Chapter 7

Designing Networks to Capture Customers:  
Policy and Regulation Issues for the  
New Telecom Environment

Robin Mansell

1.0 Introduction

Innovations in electronic information and communication technologies are creating exciting and challenging opportunities for new commercial and non-commercial activities. These innovations are of significant economic interest and have many social, cultural and political implications for all aspects of commercial and everyday life. They are calling into question virtually all the conventional wisdom about how markets for the production and consumption of new information and communication products should be organised. Governments around the world are adopting policies and regulations for the future information superhighways. In Europe the goal is to stimulate investment and to ensure that European equipment and service producing companies attain a leading position in global markets.

In the face of rapid technical change and the restructuring of markets, a central problem for government policy is to navigate a route between monopoly power, network integration and political interference, and competition, network fragmentation and government indifference to social consequences. Major issues are confronting policymakers and regulators in the face of the convergence of telecom, computing and audio-visual markets, and the introduction of competition in the telecom market. This chapter focuses on changes in the nature of control over the ownership, operation, and use of the telecom infrastructure and services and the implications of these changes for policy and regulation.

2.0 The New Telecom Environment

Businesses, governments, consumers and labour representatives cannot help but be aware of the powerful trends in the telecom industry on a global level. These trends have major implications for the suppliers of networks and services and for customers. The opportunities created by technical innovations are resulting in a contest between the Public Telecommunication Operators (PTOs) who now must operate in liberalised markets and many new entrants from the computing and audio-visual sectors (OECD 1992). There are three significant pressures for change: 1) internationalisation of telecom supply; 2) competition within national markets; and 3) the termination of monopolies on
the provision of voice telecom services as, for example, will occur in the European Union in January 1998 (Council of the European Commission 1990). In response to these pressures, regional and national government policy responses seek to implement policies to create incentives for new entry in the market and to ensure that incumbent PTOs operate on a commercial basis as the result of privatisation or greater independence from direct governmental influence. In all cases, policies and regulations must be introduced in a very uncertain environment. Uncertainty is present on both the supply and demand sides of the market.

Part of this uncertainty is the result of rapid changes in the evolution of communication networks and the services they support. Distinctions have been drawn historically between content and carriage and between infrastructure (all means of transporting information using analogue or digital techniques) and services (transporting and routing traffic, managing networks and making connections over the underlying infrastructure). Different policy frameworks have applied to three spheres of activity: telecom, broadcasting and cable television.

As visions of national and global super-highways begins to become a reality as a result of investment in networks with high capacity that can carry two-way switched traffic of all kinds, the convergence of cable television, telecom and radio-based networks is creating the potential for overlap between traditionally distinct industry sectors. For example, from a technological point of view:

- cable operators will be able to offer telephone service;
- broadband video, High Definition Television and multimedia services can be offered over a broadband (e.g. optical fibre) switched network, over upgraded cable television networks, and over broadband wireless networks;
- broadcast distribution can be provided by cable operators, public broadcast networks and satellite broadcasters; and
- point-to-multipoint data downloading (data casting) can be provided by broadcasters, satellite broadcasters and the PTO.

Many foreign and domestically-owned suppliers in the telecom, cable television, broadcasting, publishing, computing and software industries are seeking to secure their future revenue streams through ownership or control of the infrastructure and/or the content that will reach into the homes and offices of the 21st Century. They can choose to invest large amounts of money in upgraded networks before there is clear evidence of strong business and consumer demand for new services. Alternatively, they can wait to commit financial resources until they have a better understanding of the conditions under which customers will be prepared to pay for advanced information and communication services.

As telecom markets are liberalised, the transformation of the PTOs is taking a number of distinctive forms. In some cases a parent company will include a number of smaller operating companies and related units and the telecom service operator has a strategy for transforming the organisation into a profitable and flexible private company. In others, a vertically integrated structure embraces all the telecom related activities. In both cases, newly privatised companies are promoting a culture of decentralised power and of competitiveness. The PTOs are becoming involved in webs of alliances and their
diversification strategies are intended to meet the requirements of corporate customers, increase the scale and quality of operations, and explore investment opportunities outside national markets (Cave and Shurmer 1995).

National fixed telecom infrastructures generally are controlled by network services divisions within the PTOs. Their strategies focus on strengthening their positions in home markets through strategic partnerships, joint ventures and co-operation with other companies. Most of the PTOs are modernising their networks but they are reluctant to substitute copper wire with optical fibre which reaches the wall socket in the home because, in many cases, existing network are capable of delivering new service applications and the strength of demand is uncertain.

The traditional PTOs are facing competition in some segments of their markets and not in others. Licences are being granted to competing mobile telecom operators and, in many countries, there are initiatives to encourage electricity and railway companies to build competing fixed networks. Cable television operators are experimenting with new services and diversifying into the provision of video-conferencing, video telephony and fax services, often through acquisitions and joint ventures. New Digital Audio Broadcasting, Digital Video Broadcasting, and data casting services are being developed by broadcasters and direct satellite broadcasting companies are forging alliances with information content providers to offer an array of new services to businesses and individual consumers (Mansell et al. 1995).

There are two basic scenarios for the way these changes are influencing developments in the market. The first, as shown in Table 1, is an Idealist scenario which envisages the emergence of full competition in the market. The second is a Strategic scenario in which an oligopolistic market structure emerges where a few dominant players vie for success in the market (Mansell 1993). The first scenario implies only a minimal role for regulatory authorities as the market performs according to the expectations of outcomes in a perfectly competitive market (High Level Group on the Information Society 1994). The second, much more likely scenario, implies that the need for regulation will increase. However, it does not imply that regulatory measures which have been effective in the past will continue to be so in the future.
<table>
<thead>
<tr>
<th><strong>Full Competition Scenario</strong></th>
<th><strong>The Dominant Player(s) Scenario</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(Idealist)</em></td>
<td><em>(Strategic)</em></td>
</tr>
<tr>
<td>Permeable seamless networks</td>
<td>Fragmented networks</td>
</tr>
<tr>
<td>Universal services</td>
<td>Reduced universality of services</td>
</tr>
<tr>
<td>Demand-led telecommunication industry</td>
<td>Supply-led industry, multinational user pressure</td>
</tr>
<tr>
<td>Open Systems, common interface standards</td>
<td>Weak stimuli for competition</td>
</tr>
<tr>
<td>Co-operative partnerships, transparent network access</td>
<td>Rivalry, non-transparent network access</td>
</tr>
<tr>
<td>Minimal regulation</td>
<td>Increasing regulation</td>
</tr>
</tbody>
</table>

Table 1 – The New Telecommunications: Policy and Regulatory Challenges

Some of the new players in the market are municipal groups, researchers and small businesses with the expertise to experiment with the Internet and other advanced services. Others are extremely large and active throughout Europe and globally. The technical means exist to *unbundle* multimedia and other advanced information services and applications from the physical transport infrastructure. However, a parallel pattern of *bundling* of infrastructure and service provision is emerging among powerful industrial conglomerates. These often involve content providers and international telecom service providers – such as BT-MCI-BBC and Bertelsmann-Canal Plus-Deutsche Telekom-France Telecom. Foreign telecom operators are leasing capacity in multiple domestic markets to launch new services and they are building data networks for international value-added services.

As the PTOs face greater competition, national governments are responding to pressures to separate operational functions and policy and regulatory functions. These pressures may take the form of directives promulgated by regional authorities (European Commission 1987) or by observations of influential organisations such as the OECD (1994) or the World Bank as to best practice in the organisation and operation of telecom. In many countries, questions are being raised as to whether there is a need for radically new legislative frameworks which abandon the industry sectoral distinctions of the past. Existing broadcasting, telecom and cross-sectoral competition legislation may be inappropriate in the light of technical convergence, the need to address market concentration, and to ensure consumer protection. Institutionally, telecom policy issues are becoming interdependent with those regarded as the concerns of other ministries in government. However, different public administrative organisations within government give varying weights to social, cultural, and economic issues, and to the priorities and objectives which are expected of network and service operators in the domestic market as compared to objectives for their success in international markets.

The policy and regulatory issues are more far-reaching than visions of the super-highway suggest. The information super-highway concept is an inappropriate metaphor because it focuses attention on information carriage or distribution as an end in itself. More important goals relate to the knowledge and information produced and consumed as...
a result of the distribution process. The fundamental issues for policy and regulation concern how initiatives by governments will affect how people interact with electronic media of all kinds in the future. They concern individual rights to privacy, democratic processes, industrial development, and competitiveness.

3.0 Competing for Control: Strategy and Policy

In countries where governments have begun to permit new entry there is evidence of investor interest and limited market entry across the spectrum of networks and services. In theory, with all this activity, competition might be expected to flourish to the benefit of all the suppliers and stakeholders in the user communities. In practice, the strategies of the corporate actors on the supply side of the market interact with policy and regulatory measures in ways that are not necessarily consistent with social and economic policy objectives. Some of these inconsistencies come to light as a result of detailed investigation of the ways technical innovations, changes in policy, and the structure of markets are affecting the nature of control over the design, operation and use of networks and services. In effect control is being redistributed among the major suppliers in the market and there is little evidence that the Idealist scenario for the market is likely to predominate.

3.1 Controlling Access to the ‘Network of Networks’

The interconnection of the components of the telecom infrastructure is sometimes regarded as a purely commercial and technical arrangement. Competitors requiring access to each others’ facilities are expected to negotiate in the light of full information about the technical characteristics of networks and the likely structure of demand. However, a dominant incumbent operator can use a variety of strategies in a bid to retain and extend market share (Office of Telecommunications 1995a). Interconnection disputes have proven difficult to resolve with respect to leased and switched infrastructure facilities.

In markets where interconnection is required to enable new entrants to compete, policymakers and regulators initially encourage parties to reach agreement without intervention by the state. When parties fail to reach agreement, then provisions are made for a representative of the state (within a ministry or an independent agency) to mediate and/or to mandate a solution. In the initial stages of market liberalisation, solutions generally are reached on a case-by-case basis. With experience, standardised publication of charges for interconnection calculated using a transparent methodology is adopted. Delays in reaching agreement on interconnection are common. This creates uncertainty and influences the assessment by new entrants as to whether to invest in new capacity or to buy capacity from existing operators.

Achieving interconnection and interoperability between the services offered by adjacent and willing network operators often requires new investment and co-ordination to ensure that networks are linked together in a transparent way. Interconnection of trunk and local networks belonging to alternative infrastructure operators, including utilities, the cable operators, and mobile service providers, and the incumbent PTO is a major bottleneck to effective competition.

Transparent rules for interconnection are needed and must be interpreted consistently (Council of the European Communities 1990). Experience indicates that there will be substantial gaps between the perceptions of incumbent operators and new
entrants as to what is a reasonable outcome. A purely commercial arrangement can be disadvantageous for new entrants if the structure of charges is used to create unequal competitive conditions. Thus, failures to reach agreement on network interconnect issues may be an illustration of opportunistic behaviour on the part of new entrants, or they may be an ‘early warning’ signal of anti-competitive behaviour on the part of the incumbent operators. The policy and regulatory challenge is to distinguish between the two possibilities since time is likely to favour the incumbent.

3.2 Controlling Access to the Customer

There are several ways that the dominant players in the market are seeking to gain control over access to customers. From their perspective, if the customer can be ‘captured’, it is more likely that investment in innovative networks or services will result in revenues and potentially increased market share. Standardisation can be used as a strategic tool to strengthen the position of network and service operators (Hawkins et al. 1995). Departures from fully open systems reduce compatibility among network and service interfaces. This may be in the interests of all suppliers and users if it creates incentives for innovative activity. Alternatively, it may be in the interests of only some suppliers and users in the market and provide another signal of anti-competitive behaviour.

Many of the dominant PTOs are being pressured by national governments to conform with regulatory provisions requiring them to implement open systems which allow transparent access by new entrants to the underlying network infrastructure. These operators generally argue that they favour open systems and transparency at this level of the network. In the newly emerging Internet environment there are signs that the largest players are achieving market dominance as a result of their control of access to the Internet backbone infrastructure (Cook 1996).

Changes are occurring in the strategies of the incumbent PTOs and other players as they seek to ensure secure control over access to the customer. The focus of many of these players is shifting away from the underlying network infrastructure to the interface between the customer, the multimedia or content provider, and the network operator. In this area, open system standards have yet to be agreed in areas that concern broadband switched networks and services and subscription service development using existing networks is at an early experimental stage.

For example, one of the most significant challenges in the convergent content/carriage marketplace is the introduction of the ‘set-top boxes’ and related decoding and billing equipment. This equipment will offer users ‘conditional access’ to new services. It will also incorporate encryption techniques to prevent unauthorised access. Developments in this area are being designed to secure a measure of control over the choices available to the subscriber and to influence the structure of the market.

In effect, conditional access systems are becoming the gatekeepers of access to networks in a similar way that a gatekeeper might control access to a bridge or the private property of a landowner. The systems are designed to ensure that programming and services are paid for in advance by end-users and in some cases by advertisers. The software embedded in conditional access systems enables the recording of consumer behaviour. When this information is embedded in a proprietary system it can create barriers to entry by prospective service suppliers. The software can be located in a ‘set-top box’ or within the network infrastructure provided by the incumbent telecom operator.
and by cable network operators if they are permitted to offer an array of subscription and other services on a commercial basis.

Thus, the incumbents and larger new entrants in the market are exploring new ways of gaining control of the access to the customer. The PTOs are intending to implement more transparent ways of ensuring that access to the underlying network infrastructure is possible, but they are finding very innovative ways of bypassing these measures which weaken their control of supplier and user options to access the network by introducing proprietary software based systems which intervene between the underlying infrastructure and the use of services provided by the network.

3.3 Controlling Access to Market Information

The players in the market also are engaging in behaviour which can give large conglomerates and the incumbent telecom operators unfair advantage in the acquisition of new competencies and the knowledge required to succeed in the market. Informal exchanges of information are an important part of the innovation process. From the perspective of vertically and/or horizontally integrated companies, these exchanges are part of the learning process and they contribute to competitive advantage in the market. But to those excluded from these ways of sharing information, such information exchanges can be perceived as anti-competitive exclusive dealings among companies, subsidiaries or divisions that have a common interest. There are many examples of this kind of behaviour.

- Subsidiaries of national PTOs may gain access to infrastructure capacity on terms that are advantageous to their own businesses and a lack of transparency makes it difficult to determine whether other operators are being disadvantaged.

- Spin-off companies in the multimedia and other advanced services markets (e.g. Internet access) may benefit by building on the knowledge acquired by the parent company, or the parent may benefit from early experimentation by its subsidiary. The issue is whether these opportunities give undue advantage to the incumbent operator thereby reducing entry possibilities by other players in the longer term.

- Mobile network operations are often provided by a division within the PTOs. This enables transfers of information, staff and funds within the organisation. The incumbent operator can benefit from the familiarity and goodwill that it has built up among its fixed service customers.

- In the cable television industry, valuable information is exchanged among the developers of services within the PTO-owned subsidiaries if they exist and between employees involved in other areas.

These examples suggest that conclusions about the viability of competitive entry in liberalising markets cannot be based on economic and technical considerations alone. Organisational structure, the culture of information sharing can enable knowledge transfers that are needed to build up the competencies required to address new markets. Such transfers are likely to be more frequent among companies that are vertically or horizontally integrated in new convergent markets.

In many cases, what is being acquired in these relationships is important information about what services customers will be willing to pay for. This can prove to
be highly valuable commercial information and a source of market power. It is also virtually impossible for regulators to require disclosure of this kind of market information. The issue for policy and regulation is whether the relationships that do emerge are suppressing competition in the domestic market and whether this development is consistent with national policy goals.

Another important aspect of control over market information that arises in the presence of vertically and/or horizontally integrated enterprises facing competition concerns information needed by intermediate users of networks and end-users to evaluate alternative service offerings. They experience increased difficulty in accessing information that enables them to make informed choices. Regulatory initiatives are needed to promote transparency and a reasonable flow of this kind of market information.

4.0 Strategic Consequences

The outcome of the strategies adopted with respect to each of the above control issues is important in three key areas:

1. infrastructure capacity and investment strategy;

2. employment; and

3. universal service.

4.1 Infrastructure Capacity and Investment Strategy

The timing of investment in advanced information and communication technologies – fixed and radio based – is one of the most controversial issues in liberalising markets. Governments and private sector investors do not want to be confronted with under-utilised facilities if projected growth fails to materialise. The problem of determining the appropriate timing of investment in digital facilities and/or fibre optic links is exacerbated by the fact that investors must consider whether to: use existing infrastructure which may not fully meet their functional requirements; build new infrastructure to specifications similar to their competitors; and/or build new infrastructure to new specifications taking advantage of technical innovations.

Actual investment behaviour is linked closely to how the policy environment affects private investor decisions. Government policy needs to consider the reasons that private investors might seek to build over-capacity or to limit capacity using new or existing technologies.

Optical fibre technologies now offer a cost-effective way of meeting demand projections including the delivery of conventional broadcast channels and interactive information services and the migration towards High Definition Television. However, incentives for investment are influenced by the degree to which players in the market are able to bundle aspects of their activities together in a bid to protect their investments. In the search to establish up-stream and down-stream linkages, companies are looking for new ways of monopolising markets. The most effective strategy is uncertain and is influenced by whether companies can successfully win control over network access, access to customers and to market information as discussed above. These are key factors that will influence investment choices. Thus the challenge for policy is not to determine
the appropriate timing of investment in new capacity, but to determine who has access to control over capacity investment decisions.

Control over the design of the technical aspects of the information highways is located with a small number of manufacturers and network operators. At the periphery of these networks there is a shift in control away from traditional operators. However, many of the new companies who are seeking to gain control are linked with traditional players. This could provide a basis for the emergence of new forms of market dominance and suppress new entry.

4.2 Employment Consequences

The employment consequences associated with technical change and market liberalisation are of growing concern. If competition flourishes, there is the possibility that some of those who become unemployed will be taken on by new entrants. PTO employment levels are declining and there have been changes in the skills mix, employment and working conditions, and the organisation of union representation (Trade Union Advisory Committee to OECD 1995). Most of the PTOs around the world have yet to experience the full force of competition and the number of employees is likely to continue to decline. The success of these companies in related domestic and foreign markets also will influence employment levels. Research has shown that there tends to be a five year lag between the initial liberalisation of national markets and the rapid decline in PTO employment levels. During this period, there are opportunities for collaborative initiatives by public and private sector actors to introduce re-training programmes to prepare employees for new jobs in a more competitive market environment (Mansell and Tang 1996).

4.3 The Dynamics of Universal Service

Voice telephone service using copper wire twisted-pairs was relatively slow to achieve the universality it enjoys today, but it has reached a high level of penetration in many of the industrialised and newly industrialising countries, as has the penetration of coaxial cable systems in a few countries. Innovations in network and service technologies in recent years have raised concerns about the rate of diffusion of the new super-highways.

The Universal Service Obligations (USO) that could be imposed on one or more telecom network and service suppliers are generally discussed in economic terms, that is, who should pay for the extension of upgraded networks and access to more advanced services. At present, universal individual access to broadband switched networks is not being considered as a USO. In Europe, for example, universal service continues to be understood as individual access to the network via analogue or digital switches for the provision of voice telephony (Office of Telecommunications 1995c). However, there is concern about whether access to this ‘basic’ service will be sufficient in the information society. There are also concerns about whether cable operators should be subject to ‘must carry’ channel rules.

There is a shift away from policy discussions about access to networks and towards debates about the availability and affordability of information applications. A distinction between ‘basic’ access to networks at reasonable prices and ‘basic’ access to information needs to be made. The issue is whether network operators and service suppliers who control the gateways for accessing customers should be permitted to screen
out certain kinds of information that may be regarded by public policy as essential to the conduct of business and everyday life. Decisions are needed on whether provisions need to be made to ensure access to certain kinds of public information (e.g. health, education, transport, government information) and whether the governments of member states or the European Union should underwrite the costs of ensuring that this information is accessible.

5.0 Policy and Regulatory Choices

There is a continuing role for public policy and regulation to negotiate an appropriate balance among the interests of suppliers and users in a complex market which is characterised by the Strategic scenario. In this case, the role of government as a policymaker and regulator is threefold:

1. To constrain the market power of dominant operators where their activities are anti-competitive or exclusionary;
2. To create incentives for new market entry when market liberalisation and competition are given political priority;
3. To ensure co-ordination and among multiple actors in the supply of complex information and communication systems to meet a variety of social objectives (including consumer protection) and economic objectives.

Table 2 shows the key areas in which policymakers and regulators need to focus their resources. In the full competition scenario, there would be no need to be concerned with network interface standards; software embedded in networks would be used to enable the unbundling of the functionality or ‘intelligence’ embedded in networks; product differentiation would be strong across all the submarkets in the convergent communication market, there would be strong competition in service delivery; transparent access to network infrastructure and control of the access points or gateways would be evenly distributed among all suppliers are users.

<table>
<thead>
<tr>
<th></th>
<th>Full Competition Scenario (Idealist)</th>
<th>Dominant Player(s) Scenario (Strategic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Interface Standards</td>
<td>open</td>
<td>some proprietary</td>
</tr>
<tr>
<td>Unbundled Intelligence</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Product Differentiation</td>
<td>strong, all submarkets</td>
<td>superficial, strong in some submarkets</td>
</tr>
<tr>
<td>Service Competition</td>
<td>strong, all submarkets</td>
<td>superficial, strong in some submarkets</td>
</tr>
<tr>
<td>Network Access</td>
<td>open</td>
<td>closed</td>
</tr>
<tr>
<td>Network Control</td>
<td>all suppliers &amp; users</td>
<td>some suppliers &amp; users</td>
</tr>
</tbody>
</table>

Table 2 – The new telecom: policy and regulatory challenges

In the case of the dominant players scenario, however, the situation is different. Policy and regulation needs to consider the impact of the implementation of proprietary
network interface standards, and whether it matters that network functionality is bundled
together precluding its use by some suppliers and users. They also need to consider the
implications of continuing monopoly control of some segments of the infrastructure and
service markets and of the closure of network access possibilities. In effect they need to
evaluate the impact on social and economic goals of the uneven distribution of network
control among a few oligopolistic players in the market.

In many countries, the political process which enables governments to carry out
these roles is not satisfactory. For example, it is perceived by potential new entrants as
being slow and lacking in transparency. Difficulties are experienced in resolving conflicts
of interest among economic and social actors. The existing decision-making apparatus
also makes it difficult to respond effectively to the implications of technical convergence
because of the fragmentation of legislative and policy/regulatory responsibility.

A wide range of views on the need for an ‘independent regulatory agency’ is
commonly expressed within countries. However, as long as the suppliers in the market
are not competing on a ‘level playing field’ and are developing strategies that will allow
them to ‘capture the customer’, there is a need to devise effective ways of regulating their
behaviour. By focusing on content and carriage issues in a coordinated way there is a
greater likelihood that social and economic goals will be addressed.

Many countries have yet to implement a telecom-specific ‘independent regulatory
agency’ model. These countries could lead the way by establishing integrated institutions
that would allow regulators to build the expertise needed to address issues across the
spectrum of advanced network infrastructure and services. An ‘independent’ agency
which is autonomous from national ministries, would enable regulators to focus on a
manageable number of critical problem areas. These problem areas are associated with
‘competing for access’.

The majority of customers over the next ten years in many countries will be
linked to two main access points to networks – telecom and cable. The penetration of
radio technologies (mobile and satellite) will increase but they are likely to complement
terrestrial systems rather than to substitute for them. Public policymakers and regulatory
authorities have an obligation to private investors to provide clear signals for investment
and to ensure that, whatever strategies are chosen by private concerns, the outcome for
customers is as efficient and equitable as possible. In the present environment, there is
often little transparency and business units are being bundled together (local, long
distance telephone, data, and other services, cable, mobile, and interests in content
production). This is occurring at the same time that technical innovations are making it
possible to unbundle the provision of infrastructure and services. The central issues for
policy and regulation concern the characteristics of control over the information gateways
by domestic and foreign-owned companies.

5.1 Controlling the Information Gateway

Control over the ‘information gateway’ can be achieved by controlling access to the
underlying infrastructure; the customer at the level of service applications; and access to
market information. If national governments and regional authorities choose to promote
competition they have little choice but to do so through the effective implementation of
measures that tilt the market in favour of opening and diversifying access at all three of
these levels. This will mean favouring new entrants. The regulatory apparatus can be used to influence the nature of control in the three critical areas.

1. **Access to the Underlying Infrastructure**: Network interconnection can provide a focus for regulation around which related issues including universal service obligations, numbering, ‘must carry’ rules, etc., can be addressed. Incentives for investment, wider geographical distribution, accessibility and affordability of advanced networks and services can be created through the innovative use of interconnect arrangements.

2. **Access to the Customer at the Service Level**: Control of the software that supports billing systems and results in the collection of customer-generated information about transactions can be used to advantage to determine preferences for new services. Therefore, action with respect to open systems standards implementation is essential.

3. **Access to Market Information**: The *bundling* of the chain of relationships between infrastructure and service providers under a limited number of large corporate structures creates opportunities to learn more effectively about what services customers will be willing to pay for. If these relationships are not discouraged they are likely to benefit the major players and to reduce opportunities for entry into certain segments of the market.

The issues of control over access to networks and services all involve the new information gateways (or toll booths) of the information society. They are the important issues for public policy and regulation. They affect business and consumer freedom of access to, and use of, information and they are fundamental to the future of democratic processes.

**6.0 Conclusion: Policy for an Information Society**

There are many uncertainties as to whether mergers, acquisitions or arm’s length commercial relationships will be successful in enabling network and service suppliers to be responsive to demand in national and international markets. There is also controversy as to whether the opening of markets to competitive entry without restrictions on inward foreign investment in services and limited restrictions on foreign ownership of infrastructure will work to the long term economic and social advantage or disadvantage of consumers and businesses. In the face of these uncertainties, the policy and regulatory response should err on the side of supporting new entry. The incumbent operators of existing networks are likely to limit the rate of network expansion until they have a better understanding of how they can control and influence the return on their investments. This is a realistic response to uncertainty about market demand and the willingness of consumers to pay for services.

If regulation is unable to address the strategies of operators who seek to limit access to any of the key aspects of the information gateway there is a risk of a return to monopolistic supply in some segments of infrastructure and service markets or the emergence of oligopolistic markets. This may be welcomed as part of a desire to encourage (or protect) nationally-based companies or because of a reluctance to intervene in the decisions of commercially operating companies. It may be that the *bundling* of
integrated activities is necessary to achieve success in the face of internationalising markets. The rise of new effectively regulated monopolies is a preferred alternative to unworkable competition that is left to run its course.

Most countries are favouring competitive entry but it must be recognised that this is likely to be associated with the Strategic dominant players scenario. This implies that a coordinated response to issues of control over electronic information is needed. A failure to do so could jeopardise the capacity of users to gain greater control over how they access and use new services. An integrated response bringing together public policy representatives who are concerned with both content and carriage issues would make it feasible to assess the effects of regulatory measures that now are discussed in isolated organisational settings. The interdependence of the segments of the convergent telecom, broadcasting and cable industries requires that the effects be assessed across these industries and in the light of both social and economic policy.

A creative public policy and regulatory response to these developments is needed. Such a response must focus on incentives for innovative behaviour, competitive entry and social policy goals in a limited number of areas. These areas can be limited to proactive policies and regulations concerning access to networks, customers and market information. Actions in each of these areas will influence how the large players in the new telecom markets will seek to ‘capture the customer’ – that is – to build dominant market share.

Coordinated assessment of these issues by ‘independent’ agencies is more likely to be able to address these issues from the perspectives of a wide range of social and economic actors than is fragmented assessment by different ministries. Today’s communication networks and services enable increasing opportunities for innovation and experimentation by smaller firms and consumers. Experimental initiatives by smaller firms and by public organisations contribute to the total stock of knowledge and competence available within each country. In a market characterised by the dominant player scenario, the independent initiatives of public organisations and smaller firms must be candidates for public financial support to encourage experimentation on a broad scale.

The Strategic scenario will bring commercial and social benefits to some participants in the information society and not to others. National governments and regional authorities cannot address all the problems of control over access to information gateways, but they were not able to do so in the monopoly era. National markets are subject to the forces of global rivalry and many countries have strong traditions of supporting the international business aspirations of nationally based firms. Policies and regulations which support these activities at the expense of domestic businesses and consumers who need to access a range of services need to be evaluated carefully. These new telecom markets are not characterised by free competition. Public policymakers and regulators must recognise that the interests of the larger corporations, individual citizens, and the wider social community, are not perfectly aligned in the information society. Failure to use public policy and regulation to minimise these mis-alignments will jeopardise positive visions of the benefits of technical change and the liberalisation of markets.

Endnote

1This chapter draws on research supported by the Rathenau Institute (formerly the Netherlands Office of Technology Assessment) and this contribution is gratefully acknowledged. The full study is published as R.