

SCIENCE AND TECHNOLOGY DEVELOPMENT INFORMATION AND KNOWLEDGE

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Summary

Recent technological changes modify the process by which knowledge or information spreads through the economy. Economic, social and environmental opportunities need to be exploited while giving rise to some profound changes and important challenges. Codification and diffusion of knowledge is a path dependent process allowing a new mode of delivering technological learning by increasing interaction between the producers and users of knowledge. A knowledge-intensive business services industry seems to emerge as the key industry of the new knowledge-based economy with important effects on the rest of the economic system. At a microeconomic level, a market for knowledge emerges that might be reorganized. At a macroeconomic level, the organization of the society must be treated as a variable that might be addressed on all political levels.

1. Introduction

The world's advanced industrial economies have been experiencing fundamental structural change over the last two decades of the twentieth century. Events, such as oil price shocks and major recessions, have contributed greatly to this phenomena, as have institutional changes, such as the increasing liberalization of world trade and capital markets, the rapid diffusion of technology and the major shift in the locus of economic activity from goods to services.

Development has been understood, since the Second World War, to involve economic growth, increases in per capita income, and attainment of a standard of living equivalent to that of the industrialized countries. It is much more widely recognized today that knowledge and human capital are crucial to all aspects of the development process. In this article, development, and scientific and technological progress are taken to mean the processes that lead to “an evolution of shared perceptions of what humanity is and should be and of devising the means of advancing both individually and collectively towards putting those values in practice.”

Various authors have emphasized the shift to knowledge-based growth, characterized by falling costs and rising efficiency in the transmission, retrieval and analysis of information. The most distinguishing feature of this knowledge-based economy is the pervasive presence of knowledge as both an input and an output throughout the economy. In this new economy, the ability to create wealth is increasingly dependent on the effective management of knowledge, that is, the organizational capability to create, acquire, accumulate and exploit information and knowledge. Rapid integration of Information and Communication Technologies (NICT) into professional and private lives, are transforming our society into an Information Society built on technology, knowledge, and intelligence. As its basis, it facilitates fast, cheap, equitable, resource-efficient access to information and information services, accumulated knowledge, learning opportunities, and co-operation support tools for its citizens.

Recent developments in the fields of communications and information technology are indeed revolutionary in nature. Information and knowledge are expanding in quantity and accessibility. In many fields, future decision-makers will be presented with unprecedented new tools for development. In such fields as agriculture, health, education, human resources and environmental management, or business development, the consequences really could be revolutionary.

As information becomes accessible, without any significant spatial or temporal constraints to anyone, it will increasingly become a basic economic resource and a structuring factor for our society. Given the world's population size, existing technologies, current expectations, and established political framework, the embodiment of NICT in a global Information Society could make a significant contribution to the development of sustainability.

According to OECD, while the transition to a knowledge-based economy holds the prospect of improved economic performance, it also brings adjustment challenges with implication for firms, individuals and governments (see, for example, demonstrations put in the White Book of the European Commission, the *Bangemann Report*).

In the context of industrial policy for example, today's global economy is increasingly shaped by market forces rather than government intervention. A new industrial policy paradigm is emerging: the focus is shifting from subsidizing market failures to facilitating innovation and the creation of knowledge. The empirical evidence has demonstrated Canadian industrial structure evolving towards a knowledge-based economy characterized by increasing using of knowledge, technology and skills.

The key issues of concern to policy makers and international organizations are the extent to which this major transformation has benefited all aspects of society and the ways and means of achieving a truly global information structure. Although the costs of using NICT to build national information infrastructures, which can contribute to innovative knowledge societies are high, the costs of not doing so are likely to be much higher. Promoting the Information Society as a stand-alone solution will probably not succeed in achieving sustainable development: under market frameworks that are not adequately in tune with social and environmental externalities, any dematerialization achieved could be overcompensated by an increase in consumption-related activities (rebound effect). Three fields of interest have interaction areas in common: information society, knowledge-based economy and sustainable development.

Decision-makers are invited to consider the implications of alternative knowledge societies and to take action to devise strategies to ensure that the benefits of NICT are broadly available and that the risks of social and economic exclusion are avoided or minimized.

Ensuring conditions of access to information infrastructures is only one, albeit important, part of the challenge of building innovative knowledge societies. Knowledge principally resides in people rather than in NICT. The learning process represents the first step of scientific and technical capacity building that is consistent with development goals. The benefits are closely associated with establishing equitable policy and regulatory frameworks and with ensuring that understanding, sharing and partnership-building are central components of national NICT strategies. Alliances and partnerships among stakeholders in developing countries and with organizations in the industrialized countries today need to recognize the importance of building social and technological capabilities among users. In such an assessment, the Information Society and Sustainable Development will be compatible concepts, if NICT and related infrastructural issues are embedded in new political and socioeconomic frameworks. It is worth noting, that such interactions are not static, but are likely to be very dynamic and to vary with the further development of technology, social and organizational structures.

This article is thus articulated around the following demonstration: the integration of knowledge from diverse sources, especially from environmental fields, could affect the policy-making process in two ways. Section 1 will describe the decomposition process of a knowledge-based economy. Section 2 will propose a deliberative procedure to ensure the implementation of successful NICT strategies.

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Biographical Sketch

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