



Chapter IV

The Co-Evolution of Society and Multimedia Technology: Issues in Predicting the Future Innovation and Use of a Ubiquitous Technology

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Multimedia technology is becoming ubiquitous in modern society, and it is having profound effects on institutions and our expectations of the future. The technology is very fluid, and its development is shaped by a great many social factors. Prediction of the co-evolution of multimedia technology and society needs to be informed by a research framework that focuses attention on the key social, psychological, political and economic influences on technology and technology use, and the emergence of stable uses, infrastructures, standards and development paths. The paper criticises 'technological determinist' approaches, which simply seek to extrapolate social change from technological potential. It shows how a three layer model of component, systems and application technologies can be used to integrate findings from the use and development of technology in specific sectors. Three cases of technology-based predictions are examined, and lessons for understanding technology futures are illustrated by research in different industry and user sectors.

INTRODUCTION

The past 10 years has seen a huge explosion in the capabilities and use of information and communication technologies often referred to as multimedia. This has been accompanied by widespread predictions that information and communications technology will

become ubiquitous in working and social life, as we move towards an 'information society'. This vision is no longer the preserve of techno-soothsayers (Bell, 1974; Castells, 1989; Tapscott, 1995; Webster, 1995); now governments and companies from many industries see multimedia becoming central to their operations, not in the long term but within 5 to 15 years. Engaging and convincing demonstrations of the technology, and the success it has brought some companies and regional economies make this future seem inevitable.

But for all the certainty surrounding grand predictions of companies and commentators, there is extreme uncertainty over how this vision will be fulfilled. Policy makers and commercial decision-makers are faced with many questions: Who will benefit, and who will be excluded? What technologies will become common place? How will individuals cope? How can institutions and conventions change or be changed to 'make the most' of technology, as technology pundits and management consultants insist must happen. The determinism of the vision does nothing to make these questions easier to answer.

We define multimedia as technical facility to create or present and control communication or information in a *variety* of media through an integrated channel. This is often described in terms of the convergence of computer, telecommunications and television technology as it develops to allow *digital* storage, manipulation, transmission and reproduction of any media type. In addition, multimedia includes three cornerstone information technologies that are dependent on digital technology for their implementation, but give those digital technologies their uses: image recognition and compression, database and network management, and human-computer interfaces². They are all in their infancy, being as much art as science, but have already produced key parts of current and future multimedia systems (Stewart, 1994).

It is also important to bear in mind other common meanings of multimedia that revolve around changes in industry, in patterns of communication, or in broader politics and culture and are bound up with various optimistic and pessimistic visions of the 'Information Society'. Many of these take as their starting point the anticipated convergence of different *industries* — telecommunications, computing, information/media and entertainment — which could be facilitated by innovation and diffusion of converging technologies. Many of existing visions of the future simply extrapolate from technological potential and suppliers' conception of how this could be deployed to meet social need — ignoring the more profound uncertainties that surround the responses of users, and their acceptance of these and emerging offerings.

A research group at Edinburgh University was commissioned to look at the problem of forecasting the development of multimedia technologies and their uses and environment over the next 10-15 years. This study was conducted in 1995-96, and it is interesting to revisit some of the conclusions that we drew at that time, now that it is 1999. Many things have changed in this period, with huge investments in infrastructure and computing, the development of the Internet, Intranets, mobile telephony, digital television, the beginnings of e-commerce and the widespread development and use of Internet-based services. However, four years is not long in social evolution, despite a number of remarkable trends in usage. Unlike the basic substitution of one technology or technique for another, fundamental changes take time to emerge and to work through generations. Possibly the most important development to date is the spread of use and knowledge about multimedia, especially the Internet, sparking the imagination and the investment of a wide range of people outside the core techno-enthusiasts. The resources are starting to be available to a

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