



CENTRE FOR  
INTERNATIONAL  
ECONOMICS

# *Australian digital content industry futures*

*Prepared for the*

*Department of Communications, Information Technology*

*and the Arts (DCITA)*

*Centre for International Economics  
Canberra & Sydney*

*11 May 2005*

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## Summary

- This report examines the future for Australia's digital content industries. It has been prepared collaboratively drawing on the views of the CIE and the Strategic Industry Leaders Group (the SILG) contributing to the Australian Government's Digital Content Industry Action Agenda (DCIAA).
- Measuring and examining digital content is complicated by the fact that there is not a digital content industry in the normal sense used by statisticians. The approach taken here is to identify digital content activities spanning digital content production in independent organisations as well as where production is embedded as an activity within other industries. The value added by activities that distribute digital content is also included.
- The total value of the digital content industry today is estimated at just under \$20 billion (about 3.3% of GDP), with about 40% attributable to core production, 50% to embedded production, and 10% to distribution.
- The industry employs about 300,000 people and experiences an annual trade deficit of about \$2 billion.
- Technological change is a key driver of digital content creation, distribution and adoption. Digitisation reduces production costs and, especially through the internet and other communications technologies, opens up new markets including export markets. In some respects technological change reduces barriers to entry for creative firms, while it also provides advantages to very large global businesses, who are able to create or buy content and distribute it. It is difficult to anticipate the economic forces at play leaning on one hand to increased competition and increased vertical integration and market concentration on the other.
- The digital content industry is strongly bifurcated, with many small firms engaged in the production of digital content and large, often-multinational firms that aggregate and distribute content. Cluster development is embryonic and network social capital is limited.
- Barriers facing the digital content industry include the inability to obtain finance due to the nature and characteristics of the industry such

as its fragmentation, difficulties in risk assessment, and short product shelf lives.

- One of the key issues facing the digital content industry today is the importance of harnessing not just artistic, but also technical and business creativity.
- While recognised for its artistic creativity and talent, the Australian digital content industry faces a skills shortage as well as a shortfall of technical and entrepreneurial talent.
- Emerging markets, especially in fast-growing Asian economies, offer opportunities for the digital content industry provided issues such as intellectual property rights are managed properly.
- Two futures are discussed in detail in the report: the preferred future, and the base case or 'do nothing' future. A brief look at a pessimistic scenario is also included.
- The key characteristics of the digital content industry under the three views of the future are summarised in the table below.

#### Key dimensions and futures for the digital content industry

<i>Dimension</i>	<i>Preferred</i>	<i>Base Case</i>	<i>Pessimistic</i>
<b>Creativity</b>	<ul style="list-style-type: none"> <li>▪ rich in artistic, technical and business creativity including through attracting foreign talent</li> <li>▪ widespread access to high quality education and training</li> <li>▪ access to emerging and existing ideas - rapid adoption of new ideas and innovations</li> </ul>	<ul style="list-style-type: none"> <li>▪ artistic, technical and business creativity underdeveloped and underutilised</li> <li>▪ education and training sometimes at odds with commercial needs</li> <li>▪ patchy adoption of new ideas and innovations</li> </ul>	<ul style="list-style-type: none"> <li>▪ few suitable stories (content)</li> <li>▪ loss of artistic, technical and business creativity to other global creative centres</li> <li>▪ no access to high quality education and training</li> <li>▪ limited access to emerging and existing ideas</li> </ul>
<b>Capacity</b>	<ul style="list-style-type: none"> <li>▪ financiers/investors involved in providing capital (especially access to capital by SMEs)</li> <li>▪ cross media innovation raises capabilities and enables efficient re-use of ideas and content</li> <li>▪ significant funding for R&amp;D and innovation</li> <li>▪ seed funding encourages more successful creative start up companies</li> </ul>	<ul style="list-style-type: none"> <li>▪ limited capital available (particularly scarce for creative smaller enterprises)</li> <li>▪ limited funding for R&amp;D and innovation</li> <li>▪ limited access to leading technologies</li> <li>▪ enterprises struggle to win sequences of projects and accumulate expertise over time</li> </ul>	<ul style="list-style-type: none"> <li>▪ loss of capital (especially capital held by SMEs)</li> <li>▪ scarce funding for R&amp;D and innovation</li> <li>▪ poor access to skilled people</li> <li>▪ no access to leading technologies</li> <li>▪ loss of firms and collective expertise – industry regresses to cottage industry/ad hoc project structures</li> </ul>

<b>Clusters</b>	<ul style="list-style-type: none"> <li>▪ strong clusters/ecosystems</li> <li>▪ connections within sectors and between sectors</li> <li>▪ strong linkages between creative, educational and commercial centres</li> </ul>	<ul style="list-style-type: none"> <li>▪ patchy and ad hoc connections within sectors and between sectors</li> <li>▪ technological convergence favours larger/international organisations</li> <li>▪ ad hoc linkages between creative, educational and commercial centres</li> </ul>	<ul style="list-style-type: none"> <li>▪ fragmented industry</li> <li>▪ bifurcated structure very pronounced with market dominated by large/international distributors</li> <li>▪ technological convergence favours economies of scale/scope and blocks smaller start ups</li> <li>▪ poor linkages between creative, educational and domestic commercial centres</li> </ul>
<b>Channels</b>	<ul style="list-style-type: none"> <li>▪ aggressive and successful production of branded Australian content</li> <li>▪ excellent access to communications (ie, broadband access) plus widespread adoption of other new technologies support wider audiences and markets</li> <li>▪ strong commercial linkages in upstream and downstream aspects of the industry</li> <li>▪ good access to overseas markets with reduced restrictions provide 'shelf space' for content</li> </ul>	<ul style="list-style-type: none"> <li>▪ ad hoc relationship between producers and customers</li> <li>▪ contacts in upstream and downstream aspects of the industry</li> <li>▪ access to communications (ie, broadband access)</li> <li>▪ partial market access and restrictions to access</li> </ul>	<ul style="list-style-type: none"> <li>▪ random and limited relationship between Australian industry and customers</li> <li>▪ almost universal access to true broadband Internet services raises global content aggregators' access to the Australian market, leading to a significant leakage of demand</li> <li>▪ shift in consumer tastes towards the products of large global content aggregators</li> </ul>
<b>Commerciality</b>	<ul style="list-style-type: none"> <li>▪ internationally recognised brands</li> <li>▪ capacity to charge for content through convenient, cheap payment systems</li> <li>▪ better industry understanding and use of rights management and protection of intellectual property</li> </ul>	<ul style="list-style-type: none"> <li>▪ partial capacity to charge for content</li> <li>▪ patchy management of intellectual property rights</li> </ul>	<ul style="list-style-type: none"> <li>▪ limited access to charging systems for smaller firms. Larger and international firms operate proprietary systems that give them a major competitive advantage</li> <li>▪ poor management of intellectual property/rights</li> <li>▪ IP laws become a barrier to the use of existing ideas and content rather than an aid to new producers who struggle for commercial sustainability</li> </ul>
<b>Competitiveness</b>	<ul style="list-style-type: none"> <li>▪ heightened awareness of Australian content drives strong demand</li> <li>▪ Access to overseas markets opens opportunities</li> <li>▪ good supply of creative skills and other inputs keeps costs down</li> </ul>	<ul style="list-style-type: none"> <li>▪ patchy international awareness of Australian content</li> <li>▪ Australian industry demand relies largely upon cultural factors and time zones as a barrier to trade protecting the domestic market</li> <li>▪ Competition based upon lower cost rather than higher quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Shrinking awareness of Australian capabilities and ideas</li> <li>▪ Continued improvements in communications results in domestic market being swamped by dumped content (ie, content sold at below cost to drive out competition)</li> </ul>

- In the 'do nothing' or base case future scenario where current policy settings are left unchanged, the industry is projected to grow at an annual rate of 3.8 percent between 2005 and 2015. In this base case, the industry grows to about \$29 billion in today's currency. Embedded digital content production will grow at 4.1 percent, compared with 3.8 percent for core production and 3.2 percent for distribution.
- However, there is a risk that the industry will regress rather than stagnate without policy intervention in the face of global competition. In this pessimistic scenario, Australian content producers will be squeezed by large global content aggregators who aggressively flex their market power. There will be a flight of creative talent and shrinkage in industry revenues and profits.
- In the preferred future, where a judicious suite of policies is implemented to overcome the barriers and leverage the drivers identified previously and where there is more rapid adoption of digital content technologies and forms of entertainment, the industry is expected to grow at up to 6.2 percent annually. Output increases to \$38 billion by 2015, placing it ahead of industries such as agriculture and communications. In this scenario, distribution grows fastest at an annual rate of 6.6 percent compared with 6.1 percent and 6.4 percent for core and embedded production respectively.
- Attaining the preferred future requires policies that address issues relating to creativity, capacity, clusters, channels, commerciality and competitiveness (as can be seen in the table above).
- In short, in the preferred future, freely-flowing domestic and global venture capital will fuel the activities of the many small firms, each bursting with artistic, technical and business creativity, which will take advantage of new delivery platforms and the rich latticework of links with global content aggregators and distributors to reach spellbound audiences and consumers worldwide.

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# 1

## *Context*

DIGITAL CONTENT ACTIVITIES are transforming traditional industry structures, business models, and ways of doing things and are likely to form an important activity in their own right.

The Australian Government is moving towards the development of a comprehensive Digital Content Strategy, with the objective of accelerating the production, distribution and marketing of digital content and applications domestically and internationally. This commitment has risen from the recognition that digital content and applications will become increasingly important, both in economic terms and as a means of expressing Australia's unique cultural identity.

The Digital Content Industry Action Agenda (DCIAA) has been conceived to assist in the creation of the necessary framework to bring the disparate but related parts of the digital content industry together in order to deal with common issues (such as skills transfer, regulation, Intellectual Property and innovation) and to build critical mass and scale. The Action Agenda is spearheaded by the DCIAA Strategic Industry Leaders Group (the SILG). The SILG is comprised of distinguished representatives of media, games and post-production organisations as well as the finance, health and education sectors and others.

### **This study**

The Centre for International Economics is pleased to provide this report that is intended to assist in the development of the Action Agenda. The Department of Communications, Information Technology and the Arts (DCITA) commissioned this study to conceptualise a future preferred state for the Australian digital content industry.

Views about the future of the digital content industry have been fashioned by drawing together the insights of the SILG. This has been achieved through the conduct of a *Foresighting* Workshop in Sydney and telephone discussions with SILG members.

This report:

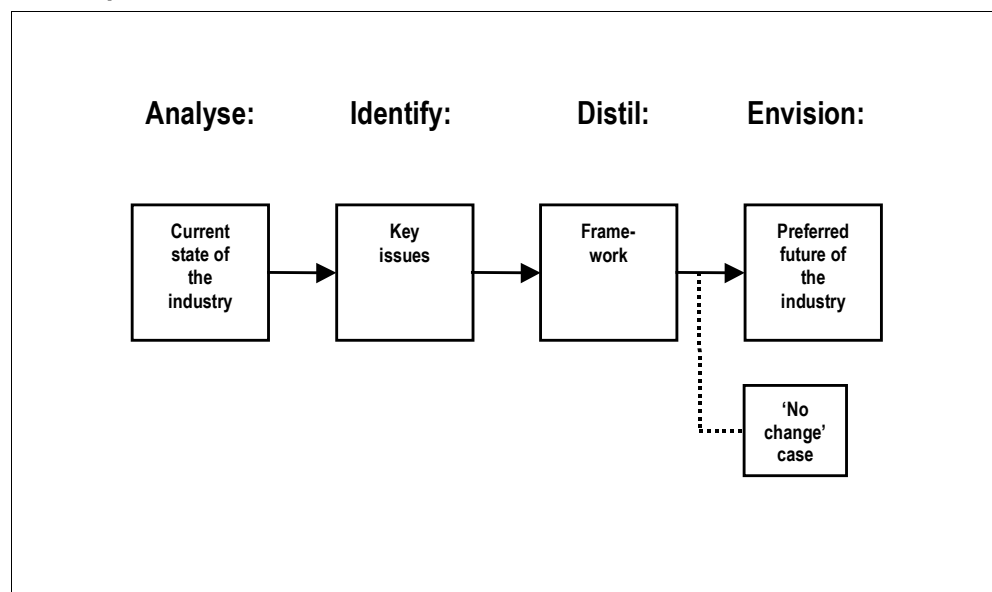
- presents a framework that will enable the SILG to identify the key processes, changes and actors required to realise this preferred industry vision;
- articulates the key features that the preferred state of the industry should embody as well as the desirable outcomes associated with each feature;
- analyses and discusses available policy and industry levers with the ultimate objective of synthesising and compiling a 'vision document' for the digital content industry; and
- provides analysis of a 'no change' scenario for the future digital content industry.

## Report structure

This report is structured around four steps (as depicted in chart 1.1):

- *Analysing* the current state of the digital content industry;
- *Identifying* the key issues facing the industry;
- *Distilling* the key elements of the framework; and
- *Envisioning* the future of the digital content industry with discussions on the 'no change' scenario and the preferred future.

### 1.1 Report structure



Source: CIE

## 2

*Digital content today*

BEFORE FRAMING THE PREFERRED STATE of the Australian digital content industry in 2015, it is helpful to form a view about where the industry is today.

**Digital content activities**

‘Digital content’ implies a coming together of content and digital technology. The production of content has traditionally been the preserve of the creative industries (such as film and advertising). Digital content production and distribution opens the door for the participation of individuals and firms with expertise and capabilities in information and communications technologies.

The descriptive terminology associated with the digital content industry is ill-defined (DCITA 2004b). ‘Digital content’ is variously described as:

- a particular set of product and service outputs within general content and media markets or within creative industries (that is, ‘creative industries producing digital content’);
- a distinct set of industries or as a ‘sector’ in its own right;
- on-line or networked content as distinct from tangible artefacts or physical modes of production or presentation, implying that the mode of distribution and access is a defining technical feature of the industrial activity.

There is in practice significant overlap between the activities grouped under the various labels used for this sector, or its closely related activities. Where digital content production is described as a subset of creative industries, the focus seems to be on the distinctive nature of the human capital inputs. Content production has also been defined in terms of the nature of the traded outputs, as in ‘copyright industries’. Alternatively, the markets for content can be defined by the nature of their distribution system (as in broadcasting, and networked or on-line content) or by the technology through which the intangible value added is captured or fixed

(as in print, film or digital code and software). This as can be seen in table 2.1.

### 2.1 'Digital content industry' and related nomenclature

Industry	Defined by:	Examples of activities:
Creative industries	Nature of labour inputs ("creative individuals")	Advertising, design, interactive software, film and TV, music, publishing, performing arts
Copyright industries	Defined by nature of asset and industry output	Commercial art, creative arts, film and video, music, publishing, recorded media, data processing, software
Content industries	Defined by focus of industry production	
Cultural industries	Defined by public policy function and funding	Museums and galleries, visual arts and crafts, arts education, broadcasting and film, music, performing arts, literature, libraries
Digital content	Defined by combination of technology and focus of industry production	Commercial art, film and video, photography, electronic games, recorded media, sound recording, information storage and retrieval

Source: DCITA (2004b)

Digital content and digital media encompass content and media in their myriad forms. As Cutler argues, this is a fundamental and important proposition that is based on the following reasoning:

Mediated content has always been fixed and defined by the technology which 'holds' and 'shapes' it. Until now, however, that media form has been specific to particular forms of expression, with specific technologies around print, photography, radio, film and television. What is different in a digital environment is that digital platforms, tools and devices now become the enabling infrastructure and DNA of content forms across the board.

As part of the wider information and communications technology environment, digital technologies now define the infrastructure platforms, the working tools, and the usage interfaces that shape the production, distribution and consumption of content. Complicating the picture is the fact that the digitisation of content and media takes place within an industry structure developed and embedded in pre-digital environments, and a technology environment that is continually evolving, with new technological developments creating new waves of innovation and disruption. Within this context, digital content becomes the innovation and R&D frontier for the wider industry. (Cutler, T., personal communication, 2005)

### *Sectors within the digital content industry*

There is also ambiguity about the component parts or sectors of the digital content industry. Table 2.2 lists activities that are often viewed as being 'sectors' with the digital content industry, and provides examples of companies in each sector. Note that the sectors listed are not necessarily

mutually exclusive nor comprehensively exhaustive. While this list may be aligned with what is pragmatically viewed as contemporary product or industry groups, it does not in fact line up with categories used in economic statistics of the sort used by the Australian Bureau of Statistics or governments in Australia. Unfortunately, many industries, even ones that have progressed well beyond the status of an 'emerging' industry such as tourism or information technology, are not well identified in economic statistical frameworks. Certainly the digital content industry and its component parts are not currently identified in such official statistics at present.

The key point from this brief review of current debates and analysis is that defining digital content in economic terms is not straightforward. Rather than being constrained by previous attempts to define an activity that is evolving and possibly mutating rapidly, it is helpful to take a broad perspective. To be useful that perspective should:

## 2.2 Sectors in the digital content industry

<b>Sector</b>	<b>Examples of companies</b>
Screen/film pre-production, production and post-production	Trout Films, Working Dog, RB Films Porchlight Films, Hilton Cordell, Jigsaw, Animal Logic, Cutting Edge, Dfillm, Movie Lab, Complete Post
Free to air (FTA) and subscription TV pre-production, production and post-production	Southern Star, Grundy, Beyond, Becker, Screentime, XYZ, Working Dog, Imagination, Hilton Cordell
Broadband content development	ABC, Chief Entertainment, Brainwaave, ITV World
Interactive and digital TV applications and content development	ITVWorld, ABC, Massive, Brainwaavee
On-line and interactive games	Auran, Krome, Bullant, Microforte, Ratbag, Torus, Blue Tongue, InfoGames, Perception
Internet-based marketing, design and advertising	Hydro, Massive, Hothouse, Brainwaave, Swish, Morpheum
Internet based digital content publishing and distribution	EBooks.com, Wired Records, Commonground Publishing, Chaos Music, Looksmart, Infomedia
Experimental digital media	The Performance Space, dLux, ACMI, Experimenta, Next Wage Festival, Electro-fringe
On-line education content development	Qantm, Ryebuck Media, Crank Media, Cadre Design, Roar Films, Nine Lanterns, Learning Curve, CWA New Media, Impart Corporation
Mobile 3G content development and publishing	Mobilesoft, Legion Interactive, BigWorld, Imagination Entertainment, 5 <sup>th</sup> Finger
Content creation and manipulation software	MediaWare, AnimalLogic, Proximity
Learning, rights and content management and other digital creative industry related software applications	Harvest Road, Southrock, Catalyst Interactive, KE Software, TerraText (SIM), Wizard Information Systems, IPR Systems, Morpheum, iTVWorld, Brainwaave, Rumble Group, Aprix

Source: Higgs and Kennedy (2004)

- draw upon existing maps of what is essentially an economic activity;
- allow users to discern the big picture as well as drill down into the component parts as necessary;
- reflect understanding of the value that is added by different elements of the supply chain (analysis of the tourism industry, for example, would be viewed as limited if it did not include the contribution made by transport activities that moved tourists to where they want to go); and
- take into account ways that digital content is a good in its own right as well as reflect the way that it is an enabler of value in other activities, often in a way that risks being hidden in statistics.

### *Our classification*

The consulting team therefore suggests looking at digital content as an activity at large as well as identifying contributions from its component parts, including activities such as:

**Core production:** the creation of digital content by firms and individuals in the ‘creative industries’ (henceforth referred to as ‘production’ for short)

**Embedded production:** the creation of digital content within the professional service industries rather than the ‘creative industries’, for example web pages and advertising materials created in-house by a law firm or an educational institution (henceforth called ‘embedded’ for short)

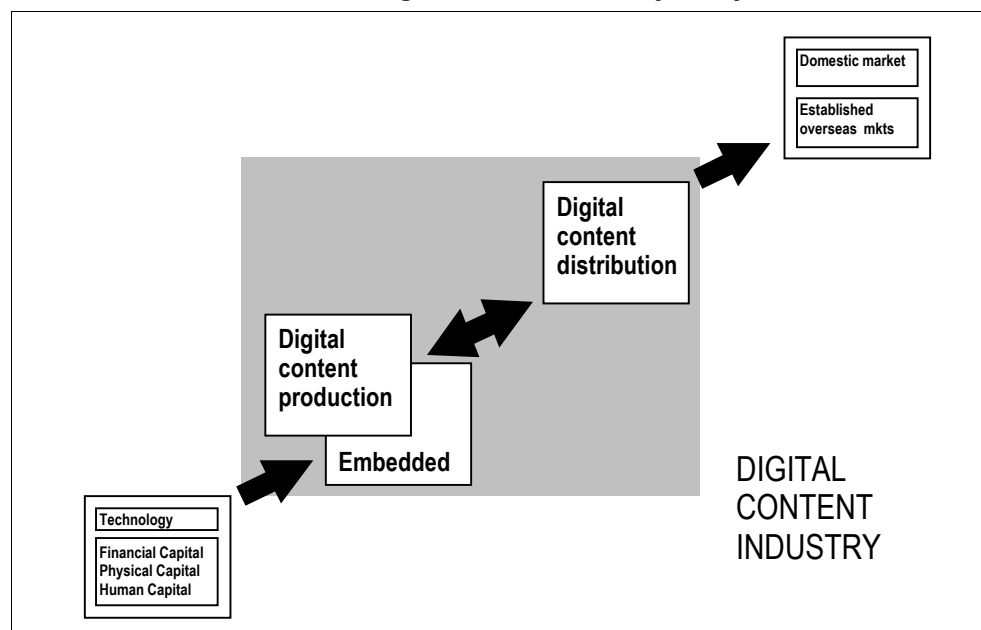
**Distribution:** value created by circulating, transmitting or exhibiting digital content or raising awareness about it

A more detailed and in-depth discussion about the distinction between core production and embedded production is presented in Appendix A.

Within this approach the production of digital content can be viewed as an activity that requires factors or inputs such as human capital, financial capital, as well as administrative, informational, scientific and technological infrastructure.

Digital content that is produced (either as separate products or embedded within the products and services of other industries) are aggregated by distributors who channel it to domestic and overseas end-users or customers. Chart 2.3 presents a simple flowchart of the digital content industry.

### 2.3 The flow of value in the digital content industry today



Source: CIE.

## Digital content metrics

The consultancy team has produced quantitative indicators about the nature and size of the digital content sector. The quantitative framework is discussed in some detail in Appendix A of this report.

### *Size (value of activities)*

The digital content industry is estimated to have generated output worth \$18 billion in 2002-03 or about 3.3 per cent of Australia's total industry gross product (which is akin to GDP). This is decomposed into digital content production (41 per cent), embedded digital content activity (51 per cent), and value added by digital content distribution (9 per cent). Production appears to have been the slowest growing component. Between 1996-07 and 2002-03, this component of the industry grew by an average annual rate of 2 per cent, compared with 4 per cent for embedded digital content, and 5 per cent for distribution.

### *Employment*

The digital content sector is estimated to provide some 289,000 jobs in 2002-03. The distribution of jobs between the component parts of the industry largely follows the distribution of output. Embedded activities account for

the most jobs (about 54 per cent). Production accounts for 36 per cent and distribution the remainder (about 10 per cent).

Digital content employment has grown by an average of 2.7 per cent over the six years up to 2002-03. The digital content industry accounts for an estimated 3.1 per cent of total employment in the economy.

### *Trade (imports and exports)*

The Australian digital content industry is most competitive in its home market. As a proportion of total value produced in the Australian digital content industry, in 2002/03 imports and exports make up a relatively small amount of the total value added by digital content. This is shown in table 2.4.

#### 2.4 Trade as a proportion of total value added (2002/03)

	<i>Exports</i> per cent	<i>Imports</i> per cent	<i>Net trade balance</i> per cent
Production	0.7	15	-14.3
Distribution	0	0	0
Embedded	2.0	0.6	1.4

Source: IBIS World and CIE calculations

Production is a relatively large importer of digital content at approximately 15 per cent of production value added compared with distribution (which has zero trade) and embedded. In contrast, embedded is the largest exporter of digital content at two per cent of value added while exports in production only makes up 0.7 per cent of value added.

The value of total digital content imports as a proportion of value added in the aggregate economy was approximately 6.4 per cent in 2002/03. The value of total digital content exports as a proportion of value added was approximately 1.3 per cent. This means that the majority of sales for the Australian digital content industry occur in the domestic market. Consequently Australian digital content businesses currently seem to be more competitive in its own market rather than foreign markets.

The net trade balance is computed by subtracting imports from exports in each sector. In the aggregate, Australia appears to be a *net importer* of digital content. For example, in 2002-03, the industry had an approximate \$1 billion deficit, which comprised net imports in production of \$1.1 billion and net exports in embedded of \$130 million. In percentage terms, the net trade deficit of the entire digital content industry was 5.4 per cent of digital content value added in 2002/03. This places the digital content industry on

a par with many activities in Australia where imports are also greater than exports.

While imports represent a significant portion of Australian digital content demand, this should be viewed in perspective. In some activities, such as consumer electronics including computer hardware, nearly all sales relate to imported goods.

The above metrics are reflected in a snapshot of the digital content industry provided in chart 2.6. In addition, table 2.5 provides some international comparisons of digital content and creative industries. The digital content industry's value is estimated at 3.3 per cent of GDP in Australia, lagging far behind the United States (7.8 per cent) and the United Kingdom (5 per cent). Furthermore, the ratio of exports to domestic value added is less than half that of the United States (at 0.06 versus 0.13).

### 2.5 International comparisons: creative digital industry

	<i>USA</i>	<i>UK</i>	<i>Australia</i>	<i>Singapore</i>
Year	2001	1997/8	1999/2000	2000
Percentage of GDP	7.8	5.0	3.3	2.8
Average annual growth rate (percent)	3.2	6	4.8	13.4
Percentage of national employment	6.0	5.0	4.0	3.4
Currency	USD	STG	AUD	S
Value added (billions)	708	113	19	4.8
Exports (billions)	89	10.3	1.2	4
Ratio of exports to domestic value added	.13	.09	.06	.83

Sources: *Singapore Creative Industries Development Strategy 2002*, QUT CIRAC, and Cutler and Company.

2.6 Snapshot of the digital content industry

<p><b>Size</b></p> <p>(2002-03)</p> <p>Value of digital content production, embedded digital content and digital content distribution — \$18b</p> <p>Share of total Industry Gross Product: 3.3%</p>		<p>Share of national GDP</p>
<p><b>Composition</b></p> <p>(2002-03)</p> <p>Production: 43%</p> <p>Embedded: 49%</p> <p>Distribution: 8%</p>		<p>Digital content components share</p>
<p><b>Growth Rates</b></p> <p>(6 years to 2002-03)</p> <p>Production has sustained the lowest rate of growth.</p> <p>Production: 2.1%</p> <p>Distribution: 5.0%</p> <p>Embedded: 4.0%</p>		<p>Growth of digital content components</p>
<p><b>Employment</b></p> <p>(2002-03)</p> <p>Around 290 000 jobs</p>		<p>Employment (job numbers)</p>
<p><b>Trade Balance</b></p> <p>(2002-03)</p> <p>A\$1.86 billion deficit</p>		<p>\$ million</p>

Source: CIE.

---

# 3

## *Issues and framework*

ANTICIPATING THE FUTURE often hinges upon identifying the main forces of change apparent today. This section reviews areas where choices may be made about matters of strategic importance to the future of the industry. A framework for analysis of different futures for the digital content industry is distilled from this review.

### **Key issues**

#### *Creativity*

Creativity is at the core of most digital content activity. Success in the digital content industry requires the marriage of what can be termed term “artistic creativity”, “technical creativity” and “business creativity” (see chart 3.1).

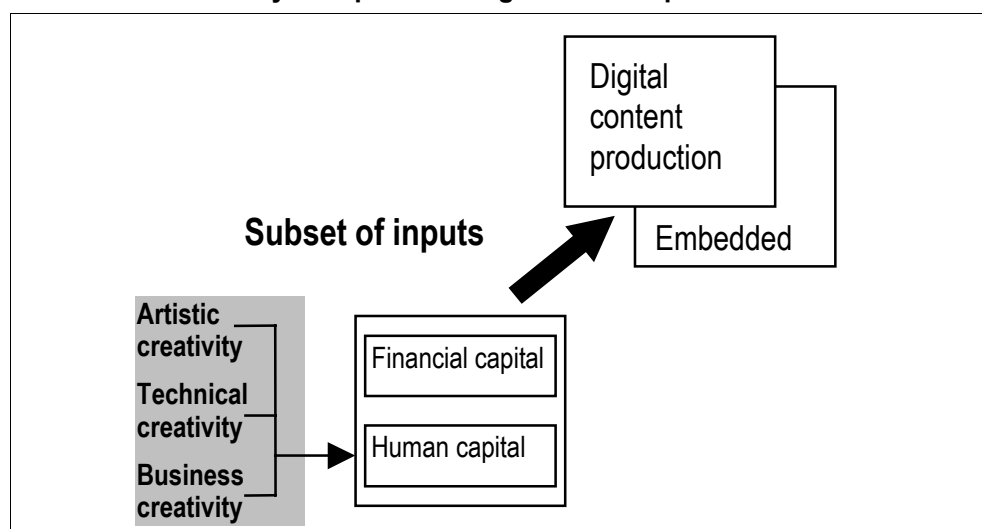
#### *Typology of creativity*

Artistic or aesthetic creativity essentially embodies the traditional and commonly held notions of human creativity, that is, those of movie directors, painters, graphic artists etc.

Technical or scientific creativity, argues Howkins (2001), flourishes equally in the sciences. Colin Ronan, author of *The Cambridge History of the World’s Sciences*, says ‘To engage in science requires a vivid creative imagination, tempered by firm discipline based on a hard core of observational experience.’ Technically creative people in the digital content industry can continually invent superior digital tools that give flight and reality to the innovative visions of the artistically creative.

Finally, business creativity is required to derive economic value from the creation and distribution of digital content. As Howkins notes, creativity is present at all levels of business from the establishment and management of a company to the development, branding and shape of each product.

### 3.1 Human creativity as inputs into digital content production



Source: CIE

#### *Harnessing creativity*

Intellectual property is the primary economic output that is produced by combining the talent and creativity of individuals in the digital content industry. Not surprisingly, in a profiling study for the Australian Interactive Media Industry Association (AIMIA), The Gist (2004) found that entities in the industry identify intellectual property as by far the most important main asset of their organisations, ahead of physical assets and business contracts.

While artistic creativity is often thought to be an innate attribute of certain individuals in a society, education, training and talent development programs must be in place before artistic creativity can be nurtured and subsequently harnessed in economically beneficial ways. Similarly, technical creativity must be given room and outlet for expression through opportunities for conducting research and development (R&D) activities.

Australia is strong in artistic creativity, solid in terms of business creativity, but relatively weak in technical creativity. Australia is recognised internationally for its artistic creative output, from films, actors, directors, designers, cinematographers, architects, musicians and artists. While Australia produces some individuals with outstanding technical creativity (for example, the inventors of the Cochlear hearing implants), a critical mass of such individuals is absent. There are no leading Australian IT companies in the world's top 100 IT firms and few domestic software companies have graduated beyond SME status. Australia's weakness in technical creativity can also be seen in measures of innovative activities: the number of patents filed per 100,000 persons is only 60.1 in Sydney compared to 101.3 in San Francisco.

## *Technological change*

The unrelenting invention and introduction of new technologies and platforms are providing a sustained impetus for the digital content and applications market. Underpinning this are the falling cost of digital technologies (a la Moore's Law which states that computing power doubles about every 18 months), the growing standardisation of digital platforms and, most importantly, the accessibility and widespread use of the Internet.

At a more basic level, the impetus for the adoption of new technologies by digital content producers and distributors is driven by the basic human desire for sensory stimulation and need as social beings for communication and interaction.

### *Digitisation*

Digitisation transforms and multiplies the usefulness of content previously encoded and disseminated in analogue forms. Digital content can be:

- reproduced precisely and perfectly;
- reproduced at little or no cost;
- re-used and easily incorporated into further works;
- transmitted speedily over open access networks than span the globe yet link neighbours and local communities;
- stored and retrieved quickly at very low cost;
- integrated with a variety of media forms resulting in potentially rich amalgamations of text, audio and visual content; and
- designed to incorporate interactive elements where the user can define or influence his/her experience of the content.

### *Integration / convergence*

Consequently, digitisation is having a profound impact upon industry structures, business models, and ways of doing things. A key impact has been the convergence of broadcasting, telecommunications and Internet activities. Distinguishing boundaries between these activities is vexing regulators and industry participants alike.

Indeed, convergence is changing and blurring the boundaries between once separate components of the content industries. A commonly cited example in the content area is the convergence of the film, animation and electronic games industries. In a convergent digital content industry, a common set of

skills (whether artistic, technical or business-oriented) may now be applied elastically in multiple contexts, thereby increasing the value of those skills. Convergence can also be disruptive. New activities and technologies may displace previously successful firms and industries.

A further factor is the way that digital content is being integrated within other activities. Digital content is becoming an important enabler across the economy. Activities as diverse as health, education, and government make extensive use of digital content to perform their core role. Architectural firms today rely more extensively upon digital CAD/CAM technologies and three dimensional fly throughs than they do upon traditional drawings.

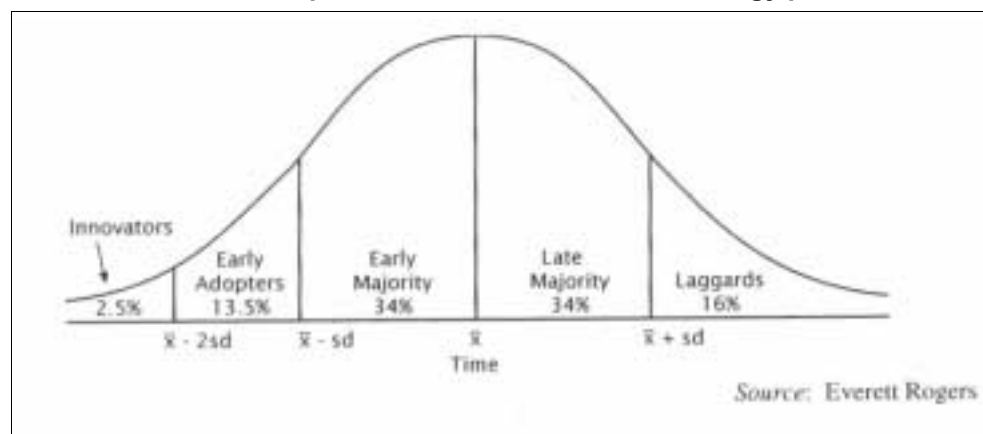
The fact that the lines between activities and sectors of activity are becoming increasingly blurred suggests the need for caution when trying to categorise and account for specific activities especially into the long term.

### *Adoption of innovation*

Taking into account what is already well known about the way that industry and the community at large make use of, or adopt a new technology can assist anticipating the future for digital content.

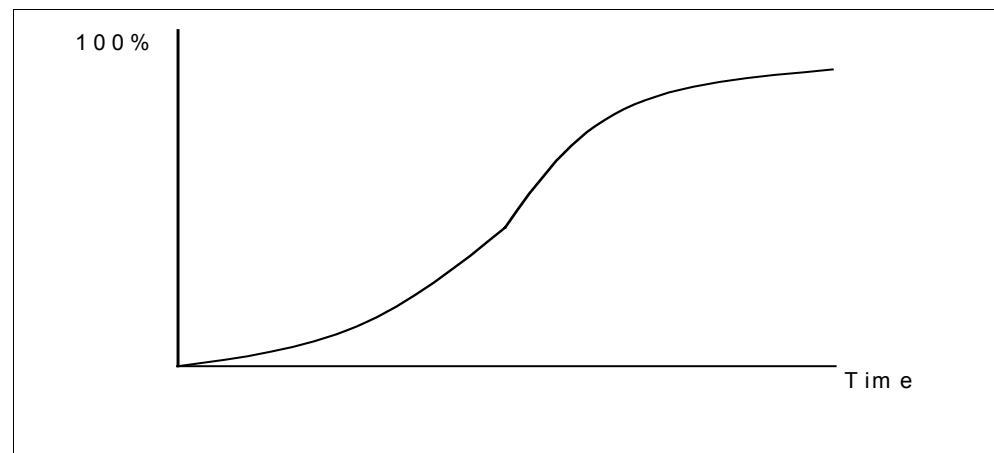
The shift to digital content can be viewed as the spread of a new product or adoption of a new industrial process. Firms electing to shift to digital content processes or households deciding to adopt digital content technologies are likely to follow well established patterns of adoption. The distribution of characteristics (chiefly innovativeness) of a population that governs the rate of adoption is generally normally distributed as is the time that it takes a firm or an individual to learn about something new and how to make use of it (Vanston and Vanston, 1996). (See chart 3.2.)

#### 3.2 Distribution of adopters under a diffusion of technology process



The process of new information filtering through a community or industry drives the diffusion process of first adoption of a new technology. This results in a technological adoption curve as shown in chart 3.2. The adoption process often begins slowly due to costs of information acquisition on the part of adopters and high production costs plus imperfect technology on the part of producers. A new technology becomes more useful as adoption rises (due to network externalities), as does economies of scale. Adoption takes off and then gradually levels off as the saturation point is reached. (The adoption curve is in fact mathematically linked to the distribution curve for adopters and is the sum of adoption over time – see chart 3.3).

### 3.3 Technological adoption curve



Source: CIE

The important thing to note is that it takes time for innovations and the adoption of new technologies to filter through. The time that it takes is not immutable. It may be changed, particularly by making people more aware of opportunities. This should be factored into technology forecasts.

## *Industry factors*

### *Industry structure and dynamics*

The bifurcated structure of creative industries is a key issue. This relates to the situation where the majority of players in an industry are small or medium-sized enterprises (SMEs), while there is a small number of large companies. Bifurcation exists in many service industries but not all of them. For example, the banking and utilities industries comprise almost entirely of large players while personal services industries (such as hairdressing) are characterised by a preponderance of small players. Still other industries (such as the

Australian accounting industry) which are traditionally bifurcated between very small and very large players are seeing the emergence of medium-size players that started as small companies but have expanded operations to other cities and regions within Australia. The key point here is that bifurcation is especially pronounced in the Australian digital content industry. This bifurcation exists because of first mover advantages to originally analogue firms that have entrenched themselves in the digital content distribution business, the enormous amount of capital required to break into this end of the industry, as well as regulatory barriers to entry.

Smaller organisations face many challenges. They focus on either content creation or distribution, but seldom both. Their success often hinges on their ability to link up with larger organisations that function as content aggregators. In many of the smaller firms, teams of workers are often assembled on a project-by-project basis, such as in the production of motion pictures. The fluidity of personnel involved in the creative industry means that it is difficult for a group of individuals to establish a track record or reputation.

This industry structure appears to be detrimental to collaboration and long-term investment. Fragmentation exacerbates information difficulties and makes it harder for firms to capture the full benefits of investment in shared infrastructure and capabilities or to secure finance from external sources (eg, via banks or capital markets).

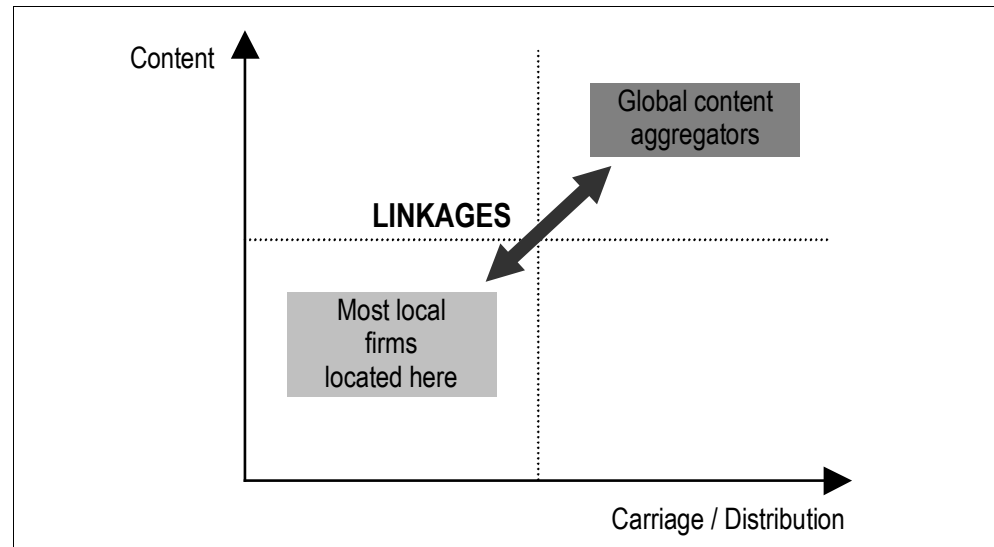
There are a small number of large organisations that wield significant market power, some of which are multinational firms. These include distributors of traditional creative content such as television and newspapers, which operate as large integrated entities that both produce and distribute content. Many of the large firms in these traditional sectors have entered tentatively into the digital arena, testing the ground and preparing to migrate or diversify in a significant way into digital (DCITA 2004).

The dependence of the small content producers on large distributors is expected to continue in the digital era. By their reputations, distributors provide a quality-assurance service that reduces the search costs and risk of disappointment faced by consumers. The distribution of digital content firms in carriage-content space is depicted in chart 3.4.

Finally, there is evidence of limited cluster development. Some digital content sectors are undergoing change and have established linkages, primarily following supply chain logics. There is little evidence of linkages

and collaboration between industry sectors. Cluster development is viewed as being embryonic, sporadic and uneven.

### 3.4 Distribution of firms in carriage-content space



Source: CIE.

#### *Vertical integration*

Related to the above discussion on industry structure and dynamics is the issue of vertical integration, one of sufficient importance to merit a separate discussion.

The majority of large multinational digital content production companies have established access to their own distribution channels – not one but many – and intellectual property (content) creators such as writers and musicians. Having access to all the distribution channels means that these companies can afford to purchase all rights and exploit the intellectual property in ways that mitigate losses or maximise profits. Examples of such companies include Disney and Warner Bros.

While it has not come about as a result of digitisation, digital production of content enhances the opportunities and viability of self-publishing, cross-promoting or otherwise leveraging assets in more cost-effective ways. Therefore vertical integration is exerting a huge impact not just on the core production of creative content by the creative industries but also on the volume of embedded digital content production and on outsourcing. This will ultimately alter the landscape and have a correspondingly large impact on skills and training. Utilities such as the state water boards (Sydney Water for example) already provide insight into vertical integration within industry or embedded content. The knowledge and expertise of employees

now extends to educational content and entertainment via a web site that is fully integrated with its marketing and advertising program.

The challenge for Australia is that vertical integration cannot be easily achieved in creative industries where there are a large number of small enterprises.

#### *Institutional and macroeconomic settings*

Studies of the creative industries in Australia (such as DCITA 2004a) have identified multiple issues pertaining to institutional and macroeconomic settings. Key issues are summarised below:

- The cost of advanced technology platforms (such as developing kits in the games sector and broadband network supply) is a significant barrier to entry.
- Intellectual property regimes are not evolving at a pace sufficient to address the challenges posed by the emergence of new technologies and delivery platforms. The complexity of digital rights management is a particular impediment to the growth of small enterprises in the industry.
- The government's competition policy (in light of the dominance of incumbent, pre-digital media channels in domestic digital content distribution and remote multinationals in global channels) has a significant impact on the development of the industry.
- There are only modest linkages from firms to universities and other research institutions. Networks are weak with limited cross segment collaboration and crossovers. Network social capital, the glue that holds together many of the world's most successful 'new economy' clusters, is patchy in the Australian digital content industry today;
- There is a lack of strong horizontal and related market linkages which has limited commercialisation and optimal exploitation of technology intellectual property arising from R&D and firm operations.
- There is a lack of synchronisation between upstream and downstream markets. There are unbalanced information flows, including finance, distorting market transactions. Feedback loops are weak and random.
- Cultural institutions can play a critical role in promoting digital content production, dissemination and use through building a critical mass of publicly available material of general community interest, but this potential is still largely untapped.

- Creative industry firms in general, including digital content production organisation report significant challenges in obtaining assistance through government R&D concessions and other schemes intended to encourage innovation and commercialisation of new technologies.
- The lack of well developed and applied standards in key markets, such as the education market, presents a barrier to industry growth at present.

### *Capital and finance*

Many of the smaller firms in the digital content industry encounter difficulties obtaining external finance. They are often forced to choose between bearing the burden of self-financing in order to take on the global market or reconciling themselves to a smaller, purely local production. A recent profiling study of the digital content industry found that surveyed firms' primary source of funds was overwhelmingly 'retained earnings' (65 per cent), in comparison with 'external investors' (11 per cent) (*The Gist*, 2004).

Australian digital content producers will increasingly find themselves trapped in a vicious cycle as more sophisticated consumers and end users demand content with ever-higher production values which low budget products cannot satisfy. This will reduce the probability of success in the marketplace and make future financing even more difficult.

According to DCITA (2004a), investors are discouraged by the absence of comprehensive revenue and market data, and by the need to invest in projects rather than specific business entities. This makes calculating risk difficult. Most digital content, such as movies and computer/console games also tend to have relatively short profitable shelf lives. Successful companies must continually produce "hits" which often require substantial new investment in human and physical capital. Even sequels to highly successful computer game need to be largely designed and coded from scratch. This is because continuous advances in computer hardware (such as CPUs and graphics processors) raise users' expectations of technical wizardry, which necessitates the purchasing or inventing of new game 'engines'.

The fundamental newness of creative content, its intangibility and the subjectivity of its value also accentuate the problem. Moreover, a small and fragmented industry increases the difficulty of spreading and managing risk. Exacerbating the problem of a poorly developed domestic venture

capital market are a range of factors including existing tax arrangements that are claimed to deter foreign venture capitalists.

### *Skills shortage*

Australia's small population means that it has a limited domestic talent pool compared with other major developed countries such as the UK, France, Germany, and even Canada. This combined with sustained economic growth over the last decade and more could be expected to lead to a shortage of highly skilled workers.

There is evidence of emerging shortages. A 2004 study by The Gist found that a quarter of the digital content sector surveyed had difficulty getting staff. Those with difficulties rose towards a third amongst the larger entities and those producing software. It is reported that successful Australian special effects firm Animal Logic recruits a large proportion of its workforce overseas – 60 per cent of the most recent 150 employed had been recruited in this way. Industry leaders comment that students leaving universities or institutes of technology are frequently not 'industry-ready', lack business and project management skills, and require further specialised training. The lack of critical mass of talent may discourage more large multinational firms from establishing R&D labs / studios / regional offices in Australia and international venture capitalists from taking more serious interest in Australian digital content start-ups.

## *Markets*

Challenges for maintained competitiveness in the digital content industry (and the creative industries in general) arise from Australia's relatively small population. A small population translates into a small talent base, a small pool of domestic investment funds, and a small domestic market. Compared with other countries at the forefront of digital content use, creation and distribution, Australia is disadvantaged by the lack of scale economies and scale externalities.

### *Linkage between domestic and export markets*

While increasing exports is the key to industry expansion, the domestic and export markets are inextricably linked. It is almost impossible for companies to export in a vacuum. Some experts such as Higgs and Kennedy (2004) believe that a healthy, globally competitive exporter has to be built on the foundations of a healthy domestic industry and infrastructure. This is so because:

- The domestic industry serves as a training ground for future creative, technical, production and business staff and entrepreneurs.
- A vigorous domestic industry enables talented individuals as well as companies to prove themselves and develop a track record in order to attract the capital, additional talent and supporters required to export.
- A vibrant domestic customer base is receptive to innovation, and encourages early experimentation on new technologies and approaches, thus fostering the development of a competitive edge.
- A strong domestic customer base can generate revenue through product sales and commissioned projects to finance research and overseas expansion.

On the other hand, other experts argue that it is imperative for firms in small country economies be “born global”, that is be established with exports as an integral part of the business plan from the very start.

#### *Established markets*

International opportunities for producers of digital content are expected to grow in the near future. Like many other countries, Australia has to balance creating content that represents its cultural values on the one hand, and commercial viability on the other. Creating exportable content is vital to most countries as few have the population size, network infrastructure and extent of device penetration such that they can produce exclusively for the domestic market.

The traditional markets for Australian creative content have been the US, UK (where interactive television is currently very hot due to investment by BskyB and others) and to a lesser extent, Canada and continental Europe. By all accounts, the US is the key media market in terms of production output, audience size and consumption. As noted in Higgs and Kennedy (2004), the impact of the US business on the viability of the Australian industry is critical: a single sale to the US market often makes the difference between the viability of a project/business or not. In addition, US-originated ‘work for hire’ and ‘runway’ productions are also major contributors to Australia’s film, visual effects and games industries.

Australian firms have considerable experience in working on projects originating from the US. Over time, Australian visual effects, games, animation and post-production houses have developed strong reputations there. Opportunities therefore exist for other sectors in the Australian digital content industries, such as broadband, mobile and web services, to participate profitably in the US market.

### *Emerging markets*

The impressive economic growth achieved by countries in the Asian region, such as China (including Hong Kong), Taiwan, Korea, Malaysia, Thailand, Singapore and India over the last two decades has spawned a very large and rapidly increasing number of middle-class consumers with significant purchasing power. These are potential purchasers and users of Australian-produced digital content such as film, music and computer games. However, many Asian markets are notorious for rampant piracy and poor enforcement of intellectual property rights. Successfully profiting from these markets require sound management of digital copyright issues and technological advances in encryption and other areas.

Besides selling digital content in these emerging markets, there are also opportunities for post-production work (such as special effects creation), joint production and other collaborative activities in film, TV and video games, among others. In fact, Australia-China joint productions have already delivered skills and financing to several children's and film projects. Opportunities abound in other East Asian countries as well: Korea is the leader in broadband and massively multiplayer on-line games while Japan has a unique market for mobile content in Docomo. Australia's time zone proximity to these Asian markets is an advantage, as is our greater understanding of regional cultural issues than our competitors in the northern hemisphere.

### *Competition and competitiveness*

There is widespread recognition that digital content and services will have a major effect on all aspects of media. Australia has the opportunity to assume a leadership position in digital media services and production. This window of opportunity is narrowing, however, as many other countries are vying for the same position. Some of them are investing heavily into a range of development programs, as can be seen in table 3.5.

The competitiveness of the Australian digital content industry is shaped by factors including awareness, demand, culture, time zones, cost drivers and intellectual property protection. Australian strengths include cultural and linguistic affinities with the US and UK, competitive salaries and wages, and relatively strong intellectual property protection. Time zone differences make it more difficult for Australian firms to collaborate (via remote networking technologies) with their North American and European counterparts but facilitate communication with their Asian customers.

### 3.5 National strategies for digital content

Country	Program	Year started	Size of program
UK	Digital Content Action Plan for Growth	1999/2000	£56 million
Canada	Digital Content National Strategy		C\$236 million
Singapore	Media 21: Creative Media Connected Society	2002	n.a.
Korea	EKorea		US\$257 million
New Zealand	Breaking Through the Barriers	2002	n.a.
Japan	EJapan Strategy	2001	n.a.
Malaysia	Multimedia Super Corridor	1996	n.a.
	Malaysian Communications and Multimedia Content Forum	2001	
European Union	Digitcult: Unlocking the Value of Cultural Heritage	2002	n.a.
	Cordis eContent Program	2002	A\$26.5 million
	Media Plus Funds to Interactive Media		A\$400 over 6 years
Mexico	e-Mexico National System	2002	n.a.

Source: Higgs and Kennedy (2004).

Australia's competitiveness in digital content production and distribution is blunted by its under-developed venture capital markets and its talent shortage (especially with regards to the availability of technically creative IT professionals) identified previously.

Finally, the geographical distance to overseas markets and potential collaborators continues to be a concern for some industry stakeholders. While some transactions can now be undertaken electronically, negotiations often have to be undertaken face to face in order to develop trust amongst participants.

#### *Market access*

In a profiling study of the digital content industry conducted by The Gist in 2004, survey respondents cited 'better access to export markets' as the factor most likely to assist their organisations to grow, ahead of 'more capital' and 'government assistance'.

Access to markets is continually being changed, reflecting changes in distribution networks, contacts, and regulations. The invention of new technologies may lead to the emergence of new distribution channels, for example Internet TV. These developments tend to have a significant impact in the Australian digital content industry as a small domestic market makes it vital for firms to reach out to global markets and audiences. However, the

success of new distribution channels also requires the development of viable new payment technologies (see box below).

### 3.6 Micropayment mechanisms

Industry stakeholders believe that the development and widespread acceptance of micropayment mechanisms will greatly facilitate the distribution of digital content by increasing the financial incentives for firms to make that content available. Currently firms are unable to capture the revenues from disseminating small bits of information as the fixed costs of financial transactions over the Internet are still relatively high. These bits of information are currently given away free to web users. The importance of developing micropayment mechanisms has been recognised by the Australian government. The Department of Communication, Information and the Arts has commissioned a study on the future of the payments industry and the ways in which it can drive the information economy.

Regulations restricting the entry of Australian digital content into foreign markets and the import of foreign content into Australia may be streamlined or made less onerous in the near future as a result of bilateral free trade agreements (FTAs) as well as multilateral trade liberalisation.

### *Non-market arrangements*

There is a wide range of approaches to the development of linkages between entities within and outside the digital content industry. Links may be formed through bilateral contractual relationships, through formal structures such as industry associations, or they may be loose and informal relationships. They may result in collaborative activities such as the sharing of ideas and information, alliances to undertake activities of common benefit, contractual arrangements such as joint ventures or project partnerships, or formal buying and marketing arrangements (DCITA 2004a). Currently, as noted in an earlier section, there is limited evidence of spontaneous collaborations emerging across traditional industry groupings. With few exceptions, traditional industry 'silo' structures predominate in the Australian digital content industry.

## Framework for analysis

Drawing on the earlier discussion, six key dimensions shaping the future for the digital content industry have been identified. In many ways, these dimensions are the result or outputs of strategic choices made about the industry today. Or they are the outputs where choice has not been exercised and the default position has been allowed to apply. These

dimensions are very broad, bringing together many issues that have a common theme. The dimensions and indicative areas for further analysis within each dimension are summarised below in table 3.7.

### 3.7 Key dimensions for the future of digital content

<i>Dimension</i>	<i>Area of analysis</i>
<b>Creativity</b>	<ul style="list-style-type: none"> <li>▪ suitable stories (content)</li> <li>▪ artistic, technical and business creativity</li> <li>▪ quality of education and training</li> <li>▪ returns from R&amp;D and innovation</li> <li>▪ quality of talent development</li> <li>▪ access to emerging and existing ideas</li> <li>▪ adoption of new ideas and innovations</li> </ul>
<b>Capacity</b>	<ul style="list-style-type: none"> <li>▪ capital (especially access to capital by SMEs)</li> <li>▪ funding for R&amp;D and innovation</li> <li>▪ access to skilled people</li> <li>▪ access to leading technologies</li> <li>▪ size and ability of enterprises to undertake projects and accumulate expertise over time</li> </ul>
<b>Clusters</b>	<ul style="list-style-type: none"> <li>▪ connections within sectors and between sectors</li> <li>▪ technological convergence</li> <li>▪ linkages between creative, educational and commercial centres</li> </ul>
<b>Channels</b>	<ul style="list-style-type: none"> <li>▪ relationship with customers</li> <li>▪ distribution networks</li> <li>▪ contacts in upstream and downstream aspects of the industry</li> <li>▪ access to communications (ie, broadband access)</li> <li>▪ market access and restrictions to access</li> <li>▪ regulatory change</li> </ul>
<b>Commerciality</b>	<ul style="list-style-type: none"> <li>▪ capacity to charge</li> <li>▪ protection of intellectual property</li> <li>▪ barriers to use of existing ideas and content</li> </ul>
<b>Competitiveness</b>	<ul style="list-style-type: none"> <li>▪ awareness</li> <li>▪ demand</li> <li>▪ cultural factors</li> <li>▪ time zones</li> <li>▪ cost drivers</li> </ul>

# 4

## *The base case*

THE BASE CASE FUTURE is the first of the two substantive *envisaging* exercises in this report. This is set out following the framework established in the earlier chapters. Quantitative indicators of outcomes are also provided.

### **Scenario requirements**

The base case future scenario analysis reflects outcomes over the next decade years (ie, to 2014-15) with 'no change'. 'No change' in this instance refers to the continuation of business-as-usual, or the circumstance where there are no major changes in policy settings and where industry approaches are largely unchanged, or change in line with current trends. Of course, the underlying economy and social settings remain subject to current trends.

The aim of this analysis is to set out a reasonable picture of the outlook without intervention. This as viewed as a 'neutral' future state in which possibilities and opportunities are not actively pursued and realised, but nothing bad happens either.

It is difficult to narrow the analysis down to a single scenario reflecting the large number of variables in play. The approach adopted here is to paint a broad brush picture to illustrate some major points.

### **Key drivers**

#### *Creativity*

It is difficult to verify if the level of creativity in the Australian digital content industry is trending up or down. It is therefore also difficult to suggest a trend for the forecast period about the production of good stories, or other creative ideas. What is more predictable is a continuation of the

pattern of bursts of creativity in Australian content being carried over into the digital content industry in the long term. This implies a continuation of cyclical ups and downs.

The talent base is projected to grow in proportion with underlying economic demands. Looking at the component parts of the talent base the picture becomes more worrisome. The base case projection extends present circumstances where Australians are well trained and equipped regarding artistic creativity, but investment in technical and commercial creativity is lacking. The lack of a strong and deep entrepreneurial tradition and ethic in the development of people and project teams or firms in the content industries in Australia is viewed as likely to constrain competitiveness and growth in the longer term.

It is likely that without policy change the adoption curve reflecting the penetration of digital content technologies into traditional areas of activity can be expected to proceed along its current trajectory. While digital content seems 'new' or innovative at this time, it has matured and has obtained sufficient critical mass to be widely noticed. In fact computing arrived on most if not all creative professionals' desks some two decades ago. Many 'killer applications' in digital content have already come and gone. Thus it is likely that the adoption curve is close to maturity and the rate of adoption would peak at some stage in the next few years and decelerate after that. The result would still spell significant growth in digital content activities, although the rate of growth would taper off towards the end of the forecast period.

## *Capacity*

The digital content industry remains constricted to obtaining capital from internal sources (largely from strict management of internal reserves). It remains undercapitalised and inefficiently capitalised (without the efficiencies and cost reductions that flow from unfettered access to capital markets).

Funding for Australian R&D and innovation remains constrained.

The digital content industries are able to recruit creative people in the base case, but the industry has to develop their commercial abilities from scratch.

Activity remains project based. Most firms are small and short-lived. It is difficult to grow and evolve from small, to medium and then larger scale firms. The leaders in creative digital content focus upon establishing recognition of their personal work and name rather than building well

known and established brand names that signal consistent quality and price attributes.

### *Clusters*

Australian digital content industry participants remain no better organised than they are today.

### *Channels*

Success for digital content industry participants continues to be flagged by the nature of relationships with customers. Highly successful firms maintain close links with their buyers. Few Australian producers are consistently able to generate the means of reaching and servicing their own large customer bases.

### *Commerciality*

All digital content firms (those in Australian as well as overseas) struggle for many more years to find means of matching access and use of digital content to payment. Income currently derived from content in general grows in proportion to underlying economic growth and growth in consumers' income. The increased availability of some new payments mechanisms (which are admittedly difficult to identify at this point) merely matches the background rate of progress in payment systems at large and there is no 'digital' dividend for producers.

Smaller scale producers and distributors of more easily copied digital content struggle with complicated intellectual property and rights management issues. Modest Australian industry gains in some areas from extended legal protection of intellectual property is offset by complexities in negotiating and paying for rights to essential inputs (such as access to graphics engines in the electronics games sector).

### *Competitiveness*

The Australian digital content industry is no more or less competitive than today. It continues to rely upon those factors which give it a strong position in the domestic market. That is, cultural factors, telling Australian stories to an Australian audience, remains as a key factor in the industry's survival. Regulatory factors such as the protection provided under local content requirements in analogue free to air television broadcasting apply over the

most part of the forecast period. While changes such as the introduction of digital TV multichannelling are likely to have less stringent local content requirements (as implied within the terms of the Australian United States Free Trade Agreement), modest potential losses to Australian producers are offset by modest gains from increased demand for content.

## Illustrative quantitative indicators

The consulting team have prepared estimates of digital content industry outcomes reflecting the base case scenario settings discussed above. This scenario is also labelled as Scenario A in some of the charts and tables that follow.

The key approach taken regarding digital content activities is that they are projected to grow in line with the expected growth of the component parts of the digital content 'sector'. It is viewed that there is no material change in the proportion of activity within each sector of the economy that is related to digital content.

To identify implications of economic growth for the digital content activities it is necessary to have information at a high level of detail (specifically at the ANZSIC four digit level) and also to have forecasts that relate to the long term.

Detailed forecasts of industry growth have been obtained from Monash University in Melbourne. These incorporate inputs from ACCESS Economics, ABARE and the ABS among other sources. These inputs have been incorporated into the MONASH Computable General Equilibrium (CGE) model of the Australian economy. The forecasts are the output of the model taking these factors into account. This helps to ensure that the forecasts are consistent with underlying resource constraints. It is also useful to ensure that growth is not extrapolated beyond the expected supply of capital and labour in Australia and that the specific sectoral forecasts are consistent with expected input and output relationships that underpin the economy. The result is an independent view of the economic outlook that forms a basis for further analysis of digital content.

2002-03 is the base year from which forecasts are derived for the years up to 2014-15. All of the dollar amounts in the commentary that follows are in real terms or constant prices (in 2002-03 prices, the base period for actual or observed data).

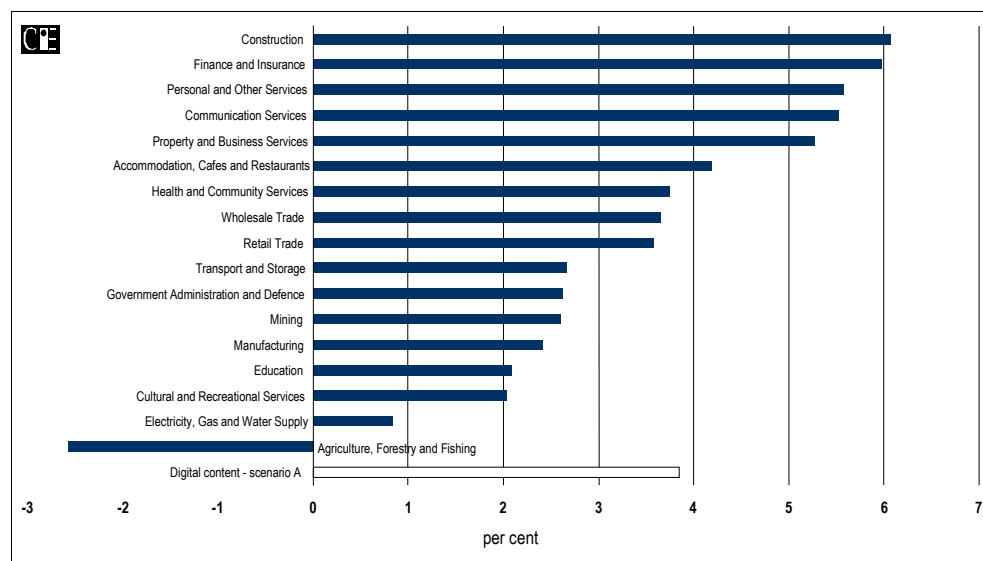
An outline of the illustrative forecasting framework is provided in Appendix A.

### *Economic output*

The MONASH forecasts of underlying economic activity suggest continued significant structural change in the Australian economy over the next decade. Of particular note is the expectation of continued strong growth of services sector activities and the slower growth or decline of activities such as agriculture, mining and manufacturing.

The digital content sector in the base case (or Scenario A) grows in line with the growth rate of its various component parts. The projected growth rate under this scenario is 3.8 per cent. This is higher than the rate of growth observed over the years to 2003-04 (3.3 percent) and compares with growth in industry product over the economy at large over the forecast period to 2014-15 of 3.7 per cent. The forecast growth rates by sector (ANZSIC Division) are reflected in the chart below.

#### 4.1 Average annual growth rate by sector over forecast period to 2014-15

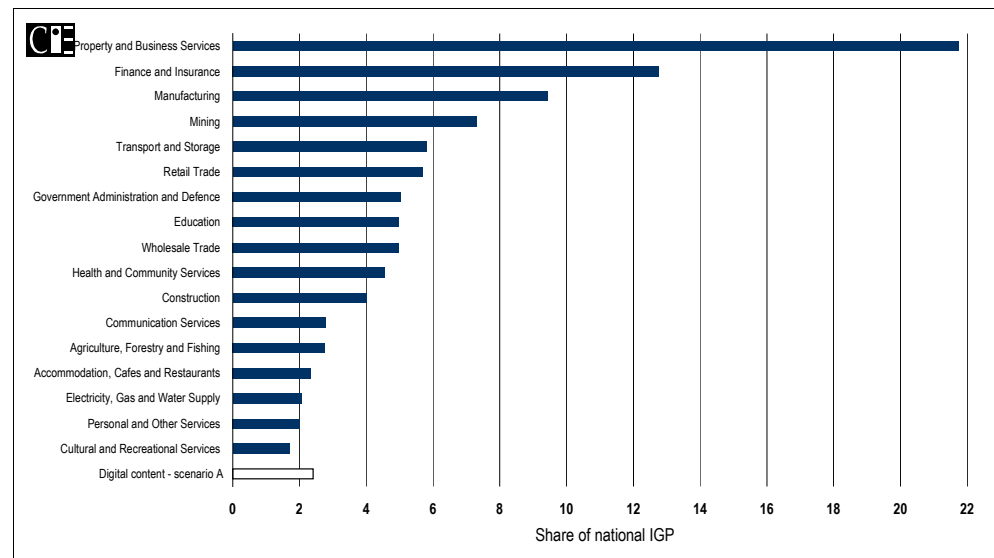


Source: CIE.

In line with the structural change referred to earlier and forecast growth rates the property and business services is projected to become the largest single sector (or ANZSIC division) by the end of 2014-15. Sectors such as manufacturing slip from their current leading position to be overtaken by many types of services.

Under the base case digital content activities are projected to grow from \$18 billion in 2003-04 to \$29 billion in 2014-15. Thus digital content activities are equivalent to 2.4 per cent of forecast total IGP (which is similar in concept to GDP). On this basis the digital content industry is viewed as largely maintaining its ranking within ANZSIC industry sectors, falling somewhere between the agriculture and accommodation industries. That is, the digital content industry in this scenario retains largely in the same industry ranking as it has today – see chart 4.2 below.

#### 4.2 Share of total IGP by sector in 2014-15

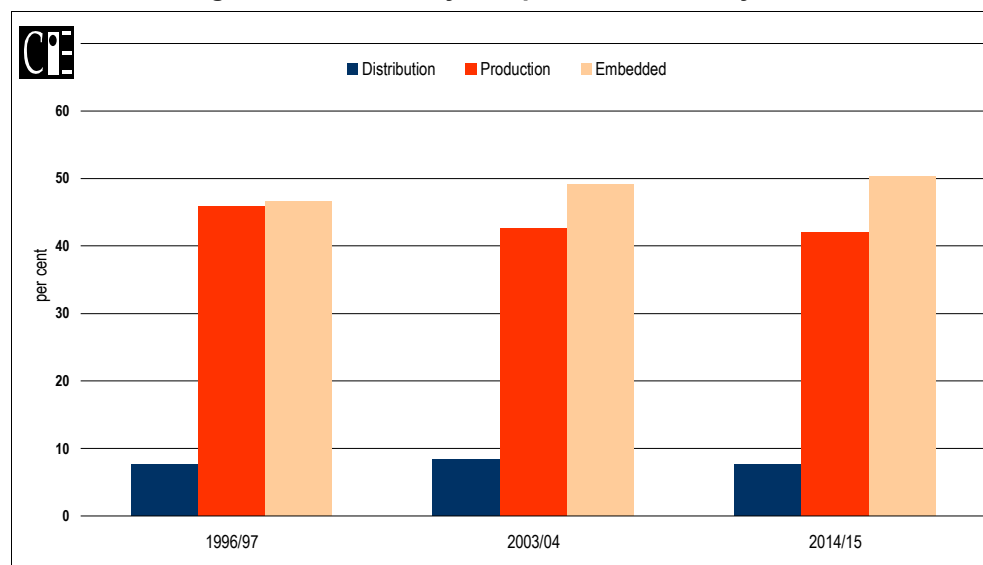


Source: CIE

The overall picture under the scenario is of the digital content sector tracking 'sideways', sustaining only modest growth on average over the forecast period.

While the overall picture is largely unchanged in this scenario there is a change in the composition of digital content activity. Embedded digital content activities, being more closely linked with faster growing services expand faster than the other components, obtain a growth rate of 4.1 per cent. Production activities grow in line with the economy average, with a rate of 3.8 per cent. Distribution activities are more stable with a growth rate of 3.2 per cent. This results in marginal changes in the share of activity within the industry from the mid-1990s with embedded activity increasing in importance – see chart 4.3.

## 4.3 Share of digital content IGP by component, selected years



Source: CIE

### Employment

Employment also changes in the forecast period under the base case scenario.

Digital content job numbers are expected to grow by 1.6 per cent per annum on average over the forecast period. Employment grows more slowly than output reflecting expected productivity gains.

The projected growth rate results in an increase in full time jobs in digital content activities of 20.8 per cent to 349 000 employees by the end of 2014-15. This implies a relatively modest increase in training and development of new employees. Under this scenario digital content industry activities account for around 2.7 per cent of total employment.

Most of the growth in employment in the digital content activity is in embedded digital content activities. Those activities sustain an average annual rate of employment growth of 2.1 per cent in the scenario. This is more than double the rate expected for digital content production (0.9 per cent per annum) and distribution (0.7 per cent per annum).

### Trade outcomes

Trade outcomes are expected to remain broadly neutral in this scenario. That is, digital content producers are neither more, nor less, competitive than they are currently. This means the ratio of exports to imports are held

constant trade so deficit of \$1 billion in 2002/03 is projected to move in line with the growth of the underlying economy to \$1.9 billion in 2014/15. This is comprised of a net trade deficit in production of \$2.1 billion and a net trade surplus in embedded of \$0.3 billion. It is assumed that trade in distribution will remain at zero.

It is notable that trade activity, especially regarding imports of digital content products, is positively correlated to trends in domestic digital content activity. That is, when there is strong domestic demand, domestic production expands as well as imports. When there is modest domestic demand there is less demand for imports. The picture of broad balance (or modest deficit) in this case is consistent with fairly subdued market conditions over the forecast period, although there may be years where the outcome is a larger deficit (reflecting cyclical periods of high demand).

#### 4.4 A pessimistic scenario

Rather than look forward to business as usual, some industry leaders and analysts are concerned about the Australian digital content industry becoming increasingly marginalised on the world stage. In contrast to viewing recent indicators such as declining sales for Australian content at large (especially in music and film) as a cyclical downturn eventually subject to a rebound, it is viewed that the industry may have suffered a structural loss of competitiveness.

The digital content pessimists point to a number of factors that suggest further difficulties. These include the following.

- A sustained shift in consumer tastes towards the product of large global content aggregators.
- Almost universal access to true broadband Internet services raising external digital content producers' and distributors' access to the Australian market which results in significant leakage of demand. Gains Australian producers obtain from access to overseas markets are insufficient to offset this leakage.
- Global content aggregators are most likely to resolve difficulties in payment systems that favour their business models and entrench their position in the market for content to the near exclusion of the smaller, independent producers that predominate in Australia.
- Global centres of digital content creation could drain Australia of its well educated talent reflecting broader opportunities abroad and higher rewards.
- Opportunities for large vertically integrated global digital content organisations to abuse their market power, set prices and bundle their products to block competitors, and minimise prices paid to smaller independent creative suppliers to maximise returns to the global organisations.
- Losses to Australian industry due to continued far reaching reforms and the removal of various policy measures that have protected Australian producers, are not offset by improved access in external markets, resulting in a net decline in the Australian industry. Provisions of the recent Free Trade Agreement between Australia and United States are frequently cited in this regard.

**A pessimistic scenario — continued**

It is unlikely that Australian digital content industry firms and individuals would disappear overnight even under the most pessimistic scenario. Australian producers currently hold a significant share of the domestic market and some are sufficiently competitive to export.

The most vulnerable portion of the industry is digital content producers that are forecast to contribute product of about \$16 billion per annum by 2014-15 in the base case. Some portion of this, possibly a large portion, could be a risk under the pessimistic scenario.

Looking toward the medium to longer term, it is doubtful if Australians would elect to pursue a career in digital content related industries if the demand for those skills was in a sustained decline because production activity was dwindling. This would in turn reduce the supply of labour available for employment within embedded digital content activities. The Australian digital content sector may not be as creative if the opportunities for domestic employment within the production sector decline.

Employers may find it beneficial to outsource these activities and rely on inputs from places where there is a fully integrated and deep digital content capacity, raising digital content imports. Thus, a significant but difficult to predict proportion of the embedded digital content sector may be at risk in the long run.

It is not clear that there are significant risks for the distribution sector under this scenario. Domestic digital content distributors would play a significant role in Australian sales and marketing activities that would still require local input. This is not a very large component of activity in terms of value added, growth or employment.

# 5

## *The preferred future*

ESTABLISHING A VISION for the preferred future of the digital content industry is the core output of this study.

### **Building the scenario**

This scenario tells of a vital, creative nation that reinvents itself to capitalise upon the profound structural change occurring in the worlds of business, consumer needs and society at large. Many of the changes are well known and well rehearsed including the rise of affordable open access networks, the increasingly free movement of ideas, knowledge, goods, services, capital, and people around the world and around everyone's neighbourhood. The most crucial change is the rise of human creativity as the defining feature of economic life. Not only is creativity valued, it is now paid for. New opportunities, new industries, and new wealth are the result.

With a well crafted mix of economic reform, engagement in international affairs and confident well-aimed action to re-energise home-grown innovation and creativity, Australia reengineers a comfortable and growing slice of global markets for itself.

The networked global economy operates across national borders and promotes the nearly frictionless flow of goods, services, people, capital and information. The physical is less valuable. Rather than dematerialising the economy, the competitive pressure is to add value to material with added creativity. Blurred distinctions between the media, information, entertainment, education, shopping, and communicating adds competitive pressure and strengthens consumer sovereignty.

Australia embraces its internal diversity and turns it to an advantage. Investments in nurturing creative talent are enhanced by supporting entrepreneurial abilities. Australian cities, well known for their lifestyle advantages and with a strong sense of place, reinvest in social capital and key infrastructure services to keep them livable, re-establishing their role as creative hubs.

A core aspect of the preferred future is a well founded range of policies that facilitate the transition to the information economy. (Some of these policies pertaining to human and financial capital are depicted in chart 5.1.) Having widespread access to true broadband services is necessary but far from sufficient to support change. It is the way that these facilities are used and factored into everyday life that matter.

## Framework factors

### *Creativity*

In the preferred future, Australia's small population and talent base will no longer be a barrier to the digital content industry's expansion and success in the global marketplace. The domestic talent base will be fully and effectively mobilised, and be augmented by human capital inflows.

Changes in immigration policy and migration criteria will attract more foreign talent, especially those who are technically and commercially creative. Federal-funded 'New Economy Scholarships' will attract several thousand smart and creative young people from around the world to Australia each year by giving them opportunities to pursue post-graduate studies in fields such as computer engineering, computer science, and computer animation.

Changes in the curricula and course offerings of learning institutions (for example, adopting a more multi-disciplinary approach) will harness domestic talent more effectively. There will also be increased opportunities in universities for the artistically creative to meet and link up with peers who are gifted with technical or business creativity.

In addition, the relevant government bodies will support leadership training in creative digital industry business management, exports and entrepreneurial skills.

Services industries are encouraged to increase their rate of adoption of embedded digital content by sustained falls in the price of inputs and increasing ubiquity (usefulness and user-friendliness) of digital content and its applications. This is also supported by government agencies raising awareness about the advantages of digitisation.

Urban and economic planning in this scenario recognises that attracting talented and creative people, not just leading companies, is effective in

creating a place where, in the terms coined by Florida, 'creative experience' can flourish (2003).

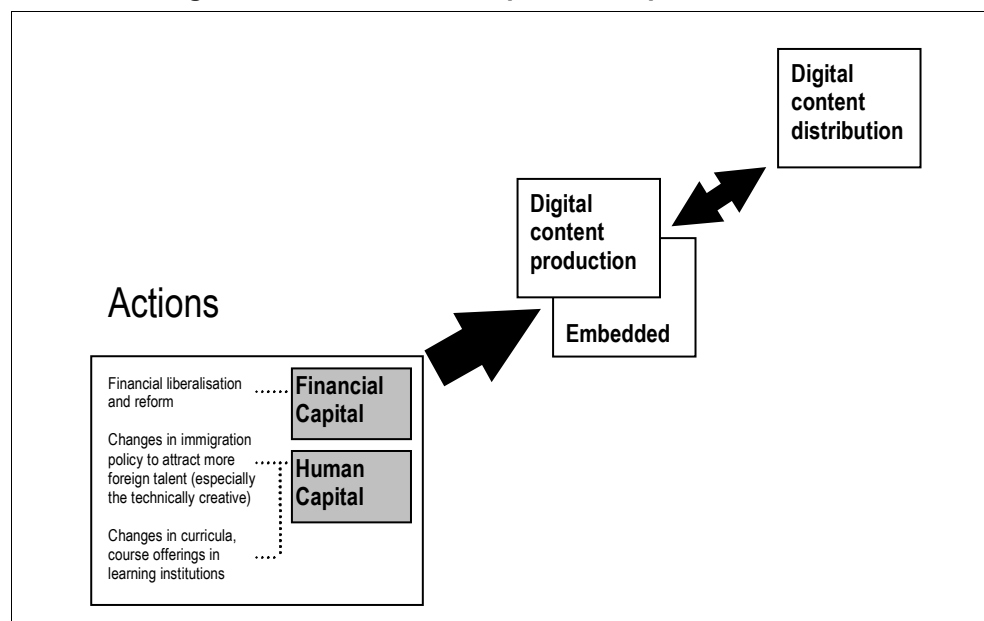
Evidence of Australia's creativity strengths will abound in the preferred future. Australian firms will be recognised with awards for their creative input into films, games and Internet broadcasting. Some of the most popular music webstores in Asia will be operated from Australia and led by talented people originally from Asia that found it better and more profitable to stay in Australia after obtaining their higher education qualifications here.

### *Capacity*

In the preferred future, financiers will view the digital content industry as a 'normal' industry.

- Sustained economic growth, deep capital markets with a predictable and efficient governance and supervision framework combine to attract foreign venture capital. A more competitive and sophisticated domestic financial sector will find investment in high risk/high return digital content projects more attractive. New tools will be built to help investors measure risk more accurately, as will improved information flows.
- There will be more interaction and engagement as well as improved communication between the digital content and finance industries. Currently, digital content promoters want the venture capitalists to adapt to their industry structure rather than vice versa. In the UK, the digital content industry is already restructuring itself to promote investment. Companies are developing slates of projects rather than on a project-by-project basis.
- In the preferred future, digital innovation involving 'cross-media' in the emerging platforms of broadband, games, mobile content and interactive television will be encouraged through experimental funding and publication channels. Higgs and Kennedy 2004 refer to this as the building of a 'digital sandbox'.
- Government and instrumentalities will also be empowered to initiate projects to seed the demand for the creative digital industry to produce innovative digital content applications and services.
- This strategy is based on the recognition that the take-up of new distribution channels and communications technologies is constrained by the availability of content that is unique and valued by customers for that new channel, and that there will be no take-up without a critical mass of solutions (Higgs and Kennedy 2004).

## 5.1 Bolstering financial and human capital in the preferred future



Source: CIE.

## Clusters

### *Overcoming barriers and market failures*

Cluster development potentially offers a means of addressing barriers and market failures in the digital content industry. For example, the information asymmetry and scarcity that plagues domestic financing may be addressed by the lower cost information, trust, reputation and recommendation structures that exist within clusters. Clustering may also increase the visibility of the industry to export markets.

Clustering reduces the information, transaction and coordination costs that are especially high for the many small firms that is expected to populate the industry even in the preferred future. They can also enhance the creative climate and culture through the flow of ideas and the sharing of creative values.

As Higgs and Kennedy 2004 point out, clusters are very effective so long as the business approach of the cluster manager is to create an 'ecosystem'. If the manager sees the cluster purely as 'real estate tenants' then the trust, awareness of complementary skills, infrastructure and common business processes will not be in place.

Clustering is thus an important component of the preferred future. However, it is not the magical solution often touted to solve the most vexing of the industry's problems.

### *Beyond clustering*

The preoccupation with clustering appears to stem from the desire to replicate the spectacular success of certain geographical locations in attracting and aggregating firms that emerge as global industry leaders, the prototype being Silicon Valley and its dominance of the information and communication technologies (ICT) industry.

Governments around the world often attempt to mimic and recreate the apparent physical structures (the 'hardware') that define Silicon Valley, for example by building industrial parks and locating them in proximity to universities and other research facilities.

However, the Silicon Valley evolved organically and has continued to thrive *in spite of*, rather than because of, the actions of the US federal government or successive business-unfriendly Californian state governments.

The key to the valley's success is its ability to attract the brightest talents from the entire country and from all corners of the world. The presence of world class universities (the "Ellis Islands of the Creative Age" and global talent magnets, according to Florida) is a critical factor, as is the attractive climate, the vibrant, optimistic and tolerant nature of its society, as well as its relatively welcoming attitude towards newcomers. The pervasive *cando* spirit and energetic entrepreneurism are also major factors in the area's success.

The same attributes also explain part of the success of the film and music industries around Los Angeles. Many of these ingredients (the 'software') are intangible and extremely difficult to reconstitute. The interesting thing is that these elements are present in Australia to a greater degree than almost anywhere else in the world. For a more detailed discussion of the importance of 'place' in attracting creative talent that enhances economic growth, see Florida (2003, 2005).

The preferred future for the Australian digital content industry is thus realised by choosing policies that will fully leverage and harness these 'software' advantages to overcome the greatest barrier to its success, which is Australia's small population. As discussed in previous sections, this lack

of critical mass limits its domestic pool of talent as well as the size of the domestic market for Australian digital content.

In the preferred future, the constraints of the small domestic market will be overcome by cluster development and by the availability of new delivery platforms that reach global audiences. Financial liberalisation will increase the flow of foreign capital and alleviate financing problems. Changes in immigration policies will enable a significant enlargement of the talent pool. The low visibility of many sectors of the digital content industry in overseas markets will be addressed by savvy marketing, branding and promotion operating in tandem with the increased financial and human resources (and general scale of the industry).

In short, in the preferred future, freely-flowing domestic and global venture capital will fuel the activities of the many small firms, each bursting with artistic, technical and business creativity, which will take advantage of new delivery platforms and the rich latticework of links with global content aggregators and distributors to reach spellbound audiences and consumers worldwide.

### *Channels*

In the preferred future, the industry will continue to be bifurcated with many small, nimble, well-funded and intensely creative firms. However, extensive linkages and pathways will be built to connect them seamlessly to global distributors and content aggregators.

- There will be a cross-industry body that will coordinate the development of the industry, identify and advocate applicable standards, as well as market the industry's capabilities and products in global markets.
- There will be concerted government support of industry clustering and infrastructure services by, for example, expanding high bandwidth pipelines to most creative digital industry sectors and clusters. There will be efficient provision of inputs and infrastructure such as digital resource repository and exchanges, rightsholder directories, and rights management.
- Relevant government agencies and industry associations will aggressively brand, market and promote Australian digital content, notwithstanding some unsuccessful tepid attempts in the past. The aim of branding is to promote the wide capability of the industry and its expertise and quality to an international market. The setting up of 'market access offices' in strategic markets will aid the penetration of

Australian digital content in these markets. A portal (perhaps with 'server farms' located within strategic target markets) that promotes and licences Australian digital content to overseas producers and consumers may also be established.

- The introduction of new content delivery platforms (such as Internet HD television or interactive television) will assist Australian content producers in reaching a wide, global audience. This will, however, require an improved understanding of and insights into the taste and preferences of different global markets, particularly the emerging markets in Asia.
- In addition, there will be greatly increased strategic international and domestic partnering to open up these emerging overseas markets, partly through the extension of co-production treaties. International collaborations with complementary countries enable risk-sharing and knowledge diffusion.

### *Commerciality*

In the preferred future, Australian digital content firms will be among the handful of global leaders that have established successful businesses charging for access to content. Their brands will be recognised in households around the world. Owners of content strive to obtain 'shelf space' within these successful, well frequented content 'outlets'. Creators and the owners of these new channels to market obtain a significant 'digital dividend' through the creation of a large customer base that values a degree of consistency or reliability and are prepared to pay more these attributes.

Widespread access to more convenient and cheaper payment systems enables many owners of creative content to start up and maintain businesses based on providing content direct to customers via the Internet. This provides the first big break of recognition for many creators who are then able to command higher prices when they negotiate with the specialist content aggregators.

Rights management remains a complicated issue. In fact, with increasing diversity in the way that products are made, distributed, copied and reused, they are more complicated than legal approaches and arrangements in earlier decades. While this is so, there is more value to be obtained from the rights to digital content so it is worthwhile investing in effective and appropriate management.

## Competitiveness

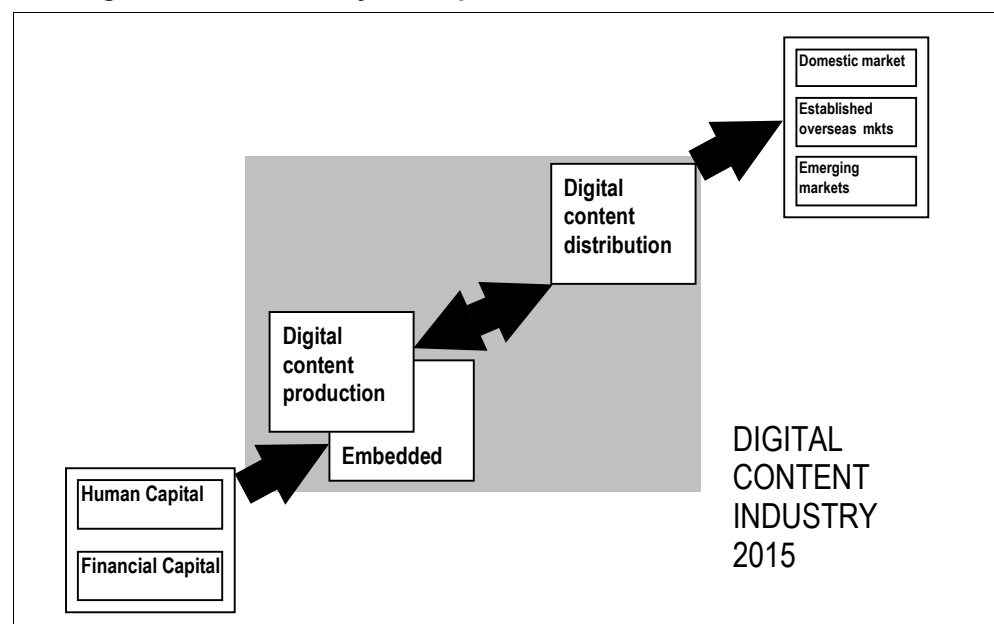
There is a major shift in the competitiveness of the Australian digital content industry in the preferred future. The impact of change in the dimensions shaping outcomes in the digital content industry produces a concerted improvement in competitiveness. Most have the effect of improving the supply side of the industry – raising capacity and reducing costs.

The preferred future also involves raising awareness about the capabilities of the industry in Australia. Building stronger linkages with customers through channels to market is essential in growing demand and sustaining the interest of buyers and opening opportunities to access customers, especially customers in additional markets.

## Overall picture

The broad picture painted in this scenario is summarised in chart 5.2 below. By building a sound foundation for the industry, especially through access to key inputs the industry is well positioned for growth. The lift to raise the industry is provided by demand pull factors, particularly raising demand due to enhanced access to markets and improved competitiveness enhancing the capacity to meet the needs of digital content buyers.

### 5.2 Digital content industry in the preferred future



Source: CIE.

## Economic outcomes

The consulting team has prepared estimates of future economic outcomes reflecting the underlying picture developed earlier in this section. It has been challenging to capture all of the elements of the preferred outcome in a single set of numbers. The approach adopted here is to break the overall picture into two parts. These are also labelled as scenarios for convenience and include:

- Scenario B – where factors in the scenario enhance the capability of the digital industry as well as raise domestic demand for digital content output. Domestic demand also rises as a result of drivers and structural parameters already at work in content markets, such as user generated content and multi-user environments in videogames. The increasing significance of such drivers and parameters will further drive adoption, production and distribution of digital content.
- Scenario C – in addition to impacts reflecting in scenario B, gains arising from increased competitiveness of the Australian industry are included.

### *Economic Output*

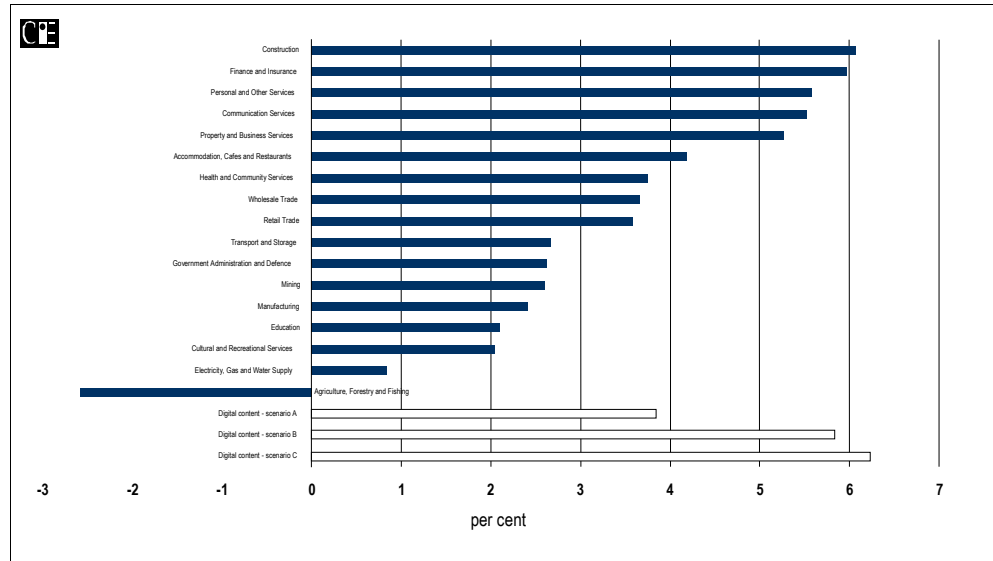
Growth in the economic output of the digital content industry accelerates strongly in the preferred future. The industry is projected to achieve an annual average growth rate of between 5.8 per cent and 6.2 per cent sustained for more than a decade to 2014-15. This is approximately twice the average rate achieved in recent years.

The projected growth rate of the digital content industry in the preferred future (scenarios B and C) is portrayed in chart 5.3. The chart also includes the growth rate expected under the base case (scenario A) as a reference.

Clearly, the projected rate of growth places the digital content industry as one of the fastest growing sectors of the economy. The industry has achieved similar growth rates in the past, but has found it difficult to sustain them, succumbing instead to a higher level of cyclical ups and downs than the underlying economy. The key achievement of the preferred future is to enable the underlying growth potential of the industry to be realised by taming the cycles.

Reflecting sustained rapid growth the digital content industry is projected to expand to produce output valued at between \$36 billion to \$37.6 billion (in Scenarios B and C respectively). This represents an increase of between 97-106 per cent over the period from 2002-03.

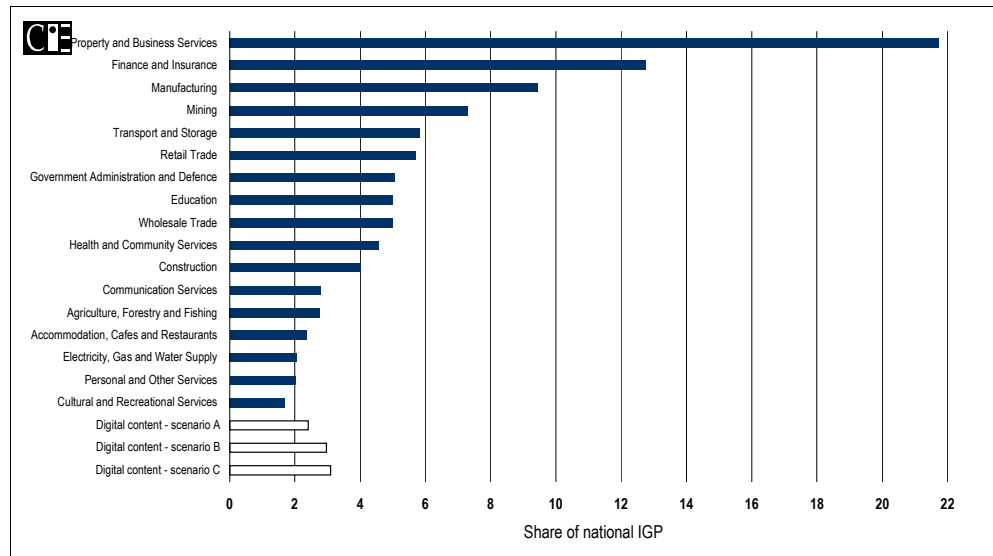
5.3 Average annual growth rate by sector over forecast period to 2014-15



Source: CIE

Even with sustained rapid growth the digital content industry would remain one of the smaller industries in the economy (measured by comparing IGP of industries at the ANZSIC division level). The digital content industry would expand to between 3.0 and 3.1 of total IGP (similar in concept to GDP). This would place it ahead of industries such as agriculture and communications services in terms of share of total output. This is reflected in chart 5.4.

5.4 Share of total IGP by sector in 2014-15



Source: CIE.

The composition of digital content activity would change within the preferred future. Embedded digital content is subject to much higher

growth rates reflecting the rapid rate of growth in the property and business services sector where many embedded digital content activities are found. Digital content distribution is also expected to grow rapidly, outpacing digital content production – see table 5.5 below.

#### 5.5 Digital content activity growth in IGP, average annual growth 2005-2015

<i>Digital content activity</i>	<i>Scenario B</i>	<i>Scenario C</i>
Production	5.3	6.1
Distribution	6.6	6.6
Embedded	6.2	6.4
Total	5.9	6.3

Source: CIE

## Employment

Employment within the digital content industry is projected to grow substantially under the preferred future. See table 5.6 for estimated growth rates for the digital content industry and its component parts.

#### 5.6 Digital content job growth, average annual growth 2005-2015

<i>Digital content activity</i>	<i>Scenario B</i>	<i>Scenario C</i>
Production	2.9	3.3
Distribution	4.7	4.7
Embedded	4.3	4.5
Total	3.8	4.1

Source: CIE

The number of full time equivalent jobs is projected to rise to between 447,000 and 461,000. This is an overall increase of between 58 per cent and 63.5 per cent on the current estimate of 282,000 jobs in the digital content industry. Essentially there will be approximately 6 new jobs for every 10 existing jobs after a decade of growth in the preferred future. Given the long lead times in building places within higher education institutions and a long pipeline effect caused by three year degrees and the development of relevant commercial experience, this represents a major achievement in skills development.

## Trade

The trade outcome in scenario B is driven by the notion of sustained growth in digital content activity. This is expected to result in a

deterioration in the trade balance for the digital content industry. It moves from a deficit of about \$1 billion in 2002-03 (the year for which most recent data is available) to a substantially larger deficit of \$1.9 billion in 2014-15. This outcome is consistent with earlier observations that historically digital content imports have grown in line with domestic demand. This results in the situation where imports do well at the same time when the Australian industry is performing strongly. Another interpretation would be that digital content producers draw on inputs of digital content from overseas and that these inputs naturally grow when they do.

The trade balance picture is different in scenario C. In this approach the digital content industry is projected to substantially improve competitiveness reflecting boosts in creative talent, expansion in capacity, improvements in commerciality of the industry at large and strengthened linkages in industry clusters and effective development of channels to market, especially export markets. This translates into higher exports and import replacement. The exports of embedded digital content activities are projected to provide a larger part of the impetus to growth from this change. Distribution is expected to have a neutral impact as its main role is adding value to content no matter where it is produced (imports bought by the distribution activity are accounted for as imports in competition to the activities of the production or embedded activities).

More specifically, in scenario C, imports of produced digital content dip slightly from \$1.22 billion in 2002-03 to \$1.12 billion in 2014-15. However, the proportion of production imports to valued added decreases more substantially as production value added has continued to grow during this period. Exports of produced digital content, on the other hand, almost quadruple in that period, rising from a mere \$62 million in 2002-03 to \$227 million in 2014-15. This increase represents both growth in the underlying production market and an increase in the proportion of exports to production as a result of promotional activities. In total, the trade deficit for production is projected to decrease from 14.3 per cent of production value added to 5.7 per cent in 2014/15.

Exports of embedded digital content also increase, from \$181 million in 2002-03 to \$745 million in 2014-15. Imports of embedded digital content remain steady at about \$53-55 million in that period (although as a proportion of embedded value added it decreases substantially). In total, the trade surplus for embedded is projected to increase from 1.4 per cent to 3.7 per cent of embedded value added.

The net change in trade balance in scenario C is a decrease in the trade deficit from \$1 billion to \$0.2 billion over 12 years, or a decrease of 5.6

per cent to 0.6 per cent of total value added. This should, however, be viewed as being at the upper end of what can be realistically achieved. Achievement of such an outcome would hinge upon all elements of the preferred future being realised.

# A

## *Measuring digital content*

This Appendix provides technical details about the methodology employed in preparing this report and the assumptions made.

### **Identifying the digital content industries**

The map of Australia's economy used in this study is driven by the Australian and New Zealand Standards Industrial Classification (ANZSIC) system. ANZSIC codes underpin the national accounts framework operated by the Australian Bureau of Statistics (ABS). ANZSIC identifies groupings of businesses or organisations that carry out similar economic activities. Such groupings define an industry. The ANZSIC system has a structure comprising categories at four levels, namely *divisions* (the broadest level), *subdivisions*, *groups*, and *classes* (referred to as being at the 4-digit level). For example, the class "newspaper printing and publishing" (ANZSIC code 2421) is a sub-category of "publishing" (ANZSIC 3-digit code 241) which itself is a sub-set of "printing, publishing and recorded media" (ANZSIC 2-digit code 24) that is in turn part of "manufacturing" (ANZSIC code B).

ANZSIC does not separately identify Digital Content (or tourism or information and communications technology, ICT) as an industry in the same way that it identifies, say manufacturing or agriculture. This does not mean that Digital Content does not exist or that Digital Content activity is not measured. As with tourism or ICT, information about Digital Content activities can be gleaned by sorting through the detailed information held by the ABS and re-grouping into industry categories that match current usage.

### ***Mapping ANZSIC codes to digital content activity classifications***

According to the ABS, when developing industry classifications under the standard ANZSIC code, the objective is to identify and group those

businesses<sup>1</sup> that undertake the same or similar economic activities (ABS 2005). Whether businesses undertake similar activities are determined by specific criteria, including the calculation of specialisation and coverage ratios. Consequently, ANZSIC industry classifications are developed based on the fact that these business groupings share the same predominant activity.

In defining the digital content industry, the CIE has followed the ABS methodology. As such, those businesses which produce digital content for their primary source of income have been grouped and classified as the core digital content industry. However, due to the nature of digital content, this definition only goes so far in its ability to measure the value added by the production of digital content. This is because digital content is not only produced within those businesses that derive their primary source of income from digital content, but also within the production of other goods and services within alternative industries (for example medical imaging in health and digital training tools in education).

### *Embedded versus core production*

For the purposes of capturing the true value added of digital content, the CIE has extended this definition and incorporated the production of digital content within those industries that source their primary income from other goods and services. Therefore the definition of digital content includes not only core production but also embedded production and the distribution of digital content.

The methodology used in measuring the value added from digital content has been derived from the World Intellectual Property Organization's guide on surveying the economic contribution of the Copyright-Based industries (WIPO 2003). This is an internationally recognised UN methodology, and has been used by governments all round the world.

Identification and measurement of the value added digital content industry requires an analysis of where value is added throughout the following stages of the digital content supply chain. These include:

- Content creation – expression of original ideas within a digital format

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<sup>1</sup> Businesses defined by the ABS include any organisation that provides goods or services, including companies, non-profit organisations, government departments and enterprises.

- Production of original works – including the digitisation of other mediums that traditionally have held content (for example television and print); and
- Distribution

The value added to the economy by digital content occurs through the production of digital content. Digital content is produced within businesses that primarily source their income from digital content (defined as core production), or those businesses that produce digital content within their own supply chain but belong to another industry classification. This type of production is defined as embedded production.

Embedded production is not the consumption of digital content. It is the new production of digital content within another products supply chain. For example, an architectural firm is not considered a core producer of digital content as its primary source of income is from architectural services. However, within the supply chain of these services, there are a number of stages where digital content is produced, for example computer aided design, which adds value to the service and therefore the economy. It is this type of production that embedded production represents.

The following tables list the activities recorded at the ANZSIC 4-digit or class level that correspond to digital content production, embedded digital content, and digital content distribution respectively.

### A.1 Core digital content production activities

<i>ANZSIC code</i>	<i>Activity</i>	<i>Description</i>
C2413	Services to printing	Providing services to printing
C2421	Newspaper printing or publishing	Printing or publishing newspapers
C2422	Other periodical publishing	Publishing magazines, bound periodicals or periodicals published less frequently than weekly
C2423	Book and other publishing	Publishing books, sheet music, maps or other printed articles
C2430	Recorded media manufacturing and publishing	Manufacturing or publishing of pre-recorded audio, video or data media including phonograph records, cassette tapes, video tapes, compact discs, digital video discs or computer tapes and discs
C2942	Toy and sporting good manufacturing	Manufacture of sporting equipment and toys from all equipment made from leather
J7124	Internet service providers	Provision of Internet services
L7831	Data processing services	Providing data processing services
L7832	Information storage and retrieval services	Information storage and retrieval services (other than library or bibliographic services)
L7834	Computer consultancy services	Providing computer consultancy services, computer systems analysis or computer programming services
P9111	Film and video production	Production of motion pictures on film or video tape for theatre or television projection. Includes services such as casting, film editing and titling
P9241	Music and theatre productions	Services in providing live theatrical or musical presentation
P9241	Creative arts	Primary activities include musical composition, the literary arts and visual arts such as painting, drawing, sculpture, pottery etc
P9251	Sound recording studios	The operation of sound recording studios
P9252	Performing arts venues	Activities involved in operating performing arts venues
P9259	Services to the arts n.e.c.	Providing services to the arts including casting agency operation, theatre ticket operation and set designing services
Q9522	Photographic film processing	Developing, printing or processing of motion picture or other photographic film
Q9523	Photographic studios	Undertaking of portrait or other photography
Q9529	Personal services n.e.c.	Engaged in providing personal services including astrology services, genealogy services and introduction agency service

Source: CIE

### A.2 Embedded digital content production activities

<b>ANZSIC code</b>	<b>Activity</b>	<b>Description</b>
L7810	Scientific research	Undertaking research in the agricultural, biological, physical or social sciences
L7821	Architectural services	Providing architectural services
L7822	Surveying services	Providing surveying services
L7823	Consulting engineering services	Providing consultant engineering services
L7829	Technical services n.e.c.	Provided scientific and technical services not included elsewhere
L7841	Legal services	Providing legal services to the community
L7842	Accounting services	Providing accounting, auditing or bookkeeping services
L7851	Advertising services	Providing advertising services except sale of advertising space in their own publications or broadcasts
L7852	Commercial art and display services	Providing graphic design services or in sign writing or ticket writing on a custom or order basis
L7855	Business management services.	
M	Government administration and defence	Central, state and local government engaged in government administration and regulatory activities as judicial authorities
N	Education	Provision of education services
O	Health and community services	Provision of health and community services

Source: CIE

### A.3 Digital content distribution activities

<b>ANZSIC code</b>	<b>Activity</b>	<b>Description</b>
F4793	Toy and sporting good wholesaling	Wholesaling toys or sporting equipment
F4794	Book and magazine wholesaling	Wholesaling books, periodicals and magazines
G5235	Recorded music retailing	Retailing phonographs, records, audio tapes or compact discs
G5242	Toy and game retailing	Retailing toys, games or hobby supply equipment
G5243	Newspaper, book and stationery retailing	Retailing books, newspaper, stationary or religious goods
P9112	Film and video distribution	Leasing or wholesaling motion picture in film or in video tape to organisations for exhibition or sale
P9113	Motion picture exhibition	Screening motion pictures on film or video tape/discs
P9121	Radio services	Activities involved in radio broadcasting. Includes the collection of news for radio and the production of radio programs whether live or on tape or other recording medium for own use.
P9123	Free-to-air television services	Activities involved in the production of free-to-air television services. Includes the production of television programs, whether live or on tape or other recording medium for own use.
P9124	Pay television	Activities involved in the production of pay television services. Includes the production of television programs, whether live or on tape or other recording medium for own use.
P9210	Libraries	
P9220	Museums	
Q9511	Video hire outlets	Hiring of pre-recorded video cassettes or discs for own use

Source: CIE

## Measuring digital content industry's economic contribution

The size or economic contribution of the digital content industry may be measured by summing up the Value Added or Industry Gross Product (IGP) of the component parts of digital content industry.

Data about industry IGP was obtained from the ABS at the division level (Government Administration and Defence, Education, and Health and Community Services) and at the 4-digit ANZSIC level for those industries identified as using digital content in their production. To estimate the value added from digital content, the total value added for these industries was multiplied by the estimated proportion of value added that could be attributed to digital content. These estimates were previously derived from surveys undertaken as part of a previous study on the value of copyright industries in Australia.

The above data on the proportion of each 4-digit activity's output that is attributable to digital content production and distribution is used to compute the employment figure for this activity that is associated with digital content. Total digital content employment is obtained by summing up these figures over all relevant economic activities.

## Making projections

### *Key Inputs*

The quantitative indicators about future economic outputs are based upon a number of inputs including:

- Starting point estimates of economic output, employment and trade performance based upon the map of digital content and other sectors discussed above.
- Long-run projections of underlying economic and employment growth obtained from the Centre of Policy Studies and the IMPACT project. These projections combine long run forecasts obtained from Access Economics, ABARE and the ABS, and is made consistent with the assistance of a simulation run of the Monash model of the Australian economy.
- Information about the propensity of Australians to adopt digital technologies;
- Insight and data obtained from CIRAC data bases assisting in the identification and measurement of creative industry activity and

employment within economy. This was analysed to assist in estimation of current levels of digital content activity.

- CIE estimates regarding the proportion of activity in each sector that is likely to be counted as being related to or based upon digital content activities.

#### *Broad approach and scenario A*

To derive the projected trend in the economy at large, the growth rate post 2002/03 for each industry was first determined. This was done through using growth rates obtained by Monash model projections<sup>2</sup>.

However, there was a problem in using projections straight from Monash as the industries represented in the model did not directly match up with the industries represented at the 4-digit ANZSIC code (which had been used for the historical trends). Therefore a concordance was developed that first mapped the Monash industries with the ASIC industry classifications and then an established concordance obtained from the ABS was used to map the ASIC with ANZSIC industry classifications. Once this had been done, growth rates obtained from the Monash model could then be used to proxy growth rates of those industries that use digital content at the division and 4-digit ANZSIC level.

The next step was to grow the 2002/03 ABS value added estimates by the growth rates estimated for each industry. This provided a forecast total value added for each industry that uses digital content. These values were then multiplied by the estimates of digital content value added within each industry to provide a forecast digital content value added.

Forecasting employment was carried out in the same way, but instead of using value added growth rates from the Monash model, growth rates of employment were used.

This approach drove the predictions reported as scenario A.

#### *Other scenarios*

In addition, a further scenario (scenario B) was established that sought to reflect an acceleration in the performance of the Australian digital content industry under preferred conditions. This was achieved within the framework by introducing estimates of growth in the proportion of value

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<sup>2</sup> Monash projections only went out to 2011/12. For the last three years the average growth rate between 1996/97 and 2010/11 was used.

added in each ANZSIC industry that makes up the digital content industry at large. Essentially digital content approaches are projected as being adopted by an increasingly large proportion of each industry reflecting technology diffusion processes. The scenario B allows the proportion of digital content to change each year along a relatively flat 'S' shaped adoption curve to reach a point in 2015.

To ensure that forecasts did not project growth in the portion of industry output that was produced using more digital content than is plausible, an arbitrary limit on the proportion of digital content within each industry was established. This represented the upper bound of the proportion of digital content. If industries reached this bound before 2015 then it was assumed to have reached a saturation point and consequently did not experience any more growth in the proportion of digital content.

Scenario C reflects outcomes where the attributes in the preferred future for the digital content industry substantially raise competitiveness. Domestic demand also rises as a result of drivers and structural parameters already at work in content markets. The increasing significance of such drivers and parameters will further drive adoption, production and distribution of digital content. As a result the digital content industries are projected to raise exports and replace imports progressively over time.

The approach taken for this scenario was to select an arbitrary target of performance in line with the picture painted in the preferred future and assess what that would mean for industry outcomes. Reflecting the emphasis placed upon enhancing export potential it was decided that export activity would expand progressively over the forecast period to 100 per cent of the level that would be obtained in any case. That is, that export potential would double by the 2014-15. In addition, import replacement potential would increase by 50 per cent by 2014-15.

As it turns out, even significant changes in trade performance have relatively modest implications for the digital content industry at large. This is because measured trade represents a small portion of digital content activity. It does, however, have implications for the trade balance of the sector and the composition of activity and induces an increment in overall industry growth. These impacts added to the outcomes of scenario B to form scenario C are discussed in the relevant section of the report.



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