

info

ISSN 1463-6697

The following article was published in **info** Vol 2, No 6, December 2000

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phases in the rise of the information society Aharon Kellerman

The rise of the information society during the last four decades has implicitly been portrayed as a single phased process. This article proposes three phases in the emergence of information society. Its roots are identified as the previously dominant industrial society, the capitalist system, the Cold War, and the emerging view of culture as information. The three phases of the information society are identified as information-rich society (1960s–1970s), information-based society (1980s–1990s), and information-dominated society (1990s–2000s). Each of these phases is characterized by specific processes.

The term 'information society' has been increasingly in use since the early 1980s, though earlier terms such as the 'age of information' date back to the early 1970s. These and other terms have emerged in the context of attempts to coin societal transformations since the early 1950s. Beniger¹ counted 75 such terms proposed between 1950 and 1984, almost all of which have not been adopted for the naming of our current age.

Definitions for the information society highlight two of its major facets, namely the economic and the cultural. At the economic end, the European Commission has said that 'in an information society, information is the most important commodity',² and Masuda that [culturally it is] 'a society that brings about a general flourishing state of human intellectual creativity, instead of affluent material consumption'.³ Castells related these two facets by claiming that the information society 'is based on the historical tension between the material power

of abstract information processing and society's search for meaningful cultural identity'.⁴

The information society consists of two major processes: production and consumption. These do not have to develop to high levels in all aspects. At the production end, several things may be produced. One major production process may be the innovation and wide-scale production of the hardware of information society, such as computers and telecommunications devices and equipment. Another major production process may be computer software, and a third one may be information itself, notably electronic, such as Internet sites, television programmes and movies.

High levels of consumption of information may too be expressed in both hardware, software and information *per se*. The wide adoption of telecommunications and information devices such as PCs, telephones and TVs is one indicator. Sales of software are another, as are the number and duration of domestic and international phone calls, or the proportion of homes connected to cable TV.

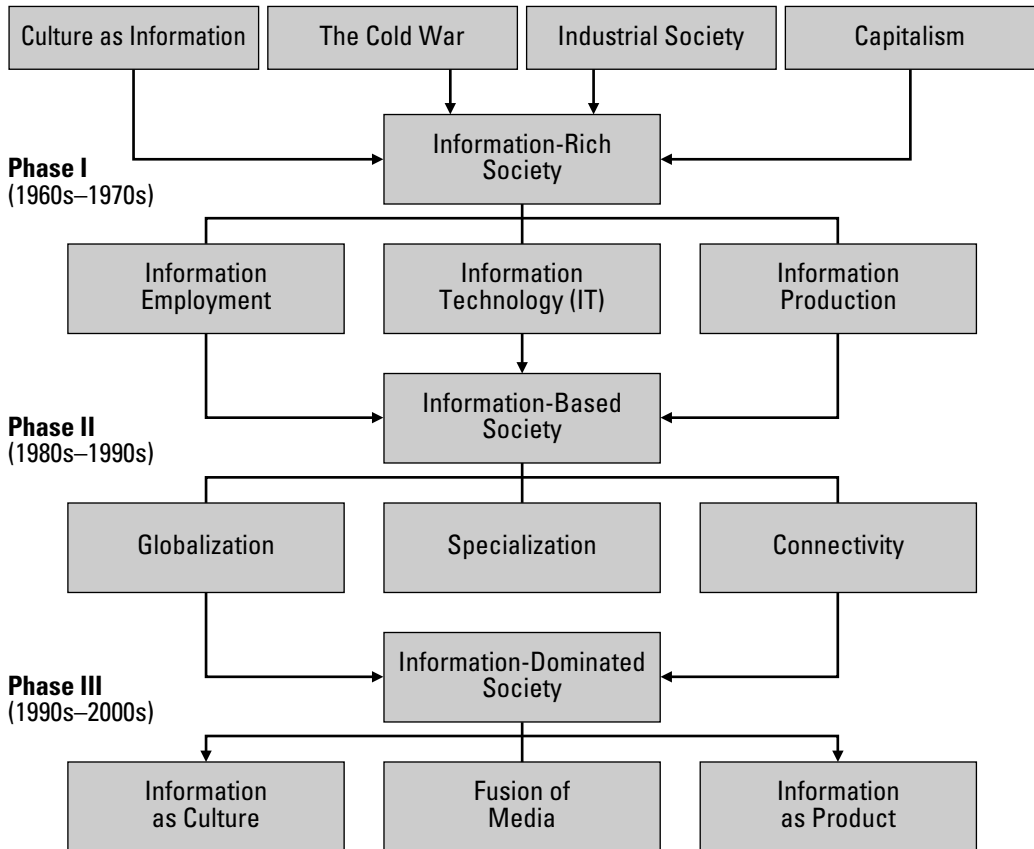
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The rise of the information society during the last three decades has sometimes been viewed explicitly or implicitly as a single phase process.⁵ Some still consider the term 'information society' to be a concept rather than a mature phenomenon, claiming that Western society is still in a process of 'informatization', thus lacking clear quantitative measures to demonstrate the existence of the information society.⁶ The following discussion outlines three stages in the development of information society: information-rich, information-based and information-dominated (Figure 1). The incubation of the information society has been chiefly in the USA, within four major societal elements: industrial society, capitalism, the Cold War and culture as information.

Processes leading to the information society

Whether industrial society has given way to information society by continuity or change has been extensively debated.⁷ On the one hand, the development of information technology (IT) and the need for skilled workers who consume and produce more information are viewed as nesting within industrial society, and the subsequent service economy. On the other hand, Castells argues that information technologies allow 'a direct, on-line linkage between different types of activity in the same process of production, management and distribution, establishing a close, structural connection between spheres of work and employment [that were once] artificially separated by obsolete statistical categories'.⁸ Thus, at a certain stage information

Figure 1: Phases in the rise of information society.



1. J.R. Beniger, *The Control Revolution: Technological and Economic Origins of the Information Society*, Harvard University Press, Cambridge, MA, 1986.
2. European Commission, *The Information Society*, Office for Official Publications of the European Communities, Luxembourg, 1996.

and knowledge may replace labour and possibly also capital as leading production factors.

Capitalism has been recognized as a major force in the emergence of an information society

by facilitating the transfer of information from the public to the private sector, or 'the privatization of information'.⁹ This process involved the rise of a class of technocrats in the so-called 'programmed society', in conflict with more disparate groups being governed or managed by them.¹⁰

A third major force in the rise of information technology and society in the USA was the Cold War.¹¹ Computers were widely required for missiles and defence from missiles, as well as for space exploration. Furthermore, the modern Internet had its roots in the Pentagon's ARPANET system.

A fourth major dimension facilitating the emergence of the information society is the nature of cultural activity in developed societies, which by the 1960s required a constant and rich transmission of written and oral information. The accent on information was not novel but before it had been constrained by volume, form, time and distance.

Information-rich society (1960s–1970s)

With these four dimensions in place, the first phase in the evolution of the information society took place in the 1960s–1970s, and may be termed 'information-rich' society. The characteristics of this phase included growing emphases on information production and use through the development of IT.

Growing employment in information-related activities has been recognized as an early and central aspect of information societies. Katz writes: 'The term 'information society' has been used to describe socioeconomic systems that exhibit high employment of information-related occupations and wide diffusion of information technologies'.¹² Porat¹³ and Machlup¹⁴ showed that a large proportion of US workers were already 'information workers' by the 1960s, employed in information-related occupations (the so-called 'knowledge sector'), followed in the 1970s–1980s by other leading economies.¹⁵ However, it was not until a later phase in the emergence of the information society that information became a common thread in production as well as consumption, through the introduction of personal computing and a common channel of information flow, the Internet.

The introduction of IT via computers and telecommunications, and its rapid and wide diffusion and adoption, have become the driving forces of information society. The impact of IT over the years has been on two levels. On the one hand it has been a major

3. Y. Masuda, *The Information Society as Post-Industrial Society*, World Future Society, Washington, DC, 1980, p. 3.
4. M. Castells, *End of Millennium*, Blackwell, Oxford, 1998, p. 67.
5. J.R. Schement, 'The origins of the information society in the United States: competing visions', in J.L. Salvaggio (ed), *The Information Society: Economic, Social, and Structural Issues*, Lawrence Erlbaum Associates, Hillsdale, NJ, 1989, pp. 29–50; F. Webster, 'What information society?', *The Information Society*, 1994, Vol 10, No 1, pp. 1–23.
6. W.E. Halal, 'The information technology revolution: computer hardware, software, and services into the 21st century', *Technological Forecasting and Social Change*, Vol 44, 1993, pp. 69–86; W.J. Martin, *The Global Information Society*, Aslib Gower, Aldershot, UK, 1995.
7. J. Gottmann, *Megalopolis*, The Twentieth Century Fund, New York, 1961; D. Bell, *The Coming of Post-Industrial Society*, Basic Books, New York, 1973; A. Kellerman, 'The evolution of service economies: a geographical perspective', *The Professional Geographer*, Vol 37, 1985, pp. 133–43; A. Kellerman, *Telecommunications and Geography*, Belhaven, London, 1993; Schement, *op cit*, Ref 5; Masuda, *op cit*, Ref 3, p. 3; D. Lyon, 'The roots of the information society idea', in N. Heap, R. Thomas, G. Einon, R. Mason and H. Mackay (eds), *Information Technology and Society: A Reader*, Sage, London, 1995, pp. 54–73; M. Castells, *The Information Age: Economy, Society and Culture, Vol 1: The Rise of the Network Society*, Blackwell, Oxford, 1996, p. 228.
8. Castells, *op cit*, Ref 7.
9. H.I. Schiller, *Who Knows: Information in the Age of the Fortune 500*, Ablex, Norwood, NJ, 1981; Schement, *op cit*, Ref 5.
10. A. Touraine, *The Postindustrial Society: Tomorrow's Social History: Classes, Conflicts and Culture in the Programmed Society*, L.F.X. Mayhew (trans), Wildwood House, London, 1974; D. Lyon, *The Information Society: Issues and Illusions*, Polity Press, Cambridge, 1988.
11. J.S. Nye Jr and W.A. Owens, 'America's information edge', *Foreign Affairs*, Vol 75, No 1, 1996, pp. 20–36; Lyon, *op cit*, Ref 7; Masuda, *op cit*, Ref 3.
12. P.L. Katz, *The Information Society: An International Perspective*, Praeger, New York, 1988.
13. M. Porat, *The Information Economy: Definition and Measurement*, Special Publication 77-12(1), Office of Telecommunications, Department of Commerce, Washington, DC, 1977.
14. F. Machlup, *The Production and Distribution of Knowledge in the United States*, Princeton University Press, Princeton, NJ, 1962.
15. M.E. Hepworth, *Geography of the Information Economy*, Guilford, New York, 1990.

enabling force for society, allowing inexpensive data recording and storage, and fast processing and transmission of information.¹⁶ But it has also become an extensive industry in itself, the high-tech industry, characterized by intensive R&D and entrepreneurship.

A third major aspect of the information-rich society of the 1960s–1970s was the growth in information production. It seems obvious that the introduction of IT and the growth in information use would lead to larger volumes of information. However, this growth had also to do with the expansion of research and study in universities and research institutes during these decades, yielding ever-increasing numbers of books and journals.¹⁷

Information-based society (1980s–1990s)

The growth in information volume, technology and employment led to a second phase in the emergence of information society, the information-based society of the 1980s–1990s. This phase has been characterized by three trends, all based, in their part, on developments in the first phase.

Globalization

The ability to move information instantaneously worldwide has become possible with the rapid development of international telephony, the Internet and cable/satellite television. These technological breakthroughs have reduced or completely removed international boundaries to the movement of information, so weakening statism. This has been evident in almost every economic, social and cultural area, including news coverage, banking, commerce and social contact. The

pace of information production and interaction has quickened as space has evaporated.

Specialization

The second phase in the rise of the information society has also been typified by the rapid diffusion and adoption of ‘information devices’ such as telephones, cellular telephones, fax machines, personal computers, television sets and the like.¹⁸ Special appliances have evolved for specific uses of information, together with specialist suppliers of equipment, software and information.

Connectivity

A third characteristic of information-based society has been increased connectivity. Internet technologies have permitted the recording and transmission of all forms of information including text, data, graphics, voice and pictures in electronic digital bit format. Coupled with fast and low-priced telecommunications and PCs they have allowed increased connectedness of individual customers with goods producers and service providers, as well as among service providers themselves.¹⁹

Furthermore, the interrelationship between electronic information and printed information has changed with the introduction of low-priced high quality laser printers and optical scanners, permitting non-professional users to produce high quality paper information products. These developments have rendered society in developed countries increasingly information-dependent.²⁰

Information-dominated society (1990s–2000s)

Unfolding in the late 1990s towards the 2000s is a third phase in the rise of the information society which might be termed information-dominated society. Information production, transmission and use, becomes a leading if not *the* leading economic and social activity, both as a product in itself and as a service leading to the production or consumption of material products. As such, three additional characteristics are added to information society:

- information becoming a major product;
- information media beginning to fuse into each other; and
- information becoming a culture.

Information has increasingly become a commodity in its own right. By the late 1990s revenues from the sale of information were matching those from the sale of material products and services. Major examples are the sale of data sets relating to Internet users, or the tremendous growth in the sales of software and TV programmes. The USA has become the world leader in the sale and distribution of electronic information.²¹

16. W.J. Martin, *The Information Society*, Aslib, London, 1988, p 40; C. Steinfeld and J.L. Salvaggio, ‘Toward a definition of information society’, in Salvaggio, *op cit*, Ref 5, pp 2–3; European Commission, *op cit*, Ref 2.

17. Bell, *op cit*, Ref 2; Steinfeld and Salvaggio, *op cit*, Ref 16.

18. A. Kellerman, ‘Leading nations in the adoption of communications media 1975–1995’, *Urban Geography*, Vol 20, No 4, 1999, pp 377–389.

19. A. Kellerman, ‘Fusions of information types, media and operators, and continued American leadership in telecommunications’, *Telecommunications Policy*, Vol 21, No 6, 1997, pp 553–64.

20. J. Feather, *The Information Society: A Study of Continuity and Change*, Library Association Publishing, London, 1994, p 2; R. Kitchin, *Cyberspace: The World in the Wires* John Wiley, Chichester, 1998, p 131.

21. Kellerman, *op cit*, Ref 19.

Liberalization trends in the provision of information services to households, as well as technological advances, have brought about early signs of possible fusions among different forms of information, their transmission and use. Thus it has become possible, for example, to use the computer also as a telephone, fax and TV, and receive several of these services from a single service provider. This fusion may possibly mature into a single appliance for information consumption and production, as well as so-called 'public networks' of data and software.²²

The information society becomes at this third phase of its development a society with a culture of information. Some commentators have seen this as 'recognition of the cultural value of information through the promotion of information values in the interest of national and individual development'.²³ Others believe that beyond promoting the proper and aesthetic production, transmission and consumption of information, the culture of information may turn into one of power:

*Cultural battles are the power battles of the Information Age. They are primarily fought in and by the media, but the media are not the power-holders. Power, as the capacity to impose behaviour, lies in the networks of information exchange and symbol manipulation, which relate social actors, institutions and cultural movements, through icons, spokespersons, and intellectual amplifiers... Culture as the source of power, and power as the source of capital, underlie the new social hierarchy of the Information Age.*²⁴

Another important cultural dimension of information is the changing significance of time and space. Instantaneous written and oral communications in global space intensify the pace of work and alter working times. In terms of cultural symbolism and reality, our source and anchor have changed from traditional national territory to a global, virtual one, bringing some to declare that 'the space of flows of the Information Age dominates the space of places of people's cultures'.²⁵ But others see no cultural imperialism in the blurring of national boundaries and no threat to domestic democratic institutions.²⁶ If they are right we can look forward to an age of enhanced social openness, understanding and tolerance.

Conclusion

Contemporary information society is characterized by the following traits:

- Technology: Sophisticated IT for the production, recording, transmission and retrieval of information of all formats, bringing about high levels of connectivity, globalization and dependence on IT.
- Production: Extensive production of information, coupled with a high proportion of the labour force employed directly or indirectly in information activities.
- Economy: Information being a major commodity, bought and sold extensively.
- Operation: Specialized channels and appliances for the handling of specific forms of electronic information may be replaced by integrated channels and appliances.
- Culture: The economic and social accent on information have turned it into a culture, typified by an amplified socio-political role of the media, shrinking time and space constraints, and an emergence of global virtual symbolism and realities.

The four elements and three phases proposed for the emergence of information society in this article are not uniform across nations and cultures. Their different conjunctions give rise to different complexes around the world, a phenomenon that may well repay further research.

22. Kellerman, *op cit*, Ref 19; Halal, *op cit*, Ref 6.

23. Martin, *op cit*, Ref 16.

24. Castells, *op cit*, Ref 4, p 348.

25. *Ibid*, p 349.

26. Kitchin, *op cit*, Ref 20, pp 101–2.