

[Robin Mansell](#)

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New Communication Markets:
Regulating in the 'Commodity' Supply Environment

by

Professor Robin Mansell

Science Policy Research Unit
University of Sussex, UK
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1. *Introduction*

Private stakeholders and public policy makers in Europe, North America and Asia have come to regard the communication infrastructure - or the 'information highway' - as a major piece of a complex economic and political puzzle. Once the puzzle is complete, they suggest, all the social and economic benefits of the information society will become available to citizens and businesses. As the rhetoric would have it, the introduction of ever higher capacity communication networks will enable economies to prosper, the creation of new socially and economically productive employment opportunities, and the enhancement of the quality of life for a growing proportion of the world's population.

Electronic modes of communication have been experiencing very rapid innovation and developments in telecommunication, computing and software technologies are changing the way we interact in the world. Audio, video and print information, converted into digital signals, and packaged as multimedia stand-alone or networked products, is capturing the imagination of technologists, futurists, educationalists and policy makers. This paper focuses on the reconfiguration of policies and regulations which is proceeding alongside innovations in communication technologies and in the structure and organisation of communication markets.

The paper raises three main questions: 1) Are the predominant characteristics of policy and regulation that are emerging in the 1990s adequate to ensure that the 'information highways' will be accessible and that they will maximise the potential for participation in the information society of the twenty-first century? 2) In the face of uncertainty and the limited resources of policy makers, where should available resources be focused? 3) Will the twenty-first century see the withering away of regulation, or will it see a renewal of public policy and regulation in the 'public interest'? These questions are addressed within the framework of a strategic evolutionary model of the new communication supply markets.

2.0 *Policies for a Knowledgeable Society*

The term 'knowledgeable society' was coined in 1966 to suggest that societies would come to be characterised predominantly by the collection, organisation and interpretation of their knowledge in a continuous effort to extract meaning applicable to the problems at hand (Lane 1966). At least since the 1950s, scholars have been investigating whether the combined impact of innovations in the technical characteristics of the communication infrastructure and the 'infostructure' of advanced industrial societies are consistent with democratic participatory ideals or whether they are increasingly divisive and exclusionary. Some have focused mainly on the organisation of the scientific knowledge creation enterprise (Bernal 1954); others on whether tacit knowledge is resistant to exchange via the sophisticated 'bits' and 'bytes' of digital communication (Polanyi 1962); and still others on the historical recurrence of monopolies or oligopolies of knowledge consistent with the structure

and organisation of each new wave of innovation in the technologies of communication (Innis 1951).

By the 1980s and 1990s, the lessons for social science inquiry into the implications of advanced communication technologies had become very clear. If we are to penetrate the rhetoric and mystique of 'the greatest technological juggernaut that ever rolled' (Freeman and Soete 1994), it is necessary to couple analyses of the social and economic aspects of the 'infrastructure of communication' with those of the 'infostructure', that is, the ways in which knowledge is produced and used. Questions about the distribution of the production and use of all forms of knowledge - both scientific and that which informs our everyday lives - are inextricably linked to the configuration of the infrastructure of communication. Questions about the technical characteristics of advanced communication technologies and markets are also simultaneously questions about the social, economic and political organisation of their development and use. Gibbons *et al.* (1994) refer to the 'new institutional landscape of knowledge production'. It is institutions, whether they be firms, policy making organisations or regulatory bodies, that need to be at the heart of any consideration of the adequacy or inadequacy of policies and regulations in the new communication markets.

The development of conceptual models which can be used to explore the structures and processes that are shaping the expansion of communication markets into a multitude of new service configurations calls for analysis in two important areas.

The first is a focus on the technical designs and architectures of communication networks - what are the technical parameters of infrastructure controls, signals, and tolls? The second is a focus on the design of policies and regulatory environments - what are social, economic and political parameters of communication controls, signals, and tolls? These two areas can be integrated using a *strategic evolutionary* model of the development and diffusion of information and communication technologies. This model can be used to suggest areas in which public policy and regulatory initiatives need to be concentrated to promote the social and economic objectives of maximising the potential for participation in the 'knowledgeable' society of the twenty-first century.

3.0 *A Strategic Evolutionary Model*

Regardless of whether the 'information highways' of the future are comprised of optical fibre networks or of a mix of optical fibre, coaxial cable, copper and radio-based technologies, the fruits of technical innovation have brought the potential for vastly expanded capacity, the promise of flexibility and greater choice of services for users, as well as the potential for flourishing competition in the marketplace. In the language of the economics of technical change, technologies and markets are co-evolving (Nelson 1994). Central to this evolutionary process is institutional change. Changes in institutions affect all aspects of the configuration of technologies and markets. Analysis of the co-evolution of technologies and markets in the context of the 'information highway' calls for the application of a conceptual model that suggests: how suppliers and users will *control* the evolution of the information infrastructure; how consumers will *signal* their preferences for new services in the

marketplace; and how political and economic incentives will govern the *tolls* (prices) of accessing and using these infrastructures.

There are two alternative models that are implicitly or explicitly employed in the growing literature on the development of information infrastructure and they appear in both national and global contexts. There is first a full competition model which envisages a transition to an unregulated 'commodity' market. Second, there is a model that envisages that economic and political incentives remain in place to create conditions for the continuing monopolisation of markets, even in the face of technical change.

3.1 The Full Competition Model and 'Commodity' Supply Environment

The decade of the 1980s was characterised by the introduction of liberalised markets for telecommunication supply. Competition in the supply of the components of the communication infrastructure continues to be positively sanctioned by the policies of governments in many countries. There is little dispute about the theoretical impact of the competitive marketplace which the liberalisation of markets is expected to encourage. In theory, markets are expected to evolve to encourage the supply of multiple competing network and service operators and their networks are expected to be seamlessly 'stitched' together by transparent agreements among competitors (Calhoun 1992). The traditional public telecommunication network operators are expected to compete and win business alongside cable and other fixed network operators and suppliers of radio-based infrastructure. In practice, however, the uncertainty associated with the willingness of customers to pay for advanced communication services (including interactive 'multimedia' services) has meant that there is considerable reluctance on the part of many national policy makers and private sector companies to opt for policies and regulations that would lead to a market structure that even begins to approximate the conditions envisaged by the full competition model.

State or privately owned public telecommunication operators historically have provided the vast majority of the national infrastructure facilities for the origination and termination of communication traffic. The liberalisation of national communication markets during the past decade or more has progressed to the point that some analysts envisage future markets in which entry occurs in all segments (i.e. networks and services). For example, in principle, international communication traffic originating on a network owned by operator A in country X could be terminated in country Y on operator A's network or on a network owned by another operator in country Y. Such traffic might be routed through a network in country Z owned by operator A, B or C on the way to its destination. The traffic itself might be processed by operator A, B, C, or D as value is added to information content by service providers. The organisation and administration of billing, maintenance, security, and management could be integrated with the provision of service by operator A in the originating country, or it could be handled by any one of a number of other parties.

In this type of market, the theoretical number of potential owners/operators of the network and service components which handle communication traffic could rise

exponentially. The share of traffic and revenues accruing to any single supplier would reflect its technical superiority, the variety and quality of its services, and the efficiency of its operation. The characteristics of the 'network of networks' would be neutral as to cost and revenue advantage for any individual network or service operator - and it would be neutral from the perspective of users, both large and small.

The failure to reap the benefits of this model generally is ascribed to the transitional problems of an unevenly liberalising communication marketplace. Suppliers point to the recalcitrance of monopoly or dominant network infrastructure operators in national markets as a major reason for their failure to meet efficiency, diversity and quality of service objectives.

The assumption is, however, that competitive entry will resolve inefficiencies and distortions of supply. Competition is expected to ensure that the provisioning of voice, data, and image services is based upon the optimisation of the economic and technical characteristics of networks in response to user requirements. The transmission, switching and information processing components of communication networks in this model effectively become *commodities* in the marketplace. These commodities could be mixed and matched according to user specifications and preferences. In the full competition model envisaged by some analysts, communication network and service suppliers would compete on the basis of price and quality differentiation. Their success or failure would reflect their business acumen and ability to maximise their competencies through a careful balancing of competition and collaboration with suppliers of different network commodities. Table 1 shows the predominant characteristics of this model.

Insert Table 1 about here

In some cases, end-to-end ownership and management of infrastructure facilities would provide an attractive route to competitive success. In others, end-to-end infrastructure supply might be coupled with the outsourcing of other requirements to third parties. Competition in this model implies the eventual commodification of all aspects of network and service supply. In this event, no special features of technology or the market would call for sector-specific national policies or regulations. The market would create strong incentives for the creation of generic intelligent network platforms, open access for all service suppliers and end users, and for the gradual 'withering away' of the formal institutions of public intervention via regulation.

No single supplier would have superior competence in the production of the commodities required to provide the range of services needed by any single large (or small) customer. In this model, there is nothing special about communication network or service supply which distinguishes it from any other industry sector. The market would provide the signals necessary to ensure the development of innovative, accessible and affordable services.

This model would prevail, however, *only* in a market in which there was uniformity within and across national markets, that is, open competition in all aspects of the communication supply market. Even the strongest advocates of open entry in national communication markets do not expect this situation to prevail for several decades (Mansell and Credé 1995). The absence of the conditions needed to fulfil the assumptions of the full competition model is not attributable merely to a failure of political will on the part of governments. Liberalisation of communication markets can bring some benefits but it also brings disadvantages. These are associated with the continuing process of the monopolisation of markets, increasing co-ordination costs, and the exclusionary impact of networks that fail to achieve the conditions assumed by the full competition model (Mansell 1993). If communication markets are unlikely to evolve - because of their special characteristics - into fully competitive commodity-like markets, what model can serve as a more effective guide to public policy?

3.2 *A Strategic Evolutionary Model*

The characteristics of communication markets in countries such as the United Kingdom and the United States where substantial market liberalisation has been introduced have the attributes of a *strategic evolutionary* model (Mansell 1993). The co-evolution of markets and technologies in the face of competition and other market liberalising measures is characterised by the following features: 1) proprietary network interface standards are maintained in key segments of the public network infrastructure; 2) there is resistance by dominant suppliers to requests that they unbundle network resources (software functionality) and introduce transparent costing methodologies; 3) there are superficial variations in equipment and network design in some submarkets, cross-subsidies are used when they are likely to go undetected, and price and quality differentiation are introduced only in submarkets where competition is strongest; 4) service competition including maintenance, billing, use of network resources and service applications is weak in most submarkets and strong generally only where the majority of customers are large globally operating multinational firms; and 5) uneven network and service access conditions are perpetuated as a result of uneven geographically distributed access, varying restrictions on the use of public network resources, price discrimination based on unjustified volume discounts and difficult negotiations over network interconnection.

These characteristics are summarised in Table 2.

Insert Table 2 about here

In spite of the rhetoric which characterises advocacy of the benefits of the full competition model, many of the new entrants to communication markets do not welcome completely unregulated markets. On the contrary, once they enter the market they regard further market liberalisation as inappropriate in the light of their commercial interests. In most cases, new entrants do not seek to, nor would they be able to, match the scope and coverage of existing domestic public telecommunication operators in terms of the extent of market penetration.

The full competition model depends for its validity on the assumption that competition is principally price-based and products are relatively undifferentiated. Under such conditions buyers would be able to assess differences in prices and respond accordingly. The interests of sellers and customers would be served best by the withdrawal of regulations and by maximising the opportunities for open entry. However, most entrants to the new communication supply market aim to achieve a viable position on the basis of niche market service provision. This is akin to the type of competition which exists in a franchise market.² All the western economies have enforceable laws which prevent imitation which undercuts an existing competitor unless a licence has first been agreed by the owner of a franchise allowing the name, procedures, etc., to be used. In order to meet the requirements of various franchise contractual terms, it is *necessary* for products to be differentiated in a number of different ways. The greater the similarity or 'passing off', the higher the likelihood of legal action.

In the *strategic evolutionary* model, communication suppliers or 'franchisees' do not 'compete' in the provision of their networks and services. Instead, suppliers are explicitly constrained from entering into some areas of the market. In the communication market of the 1990s, it is increasingly appropriate to use the franchise metaphor. For example, when foreign investors such as NYNEX or US West are granted a cable/telephony franchise in Britain, they are effectively being given rights analogous to a 'franchise' to offer a special type of service which did not previously exist. Similarly, when new entrants to local exchange markets are given licences which permit them to install fibre optic cable in the City of London, they are granted a form of 'franchise' which allows them to offer a specific type of service.

The franchise metaphor clarifies the apparent paradox whereby new entrants seek to retain regulation while they pay lip service to the full competition model - their main concern is protection of their respective 'franchises'. Suppliers in the new communication market of the 1990s negotiate the terms and conditions of regulation in the light of their long (or short) term economic and strategic objectives. For example, a study of the United Kingdom market which has experienced considerable liberalisation since the mid-1980s,³ shows that resistance to full market liberalisation (although frequently not in terms of overt corporate policy) is commonplace (Mansell and Credé 1995). At the time of the study in 1994, the only company to favour complete liberalisation was the incumbent network operator, British Telecom.⁴ The other entrants to the network and service market justified their resistance to completely open markets on the basis of their need for:

- **Regulatory Stability:** New entrants favoured a stable regulatory environment as opposed to elimination of all licence restrictions and regulatory controls.
- **Voluntary Market Segmentation:** New entrants selected a particular market segment in which to compete. Removal of regulatory constraints was unlikely to stimulate further investment.

- **New Entry and Competition:** Regulation was perceived as akin to the granting of exclusive or semi-exclusive franchises similar in nature to those awarded to cable franchisees.
- **Strategic Market Entry Incentives:** New entry was based on strategic considerations rather than primarily on financial factors.
- **Regulation and Investment:** New entrants openly sought the protection of the regulatory regime to ensure that the long-term payback of investments could be achieved.
- **Emphasis on Service Provision:** Although most entrants planned to construct new infrastructure, success was dependent on a company abilities to differentiate by higher *quality* and *unique* service provision.

Although the structuring of the new communication markets is clearly a reflection of the economic interests of both dominant and niche market players, the *strategic evolutionary* model draws attention to areas in which ‘public interest’ considerations such as universal public services, privacy protection, etc., can become embedded in the ‘franchises’ awarded to new entrants as they enter the market. Licence conditions can be used to establish conditions that give weight to the interests of individual consumers in areas where these are unlikely to coincide with those of suppliers and large customers.

The *strategic evolutionary model* draws attention to the necessary and continuing role of policy and regulation. Constraining the market power of dominant operators where their activities are anti-competitive or exclusionary; and creating incentives for new market entry when market liberalisation begins are conventionally recognised roles for policy and regulation in the telecommunication sector. A third role, however, needs to be emphasised and developed in the new communication supply market. This is to ensure co-ordination in the supply of complex communication systems via the terms and conditions of licensing or ‘franchise’ agreements. This role is needed in response to the complexity of new network and service environments, and to the need to build social and economic objectives explicitly into the operational conditions (technical and organisational) that govern entry and participation in the market.

The amount of competitive activity that has emerged thus far in the United States and in European countries is insignificant as compared to the potential for new entry in the communication supply market (Selwyn et al. 1993). However, as Selwyn et al. argue, even the presence of a significant amount of new entry would not be evidence of a long term trend toward effective, much less, full competition in the marketplace. ‘As such, the presence of individual competitors does not result in ‘competition’ in a meaningful economic sense. More importantly, while the entry of new firms may ultimately rewrite the list of major industry players..., by itself it does not assure the long-run creation of market competition’ (Selwyn et al. 1993: 7-8).

It may be argued that the new communication markets of the 1990s are becoming subject to the forces of global competition or rivalry and that they are therefore beyond the control of the policy and regulatory apparatus of many states. However,

since communication traffic ultimately originates and terminates within the boundaries of what we understand as the nation state it is reasonable to seek ways to ensure that the policy and regulatory apparatus is used to shape the design of national markets in the interests of social and economic goals that are more broadly defined than those of major supplier and user stakeholders.

4.0 *Policy and Regulatory: The Co-Evolution of Technologies and Markets*

The co-evolution of markets and communication and information technologies raises issues about both the technical design and architectures of networks and the design of policies and regulations. These include the sustainability of competition, the prospects of stakeholders in global markets (as well as their national home markets) and their capabilities to generate continuous innovation. How will the pieces of the puzzle - dynamic and sustainable technological innovation *and* competitiveness in national and international markets - fit together? Indeed, how will these pieces of the puzzle fit together with social policy issues?

Governments are being exhorted by private sector stakeholders to put the conditions in place to stimulate innovation and to allow competition to flourish. On the one hand, they argue the need to dislodge the traditional monopoly players. On the other, however, there is the need to ensure that competition does not erode resources for innovation and social and economic experimentation. The fact that these issues are interlinked is recognised at the level of policy rhetoric and exhortation. We find, for example, numerous references to the information 'poor' and the information 'rich' in the formal rhetoric of policy documents on national and global information infrastructures (Group of Prominent Persons, 1994; Gore 1995). Nevertheless, there is a missing element in the puzzle. This is the absence of a consensus on how to bring about the innovations in policy and regulation that are needed in the face of market liberalisation.

Changes in policy or regulation that affect the technical design of networks invariably are uncoupled from those changes in policy that affect the long term structure of markets and the process of competition (costs, prices, etc.). Studies of technical change and innovation have yielded useful insights in this context. Market failure and tendencies toward monopolistic or oligopolistic markets are not inherently bad; they are the very essence of the stimulus to innovation (Metcalfe 1993). However, policies and regulations addressed to issues of market failure need to be coupled directly with those aimed at stimulating the innovative capabilities and the creativity of existing and new supplier stakeholders as well as the many smaller businesses and consumers.

The missing element in the 'information highway' evolutionary puzzle is a focus on the creation of policy and regulatory institutions that can address innovation, competition and social policy issues together. Historical and current experience show that the conditions under which interconnection of networks is achieved are central to the ways markets evolve (Arnbak et al. 1994). To achieve, what Noam (1994) has called a 'system of systems', policy makers will need to take responsibility for creating new incentives in the marketplace. New institutions of policy and regulation will be needed to ensure both that anti-competitive practices are curtailed *and* that actions are taken to stimulate the creativity of suppliers and users.⁵

The interconnection issue can provide a focus for creative institution building on a national (or regional basis). Incentives for investment, the wider geographical distribution, accessibility and affordability of services, and for specialised and other services to meet social and regional requirements could be addressed via the creative use of interconnection policies and practices. Creative policies and practices along these lines will require that political resources be focused on this issue as a matter of the highest priority. It will also bring fears of the rise of a labyrinthine centralised regulatory apparatus. These fears can be countered by showing that a concentration of resources in this area could reduce the need for other forms of regulation that are proving increasingly ineffective in a market populated by many suppliers.

Failure to engage public policy and regulatory resources in this way may bring short term benefits for some of the stakeholders on the supply and user sides of the new communication market, but these benefits will be short-lived as markets continue to evolve. David Ricardo suggested in 1810 that ‘where there is free competition, the interests of the individual and that of the community are *never* at variance’. Incontrovertible evidence that ‘information highway’ markets are not *free* exists, however, both because of the history of public policy measures and because of the need for non-market forms of co-ordination of complex networks. As the co-evolution of technologies and markets continues, the need for policy and regulatory innovations will continue too. Policy and regulation will need to address three issues: constraining the market power of dominant operators; creating incentives for new market entry; *and* c) introducing innovative ways to respond to the need for technical and market co-ordination to achieve both social and economic goals.

The predominant characteristics of policy and regulation that are emerging in the 1990s are inadequate to ensure that information infrastructures will be accessible and affordable. They will not maximise the potential for participation in the information society of the twenty-first century. There is a need to focus scarce regulatory and policy resources in key areas of network and organisational design and this is not a sign of the withering away of regulation. The *strategic evolutionary* model points to the fact that, increasing choice and diversity in services and downward pressure on some prices is complemented by cost increases associated with the need to recover co-ordination costs and by exclusionary tactics employed by suppliers as they engage in new market monopolisation strategies.

Notes:

1. These arguments are developed in Mansell and Silverstone (1995 forthcoming).
2. Franchising has come to account for an increasingly large element of economic activity, particularly in the United States and the United Kingdom. Franchising can be seen to apply equally to fast food (e.g. MacDonalds, Burger King and Pizza Hut) as to retailing (e.g. Benneton, Body Shop) and specialist services (e.g. Kwik-Fit Exhausts and Pronta-print). The 'franchise' metaphor is not new to telecommunications. Charles Jonscher and others have argued a similar case with respect to early phases of liberalisation in the British market.
3. Interviews were conducted by Andreas Credé, Doctoral Candidate, Science Policy Research Unit, University of Sussex, with 14 companies active in the United Kingdom communication market over the period 23 March - 4 May 1994. With the exception of BT and Mercury, all the companies were recent entrants to the market. The selection of internationally owned infrastructure providers was drawn from the approximately 20 internationally owned companies active in the British market. The survey was designed to achieve reasonable geographical and market segment coverage. Views on the benefits and disadvantages of international competition in communication markets and the further liberalisation of national markets were obtained.
4. By January 1994, the Department of Trade and Industry in the United Kingdom had received 76 applications for new licenses and 35 had been issued. Twelve cable television companies were providing telecommunication services and 23 new licenses had been granted. The 12 companies offering services were mainly inward foreign investors.
5. This argument differs from Noam's observations about the effects of network 'tipping' as competition is introduced. His argument seems to suggest that markets more closely approximate the conditions of the full competition model. The strategic evolutionary model focuses more centrally on the articulation of new modes of monopolisation and their social and economic impact. See Noam (1991).

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Table 1: Full Competition - Idealist - Model

Permeable Seamless Networks
Optimal Service Diffusion
Demand-led Industry
Open Systems, Common Interface Standards
Co-operative Partnerships, Transparent Network Access
Minimal Regulation

Table 2: A Strategic Evolutionary Model

Fragmented Networks
Uneven (non-universal) Service Diffusion
Multinational User Pressure on Network and Service Design
Uneven Competition in Submarkets
Absence of Transparent Cost/Price Relationships for Network Access and Use
Increasing Regulation