

# Digital Divide and the ICT Paradigm Generally and in Estonia

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## TECHNO-ECONOMIC PARADIGMS

A multitude of writings have appeared since the 1970s describing how societies have undergone “information revolutions” (Bell, 1973; Castells, 1998; Masuda, 1981), “the third wave” (Toffler, 1980), etc. Indeed, ICT development has been explosive in both developed and developing countries since the 1990s. This, in turn, has given some countries an opportunity for bigger economic growth; attempts have been made in a majority of countries to rearrange the organization of the public sector, and individuals have experienced a rise in the quality of life due to the introduction of new technologies.

Yet, there is a growing understanding that similar “revolutions” have happened before in human history. According to the widely accepted theory of techno-economic paradigms, similarly to scientific paradigms (Kuhn, 1962), there are also technological paradigms that determine the technological problems, scientific principles, and material technologies to be used as well as the whole socioeconomic reality (Perez, 2002, Perez, 1985). These techno-economic paradigms have occurred in waves or cycles, named after the Russian economist Kondratjev who discovered them. This has been developed further by Schumpeter (1939), Freeman (Freeman & Louçã, 2001), and, in particular, by Carlota Perez (2002), and has become to be known as the Schumpeter–Perez–Freeman thesis.

From previous paradigms, we know that, for example, cotton, coal and iron, steel, oil, and plastic have been in the center of technological innovations of all-embracing influence in the production sphere. Once a dominant pattern, a new common sense, is established, there is a period of broad stability, in which the innovation process conforms to a common set of criteria, and the design of technological artifacts changes in an incremental, evolutionary manner. In order to bring along a techno-economic paradigm change, the radical innovations together with incremental innovations give rise to new technology systems, fueled by the financial sector, and affecting the entire economy. Although the former technology is physically as productive as before, its relative attractiveness is seriously diminished, because industries that carry the new paradigm show greater profit potential. The financial effect of these paradigm changes is that it is simply not

lucrative anymore to invest in “old economy” fields, which means that capital is siphoned out of them, even if they were still productive “as such.” All these industries, however, end up being modernized by the new paradigm, through the introduction of the generic technologies (as ICT now) and the new organizational models, which offer superior productivity across the economy. The social effect of all these change processes includes the creation of a demand for new structures in labor and education, and the dismantling of the old ones, as well as changes in key social and cultural patterns of life (e.g., urbanization, mobility, networks). This also challenges the basis of the political sphere, in that changed participatory structures transform the political cohesion of a community.

In this context, there is a reason to view ICT as a technology leading the techno-economic paradigm of the whole world. What should also be mentioned about this wave is that even those who have disputed the revolutionary character of earlier waves of technical change often have little difficulty in accepting that a vast technological revolution is now taking place, based on the electronic computer, software, microelectronics, the Internet, and mobile telephones (Freeman & Louçã, 2001, p. 301). Starting with the technological revolution, followed by the financial bubble and collapse, we are currently midway into the ICT wave, entering the “Golden Age” and probably with 20 or 30 years of deployment ahead (Perez, 2002).

## DIGITAL DIVIDE

The changes in and development of the new techno-economic paradigm, thus have both winners and losers. Namely, some countries, population groups, and persons adapt to changes more easily, and others are more passive or even work against the changes. That is why the main function of the state is to analyze the challenges brought about by the techno-economic paradigm and to change and reform the existing policy measures and institutions accordingly so as to again involve those who have become the losers in the economic development and social life. Although the primary goal is to ensure the emergence of new (ICT-based) branches of industry and the upgrading of existing industries (particularly by employing inno-

vative activities and by supportive industrial and technology policies) and related employment patterns, the risks involved in the paradigm change should not be underestimated.

The term “digital divide” refers to one of the dangers brought about by the emergence of the ICT paradigm and is understood as the gap between individuals, households, businesses, and geographic areas at different socioeconomic levels with regard both to their opportunities to access information and communication technologies and to their use of the Internet. The digital divide reflects various differences among and within countries (OECD, 2001, p. 5). In the context of the ICT paradigm, it refers to a situation where part of the population (or countries) is being or about to be excluded, because of an existing or emerging digital divide, from further economic and social development and well-being that is brought about by ICTs.

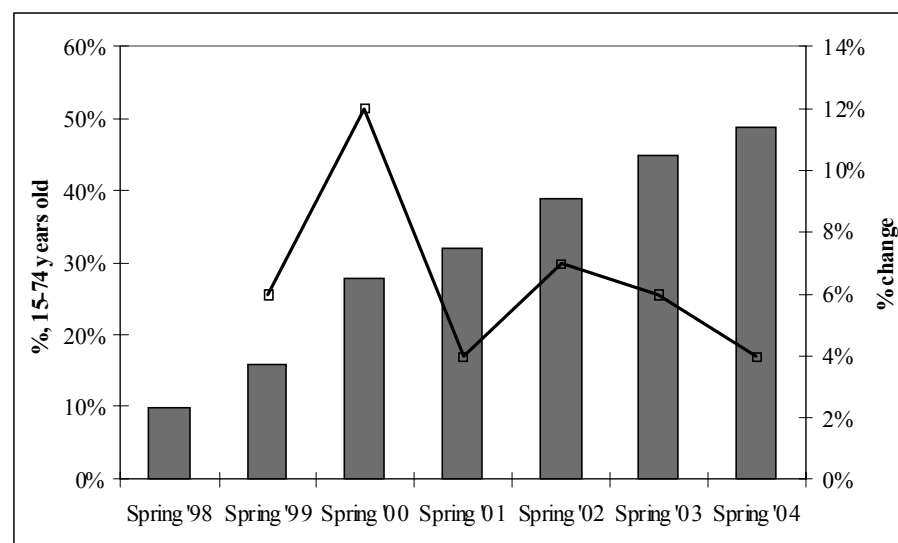
Hence, the digital divide is a complicated question by its nature, as it involves economic (why and how existing ways of business change), social (e.g., user motivation), and other issues. Thus, in order to fully deploy the enormous wealth-creating potential brought about by the ICT paradigm, governments are obliged to change, reform, and readjust institutions and the environment (legislation, the educational and taxation systems, etc.), and to demonstrate innovation in policy making. This is the government’s responsibility, as it is only the state/government that can do it, and only the government has the necessary legitimacy. Doing nothing can lead only to retardation of economic and social development.

## DIGITAL DIVIDE IN ESTONIA

Estonia is one of the smallest European Union member states (member since May 2004) with a population of 1.4 million. The regaining of Estonia’s political and economic independence from the Soviet Union took place in August 1991. Since then, various international reports on information society development have given Estonia credit for a good ICT infrastructure and a decent online environment. Indeed, Estonia has succeeded in building up modern telecommunications infrastructures, computerizing the secondary education sector, making progress with the regulatory environment, and setting up several large-scale programs initiated by the government, nongovernmental organizations (NGOs), and the private sector. An example of the supportive environment is the fact that as of spring 2004, Estonia was the only country in the European Union with an e-voting law for national elections actually in place and technological solutions in development.

Surveys from 2004 indicate that 49% of the Estonian inhabitants between 15 and 74 are using the Internet. Compared to 2003, an additional 4% of the Estonian population of that age group has become Internet users. In Estonia, where rapid changes have taken place in all fields, the issue of the digital divide has not received much attention, although several empirical surveys indicate that the problem does exist in the country: namely, since the year 2001, the previous years’ impressively steep

Figure 1. Growth of Internet users in Estonia



Source: TNS Emor, e-Track, 1998-2004.

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