PRODUCING DIGITAL CONTENT

A CONSULTANCY TO EXAMINE AND ADVANCE THE UNDERSTANDING OF THE PRODUCTION OF DIGITAL CONTENT

An abridged version of the September 2002 report for the Department of Communications, Information Technology and the Arts

Cutler & Company
Melbourne

“The challenge is plugging creativity into structures which build sustainable businesses”

Media World, 2002

"the enduring competitive advantages in a global economy lie increasingly in local things - knowledge, relationships, motivation - that distant rivals cannot match"

Michael Porter, 1998

This new environment is "big enough to matter; but still small enough to shape".

Steve Case, AOL, 1997

Contents

1. Introduction

Mid 2001 the Minister for Communications, Information Technology and the Arts convened an industry roundtable on digital content, and subsequently initiated a study programme. The first stage of this programme was a review study conducted by the Department in conjunction with the National Office for the Information Economy. The report, *Creative Industries Cluster Study: Stage One*, was released at the end of May 2002. This present study is the second stage of this programme. A final stage is intended to address the policy implications arising from this work.

Findings from the Stage One study

The summary of the main findings and conclusions from the Stage One Report highlighted some key observations[1].

> A key finding of this report is some creative and media industries like music and film-post-production are undergoing significant changes and are increasingly engaged in the production of digital content and applications. In other industries, the impact of digitisation has been slower or less dramatic resulting in smaller changes to the production of content.
>
> It is interesting to observe that while digitisation has led to significant changes within some industries, there has so far been little apparent impact on the linkages and extent of collaboration between industry sectors.
>
> Another key finding is the small scale of digital content and applications development activity in Australia. This presents a major limitation that must be faced in any strategy to position Australia's industries in global value chains. Australia is a small player, and this presents a difficult challenge. Australia's relatively small and fragmented domestic industry contrasts with the rising direct government support and increasing levels of vertical and horizontal integration observed in some industries overseas.
>
> The significant threat faced by a small player in these markets is marginalisation in the global value chain. The key opportunity is simply the reverse: by developing the new capabilities required by the global digital value chain, a strong globally-competitive position can be established.
>
> The implications for Australia are two-fold:
>
> - policies for digital content and applications industries must address the issue of our positioning in global marketplaces, including in the downstream distribution channels where large multinational firms dominate;
> - policies must have regard to the capabilities of our industries to deliver commercial outcomes in the new global digital value chain.
>
> The industry development agenda that emerges is clearly not the same as the existing cultural agenda. It extends beyond the traditional 'cultural' industries into areas like software development, industrial design, and distributed computing. It focuses on commercial capabilities rather than purely on cultural outputs. This economic agenda complements cultural policy by giving attention to the capabilities that underwrite the content industries' capacity to create and innovate.
>
> It is concluded that, based on the limited data available, cluster development in the Australia digital content and applications industries is embryonic and patchy. There are encouraging signs in some industries, but industry fragmentation and small domestic market discourages the collaboration and long-term investment that underpins cluster development.

[1] Department of Communications, Information Technology, and the Arts and the National Office for the Information Economy, *Creative Industries Cluster Study: Stage One Report*, Canberra, May 2002, p.3f.

The present study

Given the scoping nature of the first stage of this study programme, which canvassed the field at large, the intention in this subsequent study is to drill down to an understanding of what is actually happening on the ground at a firm level. The objective of the current investigation is:

> *To gain a detailed analysis, at the level of the firm and in the context of industry clustering, of current production and commercial arrangements relating to the development of digital content and applications in two or more … sub-sectors of the digital content and applications industry*[2].

Whilst this study is an investigation into what is happening on the ground, it does not purport to be a comprehensive survey of any one segment of the industry. It is a *qualitative* survey, based on interviews and field visits. Essentially this is a process of dialogue and speculative interaction with industry players. The value of this approach is that it enables the researchers to explore progressively the emerging issues and hypotheses generated from these encounters and engagements with the realities at the coal face. The insights generated over the course of this survey have been examined within the context of broader research into global developments and emerging trends in digital content production.

The value of the insights and observations from this study owes everything to the generosity and thoughtfulness of the industry leaders interviewed. The consultants are indebted to these industry colleagues for their frankness and openness. The dialogues inadequately summarised in this report are about a work in progress: the transformation of Australia's content industries.

This abridged version of the 2002 report to the Department has been prepared at the request of the Department to promote discussion of the issues highlighted. What has been edited out are detailed case studies and the particular discussion of individual firm strategies which might be prejudicial to the firms and individuals involved if taken out of context. As an abridged version of a report produced for the Department as part of an ongoing policy review, the consultants disclaim any liability to third parties for reliance on or use of the contents of this report for any other purpose.

[2] Study Brief, June 2002

2. Study approach

In fulfilling the terms of reference for this study there is a tension between breadth and depth of analysis. In addition, within the timetable and global budget for the work, there is a clear trade-off between coverage of the field and in-depth investigations. An additional factor that needed to be taken into account is the extent of firm-level interviewing and analysis necessary for the generation of robust findings and conclusions about the operation of firms in each segment. From our experience in comparable studies, there is a finite point of diminishing returns in qualitative analytical investigations. That is, after a certain number of firm case studies and interviews, there is a rapid diminution of new data and insights generated by the study process.

All these considerations pointed to the examination of fewer rather than more industry segments. There are, however, some countervailing considerations which bear on the coverage of industry segments in this study. These include:

- **the generalisability of the study findings to the sector overall**.
  An important issue in a public policy study is to provide, inter alia, a contribution to thinking about possible roles for Government in shaping or supporting sector development. The implication is that sub-sector coverage should be sufficiently comprehensive to provide a robust "bottom up" perspective to inform general conclusions about sector issues. It would, therefore, be a disadvantage if the selection of study segments involved systemic bias to sub-sectors with operational characteristics at considerable variance from other major segments in the sector.

- **sub-sectors which are at different stages of an industry life cycle or reflect different growth characteristics**.
  For example, some segments are new industrial markets - *infant industries*- (such as interactive games) whereas others are long established industries characterised by a transition into digital content production (such as advertising or printing).

- **the extent of for-profit or not-for-profit activity within an industry segment**.

These considerations were important in finalising the investigative scope of this study. In consultation with the Department it was agreed that this study would examine the following four content industry segments:

- Interactive games
- Interactive multimedia
- Advertising
- Educational content (Government Sector)

This segment coverage was designed to identify and highlight the *range* of factors and issues likely to arise across the whole field of digital content production within creative industries.

In determining the study arrangements to address these four segments, it was noted and agreed that:

- The number and geographic coverage of consultations would vary across segments;

- The consultation schedule would be subject to variation in light of issues and findings arising from initial consultations with firms in each segment.

- Face to face consultations would concentrate on firms in Brisbane, Sydney and Melbourne.

- The face to face consultations may be complemented and extended by additional telephone or written communications with other firms, to examine particular issues that may arise during the consultations.

- One or two industry workshop forums would be conducted prior to the finalisation of the study report.

In devising the consultation schedule for this study consideration was given to the following factors:

- the development of criteria for sampling firms within each of the nominated industry segments;
- the probability of nominated firms being likely to provide the best understanding of key issues. Filters for assessing possible firms for analysis included:

    - the existing knowledge base about the sector;
    - the case study literature on industry clusters and their dynamics;
    - the literature on industry value chains and the micro-economic analysis of firms and markets;
    - hypotheses generated from the consideration of possible analytical models; and
    - the timeframe of the study and the need to ensure efficient consultative processes.

The sampling criteria built into the consultation schedule included:

- the inclusion of one or more of the dominant firms active in the sector;
- the inclusion of firms that have been identified from desk research and initial segment soundings as playing significant "market organiser" roles in the evolving segment value chain;
- emerging firms or start ups in the segment;
- firms establishing a reputation for innovation in digital content production or for deploying novel business models;
- firms which have an established history involving change and adaptation over time;
- sampling across the range of firm lifecycles (ie both early participants as well as recent entrants); and
- firms and entrepreneurs in the field that have failed.

It should be noted that many firms would satisfy multiple criteria.

The firm level consultations have been complemented with highly selective consultations with industry and institutional players who play, or could emerge to play, a key role in shaping the market infrastructure for clustering. Such players include industry associations and cooperatives, specialist providers of essential support services, and cultural, educational and training institutions. The extent of consultation here has varied across the nominated segments. For example, institutional players are a primary market organiser in the segment of educational content.

Interview Schedule

There were three areas to explore in the consultations with the industry and the interviews with nominated firms:

- The profile and analysis of individual firms.

- The exploration of firm level issues within the context of its industry value chain.
- The exploration of factors associated with the cluster interdependencies of firm operations within a firm's industry segment.

Each consultation explored particular aspects of these areas.

The firm level consultations were complemented by a workshop with industry stakeholders and leaders which reviewed the results of the industry consultations; and further explored key issues and perspectives.

Industry segmentation

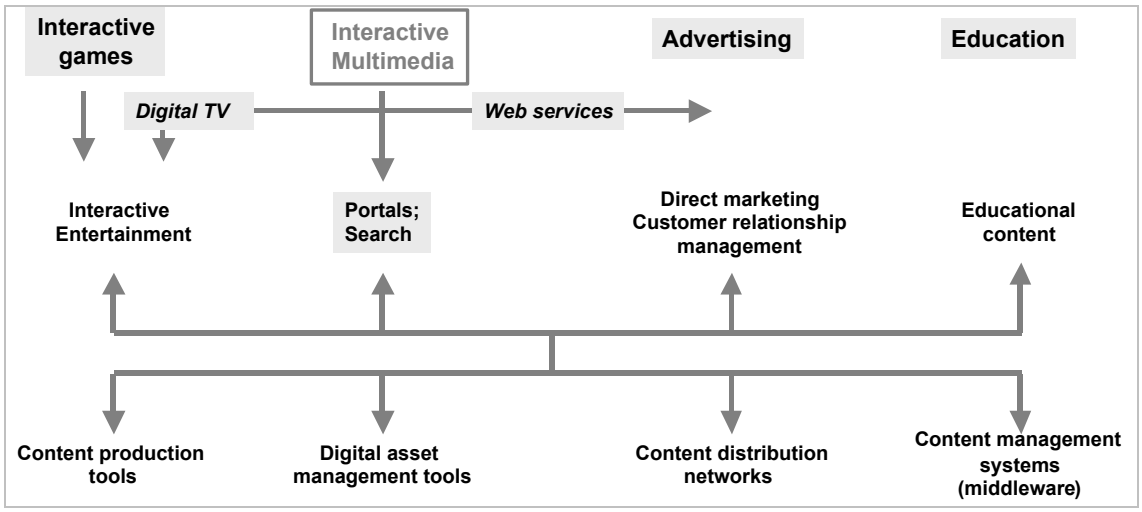
During the course of this study it became more and more evident that the segments chosen for focus in this work were "points of entry" into the exploration of the overall field rather than natural industry segments in their own right.

Unlike the natural sciences, in industry analysis there are no well established nor fixed classification schemas. Market and industry segmentation is inherently instrumental; that is, segmentation is a function of the questions asked. This is the basic reason why "industry mapping" exercises become so vexed, especially within a rapidly changing market landscape. Digital content can be variously segmented by:

- ***function***
  for example: digital content production and content management systems, or advertising and marketing business functions.
- ***end user markets***
  for example: education, or entertainment.
- ***end user demographics***
  for example: youth or community markets.

The course of this present study has reinforced the observation that the segmentation of content industries is messy and not stable. Of the areas investigated in this study, the games and education areas appear the most self contained; areas like "interactive multimedia" are more diffuse. Increasingly, there are strong horizontal linkages around technology and middleware development. The following exhibit maps the industry areas explored in this study.

EXHIBIT 2.1: THE SEGMENTATION FRAMEWORK FOR THIS STUDY



Caveats

This is a qualitative study. It does not purport to be a quantitative, comprehensive analysis of the industry. A inherent limitation to this study approach is the general lack of substantive industry data to provide a reference framework for the observations arising from this study. This problem arises from the sector's immaturity, its volatility and the rapid changes in business models. There is a lack of consistent data about firm performance and industry characteristics over time. As a result, this report is about the dynamics but not the demographics of the digital content segments it examines.

3. Analytical models and definitions.

> **"Wealth is actually created in the microeconomic foundations of the economy, rooted in company operating practices and strategies as well as in the quality of the inputs, infrastructure, institutions and array of regulatory and other policies that constitute the business environment in which a nation's firms compete."**
> *Michael Porter, 2001*

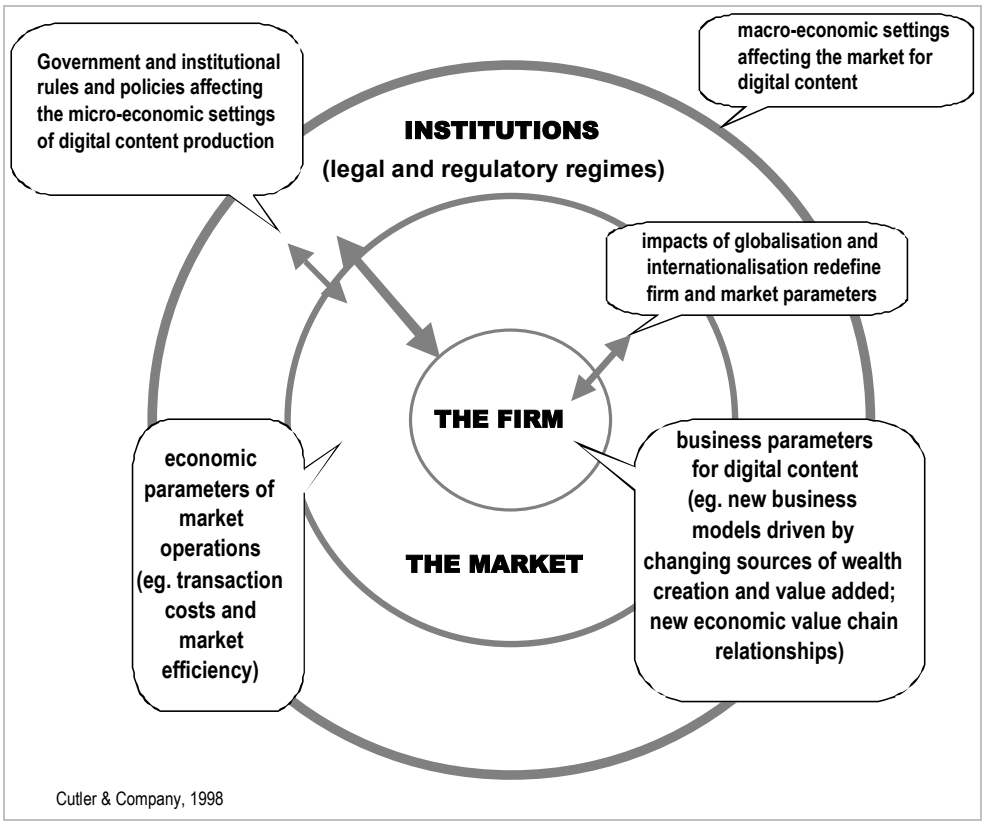
The idea of industry clusters has been receiving increasing attention from governments and industry policy analysts. This interest in clustering stems from two causes:

- changes in industry structure and composition driven by the new "information economy"; and
- the changing playing field for the competition between regional economies within a globalising information economy.

It is worth noting that much of the current literature in this field has been published subsequent to the initiation in 2001 of this study programme into digital content by the Minister for Communications, Information Technology and the Arts.

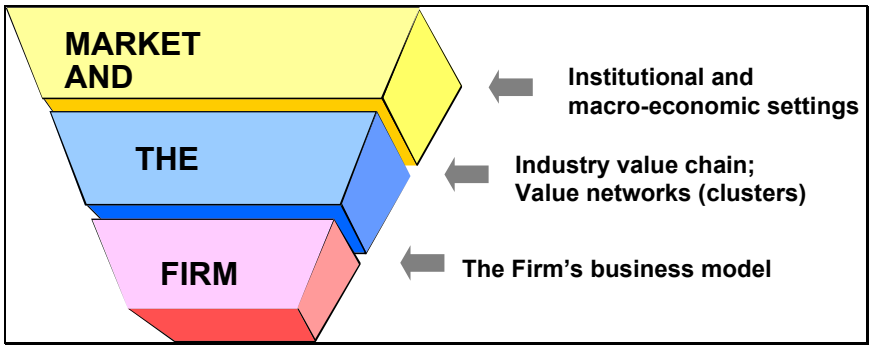
Sector analysis can be approached from a top down or a bottom up perspective. Either approach needs a contextual framework that locates particular analytical tools within their domain of applicability and usefulness.

EXHIBIT 3.1: SECTOR ANALYSIS: THE ANALYTICAL ONION



This spatial mapping of sector markets can be reduced to a more traditional policy hierarchy, as follows:

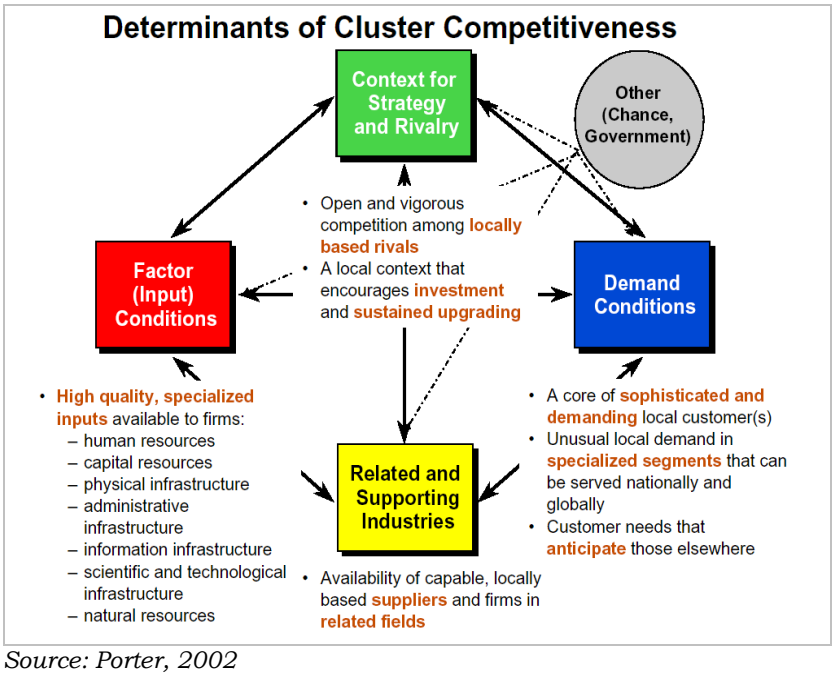
EXHIBIT 3.2: THE HIERARCHY OF ANALYTICAL DOMAINS



Depending on one's preferred visual mapping of market relationships, one can survey market territories by working from the outside in (or from the top down), or by working from the inside out (or from the bottom up). Michael Porter and his Harvard school of industry analysis typifies the first approach. Ronald Coase and his seminal work on the microeconomics of the firm as a pattern of transactions exemplifies the second approach.

Michael Porter provides the conceptual model that underpins much of the literature on clusters. His latest version of his classic "diamond model" is represented below.

EXHIBIT 3.3: PORTERS CONCEPTUAL FRAMEWORK FOR INDUSTRY ANALYSIS



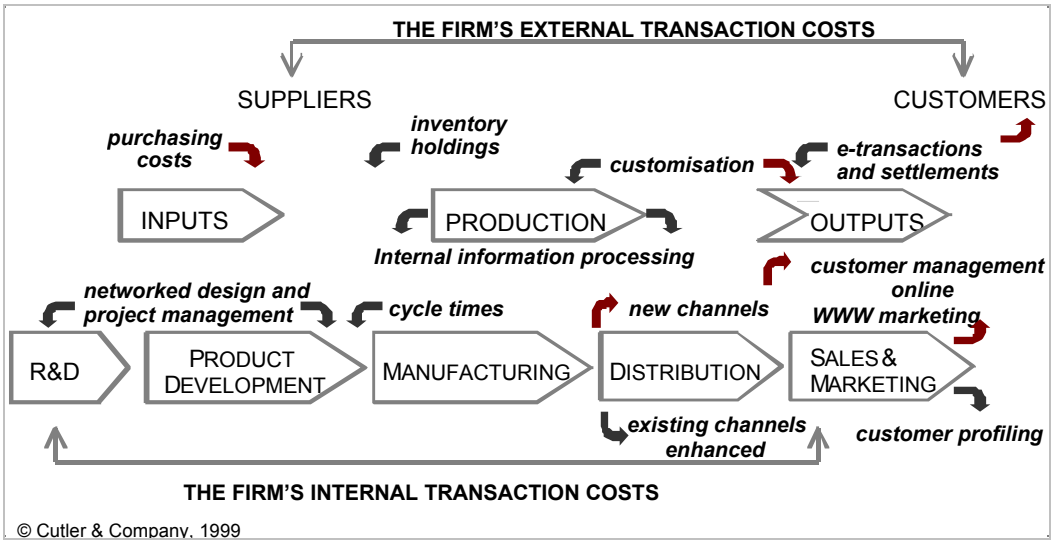
Source: Porter, 2002

It will be noted that this model, depending on one's point of view, either collapses or integrates several distinct levels of analysis. For the faint hearted, exploring the causal relationships can become a little like solving simultaneous equations.

Nobel Prize winner Ronald Coase's explanation of markets as the pattern of firm level transactions, on the other hand, begins by looking at the internal and external transactions associated with a firm's operations. This underpins the notion of firm and industry "value chains", or complex informational and transactional systems. A representation of the transactional analysis that informs value chain models is

provided below (it comes from some of our work on the impact of information technologies on market transactions).

EXHIBIT 3.4: THE MICROECONOMICS OF THE FIRM AS TRANSACTIONS



Coase's microeconomic analysis of the firm takes economic transactions as the basic unit of analysis, and is able to examine transactions at successively higher levels of generalisation, working from the firm level to the market level, and then to the institutional level at which rules about transactions are established.

It is important to acknowledge that both approaches generate useful insights. It is equally important to recognise that the "cluster approach" and the "value chain" approach each address quite different questions and concerns. Porter is concerned to address the question of why some regional industries are more competitive than the same industries in other regions. Coase and his followers are concerned to understand why some firm business models are more sustainable than others; in other words, why do firms organise themselves in the way they do.

The two lines of questioning, these different lenses on an industry landscape, may be reconcilable, but they are not interchangeable.

Harvard's hegemony in current industry and policy analysis

Michael Porter's Institute for Strategy and Competitiveness at the Harvard Business School has been carrying out a study[3] analysing the findings from the growing pool of case studies of industry clusters[4].

It is instructive to analyse the base of case studies informing the current research programmes at Porter's Harvard Institute. The raw material is provided in the annotated bibliography of case studies that underpins the work cited above.

In reviewing this bibliography of case studies we find that:

- it is not comprehensive; and
- a great deal of additional case material has already been added to the literature since the compilation of this bibliography in October 2001.

[3] Claas van der Linde and Michael Porter, "The Demography of clusters: First Findings from the Cluster Meta-Study", October 2001

[4] Based on information about 719 clusters from 49 countries; van der Linde, "Cluster Meta-Study: Bibliography", Working Paper, 25 October 2001.

With these two points in mind, an analysis of the bibliography is instructive.

Four country economies - the United Kingdom, the United States, India and Italy - account for 67% of the reported clusters. Australia rates three cursory references, for clusters in defence (Adelaide), heavy industry (Hunter) and IT services (North Sydney).

The cluster case studies have been generated by three main groups: Government agencies (the UK and India), industry associations (Italy), and by Porter's Institute for Strategy and Competitiveness. What this highlights is the pivotal role of Porter's Institute in popularising the idea of clusters as a policy product.

Cluster industry range from cashew nuts to carpets. Information and communication technology industries represent 5.6% of the case studies in this Harvard survey (although a quarter of these were only cursory). Fifteen clusters relate to creative industries (primarily film and television). Fourteen studies[5] deal with digital content (primarily "multimedia", but also web development and games). Half these cases examine *potential* clusters, and focus mainly on the UK and the US markets.

It is not to undermine the validity of the Harvard "meta study" of clusters nor the usefulness of the work at Harvard to sound some notes of caution about the current enthusiasm for cluster analysis. We must note that cluster analysis is a relatively novel methodology growing in popularity during the 1990s off the back of Porter's influential work on competitive strategy (although it has analogues with, if not genetic origins from, earlier sociological analysis of industry drawing on the work of social anthropologists [Bateson] or the work in systems and communications theory [Shannon]). The main corpus of research is based on traditional, established industries, and there is little work examining whether there are substantial differences between cluster characteristics in different industry sectors. This observation simply emphasises the obvious point that industry analysis is far from being a science, and popular "methodologies" must be deployed with care as ways to generate policy insights, but not as tools which can be relied on in their own right to produce policy formulas. This caveat appears particularly pertinent in the case of emerging industries, or industry sectors undergoing profound change and structural adjustment.

[5] Involving something more than just "cursory" discussion.

Definitional issues.

Definitions of content industries are various, as the Stage One *Report* notes. A lot depends on the context of the content matter. What matters in the context of this study programme are two issues:

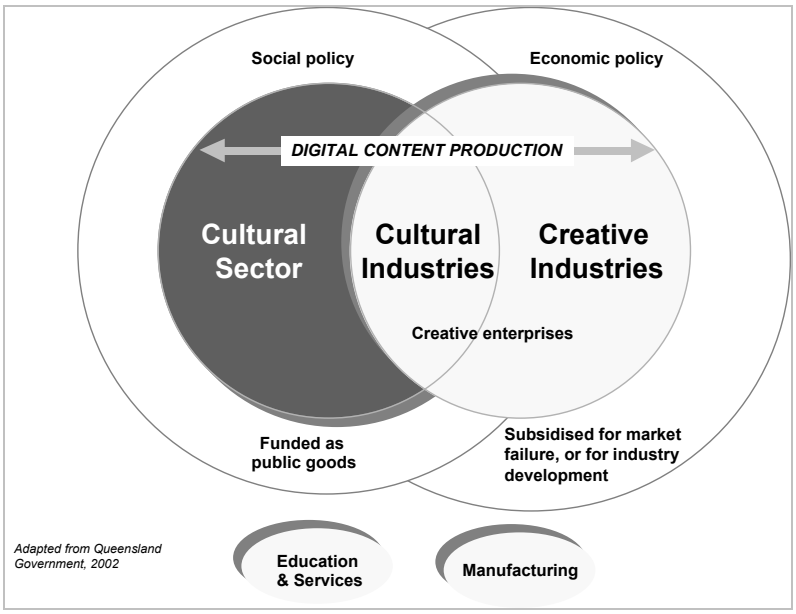
- the relation of digital content activity to content production overall; and
- the impact of digitisation on all aspects of content.

As noted in the Stage One report, all content industries form part of a cluster of creative industries, but not all creative industries are content industries[6]. Richard Caves in his study of the economics of creative industries defines them - in somewhat self-evident terms - as industries "in which the product or service contains a substantial element of artistic or creative endeavour"[7]. He notes that creative industries are characterised by "networks of informal contacts that knit together the participants", and argues that:

> effective public policy depends on the policymaker's understanding of the economic behaviour that the policy affects. Such an understanding should certainly embrace the knowledge of why creative industries are organised the way they are[8].

For the purposes of this report, a schematic developed by the Queensland Government provides a useful mapping of the industry domain affected by developments in digital content production.

EXHIBIT 3.5: THE INDUSTRIAL CONTEXT OF DIGITAL CONTENT PRODUCTION



The dialogue with industry during this study reinforced the complex, multi-dimensional nature of digital content production relative to other industrial activity.

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[6] Department of Communications, Information technology, and the Arts and the National Office for the Information Economy, *Creative Industries Cluster Study: Stage One Report*, Canberra, May 2002, p.11

[7] Caves, Richard, *Creative industries: Contracts between Art and Science*, Harvard University Press, Cambridge, 2000, p. vii. This is a little like saying that sporting industries are industries "in which the product or service contains a substantial element of sporting or physical endeavour".

[8] ibid, p. viii

There is an important linkage between commercial and not-for-profit activity; there are important linkages between content as an industrial output and related activities which form intermediate inputs to a wide range of economic and cultural activity.

Cluster definitions are equally hard to pin down. A root cause of this problem is that notions of industry or economic clusters are largely descriptive, rather than formulae. Porter's Institute for Strategy and Competitiveness defines clusters as:

> a geographically proximate group of interconnected companies and associated institutions in a particular field, including product managers, service providers, suppliers, universities, and trade associations. Clusters arise out of linkages or externalities that span across industries in a particular location[9].

Bergman and Feser, in their useful overview of the nature and meaning of industry clusters[10], provide a somewhat richer definitional lexicon. For them, an industry cluster is:

> A group of business enterprises and non-business organizations for whom membership within the group is an important element of each member firm's individual competitiveness. Binding the cluster together are 'buyer-supplier relationships, or common technologies, common buyers or distribution channels, or common labour pools" [citing Enright, 1997].

In seeking to elaborate this definition, these researchers move towards identifying what amounts to a typology of clusters, representing a wide variety of clustering experiences, and including:

- regional, or locational clusters;
- value-chain industry clusters;
- business networks;
- 'Italianate" industrial complexes; and
- innovation milieux.

This sample from a wide literature review demonstrates that the concept of clustering is more like a metaphor than an economic development algorithm. This is an important point to keep remembering, because it implies that there is no simple diagnostic template against which to test possible government policy proposals. That said, some common themes emerge from the literature which provide some useful points of reference for anyone surveying the industrial landscape. These insights include:

- notions of critical mass, where inter-organisational relationships fuel competitiveness outcomes where the collective is more than the sum of the parts;
- the importance of economic externalities in fuelling firm competitiveness and innovation;
- notions of "shared spaces" whether expressed in terms of locational propinquity or some other form of relational proximity; and
- notions of stakeholder partnerships and relationships around common interests.

The purpose of conducting a deep review of the literature of industry analysis and of cluster case studies was to develop a framework for the interrogation of practitioners in the field, but not to impose an *a priori* template within which to "force fit" resulting

[9] Institute for Strategy and Competitiveness, *Cluster mapping project: Data Glossary*, Harvard (http://data.isc.hbs.edu/isc/smp_data_glossary.jsp).
[10] Bergman, Edward, and Feser, Edward, *Industrial and regional Clusters: Concepts and Comparative Applications,* Regional Research Institute, 1999

observations. It follows that the reporting of the field consultations in this report is idiosyncratic, following the threads of the different issues which emerged in the rich dialogues with industry players. The conclusions spelt out in this report purport to be no more than generalisations which can be supported by this cross-section of opinion and experience.

4. Industry segment data and analysis

This section of the report summarises the results of interviews and discussions with the content industry, and presents a snapshot of what is currently happening on the ground in various industry segments associated with digital content production and related applications development. No one industry segment surveyed in this study is alike, and different issues have arisen in each of the segments examined. As a consequence, the format of the industry segment descriptions set out in this report varies from segment to segment, reflecting the differing levels of industry maturity and organisation.

4.1 The Interactive Games segment.

Interactive games are part of the entertainment business.

The interactive games industry, worldwide, is big, and growing. It is one of the fastest growing industries in the world. It is growing faster than film and television production, and industry players now claim the games market is bigger than the film industry[11]. Once film titles were licensed to game developers to extend the life and the returns on a content property. The recent release of *Spiderman* is an instance where a film is now produced to promote a game and other merchandise, providing an example of a possible trend.

Australia's share of the global market is very small, but does have potential to grow. Games development now employs about 600 people and has annual turnover of A$200 million[12]. The global games industry is worth about US$20 billion.

The games industry comprises title development, technology and software related to the content production of titles, and licensed software operating systems related to particular player platforms. Delivery platforms can be PCs, the Internet, or proprietary game consoles such as Sony's Playstation or Microsoft's xBox. Global distribution is controlled by a small number of publishers and distributors, such as Infogrames, Electronic Arts and Acclaim.

As a result of the rapid technological shifts, no single game console or PC system has achieved long-term dominance in the video and computer games market. Therefore, the Company must continually anticipate game console cycles and its research and development group must develop software programming tools necessary for emerging hardware systems.

Acclaim Entertainment, Inc. 2001

Australia's participation in this industry is currently in title development and associated content production technologies. Australia's only significant structural linkage into global distribution arises from the acquisition of Melbourne-based Beam International by Infogrames in 1999.

Firm level profiles and analysis

The game development industry in Australia is dominated by a small group of around 12 major companies, largely the members of the Game Developers Association. There is a significant number - around 40 - of smaller, second-tier firms.

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11 "The games we play", *Financial Review*, 11 July 2002. Precise statistical comparisons are difficult to pin down because of a lack of consistency in data categories.

12 The research firm Inform claims current revenues for the console and computer gaming market of $684 million in Australia and a year on year increase of 43%, although it is not clear what is included in these figures. *Financial Review*, 26 August, 2002, p.3

The computer games industry in Australia dates from about 1980, pioneered by Beam Software in Melbourne, founded by Fred Milgrom and Adam Lancman. During the 1980s Micro Forte was established in Canberra, followed in the 1990s by Auran in Brisbane and Ratbag in Adelaide. These firms, and their founders, continue to provide the nucleus of the industry, and take the lead in industry development advocacy. Many of the second tier firms or the more recent firms have been formed by teams spun out from these market leaders. Hence people talk about the cluster of Beamettes and Auranettes!

Beam International, acquired by Infogrames in 1999, was established by Alfred Milgrom in 1980. It's chequered history is a chronicle of the successes and failures of the industry in Australia.

FROM BEAM INTERNATIONAL TO INFOGRAMES (MELBOURNE)

Year	Corporate development	
1980	Melbourne House begins computer games development for Sinclair computers.	
1981	Beam acquires licence rights to *The Hobbit*.	
1983	*The Hobbit* is best seller in Europe. *(Sales exceed 500,000)*	
1984	Release of *Lord of the Rings*	
1985	*Way of the Exploding Fist*, the first martial arts combat game. *(Sales exceed 500,000)*	
1996	Beam lists on the Australian Stock Exchange at 50 cents per share.	
1998	Facing financial difficulties, Beams sells: ▪ the game publishing and development business to Infogrames Entertainment ▪ Hotgames.com portal to FortuneCity Inc. Company changes name to Blaze International.	Infogrames Melbourne House becomes a major node in the multinational operation.
2001	Company (finally) sells Smarty Pants Publishing (an educational CD Rom producer).	
2002	Blaze International shares trade at 6 cents.	Infogrames Melbourne receives global mandate for US$50 million title development in Asia Pacific (10% of the company's global investment in title development).

Beam International attempted, and failed, to raise enough working capital to become an independent publisher rather than a contract developer. Beam's basic problem was a shortage of working capital to support independent title development. In the end, the listed company had no option but to sell out to Infogrames as a global publisher and distributor. The upside is that Infogrames' acquisition established Melbourne as a major node in a multinational operation.

Australia's rate of segment growth now risks being marginalised from developments in the region; industry figures also comment on the constraints to growth from both infrastructure (broadband) and people. For example, only about US$20 million of Infogrames' US$50 million content development investment in the region is likely to remain in Australia – it could be more, but the scale of investment is limited by people.

Business models

The business models for game developers have similarities with book publishing and independent film production. The production of a title is undertaken on the basis of one or more of the following mechanisms:

- "fee for service" contracts. Under this model a global publisher might commission a game developer to develop a title against a licensed property (such as film spin-off, or a licensed sporting event). Examples are South Park or Formula One.

- Self-funded titles, which are internally funded and then licensed to a publisher in return for royalty payments. Developers with a track record may secure distribution guarantees that can be used to securitise the completion of a title and ease the pressure on working capital.

The average development cost of a title has increased steadily to about $6 million currently. Acclaim, a global publisher, notes that:

> the average development time for a title for dedicated game consoles is between twelve and thirty-six months and the average development cost for a title is between [US]$2 million and [US]$8 million[13].

Shrink-wrapped, CD ROM titles typically have a short shelf life, like film releases. With many of the older firms, the happy circumstance of one major hit has provided windfall returns which have bankrolled subsequent title development and company development. For every hit, there are many more misses. Adam Lancman explains that the games market is less forgiving than the Paretto Principle: game titles operate under a "95/5" rule whereby 5% of titles achieve sales of more than 500,000 units, with the rest achieving no more than 100,000. The only way to lessen this inherent risk is if developers can scale to support a portfolio of titles under development. Regardless of sale levels, the owner of the console or operating platforms receives about US$7 per unit for the software licence.

A very different model applies in the case of multi-player online games, which are really taking off in broadband-rich markets like Korea or Sweden. The Korean industry comprises some 600 companies employing around 6000 people. The typical life of an online game is currently five years. Although the industry expects this to reduce over time, the trick in massively interactive multi-player games is to embed the subscribing player, deeply, as an active collaborator in the development of the game narrative. The longer life of an online game gives the title developer a recurrent annuity of royalties derived from monthly subscriptions or "membership fees", product placement charges, and merchandising opportunities. For example, players can pay a premium to equip themselves or buy avatar accessories through online transactions. In some markets, player participants can monetise the character of the avatar they create over time by selling their virtual identity in a game to a new entrant. The deep immersion of users in the dynamic development of a game title means that the title originators have an on-going product development requirement of "customer care" and "creative moderation". Clearly the business of massively interactive multi-party games becomes very different to the production of a shrink-wrapped CD ROM.

What is not altogether clear is how the roles of - and returns to - title developers, the owners of online game software licences, and online game venues will develop. Because there is scope to build a strong virtual community around a game, or a gaming venue, this too can be monetised. In this context game titles, niche title genres, or online gaming venues, develop brand values in their own right.

Company assets

The core asset of a game developer is the intellectual capital of the team of people, comprising creative design and scripting, advanced software programming proficiency, project management processes, and collaboration skills. All games companies need to invest in maintaining their technical capability at the leading edge demanded by game users.

The leading game developers invest in the development of proprietary technologies to differentiate their product or to optimise content production processes. This can

[13] Acclaim Entertainment, Inc. SEC Filing for the year ended August 31, 2001

involve a quite expensive investment in research and development. Such investments may create technology assets which can be commercialised in their own right. In Australia, companies like Beam (Infogrames), Auran, Micro Forte, and Ratbag have all invested heavily in R&D, usually funded through government IR&D Board Start grants. In the case of Micro Forte, for example, venture capital firm Allen & Buckeridge invested in the company around its research and development; that is, they invested in the associated "middleware" of the company rather than its title development per se.

While numerous game developers have developed technical assets, not many have successfully exploited this asset category in its own right. In the case of Beam International, specific technology assets were hived off into a separate commercialisation entity at the time of the acquisition by Infogrames. In the case of Auran, the in-house technology assets are being used to develop diversified lines of business. In the case of Micro Forte, its investors are relying on the commercialisation of technical assets as their exit strategy.

Generally, the level of investment in technology and research and development is a major discriminator between first and second tier companies.

Other assets of game developers may include production studios, such as sound studios. Interestingly, game developers tend to develop such support facilities in-house more commonly than is the case with independent film producers. Whilst there is obvious scope for game developers to pool or share expensive production facilities, little of this happens in practice at present.

A final class of asset is the rights to licensed entertainment properties, whether game rights to a film or book, or to a sporting event or brand. These rights are now priced out of the range of most game developers, but become key assets for game publishers and distributors who farm them out to low cost title developers. Recent examples of pricing for licence rights are the US$15m for *Harry Potter* and US$34m for Formula One racing. By contrast, Beam acquired the rights for its first titles, *The Hobbit* and *Lord of the Rings*, for £100 in 1980. During this limited survey we did not encounter evidence of cross segment transactions in locally owned Australian rights.

Business drivers

Industry growth in Australia has been fuelled by the passion of a few key individuals. This is the leadership group around the industry associations and its various activities.

People start games companies because they love games. A passion for games can, however, be limiting. There can be a trade off between realising the dream of a particular game title and building up a sustainable business. There are strong similarities with the wine industry. At one end of the scale are the passionate, uncompromising specialists who develop a boutique business based on a local *terroir* and the high production values of a "unique experience" and at the other extreme the large wine and food conglomerates who acquire and produce brands.

Like books or movies, at the heart of the business of games is the creative title that appeals to players. While some games titles are original creations for the genre, others are cross media adaptations, such as adaptations of film titles or books. In such adaptations games become just one of a number of multiple channels to exploit a creative property (scaling overall merchandising and promotional opportunities).

Key drivers in the business of games development include:

- creative talent
- programming proficiency and quality assurance (bugs are bad for business)
- cost effective content development processes
- the publishers and distributors who decide which titles are pushed

Potential business shocks (market and technology)

Games can be run on PCs, played online, or run on special games consoles or set top boxes. Vendors of such equipment compete to grow an installed base. To put it in simple terms, there is an emerging vendor battle between purveyors of open platforms, and purveyors of closed, proprietary platforms (Microsoft's xBox).

Game consoles are becoming more and more powerful operating systems, and it is a moot point at what stage they emerge as, or merge with, multi-purpose set top boxes in the home. The stakes here are pretty high for companies like Sony, currently the dominant technology player in the domestic entertainment space, and companies like Microsoft seeking to migrate its dominance in the business software market into household markets. This contest shapes the environment into which game developers produce.

Many of the game developers interviewed see the emergence of massively interactive multi-player games as a tectonic shift in the games landscape. These sort of games assume a rich, broadband network environment (whether the wide area networks of Korea's "game parlours" or high bandwidth public networks).

The development of online and multi-player games suggests the possibility of a market shock to the current games industry, reinforcing the technology shock of changing platforms. The move from a publishing, mass market distribution model to an online subscription model changes the marketing game and the relationship with end users. This will have implications for the role of game developers and their possible business models (and returns) if they can seize a higher proportion of the margins from the product, versus the passive rents collected by the owners of operating systems.

"the average gamer is now 28 years old…
Gaming is simply a fact of life for this generation".

"If you look at massive multiplayer online worlds, the numbers are a television executive's dream. People spend 60 hours a month playing *Everquest*. You can't get that kind of dedication to any television programme….the population of *Everquest* is larger than the population of Cincinnati. That is 420,000 who have paid US$50 for a box and pay US$10 a month to live in this universe".
JC Herz, Joystick Nation, PC Forum 2002

It is an open question whether in this online, broadband games environment Australian developers will be disadvantaged in global markets because:

- they have less experience in broadband markets, because of the relative low levels of domestic penetration;
- there may be a cost penalty through the expense of international broadband links to end user markets (the "if the railway doesn't stop at your town you don't grow" argument); and
- the emergence of virtual "online gaming communities" may introduce granularity into end user markets (requiring greater "closeness" between developer and end player).

Balance sheet characteristics

Game developer companies are typically medium sized enterprises (50 to 100 people).

Given the rising costs of title production, developers have to carry huge inventory costs of work in progress before recoupment. This is why film industry type models of attachments, distribution guarantees and completion insurance become increasingly relevant within the games sector. A further difficulty is the uncertainty in the quantum and timing of royalty streams from titles, and why the alternative models offered by multi-player games are so attractive from a cash flow perspective.

The industry reports that R&D represent 25% of costs for any project (and 50% for the first project). These represent high upfront costs in cash-flow terms. An important barrier to entry and an entry level cost for new or small developers is

access to vendor platform developer kits. Here the Game Developers Association in conjunction with the Victorian Government has developed an innovative role in brokering agreements with platform vendors like Sony for subsidised access to developer kits under the aegis of the Association. This is not only about lowering the costs of access to these kits but is just as much about reducing the credentialling barriers faced by new developers.

Scaling creative title production is difficult, not just in terms of working capital but also from the perspective of project management. Hence Infogrames in Melbourne is using its capital budget to commission new titles from independent producers rather than simply scaling up its own inhouse throughput: this is a sensible portfolio approach to title risk.

Diversification is another approach to scaling: hence Auran, for example, is looking to spin off games capabilities through interactive special interests such as its trains product for train enthusiasts. Trainz is a virtual model railroad. "Design and build your very own virtual world and then put on your engineer cap and ride the rails in the most spectacular environments imaginable". Auran markets Trainz directly through its online e-commerce site (for a return which is tenfold that received from licensing a title to distributors).

Cost structures are largely determined by labour costs, and technology infrastructure. Accommodation and travel are also major cost items. Hiring out of expensive equipment facilities such as sound studios is one way of reducing the overhead carry, but is not yet a regular industry practice in Australia. Margins are largely determined by a combination of production efficiency and negotiating power and skill in striking deals with publishers.

Customer base

The games markets is a global market, and games developers need to be "born global". All the developers to whom we spoke said that they did not even bother to track domestic Australian sales. Domestic sales and reputation are entirely marginal in the business model.

Two global markets matter: North America and Europe. North Asia is now becoming a significant third market region, largely because of the huge growth in the Korean market, and the emergence of a large developer capability in North Asia. This local base is addressing the piracy concerns that previously kept North American or European publishers from any focus on Asia. On one visit to Kuala Lumpur in the 1990s we recall finding pirate copies of an Australian produced sports games for sale in street markets less than 24 hours after its commercial release in the United States. The effect of stronger anti-piracy measures in most Asian markets - driven by the lobbying of business software firms - is increasing the commercial attractiveness of Asian markets.

Game developers comment that the market for interactive games is not homogenous. For example, German consumers expect a much higher level of complexity and optional difficulty levels than do consumers in the United States. Developers have commented that Australian developers have established a track record in being able to encompass and deliver against the idiosyncrasies of both European and North American markets.

An open issue is whether the increasing interest in multi-player online games will increase the granularity of global markets. From observations about the development of other online markets, we would hypothesise that Australian developers could be better positioned to address greater market segmentation in game markets than developers in the dominant global markets who are largely captive to the requirements of their domestic consumer base. Australian developers are, of necessity, free of such blinkers.

To date the main customers of game developers have been in the wholesale trade of publishers and distributors. There has been only limited direct engagement with retail customers, but this could change with direct e-commerce sales of niche products and with whatever emerges in the market structure of online games.

Key business inputs

Key business inputs for game developers include:

- Content generation technologies, often based on an investment in proprietary inhouse technology tools. Examples include animation and 3D technologies, or motion capture technologies;
- Creative and programming people teams;
- Production facilities, including access to console developer kits, and studio facilities;
- Game concepts, titles and title rights; and
- Working capital to cash flow title development and technology acquisition.

For second tier players, a key input is the ability to compete for and win contracts to develop games against title licences.

Funding is a major issue at all stages of a company's life cycle. Venture funding has proved problematic, and the one foray into stock exchange listing by Beam International proved not sustainable[14]. In the case of Auran, associated private interests have provided patient capital. In other instances, firms' growth has had to rely on internal funding, and notably fee for service contracts. Many of the firm principals interviewed during this study expressed interest in the extension of film funding models to this related games market. Several noted, somewhat wistfully, the Canadian government's subsidies for title development.

Human capital:

Successful game developer companies need to be able to attract, retain, and manage complex people teams. The following list summarises the actual skills profile of a major game developer;

- 30 artists
- 28 programmers
- 5 designers
- 2 producers
- 12 system developers

Game developers need people who can write lean code, and can develop titles in real time - and on time and on budget. There is a premium for project management skills.

There is an observable difference between the career paths and skills of the entrepreneurs founding and growing enterprises in the games market, and the profile of specialist workers within the industry. Enterprise entrepreneurs in the industry are characterised by some eclectic mix of publishing passion, entrepreneurial flair and a commercial incentive to try and recoup a return on the investment of their sweat equity. The industry leadership group represented by the members of the Game Developers Association are quintessential information economy entrepreneurs.

[14] This is not a comment on the prospects of the residual listed vehicle, Blaze Limited, which now has a very different focus from the entity that was listed.

The employee labour force are very different. As in film and television, the games labour force is motivated by the buzz of the current project, the attractiveness of being part of a specific team environment, and the ability to recoup intrinsic creative rewards.

The growing availability of specialist vocational training[15] is creating entry options into this industry, such as the tertiary programmes in 3D animation, real time production, and interactive script development. It is noteworthy that students graduating from traditional film and television programmes now see games development as a new and attractive career option. One interviewee commented on the high proportion of script writing graduates who now go straight into the games industry.

There are strong informal networks between workers in the games industry, reflected in email lists and regular pub nights. There is evidence that a sense of membership of a community matters. This has implications for consideration of industry clustering.

Distribution channels

Distribution is about to face a period of disruptive change. The established model of shrink-wrapped game title distribution through retail outlets will be challenged by the different dynamics of multi-player and online distribution. How this will be played out is uncertain, as equipment vendors, operating software purveyors, and title developers jostle in any major market repositioning.

Information discovery and transaction costs

Australian game developers face an inherent structural disadvantage in being geographically remote from the major venues of deal negotiation and reputation building. Information discovery costs are inherently higher than for developers operating at the centre of North American or European markets. For Australians, the main trading markets are all offshore. Australian players with structural equity ties to global publishers, like Infogrames, improve general Australian access to the global markets for information about the industry.

Several firms have gone out of business, it is claimed, due to lack of market information about the marketability of titles, developing into a saturated genre market. This could have been avoided with better research and information – as is now provided through peer review by the Developers Association which passes on market information to member companies.

Government export development programmes and assistance have played a role highly valued by the industry in reducing the structural information asymmetries and in promoting awareness of Australian capabilities in the global industry.

Unlike related industries like film and television or book publishing, we have not observed, in interviews, a high awareness of the potential role of a support industry of legal specialists, producers, or agent negotiators in managing the potential information asymmetries and power imbalances in industry negotiations.

Cluster implications

Industry players have commented that games development centres have often tended to be outside the main capitals, such as in Lyon, not Paris; in Manchester, not London; and in Montreal, not Ottawa or Toronto. Several commented on a possible inverse market relationship with the film industry: "the movie industry in Sydney has absorbed all the talent"

[15] Such as AIE, Qantm, Charles Sturt, RMIT, Swinburne, and Open Channel.

The Scottish Games Alliance, the Koreans, and a games centre in Montreal have been frequently cited as examples of regional clusters. It is not clear, however, how much of this is clustering in the established industry usage, as against a regional branding in international markets, and at trade fairs such as the Electronic Entertainment Expo (E3).

What has been a notable factor in producing a sense of industry community in Australia has been the emergence of industry based support institutions[16], notably the Game Developers Association of Australia, its annual Conference, and the Academy of Interactive Entertainment. Based in Canberra, the Academy was founded in 1996 by its industry partner, Micro Forte. It offers diploma courses in 3D computer graphics, games programming and games design. It has also become a de facto incubator for new firms and creative teams. Subsequently tertiary institutions, particularly in Melbourne and Brisbane, have developed vocational courses related to games.

For the games segment these supporting institutions reinforce a close sense of distinct industry identity, something not observed in the more inclusive and less focused multimedia association. Several people commented that the sense of industry collaboration is enhanced by the segment's export focus: no one is competing for domestic market share. A good example of the level of collaboration is in the Association's informal agreement not to poach member's staff. The response by State governments to active industry advocacy, especially Victoria and Queensland, in adopting segment specific industry development plans has reinforced the sense of industry community.

[16] In the United States the following institutions have emerged: **The Academy of Interactive Arts and Sciences** (which hosts Hollywood style awards for the industry); the **Entertainment Software Rating Board** (ESRB) which provides consumer classification and content ratings, and the **Interactive Digital Software Association** (IDSA), the US industry association. It supports the Electronic Entertainment Expo trade show.

4.2 Interactive multimedia

The term interactive multimedia became popular in the early 1990s as a way of describing a distinctive wave of new media practice and technological innovation in content. One 1994 report noted it is particularly difficult to come up with a succinct working definition for interactive multimedia as a distinctive content domain[17]. Interactive multimedia became an umbrella term to capture digital content developments across the domains of information, education and entertainment. The Australian Interactive Multimedia Industry Association was formed to provide a point of focus for emerging activity, representing a motley crew of digital content developers: diverse, heterogeneous and various but finding common ground in digital production and delivery developments.

Today, these practitioners are more likely to describe themselves as in the industries of digital animation, interactive television or online advertising rather than as multimedia developers. In part this represents the reality that, after more than a decade or so, digital content is going mainstream in an increasing number of areas, such as television.

As an industry categorisation, interactive multimedia does not represent a coherent industry segment in terms of firm level organisation or clustering. That said, the inclusion of "interactive multimedia" as one segmentation for examination in this study has proved valuable for a number of reasons.

First, it sharpens the distinction between digital content activity organised around particular end user markets (such as education, entertainment and advertising) and firms producing specialist inputs into these retail industry segments as part of a market value chain (see Exhibit 4.1). A lot of firms described as in the business of interactive multimedia produce wholesale, intermediate inputs into digital content industry segments. A major finding from this survey is that there is considerable horizontal integration across digital content segments at the level of middleware and digital content production techniques, including content management systems and distributed content distribution network technologies. There is evidence that content industry segments like interactive games, online advertising and online education benefit from propinquity to such platform developers. On the other hand, distinct industry segments like interactive games themselves throw off generic technology innovations, the commercial exploitation of which and the multipliers from which appear to be enhanced by the extent of clustering with related industry activities.

Second, the exploration of firms and activities loosely grouped as interactive multimedia focuses attention on the evolving and changing characteristics of digital content production. A major conclusion of this study is that digital content production is not distinctive and different in its own right, but rather that issues around the industrial organisation and structure of digital content activities are common to content and creative industries generally. This conclusion shifts our attention to the more challenging question of how the industrial organisation and market functions of overall content industries change within a digital environment and the role that digital technologies play in transforming the competitive landscape.

Third, our interviews with an appropriately eclectic mix of firms - appropriate given the category ambiguity around multimedia - highlighted aspects of digital content production not fully captured in the other segments studied. This proved valuable in enriching the insights gained. A consequence of this, however, is that the description of our findings in this area does not fit easily into the ordered structure of the other chapters of this report.

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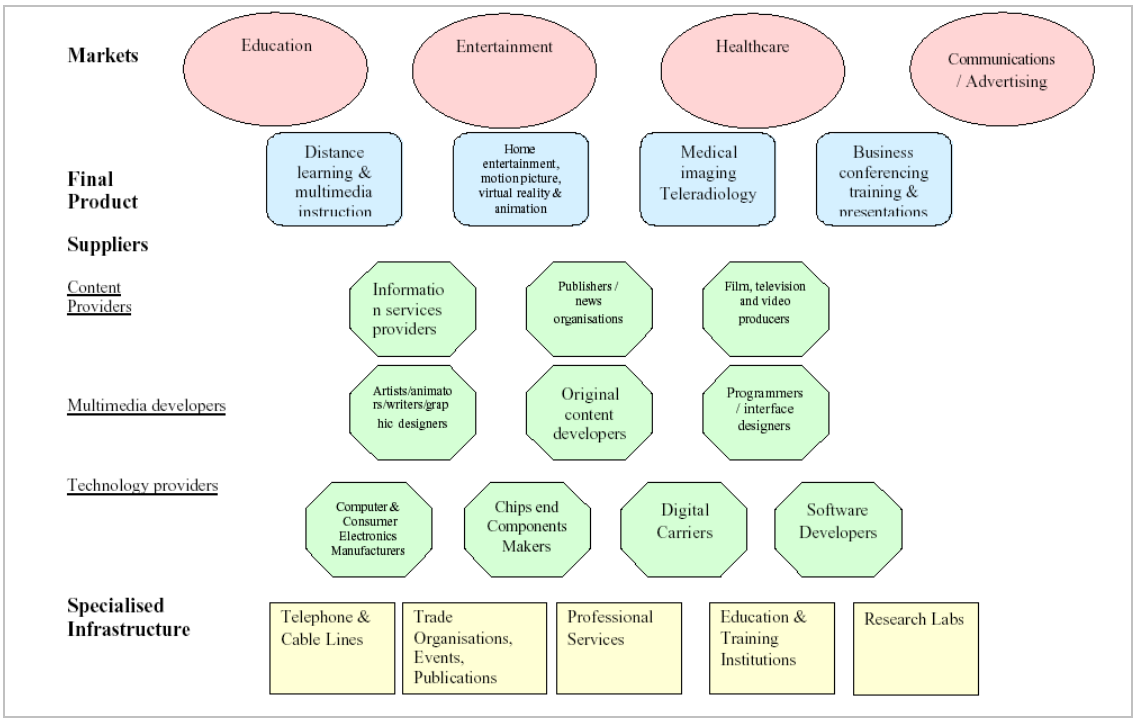
[17] See Cutler & Company, *Commerce in Content: Building Australia's International Future in Interactive Multimedia Markets*, Melbourne, September 1994, Chapter 2.

Several categories of activity were captured in our survey:

- the content organising and content management functions of web portals and online search and directory firms;
- web developers and providers of online content services; and
- interactive television and digital screen production.

EXHIBIT 4.1: MAJOR COMPONENTS OF THE MULTIMEDIA CLUSTER IN THE BAY AREA.



Source: Blandy 2001

Online portals and content management services

Online portals are firms like NineMSN and ABC Online, or CNet in the United States. In most countries a few portals dominate the market, and sit alongside more specialist sites like, in Australia, Dramatic Online for the arts industry or VicNet for community organisations.

In Australia the dominant online portals are all linked to major content firms (for example, Channel 9, News and Fairfax) or to communications companies like Telstra and its Yellow Pages directories. Many of the 1990s boom time deals tied existing content or channel owners to new media entities or spin-offs. In the more sober environment of today such linkages can constrain innovative adaptation in business model[18]. One such firm commented that "95% of the effort is on how to monetise existing content". No one is making much money yet. There is not much financial incentive to commission new content.

Most people surveyed commented that Australia was not a globally significant generator of online content. Global firms find it cheaper and easier to import content into Australia, especially US firms operating from a market base twenty times the size and three years ahead in market development.

Interestingly, the major Australian commercial portals have begun to collaborate in campaigns to educate the corporate advertising market about online channels and their value. Recently NineMSN, F2, News Interactive and Yahoo joined forces to conduct business forums.

Looksmart provides a compelling -if atypical- case study of a firm in this space. Looksmart was founded by Australian entrepreneurs with seed funding from Readers' Digest as an online directory of credentialed content. Australia's government venture capital initiative, through one of the Industry Innovation Fund scheme licensees, provided Looksmart with development financing at a critical stage of its growth, despite the company being increasingly based in the United States. It subsequently listed on NASDAQ.

Evan Thornley and Tracey Ellery, Looksmart's founders, make the telling comment that none of Looksmart's main global competitors[19] have an Australian presence, although they may shortly pursue Looksmart into the Australian market. They stress the long term advantages to Australia of the "born global" enterprise model represented by Looksmart. First, 5% of Looksmart's revenues come from Australia, compared with typically 2% for a multinational services firm. Australian nationals comprise 40-45% of the share register, and 20% of employees.

Looksmart's business model has been constantly changing and evolving in response to market developments. Currently it is largely a branded wholesaler, selling search and content management services into retail portal sites, including NineMSN. A growing proportion of revenues comes from companies buying search listings.

[18] Joint venture structures or incumbent investments in new markets frequently prove difficult to re-jig or restructure in an environment of changing conditions or of volatile business models. A large scale contemporary example of this challenge is the AOL Time Warner merger.
[19] Currently Google and Overture.

Web developers

Web developers are the quintessential wholesale providers of multimedia content services, providing web design, content management, and hosting services. In terms of firm structure and scale, these firms appear remarkably similar to support service firms in information technology. These firms operate on a fee for service basis, which caps potential earnings. There appears to be an inherent trade-off between competitiveness in terms of creativity and the scale of operations achievable. There are, as yet, few examples of web developers which have scaled in the way that other professional services have - like traditional advertisers, legal, accounting or software services firms. Discussions with the industry suggest a number of possible reasons for this lack of scaling:

- the nomadic behaviour of creative and software people and teams in an immature market (similar to the spin-offs from game developers);
- the changing business focus of firm founders - who frequently show the characteristic of being serial and chronic entrepreneurs; and
- the limits to growth imposed by the constant need to reinvest in new technology platforms and new skills to keep up with the market.

Emerging developments in web markets link the segment increasingly with advertising and in-house corporate marketing. A key point of differentiation in the market for web services, as in information technology services, is the firm's understanding of its client's business systems.

It is noteworthy that some of the most interesting and innovative web developer firms have two characteristics:

- their founders have a strong background in event management, and approach the web more as a "venue" than a publishing site; and

- sites seek to provide a rich content experience and strong production values.

This point about productions values is important, and arises again in the review of advertising and interactive television. A good reference site for thinking about production values is found at www. lifelounge.com. A key observation here is that producers complain that there is not much you can do within a narrowband environment and, to the extent that other markets move to higher bandwidth web platforms, the competitiveness and innovation of Australian web developers will be constrained.

A number of web developers have - as with games - become technology incubators. Neither web developers nor games companies, however, are necessarily well placed to commercialise this technology, due to lack of wider market linkages.

Interactive television - and beyond

The digital screen world is becoming a rich point of intersection for digital content developments. Web developers move across into programmed video streaming on broadband online channels (*Beyond* and *The Communication Factory*) and interactive video production. Media production meets networking and virtual studios (*Media World*). An emerging producer finds various government assistance programmes allows them to develop as an innovative developer of new interactive television programmes (*Hoodlum*). An aboriginal web developer becomes the catalyst for a major virtual heritage project (*Cyberdreaming*). This cross section of firms highlights the diversity of activity in the emerging segment of interactive television, or interactive screen content - to adopt a more generic descriptor. Linkages across these various developments are, however, not well established.

Media World in Melbourne, founded by John Tatoulis, started out as an independent film producer and has evolved into a firm with arms covering documentaries, animation, and now networked content delivery through globally significant developmental work on using extremely high compression technologies to deliver high quality video in real time. Media World has also developed in-house capability to support a networked "virtual animation studio" to enable it to access global talent pools - and offshore contracts. Media World is currently developing animation projects through a virtual studio linking Perth, Melbourne and Toronto. Media World sees new delivery platforms as enabling a significant re-packaging of traditional content formats, and where a background in creative origination brings a "production sensibility" to content delivery.

"plugging creativity into structures which build sustainable businesses"

Media World, 2002

Media World has internally funded development work on its new business development up to the point of needing to secure significant equity funding to enter the content delivery business.

Brainwaave Interactive is a company, like Harrow, where the original business of web services has been used to support diversification into new areas. In the case of Brainwaave, the journey has been into streaming media and broadband content development and programming. Tom Kennedy describes himself as "drifting into traditional media, but with a digital [production] model".

One of the realities with industry structure is that Telstra broadband is the only available delivery platform for content players. This reality also serves to lock out other potential content suppliers, limiting the growth options of competing firms. Other opportunities for broadband channels are seen to be in business education and corporate training. The emergence of these new media channels is raising difficulties and complexity in matters of the international licensing of content. There are also issues of competitive neutrality with the development of ABC Online channels being fueled by content from the special broadband initiatives of the AFC funded by a special Federal Government programme.

A major advantage of a relationship with an established production house comes from the international orientation it brings, and the access to distribution channels into offshore markets, significantly reducing information discovery costs. Most players surveyed saw a lot of benefit and potential in collaboration to develop international market access and to brand Australia's production abilities. On the other hand, the mobility of labour and contract teams across firms is observed to be limiting the willingness of firms to share information openly.

Digital production for interactive programming has proved a sharp learning curve in learning how to work alongside traditional film units. Government funded

educational programmes for the Centenary of Federation provided firms like Brainwaave with a significant platform for honing new production skills[20].

> "content developers are natural innovators"
>
> *Tom Kennedy, 2002*

Virtually all the people we spoke with about interactive television and new digital screen work raised the issue of the cultural divide between traditional film people and interactive television producers. Part of this divide relates to the need for different production techniques and values, or the opportunities with digital production to develop new formats and production values.

The development, albeit slow and starting small, of digital television production and multi-channelling (in the case of the ABC) has begun to suggest that new formats are likely to have significant impacts on the structures and production values of the television and screen industries. *Fly Digital*, the ABC's new youth channel, is breaking new ground in looking at programming genres for specific niche markets. There are strong similarities and potential synergies here with developments in the online advertising markets, where groups like Prourbanism are targeting the previously neglected youth market[21]. This raises the possibility of global positioning and competitiveness in specific market segment innovation, much as Australia gained a reputation for innovation in sports broadcasting.

The emerging markets for interactive television and television multi-channelling (or multicasting) appear set to create disruptive new industry dynamics and to open up new opportunities for content developers. Reflecting on his experience so far, the ABC's Bruce Kane sees changes in production processes - "multi-channel TV becomes more like radio production"; changes in skill requirements, reflecting the pressures for smaller production teams and the consequent need for multi-skilling; and changes in production values with "the emergence of new genre templates" for formats and content presentation. In the near term, the opening up of new channels creates a shortage of appropriate content, creating "swap markets" between channel operators in different content markets. At the same time the potential proliferation of channels in a broadband and digital television environment challenges traditional funding and revenue models for commercial operators.

Within the labour market, the lure of the interactive screen is attracting lots of young people and emerging content producers into the field. Fly Digital's Bruce Kane commented that he received 3,500 applications when he advertised ten positions. This included 800 animators applying for four positions as graphic artists. The continuing emergence of new genres and new developments in digital content media acts to maintain a sense of buzz and immigrant vigour.

Unlike most of the other segments examined, many of these firms do not have strong market linkages with technology firms. "Links with IT firms are difficult - they have different cultures". Content pull appears to work better than technology push. Technology based ventures in this arena have struggled, or died. During the course of this brief survey, ICE Interactive's web site went dead, and the company was placed into voluntary administration.

A post mortem of industry fatalities suggests two things. First, the vulnerability of niche suppliers to developments - or the lack of them - in upstream or downstream markets. Second, digital television's slowness to develop momentum and the consequent reluctance of the television industry to invest in digital content in advance of significant market penetration.

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[20] For example, see Australians at War - www.australiansatwar.gov.au

[21] A parallel development in the United States is Varsity TV, targeting high school audiences, and drawing on untapped -and cheap - content like school bands and varsity sports.

One emerging interactive producer provides an intriguing case study of career development and firm evolution as an independent producer. A couple of features really stand out in this case study, aside from the reminder about the importance in creative industries of individual passion, commitment and the pursuit of an artistic vision.

First, the role of creative infrastructure in opening up career opportunities. In this case this involved vocational training in film and television at QUT, the on the job training opportunities provided by the presence of major film studios, and the ability to plug into networks of generous advice and mentoring. Second, the role of a variety of government funding sources, including content quotas, in seed funding their innovative work. Finally, the assistance from the micro-level clustering of collocation and resource sharing with a firm in a related market, in this case advertising.

On the other hand, their experience also highlights some aspects of geography on industry development. Working in Brisbane, a "thin market" for film and television in terms of diversity, the dominance of a major set of players, in this case the Gold Coast film studios, can adversely affect the economics for independent producers. Players cited the studios' impact on the cost of contract services and for location fees. The biggest barrier has been distance from the cluster of distribution activity in Sydney, and getting share of mind with television executives and distributors. Nothing can be more dispiriting than rationing frequent flyer points for carefully planned visits to Sydney, only to have scheduled meetings cancelled at the last minute. This is the local equivalent of the problem that Australians can experience at overseas trade fairs.

Interactive media in a community and cultural context

No survey of interactive media would be complete without reference to the distinctive role of developments in community and cultural arenas in providing depth to industry markets, in fuelling innovation in creative content, and in seeding emerging producers.

In Victoria, VicNet has emerged as a significant community portal and internet service provider[22]. Indeed, VicNet has become a global benchmark for social policy analysts interested in online community organisations. A major source of its traction within the community market was its early focus on training and infrastructure support.

CyberDreaming is a Brisbane web developer which has focused on web services for indigenous communities, including proposals for a GeoClans Portal, an indigenous application services platform, and an indigenous internet service provider. CyberDreaming was founded three years ago by Brett Leavy, and uses web services contract work to cross-subsidise the development of these indigenous projects. CyberDreaming is collaborating with the Queensland University of Technology in the development of a major virtual heritage project.

Innovative cultural institutions are also playing a catalytic role in market development. In Melbourne, the newly created Australian Centre for the Moving Image (ACMI)[23] at Federation Square is set, with the opening of its new premises, to become a major shopfront for interactive media, and a centre for collaborations linking industry, the education sector, and other cultural institutions. ACMI has an ongoing mission to commission and distribute new digital content. Despite Commonwealth and State initiatives with online education, ACMI has had difficulty receiving anything like the special education officer placements made available to

[22] Disclosure: one of the authors of this report, Terry Cutler, is a member of the Library Board of Victoria, which operates VicNet.
[23] Subsequent to this report, Dr Terry Cutler, the author is this report, was appointed President of ACMI in December, 2002.

traditional cultural institutions. ACMI's charter suggests it could play an increasingly important role in industry development through its functions of:

- digital screen education programmes for schools;
- innovation in the networked distribution of digital content;
- commissioning and collecting new media works, and thereby supporting and credentialling digital content creators; and
- establishing international linkages and networks.

In Brisbane, the Powerhouse performing arts centre is an example of a different type of cultural institution playing a role in digital content industry development, primarily through providing a venue and commissioning platform for creative research and development, notably with its role in Rev, the *avant garde* music festival. The youth festival for new media specially funded by the Commonwealth, and marketed as Loud and Noise in the two festivals thus far, provides a similar platform for young developers.

What these examples demonstrate is an important, two-way, movement of people and ideas across not-for-profit activity in the cultural and community arena and the commercial world of creative content industries. It is evident that an environment in which such interactions and engagements can occur becomes an important factor in nurturing creativity and innovation in content development.

4.3 Advertising

Advertising, reputedly the second oldest profession in the world, has much in common with the first: it is a big business but the financial models are shady. The cognoscenti of the promotional trade talk knowingly about "above the line" stuff and "below the line" expenditure. Above the line advertising turnover is that expenditure on exposure through the mass media channels of television, radio, and print. Below the line, implying hopefully out of mind as well as out of sight, is the nether world of direct marketing, "customer relationship marketing" and one-on-one transactional relationships. Whilst media advertising spends are carefully tracked and monitored, direct marketing expenditure is much harder to quantify, as much of it is managed directly by the in-house marketing departments of companies. The Australian turnover in each area is currently estimated to be a matching A$9.1 billion[24]. Privately, advertising people will confess that the line is a curious fiction which usefully muddies the waters for the benefit of agencies. It becomes an important divide in the consideration of online advertising and the consideration of the impact of a digital environment on advertising's traditional terms of trade.

The advertising industry has traditionally been an important "market organiser" of content industries. It has provided employment for aspiring creatives (including Peter Carey), it has provided bread and butter business for independent production houses and the support services to the creative industries, and it drives the funding model for established mass media, whether television or print. For these reasons it was decided that advertising would be a useful industry segment to examine in the present study.

The advertising industry is dominated by a small number of global conglomerates who have accumulated portfolios of multinational brands. Mapping the industry ownership linkages has almost become an industry in itself, with trade publications putting out "spagetti and meatball" charts of Byzantine complexity[25]. Most of these multinational conglomerates have become listed stocks, and thus increasingly driven by the short term performance metrics loved by stock analysts. Around the fringe, there is a considerable number of small, boutique agencies focusing on localised or niche markets. There are strong parallels with the industry structure of professional service industries like law, accounting and management consulting.

The interviews and industry review conducted for this study have produced the following "top line" findings and observations:

- online advertising has so far captured little more than 1% of traditional advertising budgets, but this is much lower than the 3% plus in the United States;

- advertising supported online content businesses struggle, and advertising per se is ceasing to be the dominant revenue model (being replaced by subscriptions, product placement, paid directory listings etc.);

- established advertising agencies tend to align with established media in resisting the prospect of digital channel diversity (digital television; multicasting; broadband streaming; open access digital Pay TV), but will pragmatically have a bet each way in response to variations in market sentiment (acquiring or floating off online advertising subsidiaries; and promoting the advantages of bundled, "full service" marketing models);

[24] 2000 figures, from industry interviews.
[25] Only the poster version of the Ad Age "family tree" of advertisers is legible!

- established agency models are based on deep information asymmetry between corporate clients and targets markets (hence the magic of "the tarps[26]") and the deeply emotive resistance to notions of "space farming" and spot markets in media channels[27]);

- online marketing, fuelled by new online software platforms and middleware for customer relationship marketing, will reposition direct marketing and erode mass media advertising budgets;

- the burgeoning of online direct marketing will see a lot of traditionally outsourced advertising and marketing functions being insourced back into companies because of the tightening linkages with firm business system design and business process management (with internal co-ordination representing lower transaction costs); and

- A lot of innovation is happening "under the radar" in markets neglected by the mainstream industry, or in markets not amenable to traditional approaches (eg youth).

Online advertising firms are few in number, and they struggle because of the low levels of market penetration and because of the negative market sentiment in the wake of the dot.com collapse. Equally important, in explaining the current landscape, is the faulty assumptions of some of the first movers, now trapped in an environment of negative sentiment of their own making. Some of the false assumptions and failed approaches appear to have been (and here it must be stressed that these are tentative hypotheses on the part of the study team):

- knee jerk reactions in the 1990s to client demand for some online component in campaigns, as clients reacted to digital hype and invested in web presences;

- boom time adventurism in seeking to exploit a dot.com premium from existing operations;

- a hedging approach to possible market developments, without real engagement (this approach involved the incumbent mentality that the firm could always buy up relevant assets or capability if it suddenly became important, without considering issues of cultural integration or the possible need seriously to contemplate redesigning business models and investing in new skills and information).

It is noteworthy that the online advertising space has been promoted more by those firms who rely upon it as a revenue source or as a gateway to corporate sponsors than by advertising agencies themselves, who admit to being largely just reactive to client demand and market signals. Hence it is online portals like NineMSN, News Interactive, F2, and Yahoo who have taken an industry leadership position in promoting the benefits of online marketing.

As a crude generalisation, incumbent advertising agencies "just don't get" what is happening in the digital world. Discussions across the advertising industry suggest that their main interest is in preserving the status quo, and they are worried about the possible impacts of any government policy initiatives on media regulation (channel scarcity), and fret about the effects on their business models of any opening up of new digital media channels. And well they might.

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[26] Industry jargon for "Total Audience Rating Points" for advertising placements.

[27] It is noteworthy that innovative but impecunious media channels like *crikey.com.au* have been pioneering spot markets for advertising and the use of micro-payment systems for content.

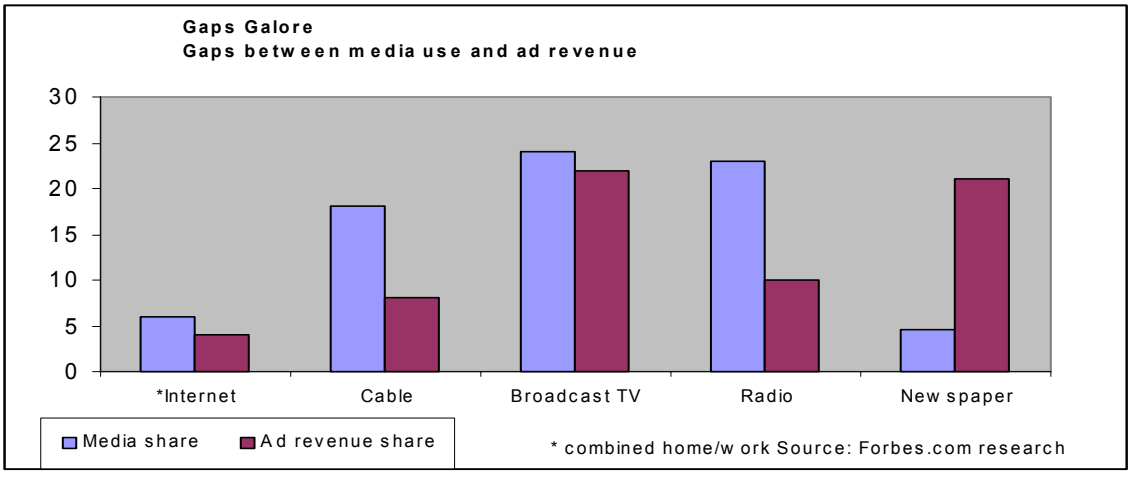
For established agency agencies, online advertising poses two main threats: new levels of transparency and accountability, and substitution by direct marketing.
It is an ancient maxim in advertising that something works, but no one is precisely sure what proportion of any advertising expenditure works and what does not. This is great for advertising agencies, and a real problem for their corporate clients. The looming impact of online advertising is that causal relationships become trackable and the world of advertising may become newly accountable for results. In an online world, consumer behaviour becomes measurable in a way not possible in the world of broadcast mass media. Hence online agencies have differentiated themselves by marketing new risk/reward models based on tracking returns on advertising investment. In the old world, advertising pitches were based on access to desired demographics. In the new world, pitches are based on the number of target consumers who actually buy. The traditional advertising function of branding - making a product or supplier top of mind in the consumer's head - becomes a new game[28]. Branding can now be linked to behaviour. Nonetheless it is possible that a distinction can be maintained between the marketing functions of branding - creating awareness of a market choice - and sales conversion. Such a distinction, if it emerges, would preserve a role for advertising agencies geared to mass market channels.

The business model for online advertising is based, increasingly, on return on investment models. Firms like *emitch* pioneered new models based on success fees and revenue sharing. Such models represent a radically new mode of inter-firm collaboration and risk sharing, wherein an advertising agency effectively enters into a co-production contract with the client. Both parties share an interest in the marketplace outcome and the actual return on marketing expenditure can be measured.

A second consequence of online advertising is a new focus on the optimisation of cross-channel promotions.

Compared with other media, there is a relatively small gap between consumer Internet usage and online advertising expenditure, now between 3 to 4% of all media advertising in the United States. This point about different media addressing different core markets[29] is highlighted in the following exhibit:

EXHIBIT 4.2: MEDIA USAGE VERSUS ADVERTISING SHARE



Source: Forbes, May 2002

[28] One of our interviewees, Martin Lindstrom, has earned an international reputation in this space. See Martin Lindstrom and Tim Andersen, *Brand Building On the Internet*, Borsen Publishing, Denmark, 1997
[29] David Simmons, "Pittman's Pitfall", F*orbes*, 13 May 2002

Online advertising markets highlight the importance of industry standards and measurement methodologies as a barrier to mainstream use. Traditional media have established media monitoring metrics which are reference point for the whole industry. It is only when matching metrics are developed for online markets that established agencies will feel comfortable about including the Internet in cross-channel promotional packages[30]. The few independent online agencies, on the other hand, tend to promote the disruptive nature of interactive advertising, by emphasising the medium's unique ability to track promotional return on investment.

The stand off between traditional advertising models and online advertising not only reflects traditional disparities between advertising spend and medium usage, but also the distinctive characteristics of a new channel. In the same way that cable TV in the US did not cannibalise television advertising markets, but attracted new advertisers who could not afford free to air exposure, so it has been observed that online channels are attractive to small advertisers concentrating on sales, not brand building[31]. This reinforces our point about online advertising essentially being about the business of direct marketing.

It is one thing to look at the new business models driven by online advertising; a much larger matter is the redefinition of advertising functions and their market organisation. This issue revolves around the matter of direct marketing.

The distinctive competitive advantage of online marketing revolves around the promises of one-to-one marketing: customisation, personalisation, and the power of networked consumer communities. What implications does this have for digital content? Three things.

1. The matching of relevant content with target demographics. This pushes new levels of granularity and depth in the demand for content. The availability of relevant content becomes the scarce resource. "Content is King".

2. Reverse loyalty models: Viral marketing determines brand popularity, and the consequent commercial value of particular content categories (or sources).

3. Channel rivalry.

At the heart of the matter is the way online marketing transforms direct marketing. The substance of direct marketing revolves around the insourcing of promotional activities, and the development of new internal linkages around the organisation of a firm's internal business systems. Traditional advertising agencies have little expertise in corporate business process analysis. The implication, and the prediction from the opinion leaders we surveyed in this study is that direct marketing functions will be insourced: managed internally within companies. Companies will buy in sophisticated CRM middleware and software which will be linked increasingly with enterprise resource management systems. New technology platforms will alter the entrenched information asymmetries within the domain of advertising. There are isolated case studies of this happening in practice. The National Australia Bank has publicly commented that the success of its direct marketing initiatives have reduced its advertising expenditure by 75%. The

"Direct marketing requires busine process knowledge: the big consultancies have this, but advertisers do not"

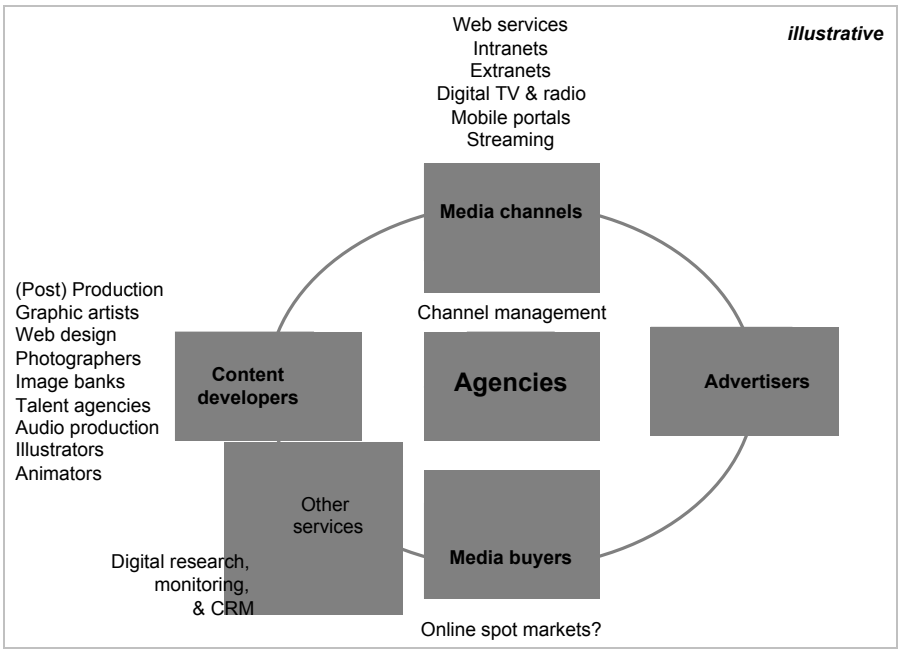
[30] Steve Coffey, *Internet Metrics: The Loyal Audience*, Online Publishers Association, New York, May 2002

[31] David Simons, 'Internet Advertising: Think small, grow big", *Forbes*, 13 June 2002

implications of such a shift in spending on the markets for digital content is unclear. A minimal hypothesis might be that traditional advertising agencies will play a reduced role as market organisers for digital content.

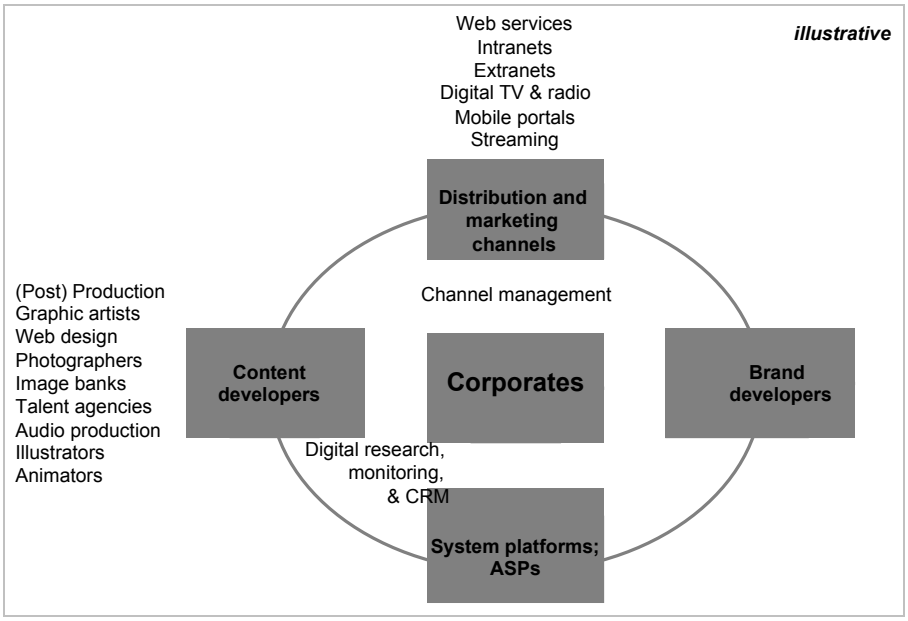
The following exhibit illustrates the value networks and linkages around the advertising agency as market organiser of promotional campaigns in an outsourced model. This represents the positioning of incumbent firms within established industry arrangements.

EXHIBIT 4.3: THE OUTSOURCED BUSINESS SYSTEM OF TRADITIONAL ADVERTISING



By contrast, Exhibit 4.4 attempts to represent the changed industry and market relationships associated with direct marketing, and the shift to internal firm organisation of promotional transactions.

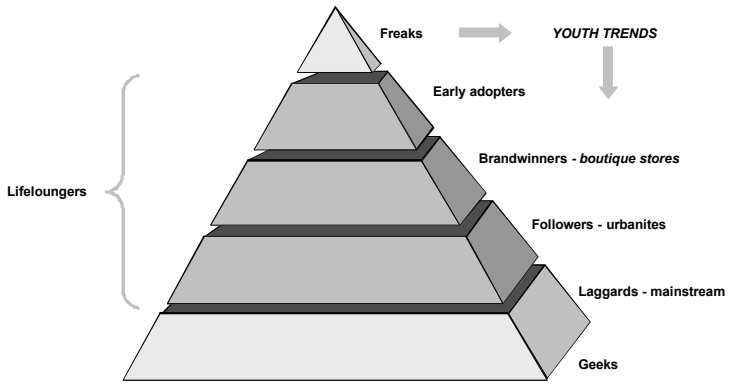
EXHIBIT 4.4: THE INSOURCED MODEL OF DIRECT MARKETING



Meanwhile, innovation in this advertising space appears to be occurring outside the mainstream in niche or neglected market segments. An intriguing example arises in the youth market. Prourbanism is a Melbourne based agency pushing the boundaries of conventional advertising. Prourbanism, and its online venues www.lifelounge.com and www.lifelounge.com.au are a revelation for ageing industry analysts. The point to note is that these are intensely content-rich sites, and highly interactive.

Dion Appel, the founder of Prourbanism, started out in sports management and his extreme sports company was subsequently acquired by US interests. In June 1999 Appel founded Prourbanism, and lifelounge as an online venue to support marketing campaigns targeting youth in the 16 to 24 year old age bracket. The company thrives on viral marketing - he calls it guerrilla marketing - and targets the trend setters in the youth market. Prourbanism's market segmentation is instructive.

EXHIBIT 4.5: SEGMENTING THE YOUTH MARKET



Source: Lifelounge

This youth market is technologically literate, and has a high penetration of game platforms.

4.4 Digital content in education

The business of education is content rich. The schooling and higher education sector is also dominated by government. The area of digital content in education was chosen for examination in this study because of the role of government as a market shaper and industry organiser. Government plays a key role in content in other areas as well, often very different roles to that in education, and some of these other facets of government were cross-referenced in other segments of the study, and some wider observations will be included in the final overview sections of this report.

Content goes to the heart of any curriculum. Specialist educational text publishers have developed, usually as subsidiaries of the multinational firms who now dominate the book trade. Australian owned educational publishers tend to be very small and niche, particularly as University presses have wound back (with one or two notable exceptions such as Queensland University Press which survives thanks to the tribal loyalty of authors like Peter Carey).

Since the early 1990s the education sector, and its counterpart in corporate and professional education and training, has been targeted as a highly prospective sector for creating critical mass in digital content and in developing Australian content for the next digital generation. Early national initiatives included the establishment and funding of EdNa, Open Learning Australia and Open Net, with corresponding activities at State level. In the higher education arena, the Virtual Colombo Plan for online tertiary education has been a recent initiative. In 2000/1 the Commonwealth and State and Territory Ministerial Council launched a special digital content initiative to be delivered through the Curriculum Corporation and edu.au. A special vehicle, The Learning Federation has been established to manage this programme. Not surprisingly, this initiative dominated discussions with the sector.

Before this initiative, a major focus at the State level had been on rolling out infrastructure to connect schools online, and to fund challenging computer per student targets. Specialist Internet Service Providers - such as MyInternet (previously SchoolsNet) - have focused on the sector. In the tertiary arena, the Australian Vice Chancellors' Committee has been active, through AARNet, in pushing high bandwidth backbone links between institutions. In the late 1980s and early 1990s AARNet played a crucial role in the roll out of the Internet in Australia, and is now taking a similar lead in promoting the next generation Internet. One of the persistent debates has been the hoary problem of how best to keep infrastructure and hardware policies in synchronisation with software provisioning and rich content.

One area of potential confusion is between new media content oriented to youth markets - whether the feisty anarchy of *lifelounge.com* or the quality children's television drama produced by the Australian Children's Television Foundation and other producers funded by content quotas - and pedagogically correct curriculum content. Some content developers have sought to promote a cross-over. In the 1990s Beam International set up a subsidiary, Smarty Pants, to publish educational CD Rom titles which drew on the production values and techniques of games development. Most ventures like this failed to gain traction in the education sector.

A note of caution. In a market where a single major customer, a government collective, shapes and organises the market opportunities, it is not to be unexpected that a lot of disappointed content developers will express gripes and complaints in private. The asymmetry in market power is a natural breeding ground for conflict and binary positions. In the discussions about this segment, the "special pleading monitoring machine" was working overtime.

Despite approaching this industry segment with a high degree of caution and wariness, no other area of this study proved more problematic. There is no sense of a developer community in this segment. Hundreds of cottage style micro businesses cluster around the government funding trough. A lot of these would-be education content developers are erstwhile teachers from the same system now funding a major digital content initiative.

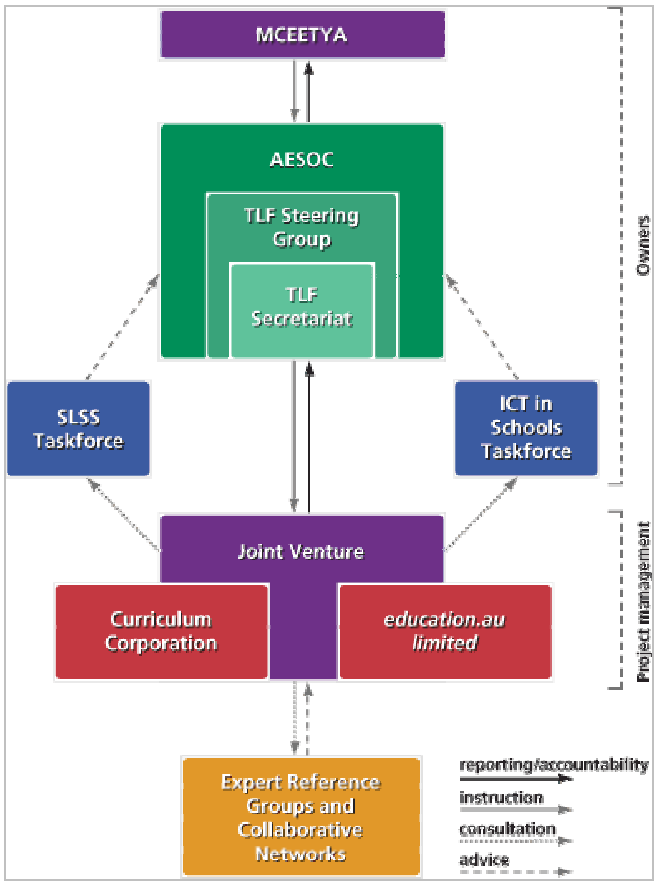
"Education is a socialist market. Take $100 and 100 people and everyone will end up with $1each"

Developer

Shaping markets: The Learning Federation

The Learning Federation is a joint venture of entities both owned by the Ministerial Council of the Commonwealth, State and Territory Governments dealing with education. The joint venture was established to implement the Commonwealth and State agreement to fund a digital content initiative promoted by the Curriculum Corporation. The New Zealand Government is also participating in this A$68.4 million initiative. Rather than fully delegating responsibility for the implementation of the initiative to line management in an executive agency, the governance of the Learning Federation comprises multiple layers of administrative and advisory committees each representing all the participating governments. Officials associated with the project at all levels confess, with sighs, that it is "one of the most over-governed projects imaginable".

EXHIBIT 4.6: THE GOVERNANCE STRUCTURE OF THE LEARNING FEDERATION[32]



Source: The Learning Federation

[32] In this acronym rich environment MCEETYA = Ministerial Council on Education, Employment, Training and Youth Affairs; AESOC = Australian Education Systems Officials Committee; TLF = The Learning Federation.

As little as one third of the the funds may end up with content developers.

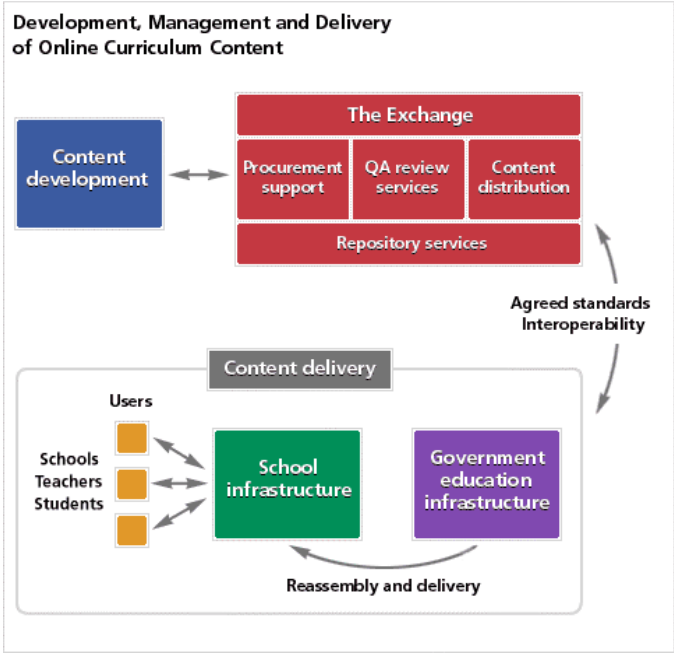
Overseen by a project steering group of participating governments, funding has been allocated across six different learning areas or themes: mathematics, science, "Innovation, enterprise and creativity", literacy, studies of Australia, and languages other than English.

There is a steering committee for each area. In each area there will be several funding rounds over the timeframe of the initiative. The end result is content development tenders for small dollars. Some industry players perceive no independence nor transparency in the decision making processes, in contrast, for example, with government film funding bodies' use of industry panels.

Up to two thirds of the project funds may end up supporting administrative overheads and support services. These support activities fall into three broad categories:

- The in-house development of standards for digital content, covering areas such as interoperability, intellectual property, and metadata formats. These activities include the adaptation of international standards to meet Australian and New Zealand school requirements.
- An infrastructure for content repositories, and for content management and delivery.
- Content quality control systems for contractors (including all testing for usability, educational soundness, editorial, technical and metadata applications).

EXHIBIT 4.7: THE LEARNING FEDERATION'S CONTENT DEVELOPMENT INFRASTRUCTURE



Source: Learning Federation

The Learning Federation defends the level of overhead and infrastructure expenditure on the basis that the original proposals for this initiative underestimated the level of technical expertise within the education systems and the extent of vendor adoption of international standards for online content development and distribution. Behind such comment lurks the strong institutional pressure for sector specific solutions and

customisation. On the other side of the fence, industry leaders query the sector "silo" approach and the persistent reluctance to promote whole of government solutions or to work to generic industry standards[33]. This is an important set of issues, affecting the ability of participating companies to scale their involvement into related markets.

On industry participant commented that "the fragmentation of content development has created the need for quality control over multiple suppliers". Some 400 putative content developers have registered on the Learning Federation's website in addition to about 1300 service users of the site. Most of these are micro-businesses staffed by former teachers or people from the education sector. Industry expects that some 60 or 70 companies will end up being involved in consortia with development contracts. Industry critics of the initiative claim that the approach being adopted is antithetical to industry development and the development of a sustainable enterprise base in this market. ("Only pretending to do business development….Fragmenting the market by handing out money in $200,000 chunks"). What is indisputable is that this in-house approach by the government education sector does not promote a market in educational content and the system lacks clear pricing signals. Whilst the government Learning Federation initiative does not purport to be about industry development, the government role as a market shaper is undeniable simply because of its sector dominance. In this regard it is no different from a dominant player in any other sector with respect to the way in which any dominant player will naturally shape industry structures and operations. In the case of government, the influence of its purchasing power is strengthened by its regulatory functions. Whether or not the consequences of government's purchasing power should influence policy settings is the matter of a wider policy debate in its own right.

At least in the case of a number of firms interviewed, the education and training market appears to be able to seed a business, but not sustain that business.

"We can no longer be a leading eGovernment player by being based in Australia"

Worryingly, firms now see more potential in eGovernment markets offshore than here in Australia and is beginning to target the United Kingdom.

A number of people interviewed echoed the observation that Australia is in danger of losing its leadership in eGovernment, as other countries catch up or pursue a more aggressive agenda, such as the UK which is seen as outperforming Australia in investment in eGovernment by a factor of 4 to 1. The danger for governments, as for all companies in this sector, is to become stuck in a time warp and not continually push the envelope of policy and strategic frameworks. This matters when government plays a major role as a market organiser, as in education.

Some of the endemic problems with sustainable business models for the education sector arise from the questions: who is the customer, and what are the channels to market? However characterised, the value chain in this area is fraught with challenges. Who is the customer? The student, who must relate to the content, and benefit from it? The teacher, who is the final delivery point, and who must feel comfortable about using and being able to reconfigure and repackage materials within their specific learning environment? The school, as an increasingly autonomous decision maker within a decentralised administration of education? The custodians of curriculum standards and formats in centralised administrative State Departments? The Committees under the Federal and State co-ordinating Ministerial Council, and its joint venture agencies such as the Curriculum Corporation and the Leaning Federation? Each claims a role at the market interface for educational content producers, and it is not surprising that many firms find the resulting market delivery framework just too hard.

[33] One of the problems here is that standards are defined by different players at varying levels of specificity, reflecting the lack of technical stability in an immature industry.

Nor is the business model for educational content production attractive. Firms wanting to play in this market must invest in both labour intensive content generation, and in software technology platforms. This typically represents a significant speculative investment in advance of any sales.

The approaches adopted by the Learning Federation sidelined some existing suppliers who had developed a model of fitting curriculum content within an architecture of courseware middleware. They did not fit the model - despite some positive responses from marketing campaigns direct to schools.

One additional hurdle confronting firms has been schools' obsession with hardware, fuelled by the bias in centralised funding programmes. For a period the bias has been to an investment in digital hardware and infrastructure for schools, without full regard to the concomitant need for an investment in software and content to harvest a direct return on this infrastructure investment. Laptops without rich educational content.

This lack of synchronisation between hardware and software deployment also affects hardware vendors. They recognise the value of bundled software in pushing hardware sales. Thus hardware vendors like Acer and Dell, and platform software vendors like Microsoft, have each been negotiating bundling options with content firms.

The role of intellectual property

Complex intellectual property issues feature strongly on the agenda of both the Learning Federation and content developers.

The Learning Federation has had three matters for attention:

- Developing a framework for holding Crown copyrights accommodating multiple governments.

  Agreement is being sought for the joint venture companies to hold copyright in the project as joint tenants in common.

- The licensing arrangements with content developers.

  The project's starting point has been to acquire and hold intellectual property rights in perpetuity in all territories and to negotiate on licensing agreements.

- The management of third part rights.

Under current copyright regimes, the management of digital content rights becomes increasingly complex and problematic, particularly as sophisticated content management systems and middleware allow content to be sourced, packaged, or re-purposed at multiple levels and by multiple parties, including school based teachers.

The education sector also figures prominently in much broader public policy debates about the future of copyright in a digital era. The Copyright Agency Limited currently gets around $40 million per annum from the education sector as part of the Education Public Lending Right scheme. On one hand current copyright regimes imply the development of ever more complex digital rights management systems, or perhaps a growing differentiation between relatively public, "open content", and privatised, closed content repositories. In the UK and US there is widespread debate over possible models, similar to those emerging in the arena of "open source" software, to differentiate between licensing models for public and educational use and licensing for commercial re-use and exploitation. The local work of Professor Bill

Cope and Common Ground Publishing bears on this debate. The education sector will be the sharp end of a much wider whole of government issue and a broader public policy debate.

Another government framework bearing on business models of digital content developers is the Commonwealth and State joint general contracting model for information technology. Draft Version 4 of this contract goes some way in increasing the recognition of contractor's pre-existing intellectual property (and embellishment of pre-existing intellectual property).

A digital content developer's ability to leverage intellectual property developed off government contracts into third party and offshore markets has been pivotal to the business models, growth, and sustainability of firms like Acumen. In this respect firms find a stark contrast between State government policies and the more liberal approaches by local government and public institutions.

Wider implications about the role of governments

One interesting issue arising from the discussions in this area is the suggestion that digital content initiatives within the education sector could provide a useful focus or framework for prioritising the digitisation of public cultural collections. This is a specific example of the wider opportunity to explore a greater focus on whole of government co-ordination to leverage the public benefit of government sponsored funding initiatives for digital content.

5. Firm level findings and issues

This section briefly summarises some general observations about firm level operations across the industry segments examined in this study.

The interviews in each industry segment provided constant reminders that digital content production is a rapidly changing area. Everyone is learning as they go. In this context it is dangerous to extrapolate snapshot observations as signposts to the future. A concomitant of this volatility is the absence of stable time series data for industry analysis. Even at a firm level, the constant re-invention of business models makes year on year trend analysis problematic (and potentially misleading).

The aftermath of the dot.com financial bubble, and the overall economic correction to technology markets, make it difficult to distinguish between short term cyclical factors and long term industry trends. A good example of this is the recent consolidation in the industry. Some of this consolidation, through business failure or takeovers, is a consequence of the excessive fragmentation of the sector through unrealistic expectations of market growth in the 1990s. Other consolidation moves reflect firms moving to consolidate vertically as part of a natural growth strategy. In the current environment both factors may combine to produce rationalisation: this is probably the case with AAV Australia's reverse take-over of Isis Communications and its acquisition of GMD (the visual effects and animation house)[34].

Most of the firms surveyed in this study are young organisations. The age profile of game developers is not atypical of other segments (but better data is available in the more homogenous games area).

GAME FIRMS: AGE PROFILE

Year	No of firms	Age
1980	2	22
1985	1	17
1992	1	10
1993	1	9
1994	3	8
1995	2	7
1997	1	5
1999	1	3
	12	

Firm size varies, but the most well established firms surveyed tend to employ between 15 and 80 people.

Everyone is vexed about business models. In part this is typical of an immature market. In some measure it reflects problems endemic to content industries, and the age old problem of how to monetise creativity. The industry is only slowly beginning to account for digital content assets. A recurrent theme in content markets is the tension between developing the "next big title" and growing a title generating company. This is reflected in the contrast between a single product venture versus enterprises developing multiple products and taking a portfolio approach. The challenge of diversifying revenue streams and not relying too much on a narrow customer base are problems for any emerging enterprise. They are problems which featured strongly in discussion with digital content producers.

Branding, and market positioning, has emerged as a key differentiator in the world of digital content. Association with industry standards, and the role of industry association awards, are two means by which emerging producers can use third party

[34] *Media Day*, Issue 1287, 4 July 2002

credentialling to position themselves in the marketplace. For others, firm brands piggy back title recognition, as in the beneficial overhang from the success of a game title or an advertising campaign.

Funding remains one of the biggest problems for digital content developers, causing most to fall back on fee for service work to subsidise business development and to fund growth. As in the film industry, backers may be found for projects but there is little appetite for investment in corporate teams.

Across segments there is a common thread in the careers of the forceful personalities shaping the sector: these people exemplify what the text books say about the emerging new generation of knowledge worker. These are people who keep reinventing themselves, and their businesses. They either move on from venture to venture or keep morphing their ventures. Many of them are serial innovators.

The second characteristic of digital content production is that it is inherently a team game (more so than in earlier content business). In part this is because of the inherent mix of techno nerds and non technical creatives. In part this is because the art of the content production has become inherently more collaborative (as a necessary corollary of interactivity and the re-purposing of content). These observations must be qualified slightly by a countervailing trend to less personal specialisation in areas like digital television production. In this area, an individual can act as a one person crew, albeit still within the context of a wider production collaboration.

As Caves has noted with respect to creative industries generally, digital content production is characterised by strong informal networks, often crossing segment boundaries.

Several firms pointed to emerging problems with a lack of staff turnover, particularly in the current economic environment. Within relatively small teams there is a trade-off between group cohesion and the regular infusion of new creative energy.

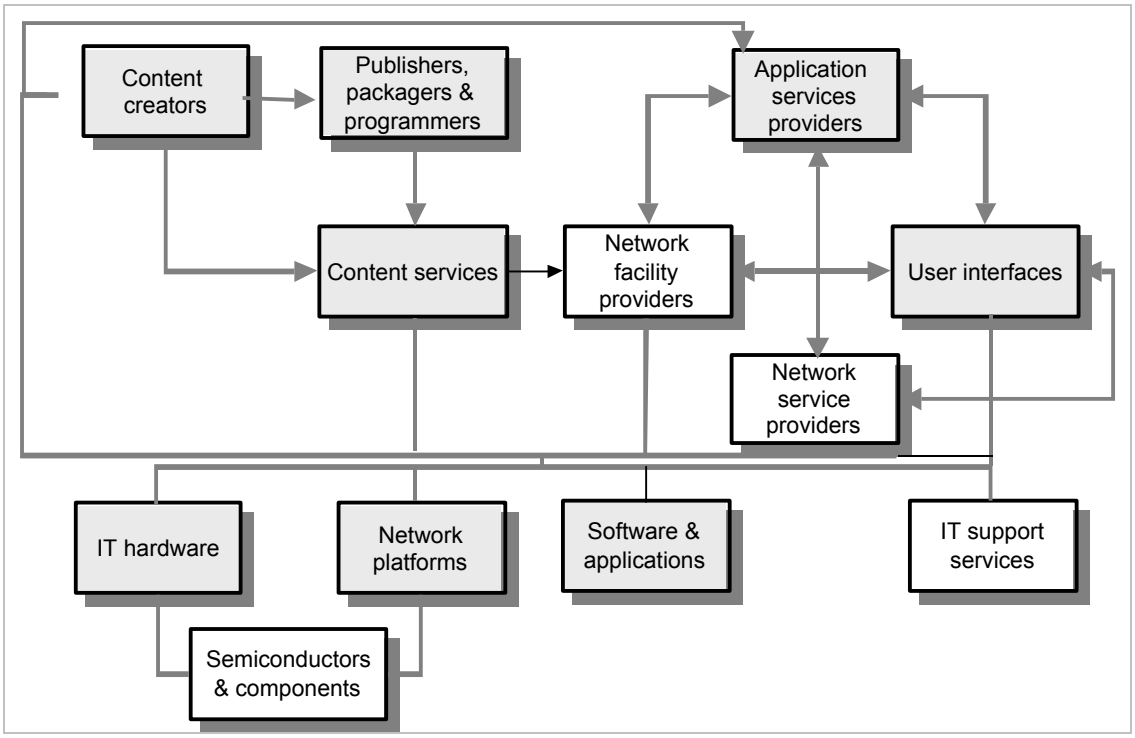
Digital content production has an imperfect market for sector information and strong asymmetries in market transactions. There are several explanations for this. First, with the exception of entities associated with multinational conglomerates, we are dealing with small businesses with limited global connections. Hence several of the case studies examined during this study highlighted the beneficial role of government agencies in sponsoring attendance at trade shows and in international promotions of the Australian brand. In the games segment, the industry association has played a parallel role. The second explanation is the strong market power of distributors and network distribution channels.

During the 1990s many digital content producers and application developers were defined, or defined themselves, strongly in technology terms. There was an element in this of the irrational exuberance of the dot.com era. Another factor was that the technology was itself a source of market differentiation, thus exaggerating the novelty of new digital product over basic value propositions. At the beginning of a new decade and a new century one gains the impression that the distinction between content focussed teams and technology focussed teams is blurring, and that the technology is becoming more transparent and embedded. Contrary to common misconceptions, reinforced by the debate over IT skill shortages, across segments all the firms have highly pluralistic people teams and highly diverse skill mixes. Generally speaking, core functions are internally resourced, with relatively little systematic contracting. The only segment exception is in interactive television, where there is carry over of the project specific organisational and staffing model that is well established in the film and television industry.

6. Industry value chains and market dynamics

There is a need to locate digital content within the wider value chain of online services and the "below the line" supply chain of technology platforms and tools. Transactions and communications have been the primary drivers and shapers of these wider online markets, not content. Hence the industry value chain of digital content and applications development is a sub-set of a wider market ecosystem.

EXHIBIT 6.1: THE VALUE CHAIN OF ONLINE, NETWORKED SERVICES.



Source: Cutler & Company 1995

The segment focus of this study suggests the utility of a narrow, tight value chain model. Reviewing the model developed almost a decade ago for our 1994 *Commerce in Content* study it seems to have proved robust over time, and is reproduced below.

EXHIBIT 6.2: A DIGITAL CONTENT VALUE CHAIN

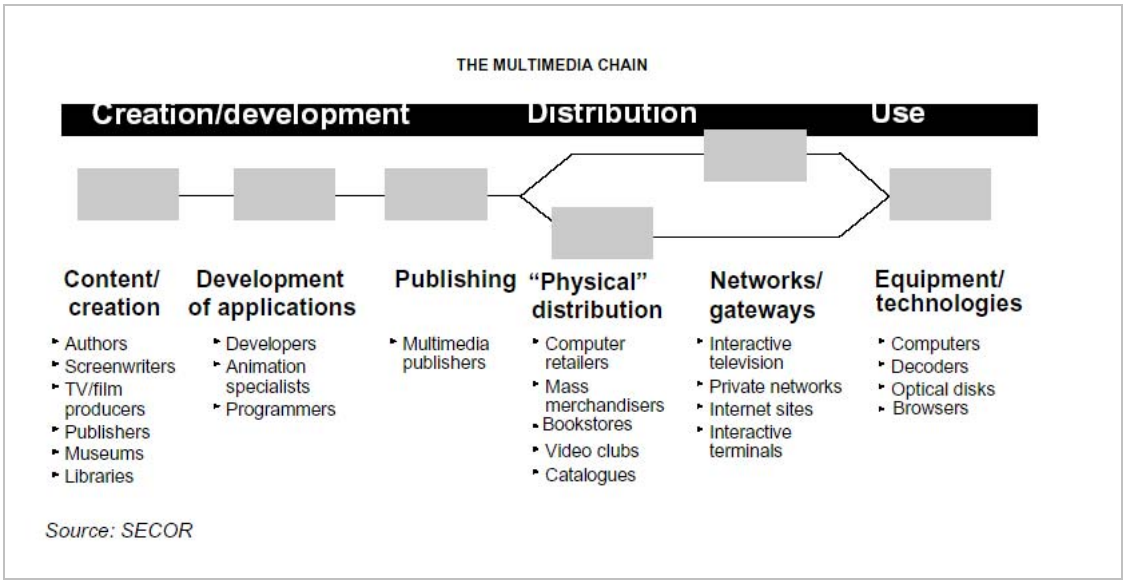
CREATION; PRODUCTION	ECODING; STORGAE; RETRIEVAL	DISTRIBUTION; NETWORKING	USAGE
The conception, design and execution associated with authoring, expression and performance.	The encoding or capturing of the created production in a form that can be shared and used.	The mechanisms by which content productions or titles can be brought to market.	The consumption and use of content (including re-use).

Source: Cutler & Company 1994

For purposes of comparison, we can set this alongside a model used in a Canadian study of multimedia. The main area of difference is that the earlier Australian model put more emphasis on the function of content management systems associated with

production formats and storage, functions becoming increasing important in networked content architectures[35].

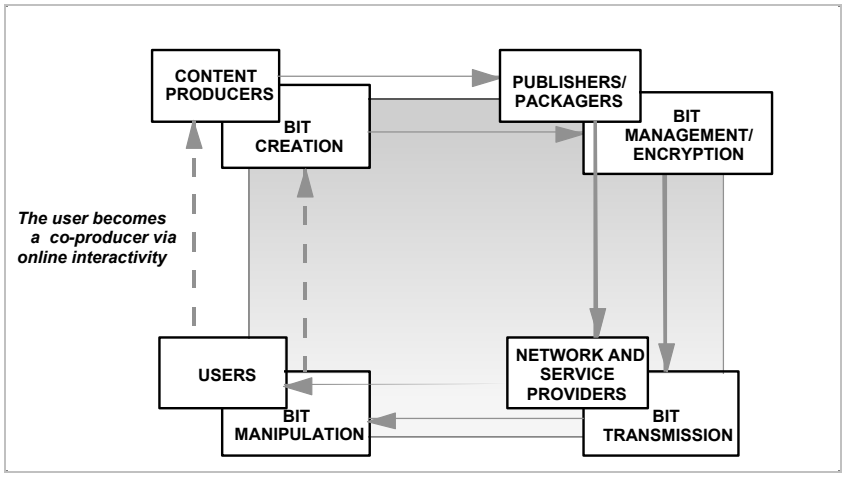
EXHIBIT 6.3: CANADIAN MULTIMEDIA VALUE CHAIN



Heritage Canada, The Multimedia Industry In Canada, 1998

One of the drawbacks with traditional value chain analysis is that it implies linear processes and market sequences. In an online environment, activity is increasingly non-linear: the metaphor of a "value net" is pertinent.

EXHIBIT 6.4: INTERACTIONS WITHIN A DIGITAL VALUE NET



Source: Cutler & Company 1994

A recent study of broadband content noted that

> Interactivity is the predominant characteristic of the new digital media …. Interactive content exists on a continuum of sophistication marked by the user's increasing control over its delivery and form[36].

[35] *Release 1.0*, 22 January 2002

[36] Canarie Inc, *Filling the pipe: Stimulating Canada's Broadband Content Industry Through R&D*, Delvinia, May 2001. pp.10, 8

The dynamics of content value chains appear to vary across the digital content segments examined in this study. What also varies is the role and importance of the markets for digital content applications and supporting technologies.

EXHIBIT 6.5: THE INTERACTIVE GAMES VALUE NET

Interactive games development is tightly tied to the underlying software operating systems. Changes in the distribution environment, from shrink-wrapped product to online access, change the relationships between content producers and distributors, with increased emphasis on network channels. Growing interactivity strengthens the integration of the end user within the business system, interacting with the content producer and with the network channel.

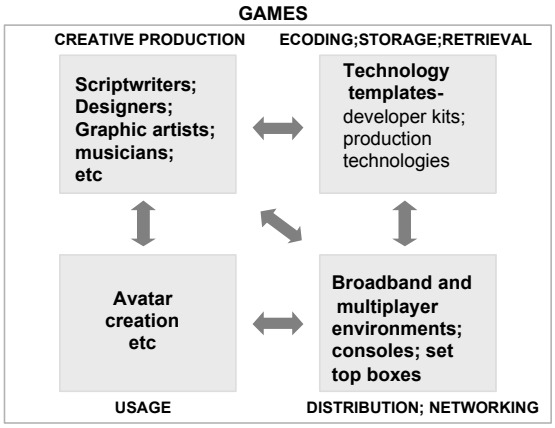
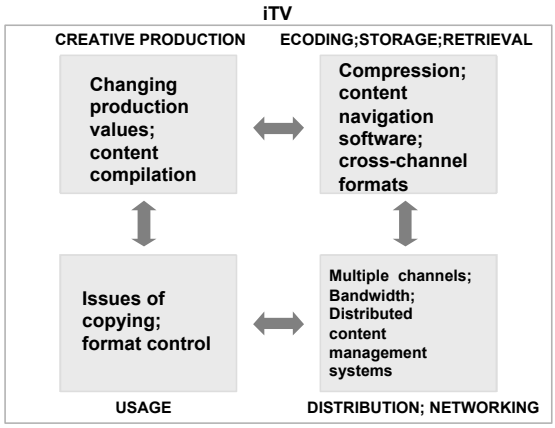


EXHIBIT 6.6: THE INTERACTIVE TV VALUE NET



Interactivity will introduce new requirements for content management applications and software. Interactive digital production significantly changes the business system of television. At issue is the market organisation of these new functions (whether incumbent broadcasters or the network operators). Any increase in cross-channel activity is likely to increase the active engagement with end users in the dynamics of the business system.

EXHIBIT 6.7: THE VALUE NET OF DIGITAL CONTENT IN EDUCATION

Digital educational content involves an increasingly tight linkage - and interchange - between content producer and content user roles. Frameworks and formats for metadata and repositories involve strong linkages between system developers and user environments. Distribution systems involve a complex interplay between the traditional, locationally based structures of schools and educational institutions, and new virtual educational environments.

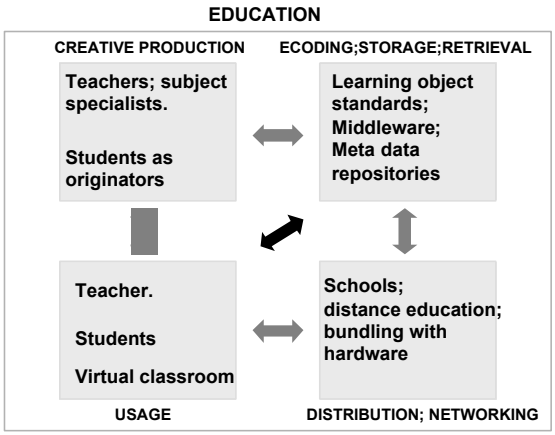
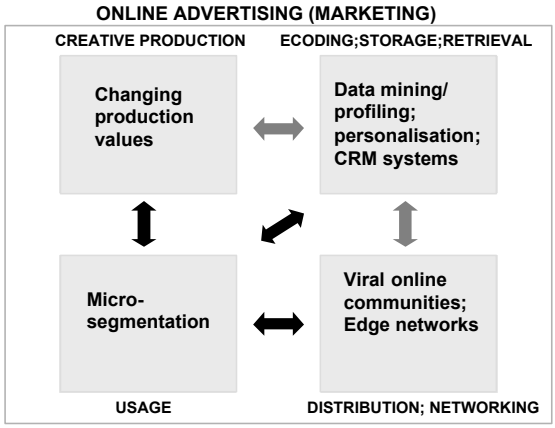


EXHIBIT 6.8: THE ONLINE ADVERTISING VALUE NET

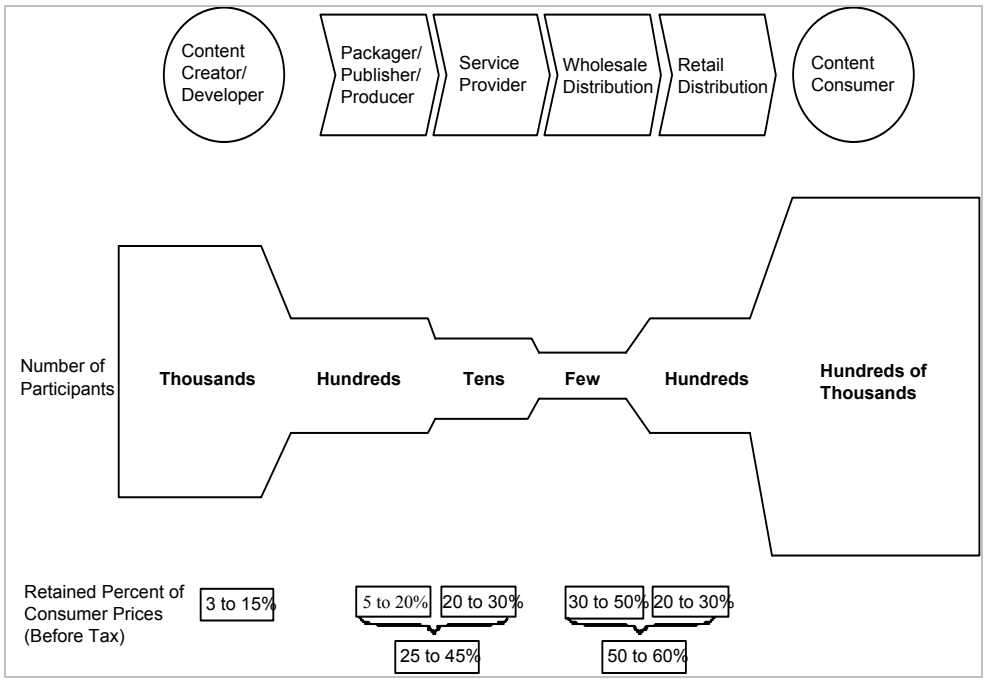


Direct marketing and micro-segmentation transforms the traditional "broadcast" advertising model, requiring new firm capabilities and market relationships. This in turn puts a new premium on digital data management systems such as profiling and Customer Relationship Management applications. Viral (networked) marketing involves interaction with end users in new ways.

This value net model emerges as a useful tool in identifying segment specific dynamics in the evolution of digital content business models. The point worth noting is that there are different drivers and dynamics in play in the different sector segments examined in this study.

The flipside is to look at what is common across digital content segments. Three key observations emerged from our consultations. First, the growing importance of content management systems at the edge of traditional - and centralised - network operations. The dynamics associated with content management systems are different from those associated with traditional communications networks. Second, increasing interactivity changes the role of the end user, and the end user environment, within content development and delivery systems. Third, distribution and the power of intermediaries between content creator and content consumer remains the primary factor in the economic returns across the industry value chain. The "hour-glass" industry structure we described in the 1994 report on *Commerce in Content* remains unchanged.

EXHIBIT 6.9 : THE DISTRIBUTION OF ECONOMIC RETURNS AND MARKET POWER WITHIN THE INDUSTRY VALUE CHAIN.



Source: Cutler & Company 1994

The next key question is to ask how digital content differs from any other content. What changes and appears different with digital content production appears to be around:

- the extent of hybrid activity;
- different or additional skill requirements;
- an increased focus on the nature of creative teams, and related skill mixes;
- changed business system linkages;
- the re-usability of the content; and
- the cycles for technology and product commoditisation, which appear to be shortening.

Digital content is different from the technology environment in which it operates. Information and communication technology is now a commodity[37]; the important point is that digital applications and digital content are not commodities. Hence there appears to be a growing difference between new technology business models and business models for content and applications production.

What is not different with digital content? One way to address this question is to look at the rigorous work by Caves on content industries generally, and then test for the relevance of his observations within a digital environment. Caves identifies seven core economic properties of creative content production. The following table describes these properties and assesses their relevance within a digital environment.

EXHIBIT 6.9: BASIC ECONOMIC PROPERTIES OF CREATIVE ACTIVITIES[38]

1	**Demand is uncertain**	*Nobody knows in advance what will be valued. The organizational problem is to deal with **symmetrical ignorance**, not asymmetrical information. This suggests that each party will seek various ways to set off risk, but not all parties will have the same bargaining power in risk minimisation. This leads to option contracts.* In a digital, networked, environment personalisation and micro-markets appear likely to increase uncertainties around demand.
2	**Creative workers care about their product**	*The property of **"art for art's sake".** Loose relationship between a producer's concerns with artistic achievement and the market's ultimate valuation of the product. In economic terms, the cost of inputs may exceed the value of outputs. (This may of course vary over time). There is an analogy with a technology firm's level of investment in R&D.* The DNA of creative workers does not change.

[37] Australian Government, *Budget Statement 4: Australia's Terms of Trade*, Canberra 2002, p.4-27

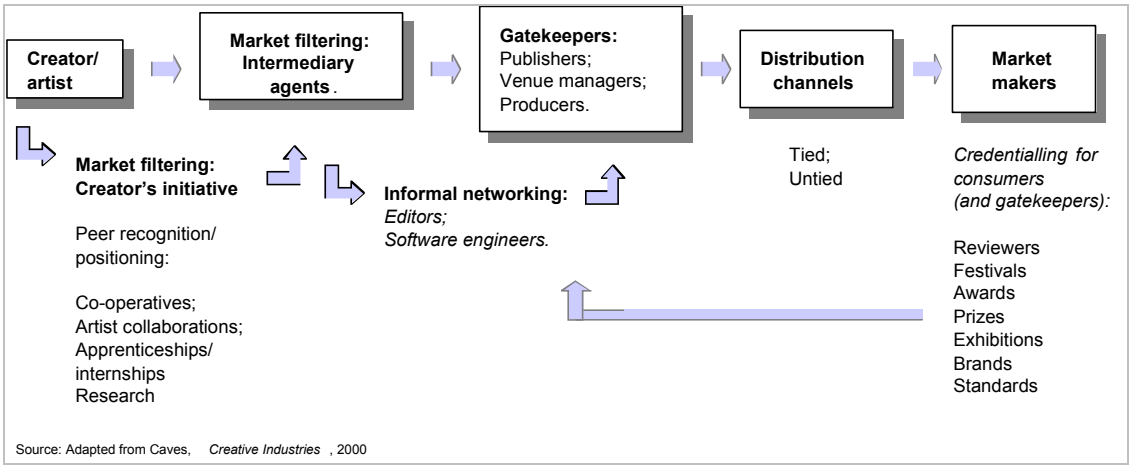
[38] Adapted from Richard Caves, *Creative Industries: Contracts between Art and Science,* 2000, p 2ff

3	**Some creative products require diverse skills.**	*In a multiplicative production relationship, inputs are not substitutable. Caves labels this the property of* ***"the motley crew".*** Digital production increases the impact of co-production and team collaboration.
4	**Differentiated products**	*This is the property of* ***"Infinite variety".*** *Caves states "we use it to invoke either the universe of possibilities from which the artist chooses, or the array of actual creative products from which consumers or intermediaries choose".* Digital content, and the digitisation of existing content, potentially increases the range and amount of content available. The issue then becomes one of whether the accessibility of this infinite variety changes, and whether content intermediaries and "gatekeepers" become more or less powerful. In oligopolistic markets, players who control network distribution may become important new gatekeepers over access to content.
5	**Vertically differentiated skills**	*'Cultural products differ unpredictably in the quality levels that consumers see in them….This is the* ***A list/B list*** *property".* This does not change.
6	**Time is of the essence**	*"That reliance of the economic profitability of creative activities on close temporal coordination of production and the prompt realisation of revenues I call the* ***time flies*** *property". Caves does not note the point that the economic life cycle of some creative properties may be skewed - such as the posthumous value of an artist's work which may increase rather than decrease over time. On the other hand, economic analysis of the issue of copyright term extension supports Caves' basic point.* There are conflicting forces at play in a digital environment. Real time interaction with end users accentuates this property. Re-use and re-authoring, including by end users, adds new value to content libraries or repositories.
7	**Durable products and durable rents**	*Many creative products are durable* ***" ars longa"****.* Digital repositories will strengthen durability.

Caves notes that these economic properties of creative activity apply equally to both "popular culture" and "high culture"[39]. It would appear that they apply equally to traditional and digital content industries. Caves' analysis of a generic creative industry value chain fits well with the analysis of digital content issues in this study.

[39] ibid, p.9

EXHIBIT 6.10: CREATIVE INDUSTRIES VALUE CHAIN (AFTER CAVES)



The conclusion is that commonalties between digital and traditional content appear greater than the differences. Identifiable differences are primarily in the role of digital applications in content production efficiency and productivity, and in user interfaces.

7. Influence of institutional and macro-economic settings

The terms of reference for this firm level examination of industry segment activity explicitly excluded detailed consideration of broader issues involving wider markets, and their policy implications. It is, however, important to note how strongly many of these wider issues featured in the discussion of firm level business operations. This section briefly identifies the major issues raised during the industry consultations.

(a). Infrastructure - and broadband

The growing cost of advanced technology platforms is becoming an entry barrier. A good example of this is in the games sector, where access to proprietary console developer kits is both a cost and an access issue (that is, console vendors tend to want to pre-qualify developers). In this instance the Game Developers Association has played (with Victorian Government funding support) a key brokerage role in facilitating access to kits by small emerging firms. On the other hand, we found little evidence of markets developing around the shared use of scarce, high cost facilities even though there would be a clear economic case for such inter-firm transactions. This may be a function of small market size and immaturity. The flipside to this is a high level of improvisation (which is probably not a sustainable business approach in the longer term).

More intractable problems arise when the business model revolves around the networked distribution of digital content or applications. Firms encounter a range of hurdles:

- The low broadband penetration in Australia translates into a small, sub-scale market for developers.
- The limited broadband market means that Australian developers will have less direct experience of engaging with broadband users and emerging markets than developers in markets with quickly growing broadband penetration. In South Korea the broadband environment has fuelled the local games industry. This hurdle will become increasingly significant in the area of massively interactive multi-player online games.
- The thin local market for broadband network supply, dominated by one player, creates huge access barriers and power imbalances in market transactions. At present, if a firm is not in the privileged position of having a Telstra relationship, there are few market alternatives. For numerous firms this has created insurmountable barriers to growth options.
- Any relative regional uncompetitiveness in access to global broadband networks will limit the scope for Australian firms to participate in global virtual studios or cross-border collaborations. During this survey numerous firms raised this as a perceived problem. Networking digital content production involves shifting massive data files: with games developers, uploads to the US, for example, can be over 4 gigabits per session.

(b) IP regimes and digital rights

Intellectual property regimes are at the core of business models for any content industry and related applications. General issues around copyright law and digital rights are complex, and hotly debated at both a firm and at public policy levels. One industry leader in this survey took the position that Australian industry development and national interest would best be advanced by a contrarian view on copyright and a vibrant "digital commons". "The Global IP regime does not work to Australia's interests - Australia should work to become a rich market of public domain content repositories and content mining, fuelling local content industries".

Other firms noted that the increasing complexity around digital rights management and the reuse of digital materials was very significantly increasing overall transaction

costs for the industry - to the point where some firms and developers tended to avoid some areas of content development as "just too hard".

A specific issue which arose in the context of specific markets involving government - in this survey in the areas of educational content and digital applications for government services - is the matter of government policies about Crown copyright and its own management of intellectual property. The segment surveys in this report have highlighted the importance of this issue in industry development.

(c) Competition policy and market power of incumbents

Several issues were raised under this heading.

First, the special and peculiar role of Telstra as the dominant network provider within the Australian market. Several people drew attention to Telstra's strong vertical integration across both carriage and content markets, and its recent initiatives to consolidate a privileged position in the market for broadband content[40]. This is an important observation because Telstra is atypical in this respect in terms of the global telecommunications industry and the regulatory regimes in most OECD countries.

Second, content distribution channels for Australia's small and medium sized content developers are dominated in local markets by incumbent, pre-digital media channels and global channels are dominated by remote multinationals. Distribution bottlenecks remain a lively issue for content and application developers.

Third, pre-digital incumbent media channels hold strong market power with respect to control over existing content libraries and repositories and the related digital rights. This is an advantage where entities have been formed to exploit these relationships. It creates potential transactional bottlenecks or bargaining asymmetries where these cross-channel relationships do not exist.

(d) Education and labour markets (incubators)

Educational institutions with a strong focus on the creative industries -such as Queensland University of Technology or RMIT to name but two- have strong linkages with digital content developers and provide important platforms for the informal sector networks of many of the firms and individuals canvassed in this study. In the case of a specialist institution like the Academy of Interactive Entertainment, the training institute also functions as a virtual incubator. Several industry players commented on the potential for university linkages to promote and facilitate a stronger R&D role within the sector.

(e) Industry organisation

Industry associations play an important role in positioning industries within institutional frameworks, particularly in providing a negotiating interface with government and a parallel channel for government funding into the industry. In this survey there are two very different examples of industry organisation. The Game Developers Association is a highly focused organisation which has formalised linkages between the small group of first tier players in the industry. It has provided a valuable interface with government, particularly in Victoria. This can prompt questions about whether effectiveness at a regional level conflicts with wider national inclusiveness. Some members from outlying States refer, only half-jokingly, to the Association as "the Infogrames Association". Outside of the tightly knit games segment, industry associations have been less closely linked to individual firm level development. Several firms commented that AIMIA's membership is too heterogeneous to provide a forum for facilitating inter-firm linkages.

[40] There is a good review of these issues, including statements from Telstra about its ambitions, in a recent feature article by Geoff Elliott, "Telstra weaves a sticky web", *The Australia: Media Supplement,* 8 August 2002.

(f) The role of cultural institutions

The digitising of cultural collections is a relatively neglected element in building digital content markets[41]. It can affect industry development in three ways by:

- building a critical mass of publicly available material of general community interest and of particular utility to online education;
- driving the adoption of industry wide standards; and
- scaling early demand to support emerging developers.

One issue raised in the survey of the education segment was the potential for educational content initiatives to provide a platform for the setting of priorities in digitising existing collections.

In general, current initiatives by mainstream cultural institutions did not feature strongly in the life of the firms surveyed. The exceptions to this statement are important. First, the Australian Centre for the Moving Image (ACMI) has the potential as a new cultural institution to play an important role at the leading edge of the interface between new media and creative industries through its commissioning programmes, its education programmes, and as a forum supporting informal industry networks. Second, ACMI and university based research programmes can play a major role in establishing an R&D base for the industry.

(g) R&D

Technical R&D has been pivotal in the development of many of the firms surveyed. A recurrent theme has been the importance of the government's R&D Start Grant scheme in supporting the sector.

A number of industry leaders commented on the importance of seeing innovation around digital content as research and development for creative and content industries generally. This strikes us as an important observation, and is consistent with the thrusts of some recent reports from other jurisdictions[42].

(h) Standards

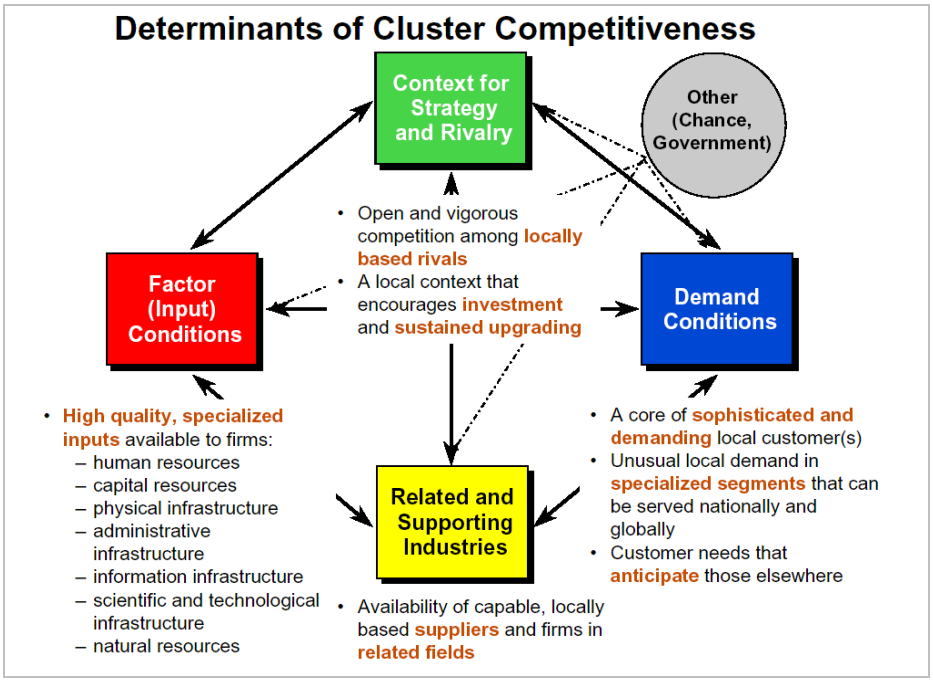
The development and adoption of industry wide standards is an important institutional factor in the growth of digital content markets. There is here a constant tension across the sector over the rivalry between proprietary and open systems. The specific issue which arose in this survey was the special role of Government in mandating standards in particular markets such as education. A number of developers commented on the risk that too much customisation around distinctive Australian standards works against the ability to leverage expertise in Australian education markets into wider global markets.

[41] For an overview of recent initiatives in the United Kingdom, see *Wired News*, 2 August 2002.
[42] See, for example, Canarie Inc*, Filling the pipe: Stimulating Canada's Broadband Content Industry Through R&D*, Delvinia, May 2001

8. Digital content production and clustering

The starting point for thinking about digital content clusters in the context of this qualitative survey is Porter's leading work on industry clusters.

EXHIBIT 8.1: PORTER'S MODEL FOR CLUSTER ANALYSIS



The preliminary data from the current Harvard review of general cluster case studies supports the following observations and conclusions:

- Employment in clusters or core industry polarises between small (less than 5000 jobs) and large (more than 30,000 jobs).
- Clusters are geographically concentrated. Almost half the clusters analysed are concentrated within a city. 88% are within a defined economic region or sub-national state.
- 75% of the case study literature relates to established industry clusters (rather than partly developed, sub-critical mass or rudimentary).
- The existence of an industry cluster does not of itself imply anything about the international competitiveness of that cluster or against other clusters in that industry.
- Most referenced clusters are old and well established, with two-thirds pre-dating 1950. But the Harvard researchers note that there is no significant relationship between a cluster's age and its competitiveness.
- 70% of current cluster competitiveness is explained by either factor conditions (44.1%) or demand conditions (25%). It should be noted that in this analysis factor conditions include institutional arrangements and "soft" infrastructure.
- The above finding is skewed by weak or uncompetitive clusters. Related industries and firm rivalry feature more strongly in the case of the world's most competitive clusters. The researchers note that the case studies show that "clusters which relied primarily on rivalry were significantly more competitive than clusters which relied predominantly on factor conditions". It should be noted that this finding appears related especially to international competitiveness.
- "Chance" or government intervention is identified as the most important reason for cluster development in 28% of cases, rising to 38% for cluster developed since 1900.

The Harvard researchers draw the following implications from their work in progress.

> "To identify potential clusters in developed countries:
>
> - focus on *linkages* to existing related industries in addition to local *factor* and *demand* conditions
>
> To upgrade existing clusters:
>
> - focus on *advanced* factors
> - focus on demand *qualities*
> - do not ignore *rivalry* [firm competition]

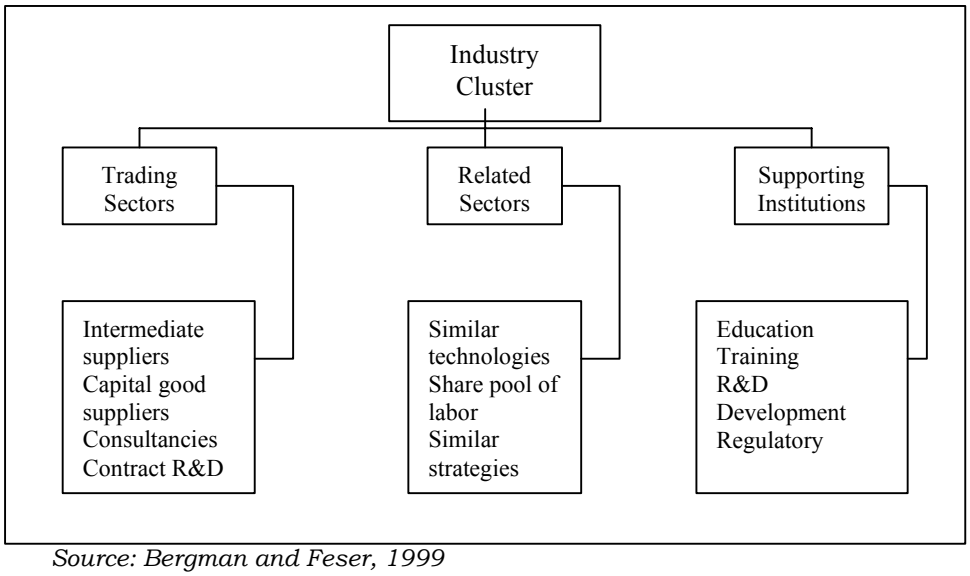
In the context of this digital content production industry study, these Harvard findings are consistent with our conclusions that:

- the driving forces in digital content production are essentially the factors at play in all content production industries, and these wider and established content industries play a key role in terms of *industry linkages* for emerging digital content producers; and

- rivalry in digital content production exists primarily, at this stage, between new and emerging digital producers and the existing and established content producers, and this rivalry revolves around the *demand qualities* and *advanced factors* of industry and market structure highlighted by the Harvard research.

It is noteworthy that when Porter himself presents an actual mapping of a cluster example[43] he departs from his own analytical schema and presents something that looks more like the mapping framework of Bergman and Feser.

EXHIBIT 8.2: ALTERNATIVE CLUSTER MAPPING FRAMEWORKS



Source: Bergman and Feser, 1999

This framework is consistent with the perspective of the content landscape surveyed in this current study. That is, with the exception of interactive games, the digital production linkages within vertical industry segments are weak: the dominant

[43] See, for example, Porter, 2002

dynamics in terms of *vertical* segment organisation are driven by the interaction of emerging digital content producers with incumbent content market organisers. Distinctively digital linkages are found in the *horizontal* relationships with related markets and industries. Finally, firm linkages with and support from proximate institutions appears to play a crucial role in fuelling the growth to critical mass in sectoral competencies and in underpinning the quality of informal people networks within the industry.

In the case of digital content production, the linkages and interplays between traded and non-traded areas of activity appear to play a crucial role in developing that creative environment of stimulation, enquiry and the sharing of ideas which is peculiar to high level knowledge-based and people-centric activity. Perhaps this is the positive insight from and significance of the chronic difficulty analysts have had in drawing boundaries between the traded and the non-traded in creative industries. This suggests that the interface between the cultural sector and content industries is an important factor in inputs to the digital content value chain, and to the support of local clusters of activity.

This conclusion is consistent with the recommendation from a recent Canadian study[44] that digital content production initiatives should be treated - and funded - as research and development to develop new competencies and competitiveness in content industries generally.

Insights from other cluster analysis

In the early 1990s, Markusen analysed regional economic development patterns in the United States and subsequently developed a typology of cluster types to describe the different patterns of inter-firm relationships in different industry markets[45].

EXHIBIT 8.3: MARKUSEN'S TYPOLOGY OF INDUSTRY CLUSTERS

Cluster Type Growth	Characteristics of Member Firms	Intra-cluster Interdependencies	Prospects for Employment
Marshallian	Small and medium sized locally owned firms	Substantial inter-firm trade and collaboration, strong institutional support	Dependent on synergies and economies provided by cluster
Hub and Spoke	One or several large firms with numerous smaller suppliers and service firms	Cooperation between large firms and smaller suppliers on terms of the large firms	Dependent on growth prospects of large (hub) firms
Satellite Platforms	Medium- and large-sized branch plants	Minimum inter-firm trade and networking	Dependent on ability to recruit and retain branch plants
State-anchored	Large public or non-profit entity and related supplying and service firms	Restricted to purchase-sale relationships between public entity and suppliers.	Dependent on region's ability to expand political support for public facility.

This current survey of different digital content production segments resonates with Markusen's framework.

[44] Canarie Inc, *Filling the pipe: Stimulating Canada's Broadband Content Industry Through R&D*, Delvinia, May 2001.

[45] Source: A. R. Markusen, "Sticky Places in Slippery Space: The Political Economy of Postwar Fast-Growth Regions." Working Paper No. 79, 1994, New Jersey Center for Urban Policy Research.

Cluster Type Growth	Characteristics of Member Firms	Intra-cluster Interdependencies	*Resonances with digital content production*
Marshallian	Small and medium sized locally owned firms	Substantial inter-firm trade and collaboration, strong institutional support	***Game developers; interactive television producers; Brisbane's creative developers***
Hub and Spoke	One or several large firms with numerous smaller suppliers and service firms	Cooperation between large firms and smaller suppliers on terms of the large firms	***Interactive games; portals; education***
Satellite Platforms	Medium- and large-sized branch plants	Minimum inter-firm trade and networking	***Incumbent advertising***
State-anchored	Large public or non-profit entity and related supplying and service firms	Restricted to purchase-sale relationships between public entity and suppliers	***Digital cultural collections; education***

That it is difficult to locate digital content industries within a definitive schema of cluster typologies is, in large part, a function of the industries' lack of maturity and the volatile and still uncertain relationship with the established, incumbent creative industry market organisers. At present, therefore, we see different industry segments within the digital content sector demonstrating a variety of sector growth characteristics. We suggest that, at present, these characteristics are not normative and fixed.

Work on industry clusters has largely been undertaken in the context of regional economic development strategies, that is, the geography of firms and industries. Against this background, two issues have arisen in the context of this survey. First, what are the locational characteristics conducive to vibrant creative industries, and second, what is the interplay between a physical location and an online virtual cluster in a networked environment for digital content production?

To a travelling analyst Brisbane**,** of all the places visited, most felt like a cluster community. First, the evidence. Over the past decade Queensland has come from nowhere to being an energetic technology centre, mainly based around emerging small enterprises. It has anchored a lot of local film and television activity through the multinational studios on the Gold Coast. Brisbane has been building infrastructure in creative industries through a strong involvement by Government and the local universities; each of Griffith, QUT and the University of Queensland have built distinct competencies and developed innovative programmes around the creative industries. SMEs have joined forces to win major Government tenders and to brand themselves. There are strong personal networks and a climate of collaboration. There is, in fact, an actual buzz in Brisbane in the same way one talks about the particular "look and feel" of an online website.

What are the dynamics at work here? Certainly Brisbane is a good example of Caves' point that creative industries are characterised by strong informal people networks. Some *émigrés* to Brisbane described the contemporary ethos of the place as comparable to Adelaide's cultural renaissance under Don Dunstan. There is strong local political leadership promoting a "Smart State" built on knowledge and technology industries. There is not that overshadowing of the sector by dominant multinationals which occurs in Melbourne and Sydney. The Brisbane City Council, with its unique jurisdiction in an Australian context, provides an additional layer of strong governmental support for creative industries. Size might be a factor, as virtually everyone in the sector seemed to have few degrees of separation from their peers. Brisbane's tertiary institutions and cultural centres seem to play a stronger role than their inter-state counterparts in providing neutral forums for collaboration,

networking and innovation. Whether all this is best described as a industry cluster or as an active community of interest is a moot point.

General studies into possible trends affecting regional economic development in a knowledge economy have focused on the importance of people attraction strategies: strategies that create lifestyles and amenities attractive to mobile knowledge and creative workers. Florida's recent work[46] on the "creative class" of knowledge worker is particularly relevant here, as he has demonstrated a strong correlation between the location of high tech firms and the multiculturalism and bohemianism of a location. This reinforces the observation from these consultations about the overlap between non-traded cultural activities and traded content production. Clear examples of this from the current study are:

- ACMI's programme of commissioning leading edge digital content is acting as a catalyst in creating a market at the interface between new media arts and commercial content production;
- the role of QUT and the Brisbane Powerhouse, as educational and cultural institutions, in fuelling research and development in digital content production, and in building and supporting horizontal, cross-segment networks; and
- the impact of the Government's broadband content development initiative administered by the AFC in seeding development projects and in providing, through the agreement with the ABC, access for developers to a distribution channel.

Models of distributed production nodes and virtual clusters raise possibilities and issues orthogonal to traditional cluster strategies. Factors at play here are emerging models of networked organisations and networked value chains, and questions about the long term impact of terrorist attacks on patterns of organisational location and the locational choices of mobile knowledge workers[47].

Globalisation itself dissociates people networks from locational parochialism, as a basic consequence of globalisation is its multi-nodal structures, which create dispersed networks of activity and power. This has underpinned the emergence of global virtual communities and cross-border personal networks. Technology developments like grid computing may reinforce the drift to 'edge networks" and distributed activity.

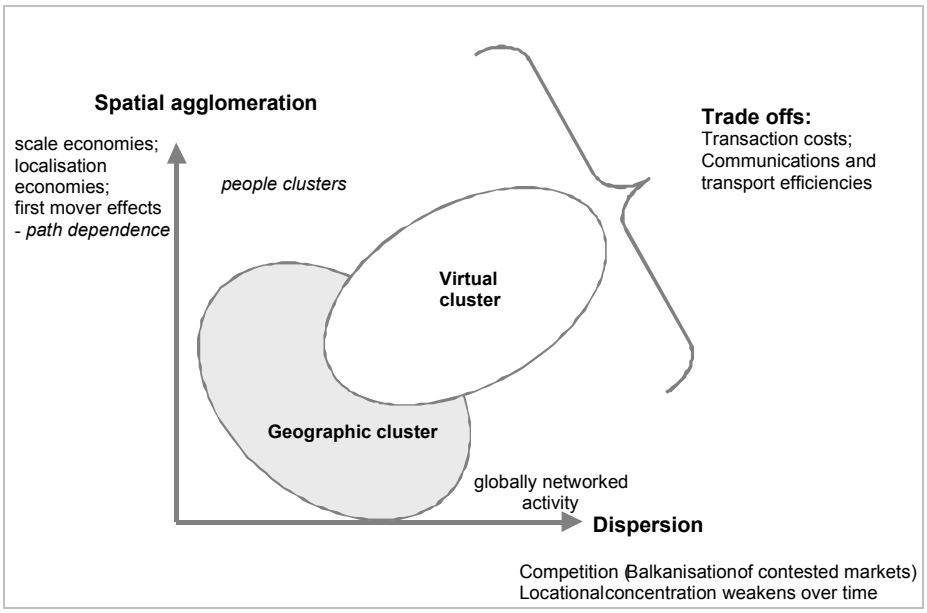
Globally distributed virtual production teams have emerged, particularly in animation. Media Works provides an example of a virtual studio. In other cases Australian based firms provide remote input to film production, as in the celebrated cases of *Babe* and *Lord of the Rings*. It is interesting to speculate how the eventual take-off of interactive television may act as a catalyst in the further evolution of networked value chains. It is already evident that digital multi-channelling is creating content scarcity, and a rise of content exchanges or swap markets (at least in the near term).

The trade-offs for digital content production activity, as for any form of e-commerce and networked industry value chain, are captured in the "hybrid" forms of evolving industry organisation combining location-specific with distributed activity and functions.

[46] Richard Florida, *The Rise of the Creative Class*, Basic Books, New York, 2002.

[47] See, for example, Joel Kotkin, "The Declustering of America", *Wall Street Journal*, 15 August 2002

EXHIBIT 8.4: PLACE VERSUS CYBERSPACE IN CLUSTERING



Changes in patterns of spatial agglomeration and urban form are slow and occur gradually, with a long overhang from existing industrial structures. Within this context predictions about long term trends are likely to be hazardous. At the same time, it is important not to assume automatically that the structures which grew up around an industrial, manufacturing economy will necessarily translate into new service based economies.

9. General conclusions and observations

During this study it became evident that the segments chosen for focus in this work were "points of entry" into the exploration of the overall field rather than natural industry segments in their own right. The segmentation of content industries is messy and not stable. Of the areas investigated in this study, the games and education areas appear the most self contained; areas like "interactive multimedia" are more diffuse. Increasingly, strong horizontal linkages are developing around technology applications and middleware development.

The dialogue with industry during this study reinforced the complex, multi-dimensional nature of digital content production relative to other industrial activity. There is an important linkage between commercial and not-for-profit activity; there are important linkages between content as an industrial output and related activities which form intermediate inputs to a wide range of economic and cultural activity. No one industry segment surveyed in this study is alike, and different issues have arisen in each of the segments examined.

A major conclusion of this study is that digital content production is not distinctive and different in its own right, but rather that the bulk of issues around the industrial organisation and structure of digital content activities are common to content and creative industries generally. This conclusion shifts our attention to the more challenging question of how the industrial organisation and market functions of overall content industries change within a digital environment and the role that digital technologies play in transforming the competitive landscape.

Three key observations about the transformational impacts of *digital* production emerged from our consultations. First, the growing importance of content management systems at the edge of traditional - and centralised - network operations. The dynamics associated with content management systems are different from those associated with traditional communications networks. Second, increasing interactivity changes the role of the end user, and the end user environment, within content development and delivery systems. Third, distribution channels and the power of intermediaries between content creator and content consumer remain the primary factor in the determination of economic returns across the industry value chain.

A number of industry leaders commented on the importance of seeing innovation around digital content as research and development for creative and content industries generally. This strikes us as an important observation, and is consistent with the thrust of recent reports from other jurisdictions.

The short term impacts from the "tech wreck" and the overall sector downtown strongly affect the current perspectives and predictions of sector participants. In each of the segments surveyed we are dealing with immature and volatile markets. Business models continue to have a brief half-life, and the life expectancy of individual firms is not predictable.

The development of institutional infrastructure appears to play an important role in industry development and competitiveness. This institutional infrastructure includes:

- universities
- collaborative research and development
- the focus and activities of cultural organisations
- industry associations and their scope of activity.

EXHIBIT 9.1: SUMMARY OF KEY FINDINGS

Level of analysis	Games	Interactive multimedia	Advertising	Education
Firm level business models	Central role of a few key firms and individuals R&D and investment in technology a key discriminator No simple funding model: ▪ contract services ▪ private equity • VC	No clear segment definition: different categories of activity include: ▪ Content/channel organisers (portals; content management services) ▪ Interactive TV and multi-channel content ▪ Web developers and support services. Different business models across and within each area.	Traditional market dominated by a small cadre of publicly listed multinational incumbents. Vulnerable to tectonic shifts: outsourcing versus insourcing by corporate client base. Insourcing via Direct Marketing creates new middleware markets. New online advertising opportunities arise from micro markets and markets difficult to address by incumbents (eg youth). New revenue models.	Firms control few of their business drivers (ie, parameters set by Government sector as market organiser). Education content hostage to wider ICT plays (eg hardware). No clear business model. Firms need to migrate to related markets for scaling.
Barriers and impediments to growth	▪ Access to equity funding and working capital ▪ Distribution bottlenecks (and access to markets) ▪ Broadband penetration (online markets) ▪ ROI on R&D spends ▪ Asymmetries in market power and information ▪ Vulnerability to market and technology shocks	▪ Access to equity funding and working capital ▪ Distribution bottlenecks (and access to markets) ▪ Broadband penetration (online markets) ▪ Asymmetries in market power and information ▪ Transaction costs around IP regimes ▪ Cultural clashes and tensions between content pull and technology push.	▪ Incumbent resistance to disruptive change and direct marketing "insourcing" - clash of business models. ▪ Asymmetries in market power and information ▪ Lack of clear or uniform metrics creates buyer resistance	• Asymmetries in market power and information - and unintended consequences of government dominance as market organiser • Crown copyright policies limit IP commercialisation • Focus on sector specific vs generic industry standards • Government purchasing policies • Scalability into related markets
IP practices	Main issue has been IP protection against piracy (this issue diminishes with online subscription model).	Complex rights management and territory licensing issues.		Dominated by issues around crown copyright. Re-use and rights management increase transaction costs and business model complexity.
Export focus	Strong: domestic market does not figure in plans.	Weak: local market oriented.	Weak: domestic market oriented.	Export focus is strong for producers who want to scale.
Industry value chain	Parallels with traditional publishing: books; film and TV Console vendors and broadband service providers dictate market structure. MNC publishers play key role as market organisers.	Intermediate producers. Strong cross-segment linkages	Volatile industry structure. Strong value net characteristics introduce disruptive elements (eg viral marketing by end users). Scope for disintermediation.	Government policy frameworks dominate. Government IP policies of paramount importance.

EXHIBIT 9.1: SUMMARY OF KEY FINDINGS CONTINUED

Level of analysis	Games	Interactive multimedia	Advertising	Education
Cluster parameters and market ecosystem.	Industry collaboration has been significant. Government funding support has been crucial (R&D; industry institutional development) Significant intra-segment people flows. Total focus on export markets facilitates local collaboration .	High level of cross sector drivers and linkages. Current focus on industry consolidation (internalisation of cluster linkages?)	People, not firm networks.	"Mothership" model - hub and spoke.
Supplier relationships	Key relationships are with platform and system vendors. Network service providers will become increasing important with growth of online games.	Hard to generalise across this area; activity specific. Immature structure of internal versus external transactions.	Diverse supply-side value nets.	Relationships with hardware vendors (packaged solutions) and network service providers.
Common technologies	Base technologies dictated by platform vendors. Differentiation around productivity tools and production values.	Growing horizontal linkages around technology platforms.	Strong cross-segment technology linkages, especially content management and distribution systems.	Strong cross-segment technology linkages, especially content management and distribution systems.
Strength of business networks	Primarily focused around vertical segment market; relatively weak cross-segment (even where there would be benefit).	Growing cross-segment cross-overs (reflecting category confusion).	Growing cross-segment cross-overs (reflecting category confusion). Undeveloped requirement for strong/deep understanding of client business process knowledge	Weak networks.
Common distribution channels	Yes - overseas distributors and platform vendors.	Strong competition for privileged channel relationships.		
Common labour pools	Yes. Industry agreements not to poach staff. Increasing labour pool from educational institutions.	Cross-segment labour pool.	Cross-segment labour pool (especially web services, and around product placement in digital content and games).	Undeveloped, niche labour market. Cultural barriers to cross-segment participation.

Career paths and people flows in the arena of digital content production resemble a roller coaster ride. It is uncertain whether current sector dynamics reflect the one-off hot house environment of a first generation industrial "melting pot" or represent a generational change in industrial organisation.

The structure of firm and market transactions appear to replicate the generic world of creative industries. If this conclusion holds true, then it increases pressure on content originators (implying decreasing market power). Within this context, a specific policy focus on digital content production is nonetheless merited because digital content production:

- represent important R&D for the content sector at large;
- focuses policy attention on some key infrastructure and policy issues (including competition policy, infrastructure development, and intellectual property policies); and
- is shaping and driving the future competitiveness of content and creative industries which are becoming increasingly significant in economic terms.

There is an important interface between traded and non-trade content production, that is, between cultural and creative industries. Digital content and applications innovation could drive major structural change in a number of established service industries (such as advertising and education).

Government plays a significant role in the evolution of digital content production, not least because government is itself a major market organiser in some key areas, including education. In this role there is a tension between government usage and industry development. This means that regardless of whether or not government adopts an explicit industry development strategy as part of its purchasing policy, its sector dominance will have direct consequences for industry structure and operations. In this regard government as a dominant service provider is no different in practice from dominant firms in other sectors (such as telecommunications), except that the government role is stronger because of concomitant regulatory roles. Government media and cultural policies also directly impact digital content business models.

EXHIBIT 9.2: SUMMARY OF BARRIERS AND IMPEDIMENTS TO FIRM GROWTH AND CLUSTER EFFECTS

Impediment	
Access to equity funding and working capital	Endemic problem in content industries. Financiers fund projects rather than companies. SME growth is stunted by need to self-finance development. Government support schemes have been pivotal in underwriting start up R&D and facilitating export marketing.
Distribution bottlenecks (and access to markets)	▪ Telstra dominance in related network distribution restricts options for independent producers (affecting especially interactive TV developers). ▪ In games market, distribution is controlled by a small number of multinational companies. ▪ For massively interactive online games, proprietary platforms could create new access bottlenecks.
Broadband penetration	▪ Limits domestic market innovation ▪ Potential to disadvantage Australian firms in international competitiveness (because of constraints to networked distribution).

Return on investment in R&D	Lack of strong horizontal and related market linkages has limited commercialisation and optimal exploitation of technology IP arising from R&D and firm operations.
Lagging statistical indicators	Masks economic potential and implications of emerging industries and trends, affecting both inter-firm negotiations and government policy settings. A good example is the growth of interactive games. In the case of online advertising, lack of industry wide metrics creates advertising buyer resistance in uninformed areas of the market.
Significant information asymmetries	Affects a firm's negotiation power and business planning. Emerging firms have limited ability to track potential technology or market shocks (eg online games vs shrink wrapped CD ROMS).
Culture clashes, limiting linkages across related markets	▪ Between content developers and IT firms ▪ Between traditional incumbents and emerging digital developers (as in advertising and television)
First mover casualties	▪ Short term reactions to dot.com bubble ▪ Required developments in upstream or downstream markets out of synchronisation with firm business plans.
IP regimes	▪ Growing complexity in cross-territory licensing ▪ Increasing transaction costs in rights management ▪ Expansion of copyright coverage and controls (affecting third party access to content development components).
Crown copyright	▪ Limits ability of firm to commercialise contract IP and scale operations. Entrenches "fee for service" business models.
Branding into global markets	• Requires inter-firm or sectoral initiatives. Affects both market access, and investment attraction.
Increasing cost of emerging technical inputs	• Cost of core technology infrastructure for firms will increase over time, creating threshold barriers for new entrants.

Concluding observations

A number of general themes emerge from this study. The following points summarise these headline observations.

- **Thinking beyond technology.**

  There has been a tendency to define digital content too much in technology terms. As the industry evolves, the technology looks set to become more transparent and commoditised. The best starting point for understanding digital content production is to start from the basic economic properties and market characteristics of any content manufacturing activity.

- **Category confusion is rife.**

  Category confusion is rife in the content industry: both between industry segments and in the convergence or blurring of boundaries around related industries and markets. Different digital content segments demonstrate different dynamics.

- **Creative upstarts raise the bar for industry competitiveness**

  Digital content production is becoming a major driver of innovation across content industries and potentially in other industry sectors like education, entertainment and advertising more generally.

- **To the brink and back: Survival of the adaptable**

  Digital content producers have been on a roller coaster ride in the aftermath of the dot.com collapse. As in other areas, the correction has turned attention back to business fundamentals. Regardless of short term volatility, however, the industry segments surveyed and the industry leaders interviewed all demonstrated high levels of adaptability and learning over extended time periods.

- **Sustaining creativity**

  The leading edge activities within digital content industries function as the research and development for the content industries at large. The interface of creative industries with the cultural and not-for-profit sectors appears to be an important factor in creating economic multipliers.

- **Creative tribes and the culture of teams**

  Digital content industries exemplify what text books and management consultants are saying about knowledge workers and the knowledge economy.

- **Creative communities**

  Digital content production appears to thrive where there are strong informal people networks and where not-for-profit organisations provide inclusive and stimulating meeting places.