

# CONVERGENCE REVIEW

## ISSUES PAPER

### 1.0 INTRODUCTION

Governments all over the world are grappling with the issues raised by convergence between previously separate industries. The traditional barriers between industry sectors such as film, music, publishing, broadcast television and radio, telecommunications, computing, and services industries such as education and health are being eroded or restructured, and new industry boundaries are emerging.

The aim of this chapter is to explain why convergence has become an issue for governments. The answer is that government intervention (or the lack of it) in the convergence process will affect national outcomes in key areas like investment, job creation, international competitiveness, social and cultural outcomes, and regional development. Without a clear understanding of the links between national outcomes, government interventions, and structural change, there is no way that the government can address convergence coherently.

#### 1.1 Convergence, industry structure and the scope of this review

There is no generally accepted definition of convergence. It can refer to technological change, commercial mergers and acquisitions, or the emergence of new service types. Convergence issues encompass structural issues like the management of access markets, social issues like the availability of new services, and legal issues like copyright definition in electronic service markets.

This paper addresses convergence from the perspective of industry structure. This is because assumptions about industry structure underpin the current policy framework. If the structure changes, then the policy framework will fail.

The convergence agenda is not the same as the information economy agenda. The information economy agenda contains a range of important issues such as the protection of digital copyright, the promotion of community awareness and participation in the information society, and the promotion of consumer confidence in digital transactions. However, these are not directly related to structural convergence and are not the focus of this Review.

Nor is convergence solely or principally about the media industries. The media industries have a special role because of their social and cultural significance, but they are subject to the same basic technological, structural and policy challenges as the rest of the services sector.

For the purposes of this review, convergence is defined as *services sector restructuring enabled by digitalisation*. This definition has been adopted because it captures the main features of convergence that are relevant to this Review:

- First, it recognises that the scope of convergence is the entire services sector, not just telecommunications and broadcasting. The use of digital network technology

already extends into new health, education, entertainment, print and financial services which use electronic text, still pictures, and transactions.

- Second, it emphasises the structural dimension of convergence, which is the focus of this Review. Structural convergence has been under way for several decades and may yet have several decades to run. For example, the same forces which are enabling and driving convergence are also behind the restructuring of Australia's telecommunications industry.
- Finally, convergence is *enabled* by technological change. At the same time, it is *driven* by commercial forces. As technological change erodes traditional economies of scale and scope, industry players are seeking commercial gains by restructuring their operations to exploit new economies of scale and scope.

'Structural convergence' simply means the structural impact of services sector digitalisation. The 'convergence industries' are simply industries where structural convergence will have a significant impact—the infrastructure-based industries which provide information and transaction-based services. These industries are prominent in Australia's industrial landscape: telecommunications, retail, education, health, financial services, and the broadcasting and the film and music industries. The analysis of convergence must start with them.

## **1.2 Two structural paradigms in transition**

Two service sector business systems are currently in contention, each with its own preferred industry structures and business models.

The first system is exemplified by the traditional industries of telephony, radio and television. It is based on:

- analog, single-service network technologies;
- vertically and horizontally integrated corporate structures;
- business models based on mass production, with limited or non-existent service flexibility; and
- domestic market scope.

The suppliers' control of service design and delivery has made it relatively easy for regulators to control service and industry outcomes, because these requirements could be imposed directly onto domestic infrastructure owners.

The Internet and the networked applications that are deployed across it exemplify the second system. It is based on:

- digital, programmable network technologies which support multiple applications;
- vertical structural separation between the services (which users see) and the underlying delivery networks, and new competition in industries which were previously monopolies or oligopolies;
- business models based on mass customisation, with close user involvement in service definition, and significant flexibility and service innovation; and
- international market scope.

Service and delivery activities are becoming increasingly fragmented, dispersed and internationalised as these changes occur. Government intervention in these activities is becoming progressively more difficult because the current policy framework relies on traditional assumptions about industry structure and market scope which are increasingly irrelevant.

The service sector is in transition between these paradigms, and this transition will be a costly and complex process. Different countries and different industries are proceeding at different paces, creating commercial and regulatory tensions in both international and domestic service markets. In many ways, it is the management of the transition, rather than the management of convergence *per se*, which is the greatest challenge for both industry participants and governments.

### **1.3 Convergence policy issues**

The scale and nature of convergence raises many issues for government, and will profoundly affect the government's capacity to achieve the economic, social, cultural, and industry development objectives set out in current policy:

- Convergence will be pervasive, extending the services sector and reaching from there into the other industries which use services as inputs. It will have a significant impact on national economic performance, our competitiveness in international markets, and our capacity to attract inbound investment.
- Convergence will undermine traditional industry arrangements and business models. There will be important new avenues for economic growth and development, and significant destruction of the value of existing businesses. Government policy settings will strongly affect industry's ability to manage the transition successfully.
- Convergence will have significant impact on our labour markets and on demand for skills. The services sector is the primary engine of employment growth in all developed economies including Australia, and convergence will affect the sector's capacity to generate new high-value jobs in the future.
- Convergence means increased trade exposure in industries where natural barriers to competition have previously afforded a level of protection for both large and small firms, and raises new issues about Australia's positioning in international services markets.
- Convergence raises new opportunities and threats for Australia's regions. Convergence could be either a centralising or a decentralising force, but it will certainly be a major factor in the competitiveness of the regions and their capacity to attract service-related investment and economic activity.

Government intervention matters. It is an important determinant of industry structure and performance, and will affect industry's ability to adapt to the new environment. A regulatory regime that imposes structural rigidity will prevent adaptation, undermine our structural competitiveness in domestic and international markets for networked services, and deny Australians the benefits of new technology. Alternatively, a policy framework, which addresses convergence developments, will enhance the ability of government, industry and consumers to realise the benefits of change.

#### **1.4 The fundamental issue: new environment, new assumptions**

There are many areas where convergence raises questions about the current policy objectives and implementation. A few examples include:

- how to facilitate innovative and competitive networked service industries, including content based industries, in domestic and international markets;
- whether and how broadcasting infrastructure should be subject to the same economic regulation as telecommunications and computing networks;
- how to ensure that Australian content and diversity can be achieved within new industry structures and alliances, new international markets, and new business models;
- how to provide minimum guaranteed levels of access to networked services in a multi-service and multi-infrastructure environment; and
- how the regulatory institutions might be structured to better serve the government's policy objectives.

The fundamental issue addressed by this review is:

*How must the government's policy objectives and intervention strategies be adapted to fit a convergence industry environment?*

National outcomes sought by the government do not change with technology, and this review takes these outcomes as given. The emergence of a new industry environment raises two kinds of issues for government policy makers.

The first kind of issue is about the relevance of government intervention in a new industry context. National outcomes such as the promotion of industry development, economic efficiency or Australian culture will always be relevant. Subsidiary or instrumental policy objectives such as the promotion of competition, or local sourcing requirements for carrier equipment, or local content rules for broadcasting, may not have the same relevance or meaning in convergence industry settings. These policy objectives may need to be reinterpreted as the external environment changes.

The second kind of issue is about the effectiveness of government intervention. If it is agreed that government should pursue certain outcomes, what kinds of intervention will be available if structural change erodes traditional mechanisms of intervention? This raises issues about new implementation strategies that will be needed to deliver outcomes.

#### **1.5 The structure of this paper**

This paper is in three principal parts. The first part deals with the structural changes arising from convergence. The second part deals with the regulatory consequences of these changes, particularly the way that convergence is affecting the scope and the effectiveness of existing policy objectives and interventions. The third part draws out the policy implications, and presents some explicit issues and questions designed to elicit comment.

The first part begins with an analysis of how changes in technology are affecting economies of scale and scope in the services sector. These shifts in economies of scale and scope are shifting the sources of economic value and the centres of economic power in the services sector, and these changes will flow through into new industry structures and business models. The objective of this discussion is to determine the most important differences between pre-convergence and post-convergence industries, and explain in broad terms what this means for industry participants.

The second part is an analysis of Australia's current policy framework from a structural perspective. Two separate approaches are taken:

- The first is a 'top-down' discussion of the impact of structural convergence on the government's overall economic, social and industry development objectives. The key issue is how to reinterpret these objectives in a new industry structure, particularly a structure where service provision is no longer tied to infrastructure ownership, and where service markets extend beyond our national borders.
- The second approach is focussed on the impact of convergence on the current policy implementation strategies. The key issue is how convergence will undermine the structural assumptions which underpin those strategies, and what implications this has for the scope and effectiveness of the current policy framework for electronic networks.

The third part is a discussion of the implications of structural convergence and the current policy framework for two major sectors: the telecommunications and information services sector, and the media and content sector.

## **1.6 Issues for comment**

A range of issues and questions are presented in those discussions, but submitters may ignore any of these, and may also address any related issues or questions that they think should be raised. The particular questions and issues raised in this paper are summarised in the following points.

### **3.1 National outcomes and the relevance of policy objectives**

*Does the government currently pursue any other objectives, apart from the ones set out in this paper? Are these economic, social and industry development objectives more relevant or less relevant in a convergent environment? Are there new policy objectives that should be adopted to meet new challenges?*

### **4.2 The telecommunications and information services industries**

*Is there a strong relationship between government intervention and industry structure, or is industry structure primarily driven by technological and commercial factors? Should the government aim to determine industry structure pro-actively or should the government merely facilitate structural change when the direction of change is already apparent?*

*Can domestic intervention in market structure and conduct be effective in an international connectivity environment? Will the primary driver of market structure*

*and conduct be domestic policy intervention, or international technology and commercial factors? How much scope is there for national approaches to structural policies in the convergence industries?*

*What is the appropriate scope of the interconnection and access regime for digital networks? Should it extend beyond telecommunications networks to include computer*

*networks and digital broadcasting and cable networks? If not, what factors should determine the boundaries of an interconnection regime? When and where is such a regime needed?*

*Are there any benefits in preserving the joint licensing of applications and services activities and infrastructure and connectivity activities (e.g. in the broadcasting sector)? Or should these two types of activity be licensed separately across the services sector? What would be the implications for the division of responsibility between different regulators?*

*Should the telecommunications access regime for content services be extended to include all applications, content-based or not? Or will technological and commercial realities ensure that third-party applications providers have access to digital connectivity anyway?*

*Will international commercial processes drive technical standards? Are there ways that governments can influence international standards processes, or is Australia a 'standards-taker' only?*

*Is there a role for government in the area of interoperability between applications? Or is this a commercial matter best left to the applications industries? Are there ways the government can facilitate commercial solutions to these issues? What are the implications for the users of services?*

*Do current domestic policies address the economic power arising from intangible assets such as branding and proprietary standards as effectively as they address issues arising from physical assets? What are the limits of government's ability to influence outcomes in this area? What are the implications for competition in convergence markets?*

*Are the current allocation processes for scarce resources such as spectrum and electronic addresses effective in international markets? If not, are multilateral or commercial alternatives available?*

*Do the efforts of service providers to build up diversified service suites, by acquisition or through strategic alliances, raise any significant competition issues? Does the 'lock-in' of users and customers to particular service providers raise any significant competition issues? Are these issues significantly different from competition issues arising from bundling or marketing in other industries?*

*Will the growing diversity of demand undermine the relevance of 'one size fits all' interventions such as the Universal Service Obligation? Is the universal provision of a*

*standardised telecommunications service the correct objective in a convergence environment?*

*Can more diverse demands be met through the current industry and regulatory framework, or will alternative implementation mechanisms be needed? What role might new sources of connectivity such as digital datacasting play in meeting these new objectives?*

*Are there non-regulatory mechanisms, including commercial mechanisms, which could be used by the government to promote access to connectivity in otherwise marginal consumer markets and user communities?*

*Should the government's long term role be the facilitation of the delivery of applications and services? Or should the government's focus be on the provision of connectivity, bandwidth and the associated infrastructure?*

*What are the implications of borderless delivery of services for the regulation of service delivery? Can the consumer safeguards and accreditation schemes already established in the education, health, retail, and other service industries be readily transferred to the electronic domain? How can these safeguards and schemes be enforced in international markets? Are commercial solutions to consumer confidence issues adequate to address consumer issues? If not, what should be the balance between government intervention and commercial incentives to preserve market reputation and the value of the brand?*

*Are current market development and innovation support schemes relevant to convergence industry structures and priorities? Are separate industry development policies for application, connectivity and infrastructure industries appropriate, or are there linkages which require concerted development policies? What are the different industry development priorities of the applications, connectivity and infrastructure industries?*

*What implications does the growing importance of intangible assets such as skills, trusted brands and proprietary standards have for Australia's international competitiveness? Do current policy settings adequately address the new importance of these assets?*

*What scope is there for the government to raise the level of international connectivity hubbing in Australia? Are there ways that government can indirectly attract infrastructure and connectivity investment by attracting key applications activities such as electronic commerce and content service provision for the Asian region?*

*Can Australian user communities be leveraged to help generate the required critical mass of activity, investment and innovation needed to ensure international competitiveness? Can government facilitate this process and if so, how? What relevance does this have to economic, industry and social development in regional Australia?*

#### **4.3 The media and content industries**

*Will one service delivery model eventually dominate the media, or is there scope for*

*different models to co-exist? Will supply-side issues, such as securing distribution channels and sources of content, mean that vertical integration will persist, at least on some areas? Or will the Internet service model prevail?*

*Should service and infrastructure licensing be separated? How does this depend on the service delivery model that prevails?*

*If service and infrastructure licensing were separated, could spectrum for broadcasting services be allocated in the same way as other spectrum? Or are there still social issues that should be accommodated in the allocation of spectrum for broadcasting services?*

*What are the implications for the role of the broadcasting regulator in spectrum allocation and technical regulation?*

*Will the emergence of international connectivity and infrastructure markets lead to the internationalisation of content-based services markets? Or will demand for local and national relevance mean that content-based service provision will ultimately remain a domestic industry?*

*What is the impact of the erosion of market boundaries on the current broadcasting licence regime? Are geographical licensing and audience reach rules sustainable if service delivery is no longer tied to terrestrial infrastructures?*

*Will broadcasting outlets continue to focus on mass audiences, or will audiences continue to fragment over the longer term? Would a more fragmented domestic audience help or hinder the achievement of social objectives such as the promotion of Australian content and media plurality?*

*How can the cultural and social significance of content-based services be measured in a multi-channel convergence environment where service provision is no longer linked to infrastructure and connectivity provision? Will channel scarcity, and ownership of infrastructure continue to be the principal source of cultural and social significance, or will other factors be more important?*

*How can other dimensions of plurality, such as localism and community access, be accommodated in a convergence environment? Would user communities play a stronger role in a more fragmented media industry?*

*What is the role of national and community media in extending media plurality and Australian identity in a convergence environment?*

*Could output requirements like Australian content rules and community standards be enforced in an environment where delivery infrastructures are international, and content and service provision are structurally separated from connectivity and infrastructure provision?*

*If a more fragmented content service industry emerges in a convergence environment, which 'community' standards should apply: the standards of the general community, or the standards of the target audience? Can the application of these two standards be reconciled, and if so how?*

*What scope is there for effective non-regulatory interventions to address community standards issues, especially indirect measures which empower individuals, families or communities? Are these measures likely to grow in importance? What is the scope for international cooperation on community standards regulation?*

#### **4.4 Regulatory transition management**

*What particular factors will determine the pace of structural convergence in your industry?*

*What other factors determine the pace of structural convergence apart from technology change and policy stances?*

*What other issues are raised by regulatory transition? Are there general lessons from past regulatory transitions (e.g. in the telecommunications or financial services industries) which should apply to the transition to convergence policy approaches?*

#### **4.5 Regulatory institutions and enforcement**

*On what basis should regulators be structured in a convergence environment? Should industry-specific regulators be restructured along economic and socio-cultural lines?*

*Or should regulators be restructured to concentrate on infrastructure/connectivity and applications/service industries separately? What are the implications for the current responsibilities of the regulators?*

*Does it make sense for some activities (e.g. spectrum management) to continue to be split between different regulators on industry specific lines?*

*Where will economic, socio-cultural and industry development objectives overlap and require coordination?*

*How should the respective responsibilities of Commonwealth and State Governments for digital services policies be determined?*

## **2.0 TECHNOLOGY, CHANGE AND STRUCTURAL CONVERGENCE**

In this chapter, we examine the structural differences between the traditional and the convergence services industries. New types of markets for services are emerging, and the geographical scope of those service markets is changing. The structural context of the services sector is now an international context, and international factors will strongly affect Australia's competitiveness in international services markets.

The questions addressed in this chapter are:

- How is technology related to traditional services industry structures and business models, and the traditional sources of economic value and centres of economic power?
- How are changes to technology affecting industry structure and business models, and shifting the sources of economic value and centres of economic power?
- Which industries are likely to bear the brunt of these changes?
- What are the key convergence changes that should be expected in these industries?

### **2.1 Technology and industry structure**

Any discussion of convergence must begin with a discussion about technology. This is because technology is the primary supply-side constraint on commercial action and policy intervention. Business and policy strategies are always designed to exploit a technology's underlying capabilities. It is impossible to understand how new technology is undermining those strategies unless the relationship between technology, traditional industry structures, and the policy framework is understood.

The political economy of these convergence industries will principally depend on two factors:

- Who creates economic value? What kinds of activities and collaborations create the economies of scale and scope which are the source of economic value-added in a convergence environment?
- Who captures economic value? How will changes to market, industry and regulatory structures shift the centres of economic power throughout the convergence sector?

Technology is the most important determinant of these factors, because technology and the associated business processes are the principal determinant of the sources of value-added and the centres of market power. Major shifts in the underlying technology of an industry are accompanied by major shifts in these sources and centres, and a redistribution of the benefits of economic activity. These changes affect different industries in different ways.

There is a close relationship between economic value, economic power and industry structure. Industry participants structure their operations in order to internalise the activities that generate value and to occupy the industry positions that confer economic power. As the sources and centres shift, industry structure will also shift as

industry participants restructure their operations in order to capture new commercial opportunities.

### *Creating and capturing economic value*

Economies of scale and scope are important sources of economic value. They reflect the efficiencies that are available through the exploitation of a particular technology.

Economies of scale exist when a bigger business operation is more efficient than a smaller one. There have always been significant economies of scale in network provision. These economies of scale still exist, although they are growing weaker with technological change. Mass marketing can also generate economies of scale in service industries. If economies of scale in an activity are strong, the result is often horizontal integration and a monopoly or oligopoly industry structure.

Economies of scope exist when two different businesses can be run more efficiently together than they can be run separately. If these two activities are vertically related, the result is often vertical integration. If these two activities are both upstream or downstream of a third activity, the result is often the horizontal and vertical integration of all three. There have always been strong economies of scope between the provision of network infrastructure and the provision of services on that infrastructure. These economies of scope still exist, although their strength is declining with technological change.

The businesses that create value through these economies are not necessarily the businesses that capture it. Technology can also create market bottlenecks which confer economic power, and allow certain industry participants to capture a disproportionate share of economic value-added produced by others. If this power is exercised in international markets, the result can be significant services trade imbalances between countries with strong positions and those with weak positions.

## **2.2 The analog legacy and the digital future**

In order to understand these shifts, it is necessary to understand the differences between the technologies that underpin the traditional and convergence services sectors. The principal technology trend is the progressive digitalisation of services industries that previously relied on analog or physical networks to deliver their outputs.

Prior to the introduction of digital technology, all communications networks were comprised exclusively of 'analog' electronics that represented the content of communications— voice or video—as a direct electronic copy of the original content. For example, the sound waves from a human voice were converted into electrical waves by a microphone, transmitted through wires, and converted back to sound waves again at the other end of the line. Analog television works on the same principle, although the system needs to be more complex to cater for both pictures and sound.

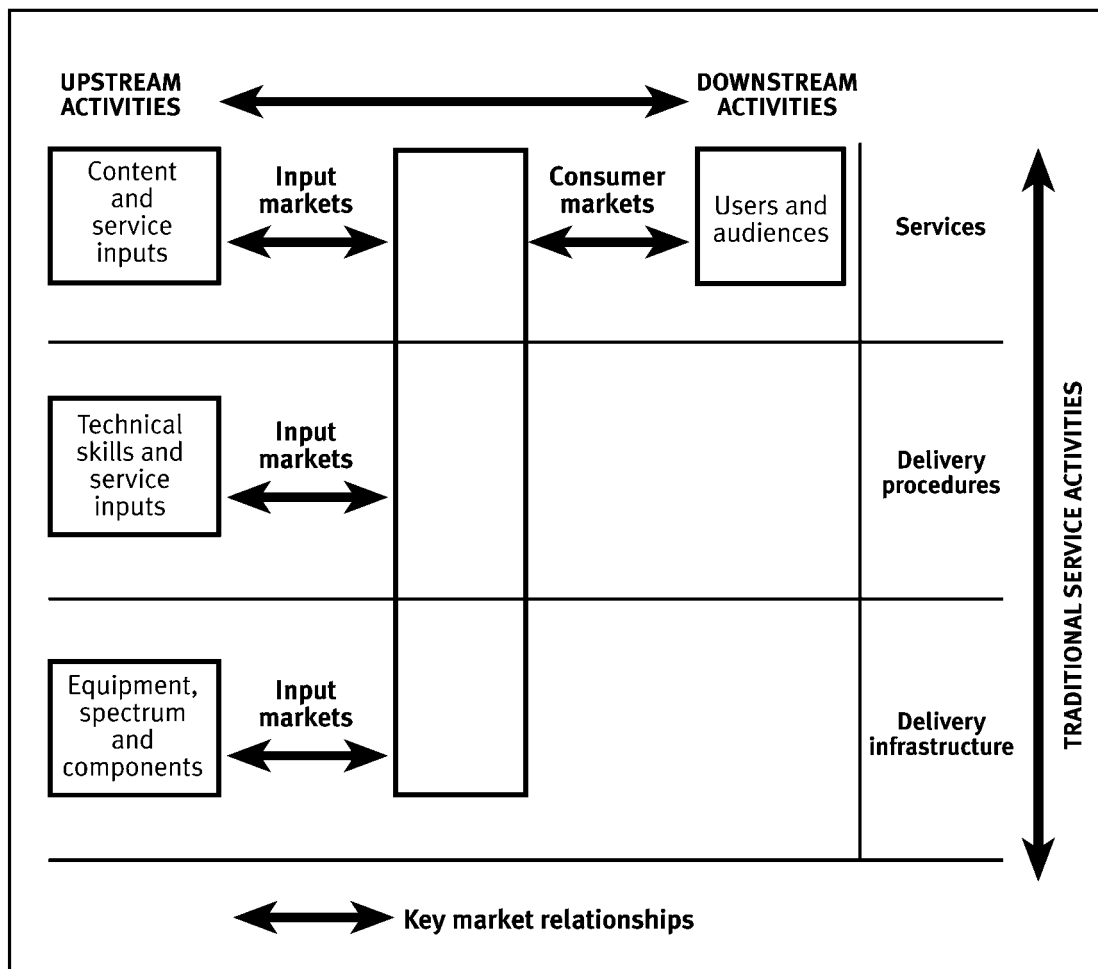
The inflexibility of analog technology makes it difficult and costly to provide intelligent and configurable services, so the traditional services sector was limited in the way it could address individual needs. Standardised services, widely deployed, were the

result. The high cost of analog infrastructures also prevented the emergence of international infrastructures spanning national markets.

In order to understand the current policy framework and the issues that convergence raises, it is necessary to understand how analog technology is related to traditional industry structure. The past dominance of analog technologies has had three key structural consequences:

- strong economies of scope promoted vertical integration of infrastructure and services. This has placed service definition and development firmly in the hands of infrastructure owners;
- strong economies of scale promoted horizontal integration of infrastructure. This has placed economic power in service, input and consumer markets into the hands of infrastructure owners;
- technological limits to the creation of international infrastructures, combined with the integration of service and infrastructure, confined service markets within national boundaries.

### Exhibit 2.1 Traditional services industry structure



The three technological/structural features (distinct and vertically integrated industries, dominant infrastructure providers, and domestic market scope) were the

basis of the regulatory model that applied to all services industries before digital technology, including telephony and broadcasting. National regulators were able to control service providers on an industry-by-industry basis by controlling entry to domestic infrastructure markets. Almost all communications regulation was implemented in this way until the beginning of the 1990s.

### *Digitalisation and convergence*

The spread of digital technology throughout the services sector is the key enabler of convergence. Digital technology is imposing its own structural consequences on the services sector, and is undermining the industry structures and regulatory frameworks inherited from the analog era.

Digital technology differs from analog technology in the way it treats the data and signals which travel on networks. Instead of representing a signal as a true electrical copy, it represents signals as numbers. All forms of content and transaction can be encoded as digital numbers: video, audio, text, and financial data. Once these different types of content are digitally encoded they all have the same form, and can be carried on the same digital network. The network doesn't know or care about the substance of the data, only its form.

There are three reasons why digitalisation is having such an important impact on industry structure:

- Digital networks allow third parties to develop and deploy their own services across these networks, so infrastructure owners no longer control service offerings. This is eroding the economies of scope between services and the means of delivery, and promoting vertical separation between the services which users see, and the underlying infrastructure and delivery procedures (or 'connectivity'). New economies of scope are emerging as digital capabilities allow users to customise services and to actively participate in economic value creation.
- The emergence of standardised interfaces for digital network interconnection, along with rapidly falling digital technology costs, have weakened the economies of scale in the provision of infrastructure. This is facilitating increased competition in infrastructure markets, which is eroding the economic power traditionally wielded by infrastructure owners.
- Falling technology costs have flowed through to much cheaper international communications. Combined with the vertical separation of service and infrastructure, this has allowed the emergence of international markets for digital content and other services.

### *Economies of scope, vertical disintegration and mass customisation*

Wholesale markets for access to digital networks are emerging. This has allowed independent third parties to develop and deploy digital services to customers over the digital network platform. The proliferation of websites and of other Internet-based applications is a good example.

This is similar to what occurs in personal computer technology. A computer can run a variety of third-party applications, and the digital network can do the same. Each

service—a financial transaction service, an entertainment service, and even a voice service—can be identified with the networked software application that provides it.

This has broken the nexus between service provision and infrastructure ownership. The result is a growing structural separation between the provision of **connectivity** (and the underlying network **infrastructure**), and the provision of the networked **applications** that exploit that connectivity. This has led to new competition between traditional service offerings and new offerings from applications development industries outside the control of the traditional services sector incumbents, increasing the level of service innovation.

The capabilities of digital technology also allow for services to be re-programmed by users to better meet their own needs, weakening the service providers' hold on service definition. 'Mass customisation' of services by users is now possible, utilising information provided wittingly or unwittingly by users. The contribution of users to service definition is a powerful source of economic value in convergence service markets. This value is multiplied if information about users' preferences can be exploited across a range of services, rather than just one.

The structural consequence is that service providers have a strong incentive to diversify their service offerings, particularly into industries where customisation is a competitive advantage and user information can be exploited. Service providers without this relationship to the user (e.g. traditional broadcasters) are in a relatively weak competitive position unless they diversify their business into new areas or implement new business models where these relationships can be developed.

This also has important implications for competition in consumer markets. A service provider in possession of detailed information on a user's preferences is in a strong position against competing service providers in seeking that user's business. The result will be the consolidation of activity around the businesses which can best manage and exploit user information databases. These databases, and the capacity to manage them, will become new bottleneck assets and a key source of economic power in networked service markets.

Proprietary technical standards are another source of bottleneck power in interface markets, particularly the interface between the network and customer premises equipment. To understand why, it is necessary to remember why standards are used at all. When standards are adopted across an industry, positive externalities are generated because technical costs are lowered for everybody. This is true of both open (i.e. free) and proprietary (i.e. licensed) standards.

The key difference between an open standard and a proprietary standard is that a proprietary standard allows the owner of the technology to appropriate some or all of these externalities through licensing royalties. This is why technical standards are emerging as a key competitive battleground in the computing, Internet messaging, digital TV, digital video and digital music industries.

The imposition of a proprietary standard places the technology owner in a powerful economic position. This does not necessarily mean that a proprietary standard is a bad thing. Proprietary standards are better than no standards at all, but there is a significant temptation for holders of any bottleneck power to abuse their position. In certain circumstances, refusal to licence a dominant proprietary standard can amount to an attempt to eliminate or exclude competitors.

### *Economies of scale, competition, and wholesale markets*

Digital technology is cheap and flexible compared to analog technology. It also makes it much less costly to interconnect different networks, because it is relatively easy to specify standardised interface technologies that allow competing networks to be connected.

In the telecommunications industry (where digital technology has become common) competing carriers and service providers have exploited these capabilities to gain access to Telstra's network. This has eliminated the need to replicate Telstra's infrastructure in order to offer voice and data services.

At the same time, alternative sources of digital connectivity have begun to emerge, notably the computer, digital radio and digital television broadcasting industries. As a result, an interconnected portfolio of competing digital networks has begun to take shape. Connectivity is increasingly being provided in competitive wholesale interconnection and access markets, and being traded as a commodity rather than a premium or specialised product.

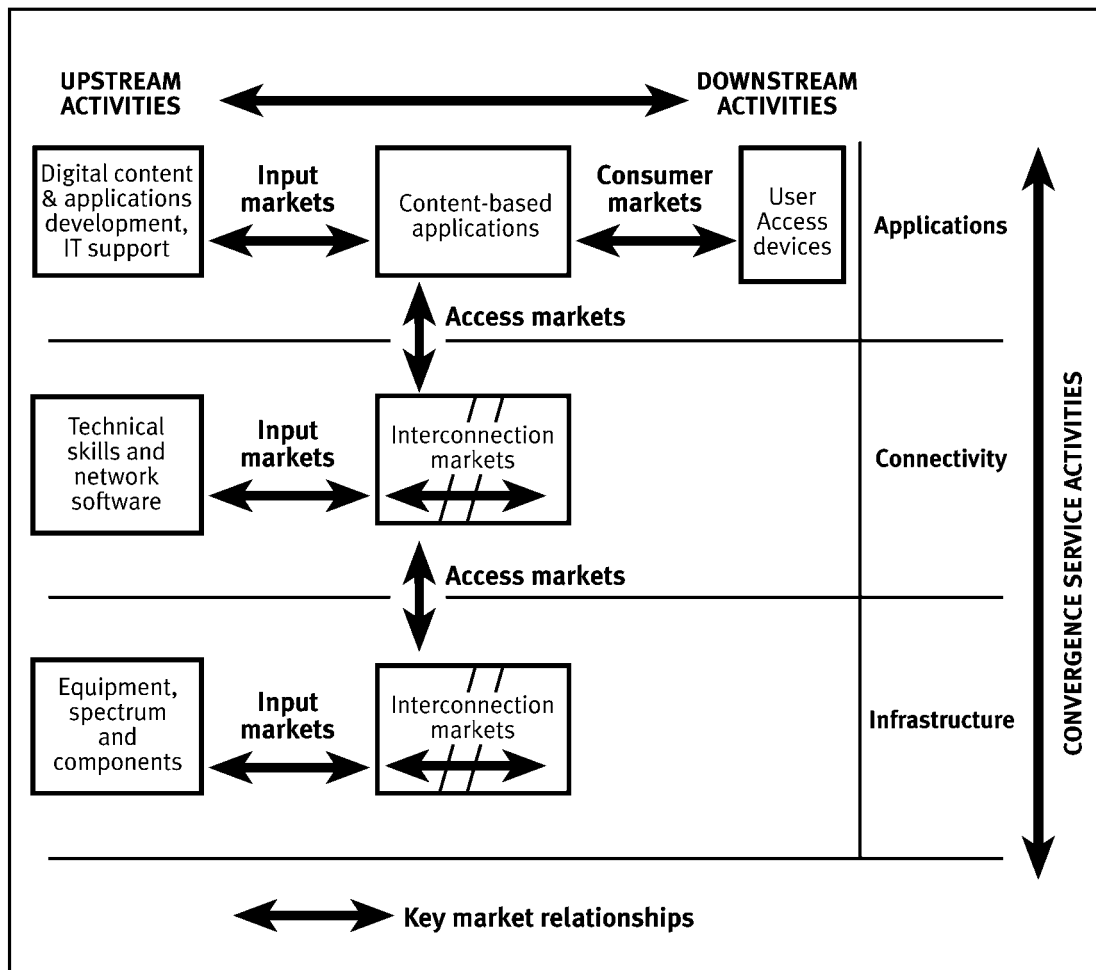
This is weakening the economies of scale and scope that had previously prevented infrastructure-based competition and integrated the provision of basic connectivity with the provision of underlying infrastructure. New entrants in the infrastructure market, and new wholesale markets for access to infrastructure and basic connectivity, are reflected in vertical and horizontal separation of the telecommunications industry.

The pace of innovation and the level of competition have increased because of these developments, but economies of scale and scope still matter. New entrants have tended to concentrate on high-value markets where the disadvantages of small size and limited infrastructure are offset.

### *Convergence business activities*

The result of these changes is the emergence of a different structural model for service provision on digital networks. This model is based on the technological characteristics of digital networks, but it does not attempt to capture the full complexity of the electronic services sector. For example there are many intermediate access markets in the connectivity industry, dozens or hundreds of interconnection markets, and there are thousands of different types of applications. The model simply illustrates the generic relationships between the principal businesses in a digital networked environment.

## Exhibit 2.2 Convergence services industry structure



Seen from this perspective, services sector business activity occurs at three main levels.

The **applications** industry is about providing the functionality and services that users want. Users can be either persons or machines - a telephone call requires two human users, but an automated financial transaction can take place between two computers.

Applications may deliver content, but many do not. Examples of content-based applications are voice telephony services, radio broadcasting services, television broadcasting services, audio and video streaming services, and web browsing. Examples of non content-based applications are electronic commerce services, search engines, and networked data processing services. Some emerging services such as interactive entertainment are both content-based and transactional, and fully exploit the capabilities of the digital network.

Applications can be deployed by the owners of the underlying infrastructure, by third-party applications service providers, or even by users themselves, provided there is access to the underlying network. The number and type of different digital applications is only limited by the imagination of applications developers and the desire of users to pay for them.

Applications are digital software, and require an access device to interact with a person. The access device is often specialised for a particular application or applications. A mobile telephone handset is specialised for mobile voice communications, and a television set is specialised to display sound and video. The type of device depends on the requirements of the application.

The **connectivity** industry is about providing the links which applications need to connect users in different locations. Connectivity is simply managed digital bandwidth. There are many kinds of connectivity provided by different technologies: digital broadcasting capacity and telecommunications carriage services are obvious examples. The Internet provides connectivity according to a technical standard known as TCP/IP.

Many connectivity providers are not infrastructure providers, or provide only limited infrastructure. Telecommunications resellers and many Internet Service Providers (ISPs) operate in this way.

The **infrastructure** industry is about providing the hardware and basic operating functions which underpin the provision of connectivity and applications. This includes the provision of digital telecommunications infrastructure, networked digital radiocommunications equipment, digital broadcasting infrastructure, and Internet infrastructure such as servers and points of presence.

Infrastructure providers are generally also connectivity providers, although some local governments and utilities are developing plans to provide 'dark fibre' (i.e. unused optical fibre) and similar infrastructure for use by other infrastructure and connectivity providers.

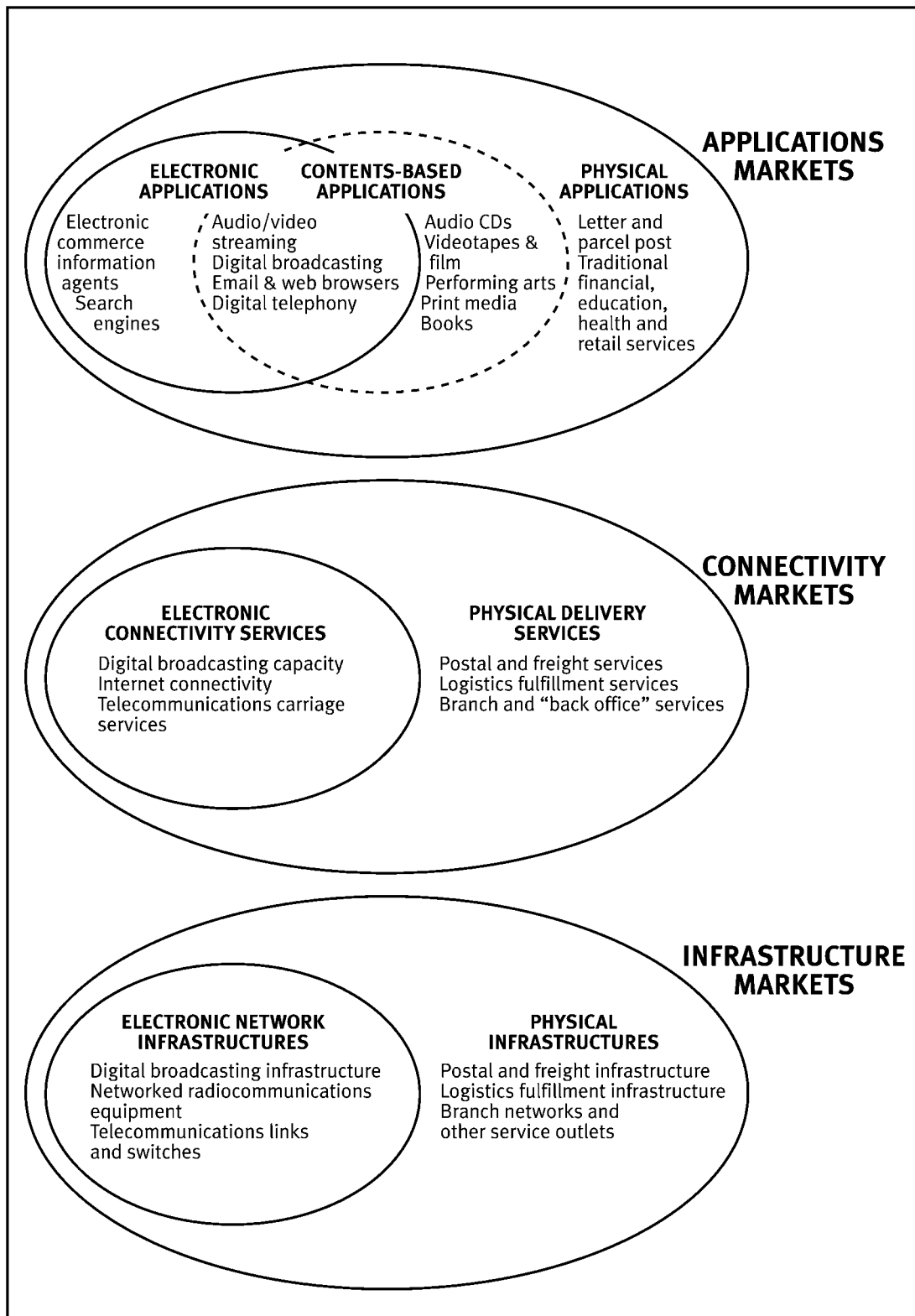
#### *Convergence industry and market boundaries*

Different digital networks are potentially competitors for the supply of the connectivity. In addition, digital applications services and traditional services are in competition for revenues and customers.

As the capabilities and bandwidth of digital networks increase over time, the level of this competition and substitution will increase. This means that applications, connectivity and infrastructure markets are progressively being linked into three corresponding industries.

The activities undertaken in the applications, connectivity and infrastructure industries are illustrated in the following exhibit. These industries include not only electronic services, but also other types of service that are, at least potentially, substitutable.

## Exhibit 2.3 Convergence industries and linked markets



The fundamental difference between the analog and the digital paradigms is embodied in the idea of an application. In an analog system (e.g. the traditional telephone network) or physical system (e.g. a system of retail outlets), the functionality of the system is indistinguishable from its delivery. The infrastructure

and the procedures which make the business work are the service that the business provides.

In contrast, on a digital network there is a clear distinction between the application (which provides the functionality) and the connectivity (which provides the delivery). Control of one does not necessarily provide control of the other.

The applications/connectivity dichotomy recalls the distinction between carriage and content which is common in broadcasting policy debates. There is an important difference. Applications include a wide range of services that are not content-based, including electronic commerce transactions, electronic mail, and search engines. Digital broadcasting services and online newspapers are simply members of a special class of application, one that transmits content with minimal interactivity.

All real networks are a hybrid of the idealised models presented here, but some real networks closely approach these idealisations.

The traditional broadcasting industry closely follows the 'analog model' of vertical integration and supplier control of service offerings. This reflects the very limited penetration of digital technology into the broadcast delivery networks. Where digital technology has penetrated (notably in satellite broadcasting), the business model more closely resembles the digital model. The broadcasting service (the application) and the satellite connectivity and infrastructure are provided by separate businesses, but the lack of interactivity still leaves the service provider in control—although that will also change soon.

The telecommunications network is a hybrid of digital and analog technologies. Digital technology has completely displaced analog technology on the national and international trunk network, but the local access network remains an analog bottleneck on the exploitation of the network's digital capabilities. As a result, the telecommunications industry has been fairly slow to adopt convergence modes of business. This is set to change as digital data technologies invade the local loop, creating an end-to-end digital network.

At the opposite extreme, the Internet closely follows the digital model. The Internet is a 'dumb' network which places almost no technical constraints on the type of applications which can be deployed by any person.

The result of this open network philosophy has been an unprecedented level of service innovation on the Internet over the last four years. This boom in innovation triggered initially by the spread of web publishing, and has been followed by Internet search engines, electronic commerce applications, free email services, advanced messaging applications, and a host of other new services. It is no exaggeration to say that four years of the Internet have generated more service innovation than the previous forty years of broadcasting and telecommunications combined.

#### *Internationalisation of connectivity and service markets*

All electronic service markets are becoming, potentially, international markets, and the international market for networked services is not a level playing field. The economies of scale in the provision of digital switching and transit result in a structural cost advantage for countries able to attract and retain large international communications traffic volumes. This kind of cost advantage is an important element

of competitiveness in international services markets, and across the economy where services are important inputs to business and households.

In the last four decades, a 'hub-and-spokes' structure has developed where international communications links (particularly undersea cable) tend to terminate in the US, and most international connectivity is hubbed through the US. As economies of scale have increased, the United States' strong position in international communications markets has been entrenched. Most of the Internet content in the world is stored in the US. In 1998, most European Internet traffic was being hubbed through Virginia, and most international Internet traffic in the South-East Asian region (including Australia) is still hubbed through California.

This kind of self-reinforcing advantage is familiar in economic geography. In international electronic services markets, the source of competitive advantage is not the economic geography of trade routes but the economic topology of networks. The *shape* of the network determines which nodes enjoy the benefits of the economies of scale inherent in digital technology, and which nodes capture the bulk of the economic benefits generated by international service sector activity.

The cost advantage derived from economies of scale in international connectivity makes North America attractive to applications and content service providers. The consequence is that Australia's international environment is currently dominated by a single external hub for both international communications transit and electronic services development, and this hub is strongly positioned to exploit its advantages of scale and the depth of its capabilities. The central question for our international competitiveness is how Australia can best prosper in an environment where competitive disadvantage is a structural feature of the market.

### **2.3 The scope of convergence and the role of the demand side**

This discussion so far has been conducted as if digitalisation will affect all service industries equally, and has practically ignored the impact of user demand. This section discusses the way that industry specific and demand related factors will complicate the simple supply-focused picture.

#### *The scope of convergence*

Different industries will be affected by structural convergence to different degrees. The most important factor that determines this impact on any given industry is the extent to which digital networks actually provide an alternative delivery channel in that industry. If digital technology presents no challenge to existing business models either directly or through new digital competition, then structural convergence is unlikely to have much impact.

Technology factors may also affect the extent of structural convergence. The discussion up to now has assumed that it will be technically possible to interconnect networks, and for third-party applications developers to have easy access to underlying connectivity. If this expectation is not met, then complete structural convergence might not occur:

- Any persistent differences between the technical standards on different networks could prevent the emergence of interconnection markets for the transfer of digital data. This would entrench traditional industry 'silos'.

- The imposition of restrictive commercial conditions (such as pricing) or technical standards (which might impose technical restrictions on applications developers) in wholesale markets could discourage third-party service deployment and innovation.

#### *Demand side factors in service markets*

The potential of the digital supply side to create an interconnected, international platform for services is constrained by the realities of demand. There are two areas where these constraints are strongest.

First, demand will be the most important constraint on the internationalisation of service markets because patterns of demand in different geographical markets will vary. A service that is accepted in one locality, country, or region may not necessarily be successful in another. Demand patterns depend on tastes, cultures, and income and education levels. Each of these factors depends in turn on geography. Not all services will be deployed internationally because demand could be global, regional, national, or even local in scope.

Second, user preferences about access devices will constrain the way that service offerings can be deployed. For instance, it is not clear that users want to operate interactive services through a television set (which is associated with passive entertainment), or want to operate passive entertainment services through a computer (which is associated with interactive applications), but either might eventually come to pass. These decisions will be crucial to the way services can actually be deployed in households.

User preferences for access devices may also have important implications for industry structure and economic power. Different convergence industry participants 'own' different user devices. The television industry has access to digital TV sets, the telecommunications industry has access to telecommunications devices like ordinary and mobile phones, and the computer industry owns the personal computer. Each industry has a head start in deploying new applications on its own devices, and will enjoy a competitive advantage and possibly bottleneck power in that environment.

It is possible that different devices will remain dominant within their own industry silos, and that different devices remain associated with the most important services. In that case a level of 'silo' segmentation of the applications industries may persist indefinitely. Alternatively, if one of these devices (e.g. digital television or the personal computer) became dominant across a number of industries, then one group of industry participants could capture a dominant position across the entire applications industry.

## **2.4 Convergence business strategies**

Established service businesses have more at stake in convergence than the emergence of new competition. The traditional business model itself is at stake.

Control of infrastructure was the key competitive advantage in the analog world because service definition requires control of infrastructure. The successful businesses were those that leveraged their control of infrastructure to deliver standardised services across large markets, and exploited economies of scale.

This supplier-driven business model has been the foundation of the mass marketing approach to services. In almost every service industry where analog networks or physical distribution is dominant there has been a strong emphasis on the supplier definition of service and the mass marketing of standardised services. This is just as true of health and education services (which use physical infrastructure) as of electronic services like telephony, radio and television (which use electronic networks).

This business model created powerful incentives for consolidation. The result was entrenched oligopolies or even monopolies for service delivery. In an analog world, that is the most rational way to organise the supply side. These arrangements were often reinforced by regulation which restricted market entry and was designed to preserve these economies of scale.

In a convergence industry structure, none of these strategies make much sense. Control of infrastructure does not flow through to control of service offerings, because the wholesale market for connectivity makes it possible for applications service competitors to enter the market even if they have no infrastructure. It is impossible to block new competition that undermines established oligopoly strategies. Nor can service definition alone provide the old economies of scale if users are increasingly in charge of service definition.

There are two basic strategies that service industry participants can adopt to respond to these developments:

- a defensive strategy designed to preserve traditional economies of scale and scope and traditional business models; or
- an offensive strategy designed to exploit new economies of scale and scope and new business models.

There is nothing to prevent these two strategies being adopted simultaneously. The successful management of the transition from traditional to convergence business models and industry structures will require a mixture of defensive and offensive tactics.

### *Defensive strategies*

There are a number of defensive strategies that incumbents can adopt to entrench or recover their traditional vertically integrated business models. These strategies generally aim to block or distort the development of the intermediate markets which allow third party providers to enter services markets without building their own infrastructure. This sets up significant barriers to entry. If entry can be controlled, it is then possible for the incumbents to set the terms of service provision without pressure from competing business models.

Blocking the formation of intermediate markets for connectivity would re-establish the nexus between control of infrastructure and control of service offerings, and preserve the traditional business model. This strategy requires the support of regulators, and can only be effective as long as no alternative service delivery channels exist. As soon as alternative digital platforms capable of carrying the service are available (say over a broadband Internet), new service entrants cannot be stopped.

Distorting the development of intermediate markets does not prevent third party deployment of applications services, but it can minimise its impact. This can be done a number of ways:

- manipulating the regulatory system to minimise the range of services subject to access and interconnection regulation, hence restricting access to the full power of the underlying network;
- establishing dominant proprietary technical standards in intermediate markets, and using technology licensing to control the entry of potential competitors;
- spoiling industry attempts to reach consensus on technical standards in intermediate markets. This will raise costs for third-party service providers because it forces them to develop different technical solutions for different standards; or
- using residual monopoly or oligopoly power in infrastructure or connectivity markets to restrict intermediate market offerings, and hence constrain the type and power of the third-party applications that can be deployed.

The result of any or all of these distortions would be a quasi-vertical re-integration of the connectivity and applications markets. This would not entirely prevent new entry, but it would tip the competitive playing field in favour of incumbents who are the principal infrastructure and connectivity providers and give the incumbents time to readjust their business strategies to the new industry environment.

#### *Offensive strategies*

The main offensive strategies are designed to capture the benefits of new economies of scale and scope. The primary economies of scale and scope in a convergence context are:

- economies of scope between user groups and service provision, based on the mass customisation of services to user requirements;
- economies of scope in the development, deployment and marketing of diverse service offerings in consumer markets. These economies are based on the exploitation of common costs and investments in developing brand recognition, user relationships and user databases; and
- ongoing economies of scale and scope in the provision of network infrastructure and connectivity.

Economies of scope between service providers and users are due to the customisation of services to individual users or user communities. The user database built up by service providers is a key business asset in the electronic services market. Knowledge about users allows service providers to tailor services, avoiding commoditisation of their services and increasing the value of the relationship to both service provider and user. It also helps to stabilise the customer base and reduce costs by reducing customer churn.

These benefits are only available to service providers who have the opportunity to develop such databases, acquire them, or already possess them. The 'lock-in' of users to particular service providers through customisation of services is a form of quasi-vertical integration.

Bundling of a wider suite of services also generates economies of scope because many of the assets used to develop, deploy and market one service can be used to develop, deploy and market other services as well. Alternatively, strategic alliances with other types of service providers can achieve similar results.

The kinds of assets that can be leveraged across a range of services include databases of information about user preferences, recognised marketing brands, and other forms of intellectual property like specialised management or technical skills. Offensive strategies can be employed to leverage these assets:

- A diversification strategy can reinforce lock-in of users if it includes areas like financial services where transfer costs for users are high. This strategy may prove attractive to providers of content-based services such as broadcasters. Customers change their bank far less often than they change their television or radio channel.
- Lack of consumer confidence in online service delivery increases the value of recognised and trusted brands. This provides opportunities for established service firms to leverage trusted brands into the online environment.
- Specialised skills and intellectual property can be applied to niche markets across domestic and international customer bases in order to maximise returns on intangible investments. The importance of this strategy depends on the relevance of the business' existing asset base to new demand markets, or on local strengths in unique skills sets. Barriers to international service provision such as trade restrictions, lack of intellectual property protection in target markets, or lack of digital and physical infrastructure in target markets can make this approach difficult.

Economies of scale and scope are still available, albeit reduced, in the business of digital network infrastructure and connectivity. There will continue to be considerable value in operating large digital network infrastructures and leveraging these assets into a variety

of connectivity markets. This is not inconsistent with the continued growth of connectivity businesses which use limited infrastructure, because these businesses may have distinct advantages in specialised markets where connectivity is not a commodity and scale is not an issue. However, it suggests that the bulk of the connectivity market will be in the hands of large infrastructure providers who are in a position to provide connectivity more efficiently.

## **2.5 Convergence and input markets**

The impact of convergence on input markets is twofold:

- structural changes in the applications, connectivity and infrastructure industries will be transmitted upstream into the input industries as the nature of industry demand changes; and
- digitalisation will directly affect the business processes in each input industry, just as it is affecting business in the wider services sector.

*The digital content industries*

The industries which will be most affected by convergence are the ones where digital technologies are a substitute for traditional technologies. The clearest examples are the film and music industries, where digital production techniques and physical media are well established. In contrast, publishing and the performing arts are less affected.

The digital production industries in Australia have generally been characterised by highly fragmented and subscale activity. Large (often foreign) companies wielding bottleneck power through their control of retail networks and major marketing channels have dominated domestic and international distribution.

Ownership of copyright on content also does not confer any bottleneck power which might offset the power of distribution. One movie or music album is normally substitutable for many others. Bottlenecks do exist in the production industries, but the bottleneck asset is not content. The bottleneck asset is the scarce management expertise that extracts the maximum return from investments in content production.

Movies are the best example of this phenomenon. The core business of the major movie studios in the United States is not making movies, and has not been for years. The core business of the major movie studios is managing intellectual property across as many distribution channels as possible. In practice, this means making significant investments in creative inputs, and leveraging movies across other forms of media such as books, music, television, computer games, and even toys. The result is not always high art, but this is the process which generates the revenues that underpin new investment, both for productions aimed at the mass markets and for innovative productions being developed at arm's length from the major studios.

In contrast, the fragmentation and subscale nature of most Australian production activity have prevented producers from generating the economies of scale and scope enjoyed by their US counterparts. This is the key reason for Australia's failure to match US productivity in these industries. Instead, output quotas (i.e. local content rules for television and radio) and direct government funding are used to maintain the critical mass of activity needed to preserve physical and human capital.

The results of this industry structure are:

- high cost of capital, due to the reliance on external funding;
- difficulty in maintaining a depth of creative and technical expertise due to low throughput;
- poor utilisation of management and marketing skills, particularly intellectual property management skills; and
- a weak bargaining position due to concentration in downstream distribution.

To sum up, the production industries in Australia already face some significant structural challenges. It is natural to ask whether structural convergence in downstream service industries (television, radio, music and film distribution) might improve or worsen their position.

The convergence trends identified in this chapter will have a significant impact on the production industry environment. As markets for content-based services internationalise, local production will feel the full impact of the US dominance in

content production. The structural separation of broadcasting services and digital infrastructure will also make it harder to enforce local content requirements through market entry conditions.

Some artists have used technology to circumvent distribution chains, but this has only worked well where an artist has a highly loyal following and has been able to maintain production standards. It is a niche marketing approach. No-one has suggested that this could be a mass marketing channel. Mass marketing is the very discipline at which the established distributors excel, and that expertise is costly to replicate.

This suggests that powerful intermediaries will continue to mediate between content producers and audiences in most cases. The argument that content owners will automatically benefit from growing demand for content rests on the assumption that a significant number of new content-based services will emerge, and bid up the price of content inputs. It is not clear that this will happen. It is not even clear that new content for new types of service is needed, since reformatting of existing content may be all that is required in many cases.

It is unlikely that the Australian production industries could ever match the US dominance of this kind of business. It is not even clear that aping US business strategies is the best strategy available. If not, then other ways of addressing Australia's structural diseconomies need to be found.

This need may become critical when technology develops to the extent that direct networked delivery of music, film or television is possible over international digital networks. That day has already arrived for radio, is very close with CD-quality music, and will come soon for film and television. A range of new business models will then be possible: subscription services, pay-per-view (or pay-per-listen) services, limited life recordings which expire after a fixed period, and traditional purchase. The parallel importing rules that have mitigated the impact of US economies of scale on local production will then be redundant, and there will be no alternative to operating successfully and sustainably in an international environment.

### *Software and equipment industries*

Digital software development will become the common currency of applications, connectivity and infrastructure industries as digitalisation penetrates all levels of the networked services sector. Even in the digital equipment industries, the hardware is simply a receptacle for the functionality that the programming provides, and the value-added is primarily in the equipment's embedded programming. The boundaries between the software and equipment industries have become blurred as a result.

The structure of the software and equipment industries in Australia is similar in many ways to the content production industries. These industries tend to be dominated by multinational companies, supplemented by a large number of medium and small-sized local companies. These multinational companies dominate the key value-added activities like large-scale systems integration and applications development. While it is possible for government programs and purchasing policies to raise the overall level of activity in the Australian-owned industry, it is very difficult to arrange for the transfer of the most sophisticated skills to these companies.

It is unlikely that convergence will result in a structural shift in the position of the Australian-owned software and equipment industries. The large participants in the applications, connectivity and infrastructure markets will probably outsource their major development and purchasing activities to the firms capable of developing and deploying software on the scale required. It is possible that software and equipment companies will have opportunities to diversify into online service provision, gaining an edge through innovation. The most likely outcome would be for such companies to eventually strategically align with, or be acquired by, a larger service company seeking to diversify its service offerings.

## **2.6 Summary and principal conclusions**

The key structural convergence trends identified in this chapter fall into three main groups.

### *The emergence of new intermediate markets and industry structures*

Structural separation between the services (which users see) and the underlying delivery mechanisms is growing. This distinction is reflected in the difference between applications (which represent services on a digital network) and underlying connectivity and infrastructures (which are the delivery mechanism).

In addition, weakening economies of scale in infrastructure provision are leading to erosion of bottleneck power in connectivity and infrastructure markets. Emergence of interconnection markets is gradually linking digital networks into a delivery platform spanning the services sector. Varying degrees of substitution between traditional and networked service delivery platforms in different industries are increasing the level of competition in both infrastructure and service delivery markets.

At the same time the importance of intangible assets as sources of economic value and centres of economic power is growing, especially assets such as trusted brands, proprietary standards, and scarce management skills.

Important unknowns are the extent to which the technical standardisation process and user preferences for access technologies will segment industries, and which industry participants and countries will develop and control the key intangible assets such as technologies, user databases, scarce skills and intellectual capital.

### *The growing role of user communities*

The erosion of the service provider's sole control over service definition and the growing importance of user customisation are emerging as important sources of economic value and centres of economic power.

Important unknowns are the ways and extent to which users will be able to assert control of personal information through political or commercial means.

### *The growing internationalisation of service markets*

Digital service markets are all potentially international in scope, because service provision is no longer integrated with domestic infrastructures. International markets for content, information and transactional services are emerging as third-party

applications providers exploit cheap connectivity to address customers outside national boundaries.

The important unknown is the extent to which demand patterns will segment these international markets into regional, national and local markets, and how developing international traffic patterns will affect Australia's competitive position in service markets.

The consequences of these three trends can be summed up in a set of 'false dichotomies'. They are dichotomies because they represent two polar opposites in the way that networked service delivery is implemented and their industry effects. They are false because they represent ideals that no existing industry completely achieves. Nevertheless, they provide insights into the broad nature of the changes being experienced across the services sector.

**Table 2.1 Key consequences of convergence**

| <b>Key structural and commercial parameters</b>   | <b>Traditional service industries</b>  | <b>Convergence service industries</b>   |
|---|--|---|
| <b><i>Technology of service deployment</i></b>    | Analog networks specialised for particular applications  | Digital networks allowing deployment of multiple applications   |
| <b><i>Dominant structural model</i></b>           | Vertical integration of the service and the delivery infrastructure.<br><br>Separate industry 'silos' for each service type  | Vertical separation of the service and the delivery infrastructure, with wholesale markets for access to connectivity and infrastructure.<br><br>Horizontal integration of 'service suites'.                                  |
| <b><i>Principal sources of economic value</i></b> | Economies of scale in ownership of infrastructure and mass deployment of standardised services<br><br>Economies of scope between infrastructure, delivery and service activities | Economies of scale in ownership of infrastructure<br><br>Economies of scope from diversified service offerings<br><br>Economies of scope generated by 'mass customisation' of flexible services by users and user communities |

|  |  |   |
|--|--|---|
| <b><i>Principal centres of economic power</i></b>                        | Ownership of infrastructure  | Ownership of infrastructure<br><br>Ownership of customer relationships, user databases, proprietary standards and other intangible assets |
| <b><i>Locus of control of service innovation and definition</i></b>      | Infrastructure owners control the nature and pace of service innovation                                      | Users and third-party applications developers control the nature and pace of service innovation   |
| <b><i>Geographical scope of service markets</i></b>                      | Domestic or local reach confined within established national jurisdictions                                   | International reach crosses geographical boundaries of national jurisdictions   |
| <b><i>Key constraint on international structural competitiveness</i></b> | International structural competitiveness constrained by economic geography of international transport routes | International structural competitiveness constrained by economic topology of international networks                                       |

### **3.0 STRUCTURAL CONVERGENCE AND THE POLICY CHALLENGE**

The last chapter focussed on the structural consequences of technological change in the services sector. The principal convergence trends identified in that chapter were:

- the emergence of new intermediate markets and new industry structures, particularly the structural separation of service and connectivity/infrastructure activities;
- the growing role of user communities as sources of economic value and market power; and
- the growing internationalisation of service markets.

This chapter examines the implications of these trends for government policy objectives and their implementation. The broad national outcomes sought by government do not change, but traditional policy objectives and interventions that support these outcomes may lose relevance as new industry and market structures emerge. Convergence issues arise when these objectives and interventions no longer address these national outcomes effectively.

A large number of policy issues arise from the impact of structural convergence, and these are presented here as questions. These questions are designed to provide some focus for responses but they are not intended to be comprehensive, only to capture the larger issues arising from structural convergence and provide a basis for discussion.

#### **3.1 National outcomes and the relevance of policy objectives**

Structural convergence does not change the broad national outcomes that the government seeks, because the desirability of these outcomes does not depend on structural factors. Examples of these outcomes include a productive national economy, a vigorous and representative Australian culture, and internationally competitive Australian industries.

For the purposes of this paper, three types of national outcomes can be identified which are relevant to the services sector:

- Economic outcomes, which are all related to notions of efficiency and economic performance. There are three types of efficiency which all add to national economic performance: allocation, production and dynamic efficiencies. The first is concerned with allocating resources to their most useful activities, the second with maximising the productivity of those activities, and the third with maximising structural flexibility and innovation.
- Social outcomes, which would not otherwise be delivered by market mechanisms. These outcomes can roughly be divided into two types: cultural outcomes (such as a representative Australian culture and media diversity) and consumer outcomes (such as universal access to certain services).
- Industry development outcomes, which relate to Australia's international competitiveness.

A number of policy objectives sit beneath these national outcomes. Examples of policy objectives include the promotion of competition, the promotion of certain levels

of local content in major media, and promotion of investment in key industry inputs such as skills.

Policy objectives are provisional by nature. After a long period of structural stability, a lack of clarity can develop about the difference between national outcomes and the instrumental objectives adopted as a means to those outcomes. Economic performance can be identified with efficient competition within a traditional industry structure, rather than maintaining efficient industry structures. Universal access can be identified with a particular service rather than the actual diversity of needs. Plurality can be identified with ownership, rather than actual level of access for alternative voices. Each of these objectives needs to be examined to determine whether it remains relevant, or whether it needs to be modified, abandoned, or replaced by new objectives.

### *Economic outcomes and objectives*

Economic objectives are concerned with the allocation, production and dynamic efficiency of markets and other institutional structures (such as corporations or other types of cooperative arrangements). They are all about maximising the national benefits of economic activity. Examples of economic policy objectives include the promotion of competition and innovation, and the achievement of any-to-any connectivity between users of networks.

Technical regulation is related to economic objectives because it is designed to lower costs and promotes productive efficiency. Examples include the promotion of technical standards which allow interconnection and access markets to operate smoothly, the promotion of interoperability standards for networking applications, and the efficient planning of spectrum, numbers and electronic addressing which are inputs for services.

The primary economic policy objectives that are currently adopted by government as the basis for economic intervention in the networked services industries are:

- Any-to-any connectivity. This simply means that it should be possible for a user to connect to any other user, irrespective of whether they use the same network or not. One way this can be accomplished is by interconnecting networks and ensuring that applications are able to smoothly interoperate.
- Formation of intermediate markets for networked services. Wholesale markets for access to telecommunications infrastructure and connectivity are essential to allow new entry to service markets. These wholesale markets are still emerging, and intervention in support of wholesale market formation is still required. Currently, access rights for applications services are restricted to content service providers and do not extend to non-content-based services;
- Protection of competition. These new markets and other input and output markets are subject to both standard anti-competitive conduct provisions, and to special provisions for telecommunications markets designed to address Telstra's residual market power.
- Promotion of service innovation. New services are needed to meet the growing diversity of user needs. This objective is related to the protection of competition because competition is an important spur to innovation. The interconnection and access regime is also important to ensure that new innovative applications service providers have access to networks and users.

- Minimising transaction costs in intermediate markets. Access to networks cannot happen efficiently without technical standards for digital interconnection and access interfaces. These standards make it possible for interconnection and access services to be commoditised and for intermediate markets to develop.
- Efficient allocation of public resources. Examples of these resources include spectrum and numbering ranges. There is provision for price-based allocation of these resources designed to maximise economic efficiency and ensure reasonable returns to the public for the use of spectrum, and for tradeable rights that exploit market mechanisms to reallocate resources efficiently.

*Are there any other objectives apart from the above currently pursued by the government in this area? Are these economic objectives more or less relevant in a convergent environment? Are there new economic objectives that should be adopted to meet new challenges?*

### *Social outcomes and objectives*

Social objectives deal with the way that industry activity impacts on the community. They address both cultural and consumer-related issues such as national identity, the maintenance of community standards for content, a diverse media, and universal access to basic services.

The primary social policy objectives currently pursued by government are:

- Promotion of universal service availability. Certain services are made available even where they are not commercially viable. Examples include the voice telephony service (and more recently 64 kbit/s links) and rural television broadcasting services. The availability of financial, health and education services is also an issue for governments.
- Promotion of minimum performance standards. Performance standards are imposed in many service markets where consumers have limited redress against poor service, especially in monopoly or near-monopoly environments, or in situations where service providers have an information advantage over consumers (e.g health and legal services).
- Promotion of national identity and cultural diversity. Influential content-based services have the potential to powerfully affect the Australian national identity. They also have an important role in reflecting the diversity of the Australian community, both domestically and internationally.
- Maintenance of plurality of control. This objective is implemented in a number of ways: ownership restrictions on influential media, and the maintenance of national and community-based media sectors.
- Promotion of diversity, quality and innovation in content-based services. This objective focuses on responsiveness to a diverse range of tastes, and goes beyond cultural diversity into consumer-related issues about the provision of content-based services to niche audiences and underserved groups.
- Maintenance of community standards. This objective focuses on the way prevailing community standards should be reflected in influential content-based

services which reach wide sectors of the community or vulnerable groups such as children.

*Are there any other objectives apart from the above currently pursued by the government in this area? Are these social objectives more or less relevant in a convergent environment? Are there new social objectives that should be adopted to meet new challenges?*

### *Industry development outcomes and objectives*

Industry development objectives deal with the structural competitiveness of industry. Examples of industry development initiatives include investment attraction schemes, the promotion of investment in physical and intellectual capital, and awareness raising in consumer markets in order to prime demand.

The primary industry development objectives pursued by the government fall into four broad areas:

- Promotion of investment. This objective focuses on Australia's relative attractiveness as a site for investment. Attractiveness depends on a range of parameters which are influenced by government policies, such as the structure of the taxation system and the competitiveness and depth of capital markets.
- Development of local capabilities. This objective focuses on ensuring the reliability and cost of key inputs such as telecommunications capacity, and technical, creative and management skills.
- Development of demand markets. This objective focuses on the development of domestic and international user communities and audiences for Australian content and services.
- Promotion of innovation. This objective focuses on maintaining and enhancing incentives to innovate.

*Are there any other objectives apart from the above currently pursued by the government in this area? Are these industry development objectives more or less relevant in a convergent environment? Are there new industry development objectives that should be adopted to meet new challenges?*

## **3.2 Policy intervention in convergence markets**

Structural change has consequences for policy interventions because these interventions are built on a set of assumptions about industry and market structure. If industry and market structures change then intervention may lose its effectiveness, and new interventions may be needed.

Government intervention can rarely reach inside a business or household. In almost all cases, intervention occurs in the relationships between different industry participants, and between industry participants and users and audiences. In most cases these are market relationships, and policy intervention is all about setting the terms of participation in those markets.

There are two basic ways that the government can do this:

- by intervening in market structure. Interconnection and access requirements on networks are an example of structural intervention because they directly affect market and industry structure; and
- by intervening in market conduct. Local content rules, consumer redress requirements, anti-competitive conduct rules, and licence conditions of various other kinds are all examples of conduct regulation. They are designed to influence market conduct within a certain industry and market structure.

These interventions can be implemented in two ways:

- Regulatory implementation uses legislation to impose mandatory requirements on market participation (e.g. licence conditions or conduct rules). Regulatory interventions can be highly effective, but may lack flexibility because they are more dependent on assumptions about industry and market structure.
- Non-regulatory implementation generally involves government intervention in markets through measures such as direct or indirect subsidisation of industry and community activities (e.g. the Australian Film Commission), participation in business activities (e.g. national broadcasting), or moral suasion designed to encourage or discourage certain activities (e.g. telecommunications industry development planning).

#### *Traditional services sector intervention*

In the traditional services industry structure, intermediate markets for networked services are non-existent. This is a reflection of the vertical integration of industries, and of the absence of interconnection markets between different networks. As a result, the accessible points of policy intervention were limited to input markets, output markets, and control of entry to domestic infrastructure markets.

Control of entry was a particularly useful implementation mechanism in consumer markets. Rather than intervene directly in consumer markets, the vertical integration of infrastructure and services meant that consumer requirements could be imposed directly onto service providers by controlling entry to the relevant infrastructure business. These interventions were structured around pre-convergence industry silos, and each intervention strategy reflected the special characteristics of each silo.

The basic intervention strategy in the traditional services industry environment was:

- Identify the infrastructure or a component of the infrastructure (e.g. spectrum) relevant to the particular service, and license entry to that infrastructure market. This step is based on the assumption that there are no other infrastructures that can deliver the service.

- Impose conditions on the service provider's conduct in consumer markets as a condition of infrastructure licensing. This step is based on the assumption that the infrastructure provider completely controls the services delivered on its infrastructure (i.e. users have no control over service definition in the output market) and that third party service providers have no access to the infrastructure.
- Apply these conditions to all service providers in the domestic market where regulatory jurisdiction runs. This step is based on the assumption that market boundaries do not extend beyond national boundaries.

This approach has been effective in implementing a range of interventions in the operations of markets for networked services, including local content rules, community standards, technical regulation, consumer regulations, and market entry restrictions.

In contrast, non-regulatory interventions tended to focus on input markets, and have had secondary status. Examples include subsidisation of research and development activity, spending programs to promote technical and creative skills formation, creation of investment vehicles which lower the cost of capital for under-invested activities such as innovation, direct subsidisation of content production, and programs aimed at raising the level of management skills.

### **3.3 Convergence and services sector intervention**

The increasing ability to substitute digital platforms, the trend to vertical disintegration, the growing importance of the user in service definition, and the internationalisation of service markets are undermining the assumptions which underpin traditional policy interventions. The result is that intervention strategies based on traditional services industry structures are also being undermined.

Convergence trends have significant long-term consequences for the way in which government will approach broadcasting, telecommunications and wider services sector regulation. In a few cases, the implications are fairly clear. In other cases, the implications of change are not clear, and may not be clear for some time.

#### *Structural change and 'technology neutrality'*

The restructuring of the convergence industries, particularly the structural separation of service activities and the underlying service delivery, means that services can no longer be identified with their infrastructures. Broadcasting services will be able to be delivered over telecommunications, computer and broadcasting networks. Similarly, telephony services will be delivered over a whole range of new technologies. Other services, such as education, retail and health, will experience the same phenomenon to greater or lesser extents.

It will no longer be possible to regulate broadcasting services simply by regulating broadcasting spectrum and infrastructure. It will no longer be possible to regulate voice services simply by regulating telecommunications carriers. Also, it will no longer be possible to regulate education, health and other services simply by regulating the infrastructures and systems that have traditionally been used to deliver those services. This has two direct implications for government intervention in service markets.

First, the regulation of services will need to be technology neutral wherever a single service is made available through a range of delivery technologies. Technology neutrality is already an accepted principle in telecommunications service regulation, but it will ultimately need to be applied to all convergence industries in order to escape the regulatory problems caused by accelerating technological change.

Second, technology neutrality will generally require separate regulation of service and infrastructure activities, including separate licensing (where appropriate). This presents a significant regulatory challenge because most services sector regulation is currently technology-specific, and will need to be recast to address new mechanisms of service delivery.

#### *User empowerment and industry capabilities*

One of the principal opportunities afforded by digital technology is that users and audiences can be closely involved in service definition and customisation. Multi-channel broadcasting already provides an element of this power to users by providing a selection of channels rather than a single one, but Internet-based services have an almost unlimited capacity to be tailored to individual requirements.

In the traditional services sector, a service provider could be held entirely responsible for the service output. This made it easy for governments to impose service requirements like Australian content quotas and community standards in the broadcasting industry. But these kinds of requirements will be less effective in an environment where users and audiences decide which services to use, and how they will use them. The boundary between service providers, users and audiences is blurring. The challenge for the government will be to find other means of achieving cultural outcomes which can supplement traditional interventions.

This is a difficult area in which to foresee developments, but the general trend will probably be towards declining effectiveness of licensing and conduct regulation as a means of imposing social and cultural outcomes in consumer markets. If that proves to be the case, non-regulatory interventions may become more important as traditional regulation declines in effectiveness. If this is so, achieving current social objectives may become harder over time.

A non-regulatory approach where government indirectly affects outcomes by empowering individuals, families and other social institutions to address policy concerns has begun to gain currency. The proposal to make Internet filtering technology widely available is an example of this approach. The role of government in these cases is to indirectly influence outcomes by facilitating industry and community-based processes.

This has particular importance for social objectives such as consumer protection, national and cultural identity, and the enforcement of community standards. Instead of specifying actual outputs, there may be more emphasis in the future on promoting user empowerment and developing industry capabilities to meet the challenge of more diverse and less regulated services.

#### *Internationalisation and globalisation*

The outcomes of convergence in Australia will be determined both by international technology and commercial pressures, and by Australia's domestic policy framework.

This means that government can manage and influence the impact of technology and commercial change, but cannot control them. Government policies will remain a factor in economic, social and industry development outcomes, but they will not be the only factor.

Internationalisation does not equal globalisation. Internationalisation simply means that service markets are *potentially* international in scope. The *actual* structure of the market could be:

- global, with activity dominated by a handful of global players;
- regional, where regional players compete on an equal footing with global players;
- national, where domestic players compete on an equal footing with regional and global players; or
- local, where local market characteristics create niches for small scale operation.

The actual outcome in each service market will depend on industry-specific structural factors on both demand and supply sides.

The key economic and industry threat to Australia and other medium-sized services markets is marginalisation by global industry participants who enjoy global economies of scale, with the key value-added activities being highly concentrated in a few centres in the northern hemisphere. This would be the preferred international structural outcome for established industry players who already enjoy global economies of scope. In contrast, Australian interests would probably be maximised if international markets were structured on a regional basis, rather than a global basis.

Australia's basic disadvantage in international service markets is a lack of critical mass needed to justify growing investment in networked applications development, content production, and international communications infrastructure. How to counteract a structurally unfavourable international environment in order to prevent a sharp and serious deterioration in the services balance of trade has emerged as the key industry development issue in the convergence industries.

The internationalisation of markets also raises difficult problems in social and cultural policy. The complexity of these challenges is sometimes overshadowed by the simplistic notions that some bring to the debate about the Internet such as beliefs that traditional styles of intervention can easily be transferred to the Internet environment, or that any government action in support of social or cultural outcomes in an international context is futile. The ultimate outcome seems unlikely to reflect either of these positions. A middle position is emerging, in which the government exploits domestic leverage and international coordination.

There are some precedents for constructive intervention despite international constraints.

For example, the international nature of online content service markets makes it difficult to impose restrictions on illegal content, but it has still proven possible to negotiate with domestic industry to implement certain measures to mitigate its effects.

The government can also negotiate with other national governments. There is certainly scope for loose or transient international 'coalitions of interest' around some issues, but it is not yet possible to reach a stable consensus on many issues, especially cultural policy or community standards. Even proposals that at first sight

seem unproblematic (e.g. pro-competitive interventions) may not be regarded as being consistent with some national interests, particularly in the developing world.

Government intervention cannot mandate outcomes in these cases. Its role is to create a framework for the ongoing negotiation between international service providers, multilateral institutions, and domestic aspirations and concerns. This is part of the ongoing challenge of managing internationalisation, and ensuring that Australia extracts its own share of the associated benefits.

'Success' in this kind of environment is not easily defined or measured. Policy interventions aim to promote industry and community processes and accountabilities, rather than final outcomes. A portfolio of interventions will be necessary to have substantial influence on outcomes, and the management of these portfolios will make significant demands on domestic regulators.

## **4.0 STRUCTURAL CONVERGENCE AND POLICY ISSUES**

### **4.1 Structural convergence and sectoral approaches**

A coherent analysis of convergence issues would split the existing service industries into applications, connectivity and infrastructure components, and develop a discussion around those new industry components. In reality, much of the services sector will remain confined to traditional industry silos for several more years because digital technology will take some time to displace traditional analog technology. The compromise adopted here is to discuss convergence issues in the context of two broad industry sectors.

The first discussion deals with the telecommunications and information services sector. This sector includes the education, health, professional, retail and financial services industries as well as the voice and data services industries. Many of the economic performance issues cluster around this sector, although they spill over into the media industries as well. There are also important social questions about consumer protection and the availability of services.

The second discussion deals with the media and content sector. This sector includes the print, broadcasting and online content industries, along with the content production industries. This sector is treated separately because important parts of the sector are lagging the rest of the convergence industries in the spread of digitalisation, and because many cultural and social issues cluster around the media sector.

The benefit of this approach is that industry interests may find it easier to consider convergence issues in a familiar context. The cost is some repetition in the issues canvassed, since several economic performance issues cross the entire convergence sector.

### **4.2 The telecommunications and information services industries**

The telecommunications and information services industries are a pivotal component of the convergence industries. They provide much of the infrastructure and

connectivity that underpins networked service delivery. Many of the economic issues that arise from convergence cluster around these industries.

### *Economic issues*

The vertical disintegration of applications services and infrastructure/connectivity is associated with the emergence of access markets on digital networks. This has occurred by two mechanisms—the emergence of open technical standards (e.g. the Internet and Telecommunications Common Channel Signalling) which provide easy access for third-party connectivity and applications services providers, and policy intervention designed to promote intermediate market formation. The horizontal disintegration of the infrastructure and connectivity industries has had similar causes—the emergence of accepted technical standards for interconnection, and market formation supported by government intervention.

These technical and regulatory innovations have both played a role in current convergence trends. As a result, structural policies and technical standardisation are the main focus of this section.

The extent of the government's influence over industry developments is sometimes exaggerated. In the telecommunications industry, structural change has occurred because of fundamental technological and commercial changes, not because of government intervention. Governments are usually the midwives, not the mothers, of change. At the same time, the scale of convergence restructuring is so great that policy choices about structural outcomes will be difficult to avoid.

The relationship between industry structure and policy intervention raises an important issue about the kinds of outcomes the Government ought to be seeking. Should the government adopt a pro-active stance in relation to industry structure, particularly vertical disintegration, or should it wait on international industry developments and facilitate structural adjustments where appropriate?

The structural policies adopted in major overseas markets such as the United States and Europe (e.g. policies on access to digital broadband networks) may also have implications for Australia. The emergence of international markets for infrastructure, connectivity and applications services may constrain Australia's capacity to adopt purely national policy approaches.

Structural issues are closely related to the scope of the economic interventions used to promote structural outcomes:

- The existing access regime covers telecommunications networks, but not digital broadcasting networks. It is not clear whether an extension of the regime is warranted. This answer depends to a large extent on whether digital broadcasting and digital telecommunications infrastructures are truly substitutable over a significant range of applications. If so, it may make sense to place them within the same economic policy framework. If not, then each infrastructure would probably end up associated with its own subset of applications, and could be treated separately. Whether they then *should* be treated differently is another question.
- In many service areas, there is no practical distinction between the licensing of a service and of its support infrastructure. If vertical disintegration increases over time, should this be recognised and entrenched through separate licensing of the service activity and the underlying infrastructure/connectivity activity? Or are

there benefits in some industries from the preservation of joint licensing? Could separate licensing of electronic services have unintended effects on traditional services industries in competition with these new electronic service providers?

- The emergence of a diverse range of applications has overtaken the current telecommunications access regime. The current telecommunications access regime only creates rights of access for 'content services' (i.e. content-based applications) to underlying connectivity. As noted in the last chapter, the emergence of intermediate markets has proven to be a powerful spur to both competition and innovation in applications service markets where these markets have appeared. Does the restricted scope of the telecommunications access regime create any problems for competition or innovation in non-content-based applications markets?
- The emergence of a range of intermediate markets and alternative infrastructures has lessened but not eliminated the significance of economies of scale and scope in network provision. This is raising the level of competition at the connectivity and infrastructure levels. Does this have any implications about the need for an interconnection and access regime? Under what structural conditions is intervention needed in the formation of intermediate markets, and when is it not needed?

Convergence does not necessarily mean that different industries will all conform to the same mould, even though the basic trends may be in the same direction. Structural policy must take the structural 'givens' of a market into account. These givens may vary from market to market, and may justify different approaches to structural policy. For instance the structural policy adopted in high-density communications markets like the capital cities may not be appropriate in rural areas, and the structural policy adopted for the broadcasting industry may not be appropriate for the telecommunications or education industry. This kind of policy differentiation must be based on the known characteristics of each market and the capacity of different structures to deliver different results and address different policy priorities.

The importance of recognised technical standards for the formation of intermediate markets for digital services was discussed in the last chapter. Conversely, the absence of recognised standards can suppress the formation of intermediate markets. The determination of technology standards is increasingly a commercial process, and these technologies are deployed globally through international infrastructure, connectivity and applications markets.

Technical standards in intermediate markets, especially interoperability at the applications level, are emerging as a potential source of economic power. The growing economic importance of proprietary technical standards and other intangible assets is reflected in the growing US concerns about the market power springing from intangibles like the desktop operating system and microprocessor designs. In contrast, many of the pro-competitive restrictions imposed on infrastructure owners have been relaxed. Proprietary standards are the clearest example of this trend, but other intangibles such as trusted brands and databases of user preferences can also confer structural competitive advantages over new entrants.

In a convergence industry structure there are multiple applications, deployed by a variety of service providers in a range of industries. Ensuring that different applications and access devices can network is becoming more complex. The policy

objective of any-to-any connectivity was created for the telecommunications industry at a time when the voice application was dominant, and it is questionable whether this objective will capture the full challenge of ensuring interoperability in a convergence environment.

Ownership of interoperability technologies confers significant economic power, and refusal to licence the technology can be a powerful anti-competitive tactic. Proprietary standards can have a major anti-competitive effect if restrictive technology licensing is used to re-integrate user access devices like set-top boxes with certain applications services. While the consumer will tolerate a certain level of diversity in user access devices, the high cost of some devices can become a serious impediment to competition in consumer markets.

It is not clear whether this raises any new issues which traditional competition policy cannot address. It is certainly true that technical standards for interoperability are being developed at a pace and scale which places them beyond direct domestic regulatory control. Australia is a standards-taker in international markets, not a standards-setter.

Users who share their preferences with applications service providers are fundamental to mass customisation strategies and a key source of economic value in service markets.

As noted in the last chapter, the possession of this information can be a powerful source of oligopoly power as well. In addition, significant privacy issues arise from the exploitation of user data for commercial purposes.

A possibly more productive approach is to facilitate the development of commercial interoperability and data protection solutions, and to directly address the abuse of the economic power conferred by intangibles. This would remove government from the details of commercial technical standards and information management processes. The recent decisions to allow limited decompilation of software and to provide a legislative framework for privacy protection are examples of this approach.

There are areas where the government has a direct role in intangible rights, principally through its management role for the rights to use spectrum, the management of the numbering plan, and the management of electronic addressing including Internet domain names. Traditional processes for the allocation of public resources have assumed that spectrum, numbering and electronic addressing are domestic in scope. The growing use of global infrastructures (e.g. satellite systems) and international connectivity platforms (e.g. the Internet) have undermined that assumption.

The ongoing efforts to regularise Internet domain name management have been well documented. However, there have been corresponding tensions in spectrum and numbering management as new technologies (e.g. international mobile satellite telephony) and commercial practices (e.g. association of telephone numbers with trademarks) have injected new pressures and priorities into the traditional management of these resources.

#### *Social issues*

There are two main issues arising in the context of the telecommunications and information services areas: the universal provision of a basic level of access to services, and the maintenance of performance standards for service provision and consumer protection. The convergence environment presents significant issues and

challenges  
for both.

The promotion of universal service availability and minimum performance standards are important objectives across broadcasting, telecommunications, financial services, health and education service industries. Digital technology is potentially a powerful instrument for the delivery of essential services to communities or areas where traditional service business models are commercially marginal.

Current policy interventions to promote digital communications service availability generally make the assumption that all users want the same services i.e. voice telephony, basic data capacity or standard broadcasting services. In a convergence environment with a diversity of user communities, this assumption might not be justified. Different users and user communities will generally have different requirements. While many people would be satisfied with a standard voice service, others have much more demanding data requirements, particularly businesses and 'power users'.

The fundamental issue is how government's should define what is 'essential'. A threshold decision is whether the availability of infrastructure and connectivity, or availability of specified applications services, should be the primary focus of policy. In the telecommunications industry, there is currently a mixture of applications and connectivity requirements (i.e. voice services and 64 kbit/s connectivity).

Imposing statutory requirements on major telecommunications licensees to cross subsidise unprofitable geographical markets from profitable ones funds these requirements. This approach is simple when the aim is to deliver a single standardised service across different geographical markets. Two factors are making this system more complex. One is that the range of services now available has increased, and different kinds of services are starting to cross-subsidise each other. The second reason is that the availability of services is not only a regional issue. Certain socio-economic groups lack access to services for reasons that have nothing to do with location: awareness, income, skills and mobility all play a role.

The growing complexity of the market for services means that unintended consequences may emerge from traditional service availability policies. For example, does the cross-subsidisation of loss-making voice services from Internet revenues have any impact on the competitiveness of Australian applications service providers? Should voice services only be subsidised from voice revenues, or is cross-subsidisation between service categories immaterial?

The emergence of new sources of connectivity, notably digital broadcasting, suggests that new avenues to promote access may emerge. It is not clear yet whether it is appropriate to include these infrastructures in the current arrangements.

A range of new measures has begun to emerge, designed to better target assistance. The Regional Telecommunications Infrastructure Fund is an example of this more targeted approach. Access and awareness programs aim to remove the cost and information barriers that disadvantage certain groups. Commercial mechanisms to promote consumer takeup have also emerged, especially in markets such as mobile handsets and Internet service provision, where up-front equipment and connection costs are cross-subsidised from ongoing service revenues.

Telecommunications and a range of other services are also subject to performance requirements of diverse kinds. The services sector is subject to a raft of Commonwealth and State-based requirements for professional accreditation and consumer protection.

It is not clear how these requirements should be transferred to an international service environment where service providers might not even be in the same country, let alone the same State.

It will certainly be difficult to maintain separate policy approaches to digital and traditional service performance standards where digital and traditional delivery mechanisms are substitutable. Technology-specific requirements could encourage service providers to avoid certain delivery technologies in order to avoid the more onerous aspects of government intervention.

This raises a host of implementation issues for the online delivery of government, financial, professional, retail, health and education services. A mixture of government and commercial mechanisms to enforce performance standards may ultimately be effective in domestic markets, but the difficulties of enforcement in international markets will be much greater.

Direct government intervention in support of consumer protection in international service markets faces some obvious jurisdictional problems, including determining the domicile of consumer transactions and the effectiveness of international consumer redress mechanisms. International regulatory coordination is still embryonic in this area.

At the same time, some commercial solutions are emerging in the form of recognised, trusted and branded online industry participants who have a valuable reputation for probity to protect. Some third parties, especially the major global consulting firms, are also offering audit and accreditation services to industry participants which are designed to provide users with confidence in audited service providers. These commercial solutions to consumer confidence issues may either co-exist with a safety net of government intervention, or they may become a dominant means of consumer regulation in international markets if international regulatory coordination cannot ultimately be achieved.

#### *Industry development issues*

The international structural environment is determined not only by technology and commercial activity, but also by trading rules and international agreements. Trade policies, telecommunications policies, and policies to promote electronic commerce will all influence the structure of international digital service markets. Both the commercial and the regulatory elements are important.

Australia's fundamental commercial challenge in international connectivity and applications markets is the subscale nature of domestic activity. Australia does not yet have the connectivity traffic and applications-related activity needed to generate the economies of scale and critical mass of investment that would justify our ambitions to be the hub for networked services in the Asian region. This will only change if the level of transaction and content-related activity based in Australia increases substantially, and is reflected in investment in international telecommunications links into and out of Australia.

There are two ways that these economies of scale can be achieved. First, Australia could generate more domestic demand by accelerating the takeup of digital technology. This means that policies for the universal availability of services therefore have an industry development dimension, as well as a social dimension. Second, Australia could attract and aggregate traffic from the surrounding region through the regional telecommunications infrastructure by developing its capabilities as a regional service centre.

Some of the most significant factors which decide international investment location are tax policy, telecommunications pricing, and the presence of key capabilities such as technical skills and management expertise (often in that order), so these are the principal levers available to the government. A strong macro-economic performance, reliable and competitive communications infrastructure, and a sound education, training and innovation system underpin these factors.

Key drivers of demand for international connectivity are the content-based services such as entertainment, education and some health services, and transaction-intensive services such as financial, retail and logistics services. Growing activity in these industries will justify further investment in international connectivity and infrastructure, driving down unit connectivity costs, and attracting international service industries.

The growing importance of intangible assets, such as skills, intellectual property, technologies and brands, is the basic fact that underpins much of the 'information economy' agenda. This has balance of payment implications because most of these assets are not in Australian hands, but mainly in American and European hands. If it is accepted that these assets are a key component of national economic performance, then industry development policies must address the promotion of investment and innovation in intangible assets.

The concept is simple, but the implementation is not. Most industry development policies have been developed in an industrial economy context. It is not clear that current innovation and investment policies are relevant to the services sector which is the centre of convergence developments.

Regional areas face many similar issues on a smaller scale. Just as Australia lacks scale compared to the major business centres of the northern hemisphere, Australia's regions face the same problem relative to metropolitan Australia. If Australia can successfully develop itself as a service centre in this part of the world, then there will be important lessons for the regions in how to attract and develop service industries.

#### *Issues and questions*

Comment is invited on any issues arising from the above or the rest of the paper, including the following issues and questions:

*Is there a strong relationship between government intervention and industry structure? Or is industry structure primarily driven by technological and commercial factors? Should the government aim to determine industry structure pro-actively or*

*should the government merely facilitate structural change when the direction of change is already apparent?*

*Can domestic intervention in market structure and conduct be effective in an international connectivity environment? Will the primary driver of market structure and conduct be domestic policy intervention, or international technology and commercial factors? How much scope is there for national approaches to structural policies in the convergence industries?*

*What is the appropriate scope of the interconnection and access regime for digital networks? Should it extend beyond telecommunications networks to include computer networks and digital broadcasting and cable networks? If not, what factors should determine the boundaries of an interconnection regime? When and where is such a regime needed?*

*Are there any benefits in preserving the joint licensing of applications and services activities and infrastructure and connectivity activities (e.g. in the broadcasting sector)? Or should these two types of activity be licensed separately across the services sector? What would be the implications for the division of responsibility between different regulators?*

*Should the telecommunications access regime for content services be extended to include all applications, content-based or not? Or will technological and commercial realities ensure that third-party applications providers have access to digital connectivity anyway?*

*Will international commercial processes drive technical standards? Are there ways that governments can influence international standards processes, or is Australia a 'standards-taker' only?*

*Is there a role for government in the area of interoperability between applications? Or is this a commercial matter best left to the applications industries? Are there ways the government can facilitate commercial solutions to these issues? What are the implications for the users of services?*

*Do current domestic policies address the economic power arising from intangible assets such as branding and proprietary standards as effectively as they address issues arising from physical assets? What are the limits of government's ability to influence outcomes in this area? What are the implications for competition in convergence markets?*

*Are the current allocation processes for scarce resources such as spectrum and electronic addresses effective in international markets? If not, are multilateral or commercial alternatives available?*

*Do the efforts of service providers to build up diversified service suites, by acquisition or through strategic alliances, raise any significant competition issues? Does the 'lock-in' of*

*users and customers to particular service providers raise any significant competition issues? Are these issues significantly different from competition issues arising from bundling or marketing in other industries?*

*Will the growing diversity of demand undermine the relevance of 'one size fits all' interventions such as the Universal Service Obligation? Is the universal provision of a standardised telecommunications service the correct objective in a convergence environment?*

*Can more diverse demands be met through the current industry and regulatory framework, or will alternative implementation mechanisms be needed? What role might new sources of connectivity such as digital datacasting play in meeting these new objectives? Are there non-regulatory mechanisms, including commercial mechanisms, which could be used by the government to promote access to connectivity in otherwise marginal consumer markets and user communities?*

*Should the government's long term role be the facilitation of the delivery of applications and services? Or should the government's focus be on the provision of connectivity, bandwidth and the associated infrastructure?*

*What are the implications of borderless delivery of services for the regulation of service delivery? Can the consumer safeguards and accreditation schemes already established in the education, health, retail, and other service industries be readily transferred to the electronic domain? How can these safeguards and schemes be enforced in international markets?*

*Are commercial solutions to consumer confidence issues adequate to address consumer issues? If not, what should be the balance between government intervention and commercial incentives to preserve market reputation and the value of the brand?*

*Are current market development and innovation support schemes relevant to convergence industry structures and priorities? Are separate industry development policies for application, connectivity and infrastructure industries appropriate, or are there linkages which require concerted development policies? What are the different industry development priorities of the applications, connectivity and infrastructure industries?*

*What implications does the growing importance of intangible assets such as skills, trusted brands and proprietary standards have for Australia's international competitiveness? Do current policy settings adequately address the new importance of these assets?*

*What scope is there for the government to raise the level of international connectivity hubbing in Australia? Are there ways that Government can indirectly attract infrastructure and connectivity investment by attracting key applications activities such as electronic commerce and content service provision for the Asian region?*

*Can Australian user communities be leveraged to help generate the required critical mass of activity, investment and innovation needed to ensure international competitiveness? Can Government facilitate this process, and if so, how? What relevance does this have to economic, industry and social development in regional Australia?*

### 4.3 The media and content industries

Convergence in the broadcasting industry and the rest of the media has special policy significance because government objectives about national identity, community standards, and media plurality cluster around this industry. At the same time, important economic issues will arise as the broadcasting industry emerges as a source of infrastructure and connectivity in competition with telecommunications networks.

#### *Economic issues*

The media industry still has a traditional industry structure. Both broadcasting and print are dominated by a few vertically integrated businesses, and domestic infrastructures still dominate the delivery of services. Digital technology has not penetrated the broadcasting industry to any significant extent, although digital content production is now the norm. Internet-based content services are an irritant, but not a serious competitive threat as yet. The most popular Internet content sites are linked to existing players.

The current regulatory structure reflects these traditional arrangements. In the broadcasting industry the licensing of spectrum and service is usually, but not exclusively, linked. This is reflected in separate spectrum allocation procedures for designated broadcasting spectrum. Restrictions on market entry preserve the oligopoly market structure, and are indirectly used to finance government requirements such as Australian content. Ownership restrictions entrench industry silos, keeping free-to-air broadcasting and print apart, and specifically exclude international industry participation in some areas. The high cost of international broadcasting means that demand markets are still domestic in scope.

The imminent adoption of digital networking technology in the broadcasting industry means that media convergence is embryonic but accelerating. The industry is subject to the same basic convergence trends as any other service industry, but those trends may manifest themselves in different ways in different industries, depending on viewer demand factors and the media business models which ultimately emerge.

A new interactive content industry, mainly based on World Wide Web technology, is growing in economic and social importance alongside the traditional broadcasting and print industries. The interactive industry was 'born digital', and grew out of the information technology industry, not broadcasting. This industry has largely adopted the basic convergence industry structure, with a vertical distinction between service and delivery activity and an international scope. It lacks many of the elements of the traditional media business model, particularly the strong emphasis on end-to-end service provision which is the key value-added in the traditional media industry (including the subscription broadcasting industry). The alternative value that it offers is flexibility and diversity of content.

The basic structural questions in the media sector are whether one service model will dominate the media and if so, which one? Will the traditional business model of domestic end-to-end service ultimately dominate the media industry, or will the international Internet-based model prevail, or will these different service models be able to co-exist? This issue is pivotal because it will determine the kinds of economic, social and cultural interventions that will be appropriate and effective in the long run.

The internationalisation trend also has implications within Australia because existing free-to-air licences are generally allocated over a geographical licence area, and some ownership restrictions are imposed on the basis of geographical reach. The emergence of the Internet content model, along with the growth of national and international subscription services, has the potential to erode the exclusivity of these arrangements.

The basic structural direction of the media industry will have a significant effect on the kinds of economic interventions which are ultimately appropriate or necessary, particularly the scope of access and interconnection requirements and whether service and infrastructure licensing should be separated. The same questions were addressed in the last section, but not from an industry-specific perspective.

A related question is whether there is any such thing as 'broadcasting spectrum' in a convergence environment. Digital television spectrum can also be used for datacasting services that may bear little resemblance to traditional broadcasting, and the same goes for digital radio. This raises the question of whether broadcasting policy priorities should be imposed on these unrelated services.

In addition, many of the current policy interventions in support of social and cultural outcomes rely on a vertically integrated industry structure for their effectiveness. A media industry dominated by an Internet service model will be a much more difficult environment in which to impose Australian content, plurality of control, diversity of content, and community standards outcomes.

### *Social issues*

Structural convergence raises profound issues about national sovereignty and the effectiveness of policy intervention where media infrastructures and markets are international in scope. Vertical disintegration would make this problem acute because it allows broadcast service providers to deliver services over open infrastructures. Even if the target market is still domestic, there is nothing to technically prevent Australian content services being delivered from outside Australia to local users and audiences through international networks. Australian service providers, serving Australian customers, can place themselves outside the reach of direct domestic policy intervention. This has implications for a range of social and cultural objectives, and for key business activities such as intellectual property management.

The promotion of national identity, cultural diversity, and media plurality is based on traditional notions of cultural and social significance. The idea of significance has been closely associated with channels for mass culture such as television, print and radio.

In a traditional industry structure, the ownership of infrastructure for the delivery of mass services is the key determinant of who should be subject to government intervention.

By a happy coincidence, these same infrastructure providers also provide the media services, and were the obvious targets for policy intervention in support of social and cultural objectives.

Wherever the media industry structure remains vertically integrated, these requirements can still be imposed. Conversely, wherever intermediate markets for access to digital bandwidth have emerged, media services will no longer be reserved to domestic infrastructure owners. Domestic or international service providers can

use open infrastructures to deliver media services in the Australian market, making it difficult to impose traditional policy interventions in support of social and cultural objectives. This has an impact in four major areas: Australian identity and content, plurality of control, diversity of content, and media community standards.

The primary intervention in support of Australian content is local content rules in the television and radio industries. These are essentially output quotas. A comprehensive shift from the traditional media service model to an Internet service model would make it difficult to enforce these requirements because international service providers would be outside Australian jurisdiction, and domestic service providers would be able to follow them to overseas locations.

Whether this becomes a major issue depends on whether the media industry substantially restructures along these lines. Even if a significant part of the future media industry operated this way and was excluded from the current Australian content requirements, it might be enough that a few major media service providers persisted with the traditional domestic business model and accepted the requirements of the domestic licensing regime. This may achieve an acceptable policy result.

Alternatively, if an Internet service model became the norm then current interventions would lose effectiveness. This might require more emphasis on indirect means of supporting Australian content, including increased support for the development of industry capabilities and the critical mass of activity needed to maintain those capabilities.

The traditional debate over cultural diversity and media plurality can tend to neglect issues like community access to media and the role of the national broadcasting sector. In Australia, community access to the means of service delivery has been implemented through the community broadcasting provisions of the broadcasting regime. The growth of the narrowcasting sector in recent years suggests that there are still underserved groups who could benefit from access to new delivery channels and content.

Ensuring diversity of content is also important. The Internet service model has proven to be an important source of content service innovation. In conjunction with growing user control over service offerings, this increases the role of smaller scale, more customised media in addressing the diverse content demands of audiences and user communities. These services may ultimately fill a similar niche that the magazine industry fills in the print market.

The maintenance of community standards is also based on the notion of the significance, or 'pervasiveness', of mass culture and the idea that services targeted to the general community should reflect the standards of the general community. The ongoing relevance of this notion will depend on whether mass cultural outlets continue to dominate, or whether a more fragmented industry will ultimately emerge. In addition, vertical disintegration makes traditional community standards requirements difficult to impose because international service providers can deliver services and content through domestic infrastructures without the knowledge of infrastructure owners. The consequences are readily visible in the market for Internet content.

*Issues and questions*

Comment is invited on any issues arising from the above or the rest of the paper, including the following issues and questions:

*Will one service delivery model eventually dominate the media, or is there scope for different models to co-exist? Will supply-side issues, such as securing distribution channels and sources of content, mean that vertical integration will persist, at least on some areas? Or will the Internet service model prevail?*

*Should service and infrastructure licensing be separated? How does this depend on the service delivery model that prevails?*

*If service and infrastructure licensing were separated, could spectrum for broadcasting services be allocated in the same way as other spectrum? Or are there still social issues which should be accommodated in the allocation of spectrum for broadcasting services? What are the implications for the role of the broadcasting regulator in spectrum allocation and technical regulation?*

*Will the emergence of international connectivity and infrastructure markets lead to the internationalisation of content-based services markets? Or will demand for local and national relevance mean that content-based service provision will ultimately remain a domestic industry?*

*What is the impact of the erosion of market boundaries on the current broadcasting licence regime? Are geographical licensing and audience reach rules sustainable if service delivery is no longer tied to terrestrial infrastructures?*

*Will broadcasting outlets continue to focus on mass audiences, or will audiences continue to fragment over the longer term? Would a more fragmented domestic audience help or hinder the achievement of social objectives such as the promotion of Australian content and media plurality?*

*How can the cultural and social significance of content-based services be measured in a multi-channel convergence environment where service provision is no longer linked to infrastructure and connectivity provision? Will channel scarcity, and ownership of infrastructure continue to be the principal source of cultural and social significance, or will other factors be more important?*

*How can other dimensions of plurality, such as localism and community access, be accommodated in a convergence environment? Would user communities play a stronger role in a more fragmented media industry?*

*What is the role of national and community media in extending media plurality and Australian identity in a convergence environment?*

*Could output requirements like Australian content rules and community standards be enforced in an environment where delivery infrastructures are international, and content and service provision are structurally separated from connectivity and infrastructure provision?*

*If a more fragmented content service industry emerges in a convergence environment, which 'community' standards should apply: the standards of the general*

*community, or the standards of the target audience? Can the application of these two standards be reconciled, and if so how?*

*What scope is there for effective non-regulatory interventions to address community standards issues, especially indirect measures that empower individuals, families or communities? Are these measures likely to grow in importance? What is the scope for international cooperation on community standards regulation?*

#### **4.4 Regulatory transition management**

In some respects, designing a convergence regulatory framework is a simpler task than managing the regulatory and structural transition to that framework. Transition management is important because poorly executed regulatory transitions create large costs and uncertainties in industry.

Timetables for transition are linked to the pace and scope of technological change, and whether the government's structural policy is proactive or facilitative.

Structural convergence is enabled by the deployment of digital technology. Because of this, the progress of structural convergence in industry will tend to lag the deployment of digital technology in that industry. Structural convergence may keep step with technology change, but it will not outrun it.

This means that timetables for regulatory transition must not run ahead of technology change. It is not so clear that it should not run ahead of industry restructuring. This depends on the stance that government takes towards structural policy. If government is promoting structural change, then a more aggressive timetable is warranted. If not, then a timetable that lags industry restructuring may be more appropriate.

The details of transition management cannot be worked out until the required regulatory changes have been decided. Nevertheless, it is clear that a number of difficult issues will arise. The transition will be challenging for a number of reasons:

- tensions may emerge between technological and commercial imperatives within industries, because the pace of structural convergence generally lags the pace of the deployment of digital technology;
- preferred timetables for regulatory change may vary within the services sector, because the pace and scale of digital deployment will vary from industry to industry;
- preferred timetables for regulatory change of government and industry may not coincide, because government objectives and commercial objectives do not always coincide;
- legislative commitments may constrain certain regulatory changes; and
- structural change in international markets may create imbalances of economic power because technological change and structural convergence will generally progress at different rates in different countries.

These and other transitional issues will ensure that the regulatory transition will face a

range of difficulties that cannot be fully eliminated by sound transition management. The role of transition management must be to minimise the costs of transition to Australia as a whole.

#### *Issues and questions*

Comment is invited on any issues arising from the above or the rest of the paper, including the following issues and questions:

*What particular factors will determine the pace of structural convergence in your industry?*

*What other factors determine the pace of structural convergence apart from technology change and policy stances?*

*What other issues are raised by regulatory transition? Are there general lessons from past regulatory transitions (e.g. in the telecommunications or financial services industries) which should apply to the transition to convergence policy approaches?*

#### **4.5 Regulatory institutions and enforcement**

Enforcement of regulation requires enforcers. Australia's regulatory structure partially reflects the categories of network regulation adopted in this chapter. The ACCC is primarily responsible for economic regulation, and the ABA is primarily responsible for cultural/social regulation. Technical, consumer and spectrum regulation is shared between the ACA and the ABA on an industry-specific basis, with the ABA required to consider a range of social objectives especially in the allocation of spectrum for broadcasting services.

This division of labour is the result of specialisation. Distinct skills sets are required for different categories of regulation and for different industries. The new issues that arise from convergence may mean that regulators need to be given a new focus or responsibilities. This may in turn require new skills and new regulatory structures.

The ideal regulatory institutional structure would exploit synergies and ease the management of tensions between skills sets and policy objectives. Regulatory tasks should be grouped in ways which maximise the efficiency and effectiveness of regulation, and facilitate the management of overlap areas where cooperation is necessary.

The States also have an important role to play in service delivery and the regulation of a number of service industries. The growing importance of communications technology in these service industries may place a significant share of this activity in the constitutional sphere of the Commonwealth.

*Issues and questions*

Comment is invited on any issues arising from the above or the rest of the paper, including the following issues and questions:

*How should regulators be structured in a convergence environment? Should industry-specific regulators be restructured along economic and socio-cultural lines?*

*Or should regulators be restructured to concentrate on infrastructure/connectivity and applications/service industries separately? What are the implications for the current responsibilities of the regulators?*

*Does it make sense for some activities (e.g. spectrum management) to continue to be split between different regulators on industry specific lines?*

*Where will economic, socio-cultural and industry development objectives overlap and require coordination?*

*How should the respective responsibilities of Commonwealth and State Governments for digital services policies be determined?*