as France or Italy. Goldberg, Prosser and Verhulst (1998) follow a similar approach where they stress the decisive impact of national regulations. From a broader perspective, cross-national studies have shown that policy formation differs among countries even when faced by similar environments or changes and that these dissimilar policies lead to different outcomes between nations. One of the most prominent explanatory approaches followed by theorists is the paradigm of 'national institutionalism'. It suggests that in order to analyse the features of a country's policy making, scholars have to turn to the national institutions that provide the structure or organizational framework within which a state's policy makers take decisions (Thatcher 1999).

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[6]Mohammadi (1997)notes that research has shown that developing countries with 71% of the global population possess only 17% of the global GNP and a mere 7% of the existing stock of telecommunications resources that are crucial for access to computer-based global markets and banking

[7] These theories suggested that society shaped technology rather than vice-versa.

[8] The four-fold model of systems according to Berghman (1995) is: a)democratic and legal, b)labour market, c)welfare state, d) family and community

[9] There is a significant number of typologies for various 'social types' and their view on Information Society technologies (Webster 2002, Tehranians 1991, May 2002, Norris 2001).

[10] The model sustains that technology acquires an independent momentum that not only puts it beyond human control but allows it to order all human activity.

[11]According to which technology sets the condition for the operation of the political system, including the political agenda even if it does not determine policy output.

## 5. Analytical Tools and Methodology

Upon review of relevant policy-making in the EU and its member states in the early years of 2000,we could suggest a threefold analytical model: e-economy, e-education and e-government;policy and decision-making for these three components address the issue of bridging the digital divide. A short literature review and an operationalisation of these tools of analysis would be appropriate at this point.

The first term reflects the theorists of post-industrial and/or post-modern society of the second half of the twentieth century, who saw a new form of capitalism based on information and knowledge rather than raw physical labour and commodity production (Bell 1973,Hearm, Mandeville&Anthony, 1998). This approach appears also in Webster's (2002) typology of the various approaches to the Information Society12. Theorists have been accredited various characteristics at this new economy. It is considered a 'gift' economy (May 2002) where everything can be obtained free from the Internet (free software as in the Linux case), a sort of cyber-communism13 or just a bazaar14. In turn the reality and future potential of the information economy has attracted its neo-Marxist critics (Schiller 1996, Lyon 1988).

In sum, knowledge technology, it is now widely argued, has become the third factor of production in the global economy and further, Information and Communication Technologies (ICTs) can now be found in all sectors of the economy. A definition of some terms that will be used through out this dissertation is necessary at this point.

The term e-economy is used to describe the financial and economic transactions made electronically between companies and consumers but also within businesses (departments, branches etc). In turn, e-commerce refers to external transactions in goods and services, to put it more simply, buying and selling online. ICT facilitate services to consumers (B2C) and collaboration with other businesses (B2B) and governments (B2G). But also Small and Medium Enterprises (SMEs) have shared the benefits that ICT bring through the collapse of the barrier of distance.

Some of the indicators that could be used to describe the state of the e-economy in a given society are e-commerce ratings, investment in ICT, ICT[15] growth and employment in the sector, infrastructure and R&D, e-business growth and levels of e-procurement, Internet costs, ISP (Internet Service Providers). Through the deployment of new ICTs, the labour market has been changed. There is now a consensus found in political and academic circles for the need of a skilled and e-educated work force (STOA 2001, OECD 1996, 2000, EC 2000). In turn it has been noted that the older distinction between blue and white-collar workers has been replaced by new typologies inspired by the e-economy (Reich 1991).[16]

E-education (the second analytical tool used in this dissertation) is the public policy, which tackles the lack of an e-skilled work force. Thus e-Education refers to the dissemination of education and literacy in terms of ICT training, diffusion of IT in academic establishments, web content production, higher degrees in IT, online forms of education like online education or tele-education etc. In primary and secondary education ICT has a twofold function: it is used as a tool for other subjects or it is included in the curriculum as a subject per se. In higher education, higher degrees in IT demonstrate a country's e-readiness and provide 'info-savvy' human resources.

E-government is the third analytical term used in this paperin order to fight digital inequalities. Every technological invention throughout history that improved communication between citizens and political authorities brought up changes in the democratic practices. The invention of typography in the 16th century spurred socio-religious movements against the Vatican and invoked political changes. In the mid 19th century the invention of the railway and the post improved the interaction between voters and politicians. And in the in the 20th century the new mass media the popular press, radio and television formulated a new framework for the practice of democracy (Coleman 2003). The Internet has been a new tool of communication that affects democracy and the implementation of governmental services once again and redefines political notions.

Since the 1990s the term e-government had been invoked by academics, and politicians as a mode to improve the efficiency, effectiveness, transparency and accountability of government. It implies harnessing ICTs to achieve better government, enhancing democratic procedures with the information and interactive potential that the Internet has, facilitating citizens and welfare services of the state. Thus, communication is channeled in various ways: G2C (Government to Citizen), C2G (Citizen 2 Government), G2B and B2G, G2G that is either inter-intra governmental agency communication or communication between levels of government (regional, federal etc.). Moreover, electronic democracy (e-democracy) is a broader term relating to e-government, that refers to the processes and structures that encompass all forms of electronic communication between

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[12] The different views were classified by Frank Webster into the following categories: a)the technological (identifying new technologies as indicators of new times), b)the economic (stressing the growth in the economic value of informational activities), c)the occupational (identifying a society where the majority of occupations are information-related), d)the spatial (according to which information networks connect locations and affect organisations of time and space), e)the cultural (citing an increase of information in social circulation).

[13]Barbrook, cited in May 2002.

[14] Raymond, cited in May 2002.

[15]ICTs are grouped in three categories: Information Technologies (PC, software, hardware), Telecommunications Technology (telephone, radio, television) and Networking Technology (Internet, mobile telephones, cable, satellite, broadband connectivity).

[16] In the new economy claims Reich (1991) the principal division is no longer between white and blue collar workers but among 3 categories: a)Routine production workers-data processors, payroll clerks, factory workers b)In-person service workers-janitors, hospital attendants, taxi drivers c)Symbolic analysts- software engineers, management consultants, strategic planners.

government and citizen. The biggest challenge that this term suggests is electronic voting that has been used in some countries but is still at its initial stages (Coleman 2003).

The terms E-government and E-democracy are associated with a vast and controversial field about the threats and promises of the new technology on democracy and the state (Elshtain 1982; Barber 1984; Walzer 1985; Roszak 1986; Winner 1986; Arterton 1987; Sartori 1989). Some theorists have examined the effect of the Internet on craft of politics (Bentivegna 1998; Ward &Gibson 1998; 1999, Margolis, Resnick and Wolfe 1999). Others have been skeptical of its independent effects: the effect of the Internet on governance is dependent on the pre-existing practices of the state (Rose 2001). There have also been concerns raised about the so-called ICT gatekeepers and how access to the new medium affects the practice of democracy (Alexander & Paul, 1998, Touraine[17] 1998, Servon 2000). And related to this is the fear that a lack of access will handicap political participation (Compaine 2001).

We will conclude this paper with a brief mention of EU's early 2000 political response to the challenge presented by the digital divide that follows exactly  this three-fold model of analysis: e-economy, education and e-government.

## 6. Early EU Policy-Making for the Digital Divide

First of all, 'ICT and Internet policies overlap with other fields such as media policies, telecommunication policies, industrial policies and technology policies' (Mansell, 1998,p.231). Therefore, the dividing lines between the above sectors are blurred.

More specifically, technology policy tries to boost economy by promoting innovation. Industrial policy deals with growth and employment and tries to foster the emergence of new industries in order to secure future growth; telecommunication policy seeks to provide communication services and media policy draws the framework for the development of the audio-visual sector.

There is a causal link between all these areas of policy-making directly resulting from technological convergence and there are different ways of regulating these sectors tailored for different social contexts.

The relevant literature for the EU's political stance in this field is vast (Thatcher 1999, Levy 1999, Hulsink 1999) but the prominent issues that have generated debate among academic and political circles are technological convergence, deregulation and liberalization of the telecommunications services.

Historically, state monopolies were central to the media and communication policy field but after the 1980s, liberalization and competition policies spurred privatisation and deregulation and created international markets so that new typologies for the comparison of regulation were

needed. That led to the creation of what has been generally referred to as "dual environments" in Western Europe where public service and international commercial channels co-exist at the Internet regulation field.

In the EU, contrasting voices have led, according to Venturelli (1997), to a threefolddominant regulatory model that shaped the information sector:[18]

a) The  liberal model that supports privatisation, deregulation, competition
b) The public service model where law and policy making guarantee the priority of the citizen over the market player
c) The nationalist/cultural model that stresses the defence of the national culture over private players or technological infrastructure

External factors such as American initiatives and internal ones such as awareness of the digital gap among member states spurred DGXIII and the Economic and Social Committee to promote initiatives that sought to stimulate digital development and growth. The key strategy has been laid down in the e-Europe Action Plan 2000 that had the following key objectives:

- To bring every citizen, home and school, every business and every administration into the digital age and online;
- To create a digitally literate Europe, supported by an entrepreneurial culture ready to finance and develop new ideas;
- To ensure that the whole process is socially inclusive, builds consumer trust and strengthens social cohesion. [19]

It is apparent that the e-Europe objectives echoed Lisbon's goal to make the EU a competitive and dynamic knowledge-based economy by 2010. To achieve that, the EU divided IS policy into various sectors necessary for the promotion of a sustainable Information Society.

Boosting e-business especially among European SMEs (Small and Medium Enterprises)20 that represent the vast majority of all enterprises in Europe, was a policy priority. But also significant efforts were made to tackle the difficulties that e-economy gives rise to, such as safety and consumer protection issues, issues surrounding competition and interoperability between European enterprises. It has been noted that economic and technological issues were given primacy of purpose in the early 1990s, evident in the Bangemann report (1994), focusing on the potential economic benefits of privatization, commercialization and liberalization while ignoring social policy (Iosifidis 2003). Job creation became the focus of the Convergence Green Paper (1997).

The second focus of the policy proposed in the  Action Plan was that of digital literacy or e-education. This remained a policy priority in the e-Europe 2005 Action Plan where the EU promoted ICT application in education, ICT training,

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[17] In Kahin&Nesson 1998.

[18] In Kahin& Wilson , 1997.
[19]From <http://europa.eu.int/information_society>.
[20] Companies that employ less than 250 employees and are independent from all other organisations.

lifelong learning and set common objectives of education and training systems among member states with the e-Learning project and various other initiatives.

Moreover, a policy target noted above and more explicitly developed in the e-Europe 2005 objectives, was that of e-Government, in other words, more efficient and effective public services through the implementation of ICT in public administration. The EU has taken up various initiatives in this sector some of which are the provision of a good practices framework that benchmarks countries' relative initiatives, the facilitation of data interchange between public administrations and the subsidization of research.

It is worthwhile noting that the literature on European case-studies was expanding at the time. I will select some of the more interesting examples. Selwyn and Gorard's (2002) study of Wales demonstrates how a small country faced the challenges of digital divide successfully. Puay Tang's (1998) study and Dutton, N Garnham, R Mansel's et al research paper (1994) are focused on UK's policy towards the Information society. B. Kahin and EJ Wilson (1997) take a broader view showing how the vision of the NII (National Information Infrastructure) is implemented in European and extra-European countries. A similar trajectory is followed by Goldberg, Prosser and Verhulst (1998).

A cross-national overview of ICT education policy studies can be found in the 2000 OECD report *Learning to Bridge the Digital Divide* where several national approaches such as the Swedish, the British, the Portuguese, the Finnish, the Japanese and the American are described. A similar study was conducted by UNIDO (1998) analysing National Information policies within an international and also European perspective. A Council of Europe publication (2001) examines public access to new Information and Communication Technology (ICT) and three reasons for the level of digitisation. A 2003 OECD study narrows its focus to national case studies of e-government policy, setting out the guiding principles for successful e-government (2003). Also another interesting comparative study is *Charting and Bridging Digital Divides* (2003).

## 7. Conclusions

The field of the Information Society is so broad that offers vast possibilities for academic research in all sectors of everyday life. At the time of research for this paper there was a significant necessity of further academic research in all three thematic policy sectors of this study: e-economy, e-education and e-government. One of the limitations of this paper is chronological. The field study for this research took place between mid 2003 and early 2005 thus it can only present a snapshot of literature and sources existing at the time. A time when digital divide and Information Society notions were relatively new, research material was scarce and the need for relevant policy-making tackling digital inequalities was just starting to immerge.

Then of course, by its very nature, studying the Information Society is like studying a moving target: the rapid rate of growth in the Internet and its associated technologies makes it very difficult to present a focused picture that stays accurate over the time.

This paper aimed to give a review of the sources and literature that existed at the early years of 2000 regarding the digital divide, its definition and analysis, its components and theories. It suggested the use of three broader sectors of analysis that could be used for policy-making addressing the digital inequalities, that of e-economy, e-education and e-government and shortly referred to EU's early 2000 political orientation towards these three directions.

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