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Ian Somerville
Queen Margaret College

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Actor-Network Theory: A useful paradigm for the analysis of the UK cable/on-line sociotechnical ensemble?

Ian Somerville,

Department of Communication and Information Studies,
Queen Margaret College, Edinburgh, Scotland.

Abstract

The context of this paper is the rapid provision of cable/on-line services in UK. The paper briefly critiques several theoretical paradigms, which attempt to explain the relationship between society and technology, before discussing the usefulness of *Actor-Network Theory* as an analytical tool, with specific reference to the UK cable/on-line industry. By advocating a seamless web composed of actors, the *actor-network* approach dissolves the dichotomous relationship between humans and machines and society and technology into a non-anthropocentric framework. Hence the term 'sociotechnical ensemble' which attempts to indicate that the dualism inherent in the phrase 'society and technology' is being contested. This paper argues that the existence of this alternative theoretical model forces researchers to at least re-address some of the most basic premises informing research into information and communication technologies.

Introduction

The application of *actor-network theory* to new media technologies is in its infancy although as a sociological and socio-economic analytical tool it has been utilised to examine many other sociotechnological contexts (Callon, 1986; Latour, 1987; Cowan, 1987; Bowker, 1994). Before examining the usefulness of the *actor-network* approach to new media technologies it is important to situate this theoretical approach in the wider context of, what might be called the more traditional theoretical approaches to studying information and communication technologies, namely; technological determinism and social shaping.

Technological Determinism

The predominant orientation of research into information and communication technologies emphasises the need to adjust socio-economic, political, and cultural systems of organisation to the exigencies of advances in technology (Mansell, 1993; MacKenzie and Wajcman, 1985). Such a perspective presumes that information and communication technologies, especially the new media technologies, are themselves transforming the way information is created, processed, stored, transmitted, and used by public and private institutions and by individuals in their everyday lives. This position, or at least the philosophical presupposition which underlies it, has been labelled technological determinism (Williams, 1974). The fundamental presupposition of technological determinism is that technology exists outside of society, influencing social change but not being reciprocally influenced. Some versions of technological determinism actually regard technology as the most significant determinant of the nature of a society (McLuhan, 1964). Although this position is most often readily associated with business, industrial, and governmental organisations (Mansell, 1993), it should be noted that this has also been a key premise of several theoretical explanations of the technology/society relationship.

As far back as the early 1960s Marshall McLuhan was articulating a position which was predicated on the assumption that media technologies are the most significant determinants of social organisation and change. The foundation upon which the 'global village' is built is the instantaneous transmittability of information. McLuhan's insistence that information and communication technologies are specific catalysts and determinants of social re-organisation has been echoed by other important thinkers both radical and neo-conservative. The claim of theorists such as Daniel Bell that information and knowledge are the organising principles of the 'postindustrial' society is similar to positions articulated by some 'postmodernist' theorists (Bell, 1973).

So, for example, while radical contemporary thinkers such as Jean-Francois Lyotard and Jean Baudrillard advance detailed critiques of contemporary Western society their analysis seems to adopt a relatively uncritical technological determinist perspective when they consider the role of technology. Indeed, in their unquestioning acceptance of the inevitability of the 'information society' some of their ideas reveal very explicit deterministic tendencies. Lyotard in *The Postmodern Condition* writes, 'Our working hypothesis is that the status of knowledge is altered as societies enter what is known as the postindustrial age and culture enters what is known as the postmodern age' (Lyotard, 1984). 'Postmodern' society is for Lyotard the society of computers, information, scientific knowledge, advanced technology, and rapid change due to new advances in science and technology. He seems then to concur with the theorists of 'postindustrial' society concerning the primacy of knowledge, information, and computerisation and, like them is prepared to argue that technology and knowledge have become the main principles of social organisation, the determining features of existence.

This deterministic premise is also characteristic of Baudrillard's 'postmodern' theory in which he appears to accept certain neo-conservative arguments which rule out possible future global alternatives to the 'technological society'. Baudrillard, it has been noted, 'aligns himself with a conservative tradition of passive and apologetic thought that envisages no alternatives to the existing order of society' (Best and Kellner, 1991). In fact, Baudrillard even resorts to using McLuhan's oft-repeated dictum 'the medium is the message' when articulating a position that posits the fundamental importance of media and technology in constituting modern life. Baudrillard's 'postmodernism' and Bell's 'postindustrialism' can then be seen to make 'technological development the motor of social change and occlude the extent to which economic imperatives, or a dialectic between technology and social relations of production, continue to structure contemporary societies' (Best and Kellner, 1991).

Social Shaping

Although it has been argued that technological determinism is the most influential theory of the relationship between technology and society (MacKay, 1995; Mansell, 1993) there are other approaches to this relationship which are underpinned by the philosophical presupposition that technology and technical change is socially constructed and constituted within an interactive and complex matrix of social, economic, and political relations rather than the premise that they follow some sort of self-determined path of development.

Several theoretical approaches share this 'social shaping' premise. Social constructivists for instance argue that technologies emerge out of processes of choice and negotiation between relevant social groups (Pinch and Bijker, 1984). Neo-marxist theories can also be regarded as privileging the social shaping paradigm in that they emphasise that ultimately it is the socio-economic imperative that determines the development and production of technology. On this view, the capitalist ruling class is continually seeking to lower costs in order to maximize profits and new technological developments are the means to achieving this end (Braverman, 1984; Russell, 1986). There is also an approach to technological development and deployment which is sometimes referred to as 'culturalist' and which focuses primarily on consumption. This perspective can be described as semiological in that it regards technology as a form of text. In other words, it is argued, that while design and development processes may 'encode' preferred forms of deployment in a technology (its 'official' technical possibilities), which may also be reinforced through marketing, the ways in which consumers actually deploy technologies is crucial. On this view the social appropriation of a technology or the way in which the text is 'decoded' is not inevitable or fixed by the technology itself or the social forces behind its development, instead it is argued that the use and meaning of information and communication technologies 'can only be understood within the class, gendered, geographical and generational contexts of its consumption' (Mackay, 1992). Research in this area tends, unsurprisingly, to be ethnographical in character (Haddon, 1988; Turkle, 1984; Silverstone and Hirsch, 1992).

Most recent sociological research into the domestication of information and communication technologies has been predicated upon the presumption that it is the social that shapes the technological. And within this framework there has been a recognition that structurally oriented approaches, such as neo-Marxism and political economy, need to be integrated with the culturalist research into consumption. The argument is

that 'a specific synthesis of these approaches is the most fruitful for understanding technology as a social phenomenon' (Mackay, 1992). This has produced an approach which advocates focusing on the 'full life cycle' of a technology, or its 'cultural circuit', that is, from its development, to its production, to its later consumption (Johnson, 1986). The cultural circuit approach offers the possibility of a more comprehensive account of the relationship between the social and the technical, however, it is also clear that it shares a foundational premise with social constructivist, Neo-marxist and culturalist approaches and, like them, it will always describe the trajectories of technologies in terms of the social.

Actor-Network Theory

Several problems have been identified with the above positions, primarily in respect to the perceived partiality of the two approaches. One of the problems with the social shaping thesis is that it seems to leave little room for the obvious effects of technology on society, and it is clear that technological determinism suffers from the opposite problem in that it apparently ignores social influences. There are additional problems with technological determinism in that it is viewed as playing an important ideological role in public and political discussions about technology where, it has been argued, 'it results in a displacement of causation from human agency to machines, which is detrimental to attempts to create instruments for a more democratic control of technology and society' (Bijker, 1995).

Both the technological determinist and social shaping perspectives tend to propose research questions which presume a radical distinction between the social and the technical. Questions which presuppose technological determinism will inquire into the nature of social and personal changes which technological developments 'force' people to adjust to, in other words, its effects. On the other hand, questions which presuppose social shaping will be concerned with investigating how producers and consumers develop and appropriate technologies. Thus humans are constituted either as the overdetermining agents in the technology/society relationship or as the recipients of a technological destiny. In any case it is clear that both paradigms display what might be called an unreflexive predilection for Kantian dualism (Crawford, 1993; De Vries, 1995).

There is a third alternative which would conceive of the technology/society relationship, or 'sociotechnical ensemble' as a *seamless web*, a view which resists the *de facto* distinction between the two and rejects both technological determinism and social shaping as limited paradigms. This position is admittedly counterintuitive nevertheless those who propose it would argue that any analysis should begin with the ontological presupposition that the social and the technological make up a seamless web of elements. It is of course the case that we distinguish between them, for instance, we can point to machines and operators, but this should be regarded as an achievement rather than something that can be taken for granted (Bijker and Law, 1992). From this perspective explanation of sociotechnological change and development is addressed through the concept of the *actor-network*. The essential element of this approach is the way it links technological and non-technological (human, social, organisational) elements together into networks and does not distinguish them into hierarchies. The *actor-network* in regard to information and communication technologies can be defined as companies, government departments, social groups, consumer organisations, standardisation bodies, regulators, on-line systems, software and so on. The approach emphasises the inter-connectedness of the heterogeneous elements that make up an *actor-network* and this inter-connectedness is elucidated in the process of *translation*. This process has been described as pivotal in any analysis of how the different elements in an *actor-network* interact (Callon, 1986). Translation rests on the idea that actors within a network will try to *enrol* (manipulate or force) the other actors into positions which suit their purposes. When an actor's strategy is successful and it has organised other actors for its own benefit it can be said to have translated them.

In regard to cable/on-line technology an *actor-network* approach would argue that, as is the case for any other information and communication technology, British society is shaping the technology as much as the technology is shaping British society for the future. However the *actor-network* approach doesn't just stop with the conclusion that the impact of technology on society and the shaping of technology by society are complimentary phenomenon, it would also argue that the actual distinction cannot be made a priori. *Actor-network* theorists would insist that when a sociotechnical ensemble is examined it becomes clear that it is

not constructed from elements that are a priori and intrinsically social, technical, economic, or cultural rather than these various elements form a seamless web. It is this ontological basis, that is, the rejection of the fundamental distinction between human and non-human actors, which distinguishes the actor-network approach. This fundamental dualism is central to western sociology and most post-Kantian thought and by not accepting it the *actor-network* approach is content to label itself pre-modern (Latour, 1993). From the *actor-network* perspective the explanation of the development of sociotechnical ensembles involves neither technical nor social reductionism rather a 'principle of generalised symmetry' must be adhered to, that is, the human and the non-human will be analysed with the same conceptual framework (Bijker, 1995).

Conclusion

If an actor network approach to the developing UK cable/on-line sociotechnical ensemble is adopted, and human and non-human elements are treated as *translating* agents, then a much more comprehensive account may be produced especially compared with the partial and often simplistic explanations in the technological determinism or social shaping accounts. The question of what is significant in the development of a sociotechnical ensemble is answered with the insistence that everything is, it depends on which point, temporally, the analysis occurs. A sociotechnical ensemble exists in a constant state of economic, political, cultural and physical flux and *actor-network theory* provides a tool by which a complex and sophisticated account, of causation, agency and significance, may be constructed.