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An Innovation Agenda for the Creative Industries: Where is the R&D?

Stuart Cunningham, Terry Cutler, Greg Hearn,

Mark Ryan, Michael Keane

Professor Stuart Cunningham is Director, Creative Industries Research and Applications Centre, Queensland University of Technology.

Dr Terry Cutler is Principal of Cutler and Company, a high-level communications consultancy.

Professor Greg Hearn is Research and Development Coordinator;

Mark Ryan is a doctoral candidate; and

Dr Michael Keane is an ARC Postdoctoral Fellow in the Creative Industries Research and Applications Centre.

Abstract

What would an innovation systems approach to the creative and especially the digital content industries look like? This is important for two reasons: such an approach may open up dynamic and central policy territory which has been the preserve of science, engineering and technology (SET) worldwide; and it asks new questions, outside the domain of cultural support, which may precipitate a more holistic approach to the creative industries. This article draws on aspects of a report produced as part of the Australian Government's Creative Industries Cluster Study which outlined key elements of such a system. It focuses on the issues raised in looking at the role of key public institutions such as research agencies, educational and training bodies, including universities, government support agencies and others. We argue that these elements need to be greatly strengthened as well as challenged in terms of their orientation and their capacity to contribute to the innovation system.

The Australian Government's Creative Industries Cluster Study (http://www.cultureandrecreation.gov.au/cics/) conducted through the Department of Communications, IT and the Arts (DCITA) and the then-National Office for the Information Economy (NOIE), has resulted in the announcement in 2004 of a Digital Content Industry Action Plan (Williams and MacFarlane 2004). This is turn may result in innovative investments by government in the small but growing digital content industry sectors in Australia.

One of the studies that forms part of the Creative Industries Cluster Study brought together QUT's CIRAC and leading technology and communications consultant Terry Cutler to examine what an 'innovation system' for the creative industries producing digital content and applications might look like.

In what is arguably a key output of the Cluster Study, this report - *Research and Innovation Systems in the Production of Digital Content and Applications* (QUT CIRAC and Cutler & Co 2003) – provided in outline form a conceptual frame that

may begin to see the creative industries being seen in the context of the broad innovation agenda. This is important for two reasons: it opens up dynamic and central policy territory which has been the preserve of science, engineering and technology (SET) worldwide; and it asks new questions, outside the domain of cultural support, which may precipitate a more holistic approach to the creative industries. As John Howkins puts it:

> The conventional thinking about innovation doesn't capture what actually happens in the creative industries….The problem is two-way. People who talk about innovation tend to ignore what happens in the creative industries; and the creative industries tend to downplay the benefits of innovation (Howkins 2002)

Research and Innovation Systems in the Production of Digital Content and Applications explores the fundamentals of an innovation system, canvases issues for optimising the innovation system, and looks at possible intervention strategies. The report gives some sense of the *components* of a creative industry innovation system. There are many *elements* of such an innovation system in place. There is a very large education and training sector providing skilled graduates and trainees into the sector. There are large market organisers and industry players, both in the public sector (broadcasters, funding agencies, and cultural institutions such as museums and galleries) and in the private sector (commercial broadcasters, publishing houses, telecommunications firms, and advertising). There is strong and growing demand, both in retail consumer demand and in the role of digital content as an enabler across a growing range of industries, particularly in the services sector.

However, the *quality of linkages* and the *lack of clear public policy signals and frameworks*, together with a number of other critical issues mark the innovation system as embryonic at best. Public policy needs to address the significant framework shifts required to capture the innovation potential of digital content industries by moving, for example, from a situation of unrelated cultural policy and higher education policy to a more fluid, dynamic but more challenging mix of more coordinated program initiatives. In particular, the scale of investment in innovation in and through digital content appears significantly underweight relative to the funding of other industries. Given the growing economic importance of the creative industries, increased investment in innovation through digital content initiatives is key to capturing future national benefits.

There are several possible strategies for improving the innovation system for creative industries. There is clearly a need to develop an industry action agenda to establish a framework for alignment of existing policy regimes with digital content industries and an emerging agenda. A primary focus of the innovation agenda is better to align cultural policies with industry development and R&D policies. Nationally-funded centres of research designed to promote university and industry linkages need to encompass *tripartite* interfaces between cultural institutions, universities and creative industries. This initiative would create incentives for, and legitimize the role of, cultural institutions in research collaborations. Such an R&D initiative might invite participating industry sectors to pay levies to fund innovation, which would then trigger government funding. The industry levy could be limited to creative industry firms with turnover above a floor level, to exempt emerging SMEs. The levy might apply to broadcasters, publishers and distributors. Levy contributions could offset, or replace some or all of existing broadcasting licence and other imposts. The scheme

could be extended in the event of any major changes to cross-media or ownership rules, offsetting any windback of existing local production requirements which might become obsolescent. An essential element of such a centre (or R&D corporation) would be a national information and resource brokerage centre for the sector addressing the serious and endemic information asymmetries and structural weakness in the innovation system.

A suite of reforms to research and higher education policies to accommodate digital content and the creative industries is necessary; as are educational and PR campaigns targeting school-age young people with the message that knowledge entrepreneurship - a 'creative career' – is a viable and attractive option. Supporting and promoting an export orientation is important as the only way the sector can scale to realize sustainable growth. Equally important, only evidence of sustainability and scalability will make the sector investable over the long term, breaking the vicious cycle of underinvestment.

Broadcasting and broadband's role in the innovation system is crucial, as the gateway between established and emergent *content creation* (major popular entertainment and informational formats transmigration to interactivity and mass customization) and *industry structure* (highly centralized distributional models to more networked and distributed models). Understanding the interaction between the potent legacy of broadcasting and the potential of convergent broadband media is the key to positioning innovative opportunities in content creation if they are to remain close to the mainstream of popular cultural consumption rather than being siphoned off into science or art alone.

Major technology-related reforms such as national investment in content and metadata standards and supporting systems (thus limiting the huge transaction costs for both producers and users created by the current "bottom up" approach to standards) and tax credits for R&D investment in technology infrastructure in emerging content areas, are crucial pieces in the innovation jigsaw.

Open content repositories, or public domain digital content, are the content industries equivalent of open source software. They *selectively* addresses barriers to production and unintended cultural outcomes of prevailing copyright and IP regimes through an alternative *opt in* model which can operate in parallel with existing regimes. As such it can be a powerful structural mechanism to support a rich "digital sand pit" for creative content producers. The measure facilitates the active re-purposing and re-use of digital content assets. Misuse of this public domain material would be protected under the provisions of a General Non-Exclusive Public Licence scheme.

WHERE IS THE R&D?

In this article there is only room for one case study arising from the report: the issues raised in looking at the role of key public institutions such as research agencies, educational and training bodies, including universities, government support agencies and others. It is the argument of the report that these elements need to be greatly

strengthened as well as challenged in terms of their capacity and orientation to contribute to the innovation system.

Universities and R&D

The creative industries appear to be marginal within university-based research. University research strategies do not embrace content readily (in contrast to their emphasis on ICT and biotech). The many different research fields involved with creative industries do not relate to each other well and the potential linkages are seldom articulated into an R&D strategy involving the linkages between ICT, creative content, and educational and services industry content. University research assessment systems rarely specifically reward industry collaboration or inter-disciplinary and multi-institutional activity.

Digital content and applications appear underweight in national competitive research funding under the Australian Research Council's (ARC's) industry 'Linkage' programme, receiving funding of only 5% of projects funded under the Humanities and Creative Arts category (9 out of 172 projects) for the period 1998 to 2003. (This finding is based on estimates derived from data supplied by the ARC to the ARC Learned Academies Special Projects grant 'Partnerships in the Humanities', based at the University of Western Sydney. For a general orientation to Humanities and Creative Arts ARC Linkage outcomes, see the report by Ang and Cassity 2004).

The National Research Priorities announced in December 2002 included 'Frontier technologies for building and transforming Australian industries'. In this priority area there are key statements such as 'research is needed to exploit the huge potential of the digital media industry', and a number of examples of content applications such as e-commerce, multimedia, content generation and imaging are mentioned for priority research and development. This has been strengthened by the more recent inclusion of a related priority goal of 'maximising Australia's creative and technological capability by understanding the factors conducive to innovation and its acceptance'. We must wait and trust that these new priority areas will be 'cashed in', as the research culture and administration frameworks continue to marginalize research into content and related interdisciplinary research.

R&D in content involves a shift in research focus from the supply to the demand side environment, consistent with the feedback systems characterizing an effective innovation system. Within a consumption-driven, innovation-led new economy, R&D into the contexts, meanings and effects of *cultural consumption* could be as important as *creative production*. Major international content growth areas, such as online education, interactive television, multi-platform entertainment, computer games, web design for business-to-consumer applications, or virtual tourism and heritage, need *research* that seeks to understand how complex systems involving entertainment, information, education, technological literacy, integrated marketing, lifestyle and aspirational psychographics and cultural capital interrelate. They also need *development* through trialing and prototyping supported by test beds and infrastructure provision in R&D-style laboratories. They need these in the context of ever shortening innovation cycles and greater competition in rapidly expanding global markets. The centrality of consumption is one of the realities of the new economy that brings the research traditions of cultural and communication studies into

mainstream and sharp relief. An innovation agenda would seek to facilitate hallmark work such as *Accounting for tastes: Australian everyday cultures* (Bennett, Emmison, and Frow, 1999), and depth industry intelligence such as Saatchi & Saatchi's report to the Australia Council *Australians and the arts: what do the arts mean to Australians* (Australia Council 2000) being regularly updated.

The creative industries are supported by a mix of fields of study based in the ARC discipline cluster of Humanities and Creative Arts, but crossing over to the Information Sciences discipline cluster as well as into the business disciplines in the Social Sciences. Many of these are typically young academic disciplines with marginal to negligible profile within the wider research community. The ARC could more actively support the creative arts disciplinary array at the intersection of the information sciences and the creative arts through new incentives for cross-disciplinary activity and strategic investment in emerging industry innovation.

A clear example of how current models penalize digital content and creative industry outputs in university research is the Higher Education Research Data Collection (HERDC) process administered by the Department of Education, Science and Training (DEST) which measures – and rewards – research outputs. Research output data is collected in only four 'proxy' categories out of a possible 34 recognized research output categories. These four are authored research monographs, book chapters, refereed journal articles, and refereed conference proceedings. Designs, patents, major creative works and contributions to professional communication are not included and are thus subject to informal discounting as academic behaviour 'follows the framework' of recognition. An innovation system more supportive of the creative industries would seek to weight these discounted outputs differently.

Universities and postgraduate research

Current higher education research policy, administered by DEST, discriminates against digital content in terms of the Research Training Scheme (RTS) which awards funding for research and funded places for research training based on the dollar value for grants won (rather than, for instance, valuing them on the basis of numbers of grants won or weighting them to take account of the much higher dollar amounts required to conduct research in traditional science and technology areas) and thus creates significant differences between high cost and low cost higher degrees in terms of the dollar value for their completion to the university from which the student graduates. This formula produces a regressive outcome whereby it is impossible for digital content and the wider humanities, creative arts and social sciences disciplines to advance their funding base no matter how hard they try and indeed succeed in their own terms. Universities may be constrained to focus RTS places into areas which perform well in terms of the DEST formula, none of which are digital content areas. Unfortunately, this is not necessarily into areas that will, in turn, drive innovation.

The Cooperative Multimedia Centre (CMC) scheme from the mid 1990s was one initiative aimed specifically at a development and training focus on digital content. Six centres were funded at $1.375m per annum over the period 1996-1998, and this funding was extended in 1998 to 2002. This scheme notably failed to achieve sustainable linkages between higher education sector and industry. Instead of

paralleling Cooperative Research Centre (CRC) processes which enjoy significant public funding triggered by industry involvement, the scheme became in effect a State Government oriented industry development programme. Only a few CMCs remain standing, mostly having transformed themselves into vocational education and training service providers.

The ARC, through its Networks, Centres and Projects programs, could seek to address key lacunae in the innovation system for DCA by connecting early career researchers with industry skill sets to the research and development system through cross-disciplinary initiatives and encouraging research mentorship whereby a major advance in the R&D credibility and competence of next generation emerging talent in the digital content supporting disciplines is achieved.

The fit between education and training and contemporary careers

Placement and role of creative industry graduates in "out of field" jobs tends not to be captured by higher education employment surveys, thus discounting the market value attributable to career paths outside the sectors which creatives are traditionally employed in. There appears to be real data gaps about the career and vocational choices increasingly available to creative workers and talent in the broader service industries as creative solutions are now increasingly sought in domains such as government and financial services, education, tourism and health. Some jurisdictions, notably the UK, have implemented national initiatives to promote the wide and innovative career options arising from a background in the creative industries (for example, the National Advisory Committee on Creative and Cultural Education's report, *All Our Futures*, published in 1999, and the UK Goverment's statement of progress made following the original recommendations of the NACCCE Report, in January 2000, at www.dfes.gov.uk/naccce/). Of course, much excellent research is done to track the career prospects and actualities of creatives (eg., www.ifacca.org/files/040527ResearchingArtists.pdf for a good international literature survey). However, it tends to focus on employment in the creative sectors as such. There is evidence that there are at least as many (and, given the problematic status of much of the data, probably many more) 'creatively skilled' people outside the actual sectors recognized as creative industries as inside them.

Preliminary analysis of national industry input:output tables suggests that there is increasing use of digital content and applications as intermediate inputs by traditional content and creative industries and especially by the wider service sector industries. Lags in statistical publications limit dynamic trend analysis. For example, the latest published input:output tables are for 1996/97, with the following year's data not due for release until Quarter 1, 2004. Against this several- year lag in the relevant data, it is hypothesised that the emerging trends identified will have strengthened significantly in the subsequent period of major development for the creative industries.

Intermediate industry use of creative industry outputs outweighs final consumption in each broad segment of the creative industries – as captured by ANZSIC statistical codes – except in the case of the more traditional arts and cultural institutions.

Figure 1: Use of sector outputs (1996/7)

ANZSIC code	Supplying industry sector	Total industry use as % of total supply	Total final consumption as % of total supply
2401	Printing; services to printing	89	11
2402	Publishing; recorded media	65	35
9101	Motion picture; radio etc.	65	35
9201	Libraries; museums; arts	27	73

Source: ABS Input Output Tables, 1996/7 (ABS 2003)

The following table highlights the main industry sector reliant on creative industry outputs. The Australian data is consistent with findings in other jurisdictions (eg., Singapore Ministry of Trade and Industry 2003).

Figure 2: Utilisation of Creative Products by Major Industry Users

User Industry	1996/7
(I-O Sector)	%
Wholesale trade	2.4
Retail trade	6.7
Hotels & restaurants	1.8
Communications	6.6
Other Property	2.6
Scientific Research	2.5
Legal & Accounting	5.6
Other business services	6.2
Government	2.5
Education	10.7
Sport; gambling	3.3

Source: ABS Input Output Tables, 1996/7 (ABS 2003)

In addition, the *intra*-sectoral patterns of intermediate use within the creative industries themselves reinforces observations about the importance of cluster development for the creative industries and digital content. The emerging statistical evidence of growing intermediate use, supported by qualitative evidence, should put an increased spotlight on the relatively high economic multipliers associated with digital content and creative industries. This observation highlights the growing importance of digital content within the wider context of national innovation systems.

Co-operative Research Centres

The CRC program has been running for over a decade and more than 70 CRCs have been awarded. Despite this program being a lynchpin of R&D linkages

between university and industry sectors, it has programmatically excluded from its purview the DCA and related sectors, permitting only science, engineering and technology disciplines and related industry sectors to apply. While a few CRCs (Smart Internet, Sustainable Tourism) have contained slivers of the social sciences, and Interaction Design was funded in the last round, it remains the case that CRC support for digital content and applications is extremely limited. In addition, the focus of CRCs does not appear conducive to the three way linkage between universities, industry and cultural institutions that appears highly desirable in the field of digital content and the creative industries.

Government support agencies

There are numerous well known government agencies with specific industry support and funding charters involving digital content at national, state and local levels. Apart from the agencies with specific charters relating to creative industries, a range of other government programmes may be relevant to support of the sector. These include:

- Co-operative Multimedia Centres Programme, 1996-2002, now no longer funded;
- Sustainable Regions programme (2001), from which the pilot programme funded small grants to two projects in Far North East NSW;
- Austrade, through the Export Market Development Grants scheme, support for Games exporters at E3 (Electronic Entertainment Exposition, held annually in Los Angeles), high tech tours, Australian supplier databases;
- Foreign Affairs and Trade, through bilateral cultural exchanges;
- AusIndustry, through the IR&D Board, the COMET programme, the Pooled Development Fund programme, the IIF venture capital initiative; the Australian Technology Showcase
- The Enhanced Printing Industry Competitiveness Scheme (EPICS) of $48m over four years as part of the GST offset Book Industry Assistance Plan; and
- a range of state government industry development schemes.

As a general observation, available data appears to support the finding that digital content is systematically under-represented in generic industry support schemes – that is, industry support not specifically targeted at a particular sector.

Figure 3: Registrants for R&D Tax Concession

ANZSIC sector	1998-99		1999- 00		2000 - 01	
	No of registrants	%of total	No of registrants	%of total	No of registrants	%of total
Printing, Publishing & Recorded media	35	0.2	38	0.3	31	0.3
Cultural sporting etc	42	0.5	36	0.7	30	0.6

Source: AusIndustry, IR&D Board *Annual Reports*; Note: Reporting by industry code is in aggregated categories. Separate and specific tax concessions apply in the film industry.

Another telling example is the following figure which gives a sense of the content industry's participation in the major export facilitation scheme, Austrade's Export Market Development Grants.

Figure 4: Digital content share of Austrade's export grants scheme

EMDG scheme	2000/1	2001/2	2002/3
Total Funding (Sm)	150	150	150
Total number of companies receiving a grant	3214	3018	3795
No of DCA companies	143	136	151
as % of total	4.5	4.5	4
Total DCA funding (Sm)	7.1	8.3	6.7
as % of total funding	4.7	5.5	4.5

Source: Austrade; QUT and Cutler & Company analysis.

While the industry's share of export support funding is roughly commensurate with its share of GDP, the base is soberingly low for a sector characterized by high growth and increasing trade deficits in intellectual property. In addition, the bulk of sector applications come from one segment, the export oriented games industry. If the contribution of games companies is discounted, it is clear that most digital content activity pursued in conjunction with Austrade is incremental to domestic market turnover.

Government support funding

There is evidence of a variety of support for digital content over the past decade by government agencies administering funding programs. However, it should be noted that, apart from specific programs (such as the Cooperative Multimedia Centres, the

Australian Multimedia Enterprise, and the Learning Federation) which have delivered one-off surges of funding into the sector, the base level funding remains extremely low when compared to the funding allocated to telecommunications infrastructure, digital television conversion, and biotechnology.

Government procurement

A fundamental issue for innovation systems is that of Government and agency approaches to the administration of IP and Crown Copyright. Unlike the UK and Australia, the US Copyright Act explicitly excludes coverage of works produced by government. In the UK there were detailed reviews of Crown Copyright in 1998, resulting in a White Paper (*The future management of Crown copyright*, HMSO, March 1999) which sets out a new policy to open up access to government content and to streamline administrative processes for access. A good Australian example of how treating government content as a public domain resource supports digital content development is in the area of legal resources. Following the shaky beginnings of the CLIRS legal database in the early 1980s, subsequent relaxation of access and re-use rules applying to statures and case law across Australian jurisdiction has lead to the very successful AUSTLII online service. In other areas, digital content producers continue to complain that policies on Crown Copyright within government procurement practices creates barriers to the commercialisation of sector innovation.

Human capital and skills

Richard Florida's (2002) work on creative workers has recently highlighted the wider economic significance of creative capital, especially in under-pinning high technology industry development. An overall creativity index comparing Australia and the United States on the parameters of population diversity, high-tech output, innovation and human capital was prepared by National Economics (2002), with the following results***:***

Figure 5: Creativity Index: Top Ten Regions – US and Australia

Region – Australia	**Score**	**Region - USA**	**Score**
Global Sydney	***992***	San Francisco	1057
Melbourne Inner	***985***	Austin	1028
ACT	831	San Diego	1015
Perth Central	744	Boston	1015
Adelaide central	735	Seattle	1008
Sydney inner West	733	Raleigh-Durham	996
Brisbane City	720	Houston	980
Melbourne South	606	Washington-Baltimore	964
Sydney Outer North	535	New York	962
Melbourne East	519	Dallas	960

Thus, ranked against US cities, the high-tech inner 'cores' of Sydney and Melbourne would have come in at 7th and 8th places.

As a percentage of the population, Australia's 'super creatives' are out ranked by the US by about 2 percentage points, but the reverse holds for the second tier creative professionals in business services, health and education. Australia also out-performs the US on the "Bohemian" Index of arts workers as a proportion of population, and also on the Diversity Index. Where we lag significantly in this comparative study is in Innovation (patents per capita), human capital talent (% of population with a higher degree) and high technology production.

Whilst the Australian survey confirms and replicates Florida's US findings about the correlation between concentrations of creative populations and the location of high tech industries, it is also apparent that Australia is not successfully leveraging its creative capital into economic outcomes as successfully as the US. This suggests there are significant points of failure in Australia's national innovation system.

This then carries a wealth of implications for education and training. Most of the people working in the sector are highly skilled with a high proportion of youthful energy. It has been observed at an industry level that university graduates often lack industry readiness, indicating a lack of career preparation pathways. A widespread industry view is that universities cannot structure research and teaching around a multi-disciplinary focus, limiting the competencies of graduates.

The skills requirement in this sector is not straightforward. The skills typically needed in digital content sectors include creativity, a risk taking and innovative mindset, integrative problem solving abilities, high levels of technical knowledge and applications ability, and entrepreneurial business acumen. The split between higher and further education, between mass undergraduate, boutique coursework postgraduate, and R&D postgraduate, and the deep silos representing the discipline clusters from which these skill sets might be nurtured (ICT, creative arts, and social science disciplines) makes planning for skill development for the digital content sector a particularly difficult feat. This inherent challenge is compounded by the embryonic nature of some of the sector, and its inherently volatile nature.

Despite a somewhat negative public image of entrepreneurial activity in mainstream business culture, the 'creative entrepreneur' is a different class of actor than the corporate buccaneer. As Leadbeater and Oakley (2001) point out in their study of knowledge entrepreneurship in Britain, the knowledge entrepreneur acts collectively and is data - and evidence - driven in order to sense new opportunities in extremely volatile emerging fields based on new knowledge.

Lack of critical linkages between the education and training sector and the digital content industry sector needs means that skills development is not yet fully coordinated for maximum value. There is but patchy support for a suite of suitable and widely accepted credentials in the industry analogous to the situation with nursing prior to the development of a nationally accepted and coordinated credentialing system.

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