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Abstract: This report examines the methodologies and metrics of previous cultural and creative industry

mapping studies and discusses the methodologies developed by CCI in its attempt at a robust approach for measuring the employment based impact of cultural and creative based activities across the economy. This approach includes both the specialist creative firms and employment in *Creative Occupations* in firms in other industries. Use is made of population databases of Australian firms and occupations categorised to the most detailed levels of the newer standard statistical classifications. This enables a more specific separation of the *Creative Industries* and occupations and captures more of these activities across the economy. Application of the methodology reveals significantly larger impacts on the economy from creative activities than would be obtained using other methodologies. The research also highlights the critical need for high detailed industry and occupation classification schemes and access to population and

business data at these fine resolutions.

Reports in this Series: This report is focussed on the development and application of the CCI experimental

methodologies and is best understood when read in-conjunction with the project's other research reports that are available from the project web-site <a href="https://wiki.cci.edu.au/display/">https://wiki.cci.edu.au/display/</a>

NMP/NMP+Publications>:

"Australia's Creative Economy: Basic Evidence on Size, Growth, Income and Employment"

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"Australia's Creative Economy: Definitions of the Segments and Sectors"

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"The Creative Industries: Topography and Dynamics"

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### 1. Summary

The Creative Industries National Mapping Project undertaken at the ARC Centre of Excellence for Creative Industries & Innovation (CCI), examined the methodologies and metrics of previous cultural and creative industry mapping studies andbuilt a more robust approach for measuring Creative businesses and employment in Creative activities. The CCI methodology is more complex and multi-dimensional. This is necessary to more closely mirror the complex ecology of creative businesses and people - an ecology with a value web of relationships and flows, consisting of many intersecting value chains. Better specification of the relevant Value chains provides a clearer composite picture of the Value web and more accurate measures of employment in the Creative Workforce and financial aspects of the Creative Economy.

Our methodology uses data at the finest level of classification available in very large datasets of business surveys and employment. CCI developed a classification framework to enable a more precise selection of relevant data in occupation, industry, qualification and product classifications from the data bases and to construct a more complete measure of Creative activities across the economy. This methodology reduces the impact of the lack of richness within the business, industry and occupational data-sets and in the official national data classification systems.

CCI's Project developed the Creative Trident approach for measuring the Creative Workforce - the combined total employment in Creative Occupations within the Creative Industries, the Creative Occupations within other industries and the Support Occupations in the Creative Industries. This enables capture of more of these activities across the economy and reflects the extensive production, adaptation and use of Creative products and services in final non-Creative production. Application of the methodology reveals significantly larger impacts on the economy from Creative activities than would be obtained using other methodologies.

In addition, we also study the characteristics of the Creative Businesses operating within the Creative Industries using data from the Australian Business Register. We have suggested six broad Creative industry groupings or segments within the Creative Economy and a number of finer subdivisions or Sectors.

This paper discusses the development of the CCI methodology and toolkits and demonstrates the effectiveness of applying this new ruler to the Creative Economy.

### 2. Introduction

This article initially discusses the body of creative industry mapping studies starting from the 1998 Creative Industries Mapping Study<sup>1</sup> by the UK Department of Culture, Media and Sport (DCMS). The emphasis is on the development of an analytical methodology for measuring Creative activities and some key issues that arose in this process. These lessons were applied in the development of the CCI methodology.

The DCMS study was the genesis of several academic and government-commissioned studies at the national, regional and even city level. However, these and subsequent analyses have generally struggled with one or both of the Scylla of the definition of the "Creative Industries" and the Charybdis of measuring the economic impact of the creative activity using the statistical data available.

The first wave of studies to map the *Creative Industries* focused primarily on business activities within selected classifications defined as comprising the "*Creative Industries*". Relevant data was extracted from a variety of surveys of businesses within these industries, supplemented with some industry-specific employment data where it was available.

A second wave of Creative Industries Mapping Studies, exemplified by the Hong Kong Creative Industries Baseline Study<sup>2</sup>, used a modified approach. Acknowledging nationally distinct cultural, social, technological and economic characteristics, the analysis in the Hong Kong study addressed slightly different groups of industries and focused more strongly on the *Creative Occupations* within the *Creative Industries*, their relationships to other parts of the economy and the value adding stages within the creative production chain.

In both the first and second waves, researchers were constrained by the paucity of good data and the statistical frameworks that did not always permit specific extraction of information relating only to the various Creative activities across the economy.

Commencing as it did in 2005, the Creative Industries National Mapping Project (CINMP) at CCI was able to build on the experiences of the earlier methodologies and metrics. The overarching vision of the project was to establish the resources and protocols necessary to support an evidence based policy approach with respect to Creative activities. This article presents the methodology developed by CINMP, using Australian data, that overcomes many of the measurement issues and presents some high level findings of our analysis. A companion paper discusses our approach to the definition of the *Creative Industries*.

Our analytical strategy has provided some meaningful insights:

- Previous studies have significantly underestimated the impact of creative activities as they have not
  taken account of *Creative Occupations* across the economy. In the case of Australia, inclusion of the
  creative activities in businesses outside the specialist *Creative Industries* enhances estimations of creative activities by up to 35%.
- The size and impact of the specialist *Creative Industries* cannot be accurately measured simply by summation of the activities within the industry codes which are at best approximate, rather than specific, to the sectors of the *Creative Industries*.
- The newer Australian industry and occupation statistical classification systems (ANZSIC06 and ANZSICO respectively) allow a more precise extraction of data relevant to creative activities. Use of the older classification systems can substantially reduce estimations of creative activities, possibly by up to 25%, if conservative criteria are used to select the appropriate industry or occupation classifications.

Department of Culture, Media and Sport, Creative Industries Mapping Document 1998, Department of Culture, Media and Sport, London, <a href="http://www.culture.gov.uk/global/publications/archive\_1998/Creative\_Industries\_Mapping\_Document\_1998.htm">http://www.culture.gov.uk/global/publications/archive\_1998/Creative\_Industries\_Mapping\_Document\_1998.htm</a>

Desmond Hui, Baseline Study of Hong Kong's Creative Industries, 2003, HKSAR Government Central Policy Unit, Hong Kong, <a href="http://www.info.gov.hk/cpu/english/papers/baselinestudy(eng).pdf">http://www.info.gov.hk/cpu/english/papers/baselinestudy(eng).pdf</a>

### The Objectives of Mapping Studies

### 3. The Objectives of Mapping Studies

Mapping studies need to be of value particularly to policy makers within government, but also to academic researchers and relevant industry bodies. They are used as a focal point for the analysis of economic trends and impacts, the identification of problems and opportunities for policy development.

The UK mapping study for example was an attempt to establish a policy "brand" pertaining to the many creative related and cultural industries in which the UK excelled. It appears that this was partly in response to the high exposure the "brands" for the BioTech and ICT related industries have achieved with policy makers and investors. It was also partly an attempt to put a "new economy" context to the cultural and some related industries and to identify their importance to the wider economy.

The development of a robust measurement methodology is critical to achieving the primary function of mapping studies. Four areas of metrics are consistently used by government-sponsored *Creative Industries* mapping studies to express their relative size or contribution to the economy:

- Employment: primarily the full time employment within specific industry classifications;
- Firm activity: primarily the number of firms and industry income;
- Gross value added to the economy;
- Trade, particularly the value of exports.

### 3.1 Metrics Issues

The study of the creative activities in national economies is relatively new and measurement of these industries has many similar problems faced in relation to ICT. Indeed, some of these problems are still unresolved in the ICT context particularly given increasing integration of ICT in all aspects of the economy and the new business models and even industries emerging.

Key metrics issues for creative activities are:

- A first order requirement for standardised definitions and specific classification based data for the relevant industries, products and occupations;
- This framework will need to meet the challenges of an environment of rapidly changing business models and technology development. New hybrid occupations and industry sectors will emerge that do not comfortably fit into standardised classification structures used by statistics organizations. The decade long gap between the updates of national classification schemes means that, in particular, there will be almost no comprehensive, standardised employment or industry data available during the critical emergence period. As technologies and markets evolve there can also be considerable fluidity of activities between specialist industries and specialists employed within other industries;
- In an era of increasing digitisation and the Internet, measuring the value of relevant services as intermediate inputs and as exports is particularly difficult;

However these challenges pale into insignificance in comparison the issue of trying to measure the strategic impact of the *Creative Industries and Creative Workforce* to other sectors of the economy. This is similar to the task<sup>3</sup> the ICT analysts struggled with during the 1980 and 1990s.

In 1987 in The Solow productivity paradox: what do computers do to productivity? Robert Solow said "we see computers everywhere except in the productivity statistics" http://www.csls.ca/journals/sisspp/v32n2\_04.pdf

The First Wave: The DCMS Template

### 4. The First Wave: The DCMS Template

Starting with the 1998 UK Creative Industries Mapping Document, the first wave of mapping studies comprised:

- 2001 UK Creative Industries Mapping Document 2001
- 2002 Creative Industries in New Zealand: Economic contribution
- 2003 Australia Creative Industry Cluster Study Series
- 2003 Economic Contribution of Singapore's Creative Industries
- 2003 Queensland Creative Industries Strategy (QCIS)

The thirteen sectors selected by the UK DCMS (Advertising, Architecture, Art & Antiques Market, Crafts, Design, Designer Fashion, Film & Video, Interactive Leisure Software, Music, Performing Arts, Publishing, Software & Computer Services and Television & Radio) were analysed independently.

The measurements included data on:

- the level of employment generated;
- the characteristics of the firms in the industry (including their number, their size, turnover and margins);
   and
- the outputs including the value of exports and estimates of Gross Value Added.

Some of the sector reports also discussed the nature of the sectoral value chains, the level of competition and concentration within the industry and the industry's competitiveness with overseas industries. A *pro forma* for analysing the *Creative Industries* was formalised in subsequent UK Creative Industries Mapping Documents (see the 2001 Document in particular) and this structure was generally applied in the other studies above.

### 4.1 The First Wave limitations

The UK mapping studies were significant in establishing the first comprehensive benchmarks for the *Creative Industries* but there were a number of weaknesses that the CINMP identified and sought to avoid in its own methodology. The three areas of weakness identified were:

- Limitations in the definitions of the *Creative Industries* sectors that resulted in overreach, overlaps and gaps;
- Data source limitations that led to inconsistencies in measures, frequency and time periods;
- Granularity limitations from relying on highly aggregated source data.

### **Definition limitations**

First wave mapping studies have naturally been focused on the industry activities and therefore gathered data about the specialist firms operating within each specific segment. However Pratt (1999, 2004) and others have noted that many industrial classifications schemes are poorly suited to *Creative Industries* especially in the Design and Interactive Media segments. The lack of alignment meant, for example, that some industry data was not disaggregated sufficiently to enable specific measurement of Creative activities. Where the relevant Creative activities data was subsumed in other industries, estimates were made based on a proportion of that larger industry - for example the value of the Fashion Design sector in the UK was estimated as 2.5% of the apparel related industries. Such factors are subject to adjustment in the light of better knowledge and result in the need for revisions of the earlier industry estimates.

Measuring the activities within the *Creative Industries* requires a framework that can enable a focus on the primary or core activities of each sector on a consistent basis. However the original DCMS sector definitions appear to have been developed, on one hand, to meet pragmatic "political" criteria in line with DCMS portfolio

The First Wave: The DCMS Template

responsibilities rather than a rigorous framework to support analysis and on the other hand to make the best of national dataset with levels of classifications ill-suited to the nuances of the Creative Industries.

### **Data source limitations**

A primary difficulty for the first DCMS study was the lack of relevant data. The reports relied on a range of available data collated from government statistical agencies and from reports or surveys conducted by various industry bodies. As a consequence, there was a variable range of data on economic activities available and there were significant data gaps for some of the industry sectors. For example the 2001 UK census used a relatively old industry classification scheme when coding Census responses and as a result the DCMS analysts had a very limited group of industry classification they could use "as is". The other sources of data also had problems as there was limited information about the very important SME grouping and micro-firms and the economic activities of the many people engaged in Creative activities on a self-employed or casual basis. These individuals collectively make a substantial contribution to creative activities and there is frequent cycling between sole practitioners status and working on contract to, or as employees in, larger organisations and firms.

Each DCMS segment report identified the core and the related activities of that segment with the result that there were considerable crossovers between the reports on the various *Creative Industries* segment. These limitations reduce the ability to make a comparison of the performance of segments and regions.

Subsequent reports used national data bases wherever possible (particularly in relation to indicators of business activity and employment) and the methodology proposed in the *DCMS Evidence Toolkit*. However the data gaps relating to SMEs and micro-enterprises has remained a particular issue. The ongoing need to use a variety of data sources and the consequent lack of uniformity between analyses has meant that in some instances meaningful comparisons cannot be made over time.

### **Granularity limitations**

Separate to the issues arising from limited datasets are the constraints on the granularity of the classification of the data. As covered in more detail in Section 5.1.1, of the 172 industry classification codes used in the UK census only eight were directly relevant to the Creative industries compared to 28 in Australia. Of those eight, three were very broad in their scope and could have included 30 to 40% of extaneous activity. The accuracy would have been substantially greater if the data was available at a modern four digit resolution where there should be 20 to 30 industries that could be confidently selected as primarily Creative.

The Second Wave: Utilising Industry and Occupation Tables

### 5. The Second Wave: Utilising Industry and Occupation Tables

- 2003 Baseline Study of Hong Kong's Creative Industries
- 2003 UK Creative Industries Economic Estimates Statistical Bulletin July 2003
- 2004 Designing The Economy: A Profile of Ontario's Design Workforce

### **Measures on the basis of Creative Occupations**

The second wave of Creative Industry mapping documents included the UK Creative Industries Economic Estimates Statistical Bulletin 2003, the Hong Kong Baseline Study<sup>4</sup> and the Ontario Design Study<sup>5</sup>. This body of work looked beyond an industry activity analysis and began to explore the impact of including occupational data, counting the number of people employed in specialist occupations and the patterns of employment in relevant occupations across the whole economy.

The annual DCMS Creative Industries Economic Estimates Statistical Bulletin<sup>6</sup> series explored an increasingly sophisticated approach. In 2003 it first incorporated an analysis of the creative jobs outside the *Creative Industries*, this added approximately 780,000 people to the estimated total UK *Creative Workforce*. The data was extracted from the Labour Force Survey- a panel based survey of 172,000 UK households (a 1 in 400 sampling rate) which is then scaled up to national level. Because of the sampling basis the Office of National Statistics has a policy to not release data with less than 2,000 (sometimes higher) in a cell and this means that analysis could not be conducted at a fine level on more than one dimension nor on a multi dimensional basis at any reasonable level of detail as doing so would generate substantial statistical errors. This and the coarseness of classifications would have prevented the DCMS from conducting more detailed sector analysis on LFS data.

Nor could the DCMS use the 2001 Census data for this purpose because of classification limitations: of the 172 industry classification codes used in the UK census only eight were directly relevant to the *Creative industries* compared to 28 in Australia. Of more concern is that some industries, such as 72 Computer and related activities are only available at two digits of detail even though they account for over 540,000 (2%) of the UK workforce while a number of general manufacturing classifications have less than 500 people employed within them. Of the 354 occupation classifications used in the UK Census, only 24 are directly relevant to *Creative Occupations* compared to 85 in Australia and New Zealand.

The newer UK methodology of using a matrix of data from occupation and industry classifications was extended in the Hong Kong Creative Industries Baseline Study. Three types of creative employment - Occupations of creative production (OCP), Associate Profession of Content/Creative Production (APCP) and Occupations of Creative / Content Production in all other industries – were mapped across nine industry groups.

Unfortunately the low resolution<sup>7</sup> (3 digit classification level) of the occupation and industry codes available for the HK study constrained the accuracy of this approach and substantially limited analysis at the sector level. In addition the APCP grouping did not include many of those employed in business support roles within the specialist *Creative Industries*.

Selection of the appropriate industry and occupation classifications should vary depending on the purpose and context. However the industry and occupation classifications used to calculate employment by the UK DCMS appeared to have been selected with little understanding of how they would interact. For instance, the UK Economic Estimates 2006 report includes four occupations that would be counted within the Publishing

<sup>4</sup> Hui D., (2003)

Meric S. Gertler And Tara Vinodrai, Designing The Economy A Profile Of Ontario's Design Workforce, 2004, The Design Industry Advisory Committee, DIAC, <a href="http://www.utoronto.ca/progris/pdf">http://www.utoronto.ca/progris/pdf</a> files/DesigningTheEconomy.pdf>

DCMS, Creative Industries Economic Estimates Statistical Bulletin, 2006, Department of Culture Media and Sport, DCMS, <a href="http://www.culture.gov.uk/NR/rdonlyres">http://www.culture.gov.uk/NR/rdonlyres</a>

<sup>7</sup> See the Sections 8 on the importance of detailed classifications on analysis

### The Second Wave: Utilising Industry and Occupation Tables

industries but which would not be considered *Creative Occupations* when *Embedded* in other (non-Creative) industries.

The 2004 Ontario Design Study<sup>8</sup> was notable for, firstly, comparing the number of people in a range of design occupations in Ontario and the US per 1,000 people in the workforce. The benchmarking of cities and regions on the basis of specific occupation densities revealed some striking patterns in the competitiveness of population centres that would have been missed if the analysis was just made on the basis of employment within the specialist design services industry. Secondly the study was significant for its analysis of the proportion of employment of a slice of *Creative Occupations* across the economy. The study looked beyond the simple number of *Embedded* designers to look for patterns in where they were employed and on what basis.

Another advance in thinking was derived from the UK DCMS Evidence Toolkit, which was released in 2002 but derived from a body of earlier work relating to cultural statistics. The DCMS Evidence Toolkit (DET) was a substantial effort that sought to address the need for consistency in metrics by taking into account of the industry activities and occupations for each stage of a value chain for each sector of the Cultural Industries. The process stages of the value chains were seen as comprising:

1.Creation> 2. Making> 3. Dissemination> 4.Exhibition/Reception> 5. Archiving/Preservation> 6. Education/ Understanding.

The DET framework however did not differentiate between the core activities of the Creative value chain and the support or infrastructure value chains that may be relevant to input/output studies of Creative activities but not when assessing direct employment levels. On this basis the Hong Kong study is more sophisticated as it included a rudimentary filter for discriminating on the level of involvement – content origination industries, manufacturing input/infrastructure and reproduction and distribution industries – in the context of a *Creative Industries* production system. But while it had the advantage of taking account of the infrastructure issue, it did not provide a basis for selecting relevant activities based on their position along in the value chain.

<sup>8</sup> Meric S. Gertler And Tara Vinodrai, Designing The Economy A Profile Of Ontario's Design Workforce, 2004, The Design Industry Advisory Committee, DIAC, <a href="http://www.utoronto.ca/progris/pdf\_files/DesigningTheEconomy.pdf">http://www.utoronto.ca/progris/pdf\_files/DesigningTheEconomy.pdf</a>

### 6. The Third Wave

The first steps towards implementing the "third wave" approach to measuring the workforce defined in either creative or cultural terms were taken in parallel in France and Australia.

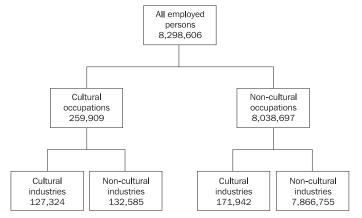
In Europe, the French Culture Ministry's Department for Studies, Prospectives and Statistics produced a report in 2005 entitled "Cultural Employment in Europe in 20029". This defined Cultural employment as "the total of active workers having either a cultural profession, or working with an economic unit within the cultural sector". The definition supported three distinct situations which are directly equivalent to the CINMP modes of employment, *viz*:

- Workers with a cultural profession working in a cultural sector (e.g. a singer in an opera production company);
- Workers having a cultural profession but working outside the cultural sector (e.g. an industrial designer in the car industry);
- Workers having a non-cultural profession but who are working in the cultural sector (e.g. an accountant, cleaner or secretary in a film production company).

To generate the employment data the researchers selected 13 professions at the four digit International Standard Classification of Occupations. (ISCO) and 9 industries at the three digit NACE<sup>10</sup> levels from labour force surveys from 25 European countries and used a complex formula to derive the total creative employment.

Similar studies had also been undertaken in Australia and New Zealand of employment in the Cultural sectors

Table 1. The Australian Bureau of Statistics Cultural
Employment Tree showing the three empoloyment
"situations"



Source: ABS Catalogue Number 6273.0 Employment in Culture, Australia 2001, 2003 using a very broad selection of occupations and industries. The Australian Bureau of Statistics (ABS) study<sup>11</sup> explicitly reported on the same three types of employment as the European study but did not establish a total for cultural employment. The New Zealand study<sup>12</sup> provided a total level of Cultural employment, derived from Total Creative Occupation employment and non cultural occupations within Cultural Industries, but the analysis was more focussed on the detailed within the two dimensions, Cultural Occupations and Cultural Industries, than on the three components within them.

### 6.1 The CCI National Mapping Approach

A key objective of the CCI project was to provide a series of measures for creative activities, especially employment and earnings, that would be "bullet proof" and national in scope. It was felt that to break new ground in understanding how

to consistently define and measure the many dimensions of the Creative Economy would require a substantial investment in research infrastructure.

L'emploi culturel dans l'Union européenne en 2002: Données de cadrage et indicateurs, L'OBSERVATOIRE DE L'EMPLOI CULTUREL, Département des études, de la prospective et des statistiques, Paris, June 2005 <a href="http://www2.culture.gouv.fr/deps/telechrg/noec39.pdf">http://www2.culture.gouv.fr/deps/telechrg/noec39.pdf</a>

<sup>10</sup> The NACE acronym derives from the French 'Nomenclature statistique des Activites economiques dans la Communaute Europeenne'"

<sup>11</sup> ABS Catalogue Number 6273.0 Employment in Culture, Australia 2001, 2003, Australian Bureau of Statistics

<sup>12</sup> Catalogue Number 16.001, Employment in the Cultural Sector 2005, Statistics New Zealand

**The Third Wave** 

To reduce the errors that could be introduced by inconsistency in selecting relevant classifications from different releases, different resolutions and domains, CCI sought to develop a framework that it could apply to occupation, industry, qualification and product classifications.

The methodology we developed utilises a flexible, abstract, multi-layered classification scheme for sorting data relating to industry activity and workforce occupations to build a picture of Creative activity across the economy relating to the workforce and specialised Creative production. In effect, we developed a data classification relationship infrastructure for extracting information that enabled us to operate on large datasets, some with over 20 million records, to tease out the individual fine strands of activities and then combine them within a systematic framework to derive robust measures.

This infrastructure comprises three criteria (or dimensions) that are applied to the data:

A filter addressing the relationship of an activity's value chain to the Creative Value Web (the participation level filter);

A filter addressing the activity's stage along the value chain (the stage filter); and

A three-level Hierarchy reflecting the type or domain of the activity (the segments).

The Spine Activity Hierarchy's three levels are:

- level one -"form" which is based on the human senses
- level two segments or significant groupings of activities based on national statistical classifications
- level three which is used to provide a finer division of the segments obtained from the level two hierarchy groupings.

These filters and hierarchy are applicable to data collated under all systems of classification for industry and occupations at the highest level of resolution available for that system.

The key criteria of the CCI abstract spine is the domain of an activity - occupation, product, or an industry activity. The top two levels of the Activity Hierarchy are purposely abstract so that they do not create a bias with respect to specific groupings.

When analysing datasets, the Spine Activity Hierarchy must always be used with the two filters. However the Activity Hierarchy has some degree of redundancy within it and a selection of the filter(s) must be made appropriate to the analysis. This is particularly important for constructing a picture of the total CCI grouping built up from the individual segments (see the companion report for more details on grouping Australia's Creative Economy: Definitions of the Segments and Sectors).

The data used within the project was classified at the finest level of classification and extracted from the Australian Business Register and the Australian Census databases, using the most detailed classification systems for industry (the Australian and New Zealand Standard Industrial Classification 1993 and 2006, the Australian Standard Industrial Classification 1983 and the Australian Standard Industrial Classification 1969) and occupations (the Australian Standard Classification of Occupation V2 and the 2006 Australian and New Zealand Standard Classification of Occupation) attached to the information in the databases. Data from the Census relating to educational qualifications (classified according to the Australian Standard Classification of Education 2001) is also included in the database.

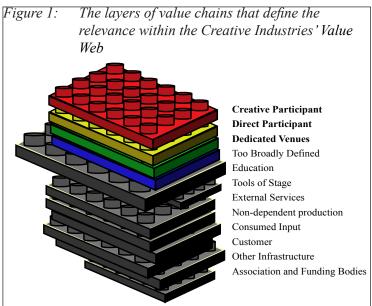
The information relating to business activities and occupations collated in the databases was extracted using the spline to obtain measures of the Creative Industries (comprising the firms which specialise in Creative production), employment in Creative Occupations and the Creative Workforce comprising the people in Creative Occupations across the economy and business support people employed in specialist Creative firms. Information on the occupation-based income, extracted from the Australian Census survey provided an indication of the earnings from Creative activities across the economy. By adjusting the classification

frame, information relating to, for example, cultural activities or the creative digital industries can be similarly obtained.

However, there are a number of shortcomings with secondary data especially that relating to the activities of the businesses. The official statistical classifications used in the collation of the data were not designed with the Creative Industries in mind and there are significant gaps in the data. One consequence of this is that CCI does not currently report estimates of the value of creative goods and services purchased or consumed domestically or exported as we consider that there is currently no data available that satisfies our requirements of consistent national coverage, appropriate fineness of resolution of the commodity classifications and that fully captures the value of digital purchases.

The next section discusses the elements Abstract classification Spine in more detail, followed by an explanation of how the elements are combined and used appropriately in analyses.

### 6.2 Filter 1: "Participation Level": The Layers of Value Chains



While essentially unknowable, the extent and nature of the ecology of Creative activities would be more likely to be revealed if the taxonomy framework was capable of handling the nuances of the Value Webs that are evident within the ecology of the Creative segments and industries. A better framework for classifying the Creative Ecology makes it possible to undertake better economic measurements that would, in turn, better reveal the extent of the Creative Economy.

We applied the concepts of the Value Web previously used by researchers in specific segment studies such as QUT's of the Queensland Music Industry and University of Texas' on the Internet Economy . The latter report divided the Internet Economy "into four distinct but related layers: Internet infrastructure, Internet applications, Internet intermediaries and Internet-based transactions." The researchers noted that many of the companies they surveyed for the report operated

in more than one layer.

CCI has identified 13 layers of activities within the Value Web that produce Creative goods and services even though our sizing analysis focuses only on the direct participants of the value chains (see the coloured sections in Figure 2). The directly relevant layers, from the viewpoint of the Creative Workforce, are the Creative Participants layer which is responsible for the core Creative origination activities such as Film Directors and Architecture services, the Direct Participants and Dedicated Venues. Those in the Direct Participants layer such as libraries and stage lighting services have a direct and active infrastructure role supporting pre-creation or creation activities. The Dedicated Venues layer encompasses the provision of direct infrastructure that is necessary for the pre-creation and creation activities, including performance within drama and opera theatres.

The indirect contributors to the Value Web include the provision of education services to creators and customers, the provision of tools and capital items to all or specific stages of the value chain. The making and sale of musical instruments and the manufacture and sale of television sets are also excluded as these are considered "tools of stage" and thus lie on separate, often parallel value chains to the primary Creative value chain. Other indirect value chains include indirect or partially downstream activities such as office building and home construction and real estate agencies (all partially downstream from architecture), or apparel manufacturing

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(which is partially downstream from Fashion Design). The CCI methodology defines these types of activities as "Relevant non-core dependent Production".

Table 2: The CCI coding for the levels of participation of Value Chains in the Value Web with the core levels shaded

Parti	cipation Code and Name	Explanation and Rationale
XA	Value Web Participant	Core Creative Value chain of the value web (used in most calculations)
XS	Value Web Direct Participant	Direct participant in the Value Web but in "non creative" activities
XD	Dedicated Venues	Venues such as Performing Arts Centres, opera houses, movie cinemas which are separate from the companies, artists, bands, projects or titles that perform within them
XB	Management of a Value Web member	Talent management, orchestra management, venue management, event management, promotions management. (This layer doesn't take precedence over the works created. There are extremely few standard classifications that currently fit into this layer.)
XC	External Services to Value Web	Includes marketing support services, surveying, or engineering services, accounting, legal, and other professional advice
XE	Value Web Education	Providing education services to people at all stages of the value chain
XJ	Value Web Association	Industry associations and cultural support organisations such as "Friends of the Opera"
XK	Value Web Funding Bodies	Dedicated, usually government funded, industry development and financing organisations. In Australia these include the Australian Film Commission, Film Finance Corporation and the Pacific Film and TV Commission.
XL	Value Web Customer	A customer for the output. The occupation Chief Information Officer is an example of a customer who is not an <i>Embedded</i> specialist occupation
XM	Consumed Input to Value Web member	Non capital items: e.g. provision of items such as paint to artists, paper to Newspaper publishers
XN	Relevant non-core dependent Production	Includes downstream (manufacturing and retailing) activities that could be but don't have to be the result of the creative activity. Clothing, furniture and white-goods manufacturing, construction of buildings (and real estate agents) etc. that may or may not use design or other segment services.
XO	Other Infrastructure	Infrastructure other than dedicated venues, such as radio and TV relay stations, transmission towers, telecommunications services
XT	Tools of Value Chains stage	Non-consumed Capital items: includes musical instruments, computers, CAD workstations, printing presses, TV sets etc
XW	Too Broadly defined	Applied to aggregated classifications where there are relevant creative activities at the sub-classification level but the classification itself is too broadly defined to be used reliably due to the inclusion of a significant proportion of non-relevant activities.
XZ	Not relevant	The activity has no relevance to the creative ecology

Some decisions on the inclusion of specific industries or occupations are made on the basis of the relative contribution of the *Creative* activities. For example, while architects are used to design houses and office buildings only 30% of houses are designed by architects and architect's fees represent a small proportion of the total value of buildings so it would be inappropriate to include the value of house construction in the analysis of employment or numbers of businesses. Other layers of value chains include "External Services to *Value Web* member" such as accounting, legal, engineering, surveying and business services; Associations such as a professional or industry associations; Funding Bodies such as government industry development and investment bodies. There is one further layer whiich is not strictly a value chain, "Too Broadly Defined" is used for those classifications that could be directly relevant except they also include a significant proportion of non-relevant activity. This is discussed further in Appendix 2. The Criteria for the Allocation of Classifications to the Segments.

### The benefits of having the participation filter

This filter allows for the separation of the core creation related value chains within the value web from those of support or infrastructure industries and can, in effect, facilitate the undertaking of a cluster-based analysis.

By having a participation filter, the complexity of parallel or interacting value chains can be aligned with those of the core value chains but not necessarily included in calculations of employment or the number of firms. For instance the design, manufacture, wholesaling and retailing of musical instruments such as violins or of computer hardware can be measured by selection of appropriate sectors, stages and participation. If the data was available, the monthly production and sales of musical instruments or computers could be compared to the employment levels of musicians or software designers but it would be inappropriate to count them into the size of the recorded music industry.

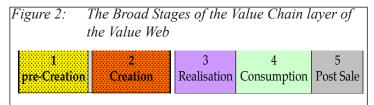
Furthermore when undertaking geographic analysis, it may be important to be able to systematically test for the correlation in the location of the participants of related values chains within the Creative Value Web.

While it is not appropriate to include indirect contributors to the *Value Web* when measuring the employment generated or the scale of business activity, it would be relevant to utilise to use them for cluster studies, for determining the total input/output effects or for investigating the flow-on strategic impact of a segment.

Refer to Appendix 1 for a table showing the distribution of recent Australian standard industry and occupation classifications to the value chains stages and value chains layers.

### 6.3 Filter 2: The Activity's Stage within a specific Value Chain

Each value chain layer within the Creative Value Web has its own series of steps or stages. CCI's classification of these stages is shown in Figure 3. The broad stages are 1. Pre-Creation (Archiving/Preservation)> 2. Creation> 3. Realisation > 4. Consumption 5.Post-sale.



In addition, CCI has refined the Value Chain by further divisions of the process stages to enable closer examination of important stages in the production process. Table 3 describes the process stages and their finer subdivisions – the shaded levels represent the core creative production activities.

The pre-creation stage includes preservation & access functions such as libraries, museums that are a critical resource for

*Creative* people. Museums and libraries have been at the forefront in projects that facilitate the production or repurposing of analogue and digital creative content. This stage also includes post-consumption & preproduction activities such as collecting societies, commercial image libraries and stock footage libraries.

Table 3: The CCI codings for the stages and fine stages of an activity within its Value Chain

Stage	Fine Stage	Comment	
Pre-creation	Preservation & Access	Includes entities such as libraries, museums that are a critical resource for creative people. Museums and libraries have been at the forefront in projects that facilitate the production or repurposing of analogue and digital creative content.	
	Post-consumption & Preproduction	Collecting societies, commercial image libraries, stock footage libraries	

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Stage	Fine Stage	Comment	
	Creation	Primary creation activities such as writing, music composition etc	
	Performance	Primary performance activities such as a musician?? or musical performance	
	Recording	Includes digitisation, conversion, capturing etc. Activities may be also part of performance e.g. film.	
Creation	Pre-publishing	Editing, layout	
	Publishing	The legal and practical act of publishing	
	Creation and realisation	Activities that span most or all of the stages from creation through to realisation. This is relevant to some Value Webs only. For example, the Jewellery maker or manufacturer is generally responsible for the design and manufacture of jewellery.	
Realisation	Manufacturing/ Hosting	Replication of a creative product - newspaper and book printing, CD, DVD and VHS duplication	
(Not normally counted as part	Distribution/ Wholesaling	Music and publishing wholesalers, TV transmission networks and transmission equipment	
Retailing/ Presentation wotif.com	Cinemas, Newsagents, Online merchants such as Amazon.com and wotif.com		
	Post-sale Distribution	Includes video rental stores etc	
Consumption (Only relevant for Input/output or total market size analyses)	Consumption/Customer	TV Stereo and Radio equipment are utilised primarily at the consumption stage. Chief Information Officer and database administrator are examples of occupations normally undertaken within the consumption/customer stage of the value chain.	
Post Sale (Only relevant for	Repair, maintenance, support, alterations	TV equipment repair, computer repair, software technical support services, furniture and art restoration	
Input/ output or total market size analyses)	Second Hand Sales	Antique stores, secondhand furniture and goods stores, online resale sites such as eBay	

The Creation stage includes the originating activities such as writing, music composition, software designer; the performance related activities such as musical performance; the recording stage including digitisation, conversion and activities that may also part of performance e.g. film. Other activities within the Creation stage include Pre-publishing (editing and layout, software testing) and the activities associated with the legal and practical act of publishing.

The CCI Value Chain Stage filter is similar in purpose to the UK DCMS Evidence Toolkit's value chain (1.Creation> 2. Making> 3. Dissemination> 4.Exhibition/Reception> 5. Archiving/Preservation> 6. Education/ Understanding).

We argue that Education/Understanding is not part of the direct production of products or services and furthermore can be provided to all stages of the value chain: such as education and training to film directors (creation stage), film studio executives (publishing stage), cinema staff (realisation stage) and film appreciation classes to audiences (consumption stage). As a consequence, we have categorised education to its own, parallel value chain, managed through the second filter (discussed below).

The positioning of Archiving/Preservation towards the end of the DCMS value chain appears to be primarily due to the recognition of only one of the (traditional) roles of libraries, museums and galleries - preservation - and ignores the very critical role they have of providing ongoing access to the public and to other creators with explicit education, discovery and access roles. The significance of the collecting institutions as innovators in their own right and as stimulants of content creation by others, especially of digital content, was examined in

2003 Creative Industries Cluster Study report Economic Benefits from Cultural Assets Report . It is for this reason that CCI positions it at the start of the Value Chain.

The strength of the Stage of the Value Chain approach is that it allows different activities to be compared more accurately because the production process stages such as creation, publishing and manufacturing can be separately coded and therefore looked at in isolation or else aggregated to match other industry definitions.

### The pragmatics of applying the stage filters to classifications

The Australian Bureau of Statistics uses classification structures that vary in their treatment and coverage of stages of the value chain. For instance the book publishing industry subsector includes separate ANZSIC codes for the stages of publishing, printing, wholesaling and distribution as well as retailing. However authors, who are the anchor "creators" of the "Book" Value Web, are bundled into Creative Arts and consequently the measured value to the economy of "Book publishing" is almost solely the size of the publishing, realisation and channel activities.

Less clear cut though are those *Creative* activities, especially those mostly conducted by individuals, that can have standard classifications that span most or all of the *Value chain* stages from creation through to realisation: for example for the Jewellery design sector the most relevant industry classification would appear to be at the manufacturing stage (Australian and New Zealand Standard Industry Classification (ANZSIC93) 2941 Jewellery and Silverware Manufacturing) However some 40% of the people employed are in either the occupation of (under Australian Standard Classification of Occupation ASCOv2) 498311 Jeweller. or 253179 Visual Arts And Crafts Professionals not elsewhere classified. Therefore the industry classification 2941 is considered to cover the design and concurrent manufacture of jewellery and is included in the creation stage despite "manufacturing" being in the title of the classification.

Nevertheless, the CCI definition of the *Creative Industries* generally ignores those stages downstream from the creation stage as these are not a direct measure of the *Creative* capacity: the explicit realisation (manufacturing, wholesaling, distribution and retailing stages), customer usage and the post-sale stage that includes second hand sales, service and repairs.

### 6.4 The Spine Activity Hierarchy

### 6.4.1 Hierarchy Level 1: "Spine Form"

We have described the highest level in our Hierarchy of the primary axis, level 1, as "form". The level 1 grouping of forms is broadly related to the senses (hearing, sight etc) and combinations of them. The components of the level 1 Hierarchy are listed in the table below.

The level 1 Hierarchy is not useful to describe an activity per se - it is intended to facilitate the selection of more detailed activities deeper in the hierarchy.

Table 4: The CCI Abstract Spine Hierarchy Level 1: "Spine Form"

Level Code	Spine Form Name	Explanation	
A1	Audio	Music, radio, recorded voice	
A2	AudioVisual	A moving image combined with sound	
A3	Compound	Works or activities which are amalgams of other forms. This grouping collects, for example, marketing and advertising activities.	
A4	Performance	Works or activities primarily related to experience in a live performance	
A5	Text/Image	Informational content, primarily text based, with or without images. It can be in a printed form or via computer.	

Level Code	Spine Form Name	Explanation
A6	Visual	Primarily three dimensional, physical objects such paintings, sculpture, buildings which can be viewed and experienced
A8	Other Creative	For capturing mostly industry classifications that may be across a number of creative segments. (This form is used sparingly rather than an alternative to the compound form.)
A9	Not_CI	All other activities

### 6.4.2 Hierarchy Level 2: Spine Segments

The second level of the Spine's Activity Hierarchy, Spine Segments, is the one generally used for analysis. Its components are listed in the table below. This level of the Hierarchy is particularly useful for describing significant groupings of activities and operating on data already classified under standardised systems such as Australian and New Zealand Standard Industry Classification, Australian Standard Classification of Occupation etc. It enables the analyst to mix and match selections of activities to address a specific definition of a Segment.

In the absence of fine divisions in national statistical classification schemes, potentially relevant activities identified through the application of the level 1 Hierarchy can be further separated by use of the level 2 (and optionally level 3) of the Hierarchy.

Table 5: The CCI Abstract Spine Hierarchy Level 2: "Spine Segment"

Spine Form	Level 2 Spine Segment Codes and Titles
A 1 (A 1: -)	A11 Music
A1 (Audio)	A12 Radio
A2 (AudioVisual)	A22 Film & TV
	A31 Services
A3 (Compound)	A32 Software
	A33 Interactive Content
A4 (Performance)	A41 Performing Arts
A.F. (Taut/Image)	A51 Publishing
A5 (Text/Image)	A52 Composition
A C (Viewal)	A61 Design
A6 (Visual)	A62 Visual Arts
A8 (Other Creative)	A81 Other Creative Arts
AO (NI-4 CI)	A95 SET (Science Engineering and Technology)
A9 (Not_CI)	A99 Not relevant to Creative Industries

### 6.4.3 Hierarchy Level 3: The Spine Sectors

The level 3 of the Hierarchy further subdivides the groupings of activities established under level 2 and was mainly developed to address the problem of classification of primary data. The categories were derived from various classification systems and further refined in the light of experience. This level may be further refined and expanded to meet new requirements.

At this level of the Hierarchy, there is considerable redundancy as they very often include data relating to elements of the value chain stage that are not relevant to the analysis. Examples of this are Music Retailing, Music Performance and Writing Education.

Table 6: The CCI Abstract Spine Hierarchy Level 3: "Spine Sectors"

Level 2 Spine Segment	Level 3 Spine Sector Codes and Titles
	A1110 Music Composition
	A1111 Music Performance
	A1112 Music Recording
	A1113 Music Talent Management
	A1114 Music Composition Publishing
	A1115 Music Record Label
A11 Music	A1116 Music Recording Manufacturing
	A1117 Music Retailing
	A1118 Music Venues
	A1119 Music Instruments Making & Retailing
	A1120 Music Performers Education
	A1121 Music and Sound Archive
	A1122 Music Events and Organisation
A 10 D - 1: -	A1219 Radio Broadcasting
A12 Radio	A1220 Radio program production
	A2210 Film Production
	A2211 Film Special Effects, Post Production
	A2212 Film Acting
	A2213 Film Scriptwriting
	A2214 Film Manufacturing and Duplication
A22 Film & TV	A2215 Film Distribution
	A2216 Film Exhibition, Retailing and Lending
	A2217 TV Production
	A2218 TV Broadcasting
	A2219 Film and Video Libraries
	A2220 Film TV Radio Education
	A3110 Advertising Services
A31 Services	A3111 Marketing Services
ASI Services	A3112 Advertising Media

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Level 2 Spine Segment	Level 3 Spine Sector Codes and Titles
	A3200 Software (general)
	A3210 Software Development
A32 Software	A3212 Software Contract Development ???
	A3213 Software Product Publishing
	A3214 Software Packaged Retailing
	A3314 MultiMedia eLearning Content Development
	A3315 Multimedia Internet Development
	A3316 Interactive and Online Games Development
	A3317 Interactive Games Publishers
A33 Interactive Content	A3318 Interactive Games Retail or Hiring
	A3319 Multimedia Internet Service Providers
	A3320 Multimedia Internet Content Publishing
	A3321 Multimedia Talent Education
	A3322 Multimedia Production Service
	A4110 Performing Arts (general)
	A4111 Performing Arts Dance and Ballet
	A4112 Performing Arts Talent Education
	A4113 Performing Arts Drama
	A4114 Performing Arts Drama Education
A41 Performing Arts	A4115 Performing Arts Booking agencies
	A4116 Performing Arts Venues
	A4117 Performing Arts Talent Managers
	A4118 Performing Arts Events and Event organisers
	A4119 Performing Arts Opera
	A4120 Performing Arts (other)
	A5110 Newspaper Publishing
	A5111 Periodicals Publishing
	A5112 Book Publishing
A51 Publishing	A5113 Book Wholesaling
	A5114 Book Production
	A5115 Book Magazine newspaper retailing
	A5116 Publishing support services
	A5216 Writing
A 52 G	A5217 Writing Education
A52 Composition	A5218 Proofreading-Editing
	A5219 Libraries

Level 2 Spine Segment	Level 3 Spine Sector Codes and Titles
	A6110 Architecture
	A6111 Drafting
	A6112 Graphic Arts
	A6113 Jewellery Design
	A6114 Fashion Design
A61 Design	A6115 Interior Design
Aor Design	A6116 Product Design
	A6117 Landscape Design
	A6118 Urban Design
	A6119 Furniture Design
	A6120 Marine Architecture
	A6121 Industrial Design
	A6210 Artist
	A6211 Sculptor
	A6212 Art Works Retailing
A62 Visual Arts	A6213 Museums and Galleries
A02 Visual Aits	A6214 Visual Arts Talent Education
	A6215 Visual Arts nec
	A6216 Services to the Arts nec
	A6221 Photographer
A8 Creative Art poorly defined	A8100 Creative Arts (poorly defined)
A00 N + GI	A9910-9800 Not creative activities
A99 Not_CI	A9899 (Includes some creative activities)

### 6.5 Application to Classifications

CCI has established a series "standard classification" databases as part of its infrastructure. To date it has cross classified the Hierarchies of nine industry classification systems (including two from the UK), eight occupation classification systems (including one each from the UK and New Zealand) and two qualification systems in relation to Creative activities. (See Appendix 5 for a list of the classification encoded.)

The classification codes that are at the finest level of resolution from each hierarchy are categorised with the appropriate five digit code from the Abstract Spine Sector level 3, with the two digit code for the stage of the value chain and the two letter code for the participation level of the value web. Once all the finest level classifications are mapped, then this is used as the basis for mapping the subtotal level of aggregation. Each of the higher levels of a classification hierarchy is classified with reference to the activities encompassed at the finer level of detail.

It is important to take account of the relevance of the segments at the level of statistical classification. For example, there are a number of 4 digit industry classifications that are relevant to the Creative Industries where the subtotal or parent level 3 digit classification is not because it also contain extraneous activities. The ANZSIC93 three digit classification, 782 (Technical Services), is not considered by CCI to be part of the

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Creative Industries as the only sub group relevant to the Creative Industries, 7821 (Architectural Services), accounts for 26% of the Technical Services employment. Similarly, there are a significant number of six digit occupations where the parent four digit code is not relevant and should not be counted. Refer to Appendix 2 for examples.

Each dataset used in the CINMP was processed into the Creative Industries Statistical Repository using SuperChannel software that supports alternate classification cascades down to the common, finest level of classification within the dataset.

The CCI Abstract Categorisation Spine can therefore be used as an alternative path to the "raw" industry, occupation and qualification classification schemes used by the ABS and the Australian Business Register. Researchers always have the choice of utilizing either the standard classification cascades or the Abstract Spine Hierarchy.

### **Updating the Classification Spine and Mappings**

As new classifications are released it may become necessary to update the Classification Spine or the mapping of the Spine Sectors to the finest level of the national statistical classification system. The Abstract Spine is linked to the national classifications databases, so a change in an item in the Spine Hierarchy requires a change in the mappings to the affected standard classifications databases. Once these changes are made however, the new mappings are propagated throughout the analytical datasets with a simple update command in the software that is used to create the analytical datacubes.

**Using the CCI Methodologies to measure Creative Workforce and Creative Businesses** 

# 7. Using the CCI Methodologies to measure Creative Workforce and Creative Businesses

The CCI methodologies are applied to current and historical data sets that have been converted to the SuperStar format and which are made accessible through the SuperStar based Creative Industries Statistics Repository. Researchers can access this using the SuperCross or SuperTable applications or a web browser.

The advantage of managing the research data via SuperServer datacubes is that they include all of the field metadata, facilitating direct analysis. In addition the server can control access permissions and confidentiality. If required (and permitted) researchers can export results to excel or tab formatshe data can then be accessed via standard and abstract classification hierarchies.

### 7.1 Generation of Grouping Definitions

CINMP understood the importance of supporting flexibility in the definitions or groupings of activities, industries and occupations that are used to extract, total and analyse data. Because the Abstract Spine consists of three dimensions - an activity cascade, a value chain stage filter and a participation level filter - very complex groupings can be built up and consistently applied to datasets from these three dimensions. This capability enables the measurement of cultural industries, creative industries and science engineering and technology industries from of the same datasets.

The Abstract Spine can be used to define and extract data in accordance with all the current UK, Australian, Queensland and Hong Kong definitions of the Creative Industries. Other industry groupings such as cultural industries and the WIPO copyright industries can also be expressed as groupings of component industry or occupation subsectors, production stages and participation types.

### 7.2 Examples of Applying the Abstract Spine

### Application to the WIPO Copyright Industries Definition

The World Intellectual Property Organisation (WIPO) "Guide on Surveying the Economic Contribution of the Copyright-Based Industries" (Dec. 2003) defines the copyright industries as having four categories:

Core Copyright Industries Press and literature, music/theatrical productions/operas, motion of which there are 9 sub-groups: Press and literature, music/theatrical productions/operas, motion picture and video, radio and television, photography, software and

databases, visual and graphic arts, advertising services, copyright

collecting societies

Interdependent Copyright Industries TV sets/radios/VCRs/CD players/DVD players/cassette players/ electronic game equipment and others, computers and equipment,

musical instruments, photographic and cinematographic instruments,

photocopies, blank recording material, paper

Partial Copyright Industries Apparel/ textiles/ footwear, jewellery and coins, other crafts, furniture, household goods/china/glass, wall coverings and carpets, toys and

household goods/china/glass, wall coverings and carpets, toys and games, architecture/engineering/surveying, interior design, museums

Non-dedicated Support Industries

General wholesale and retailing, general transportation, telephony and

internet

The groupings can be aligned with the CCI levels of participation with varying degrees of accuracy (see the table below).

[3 sub-groups]

### Using the CCI Methodologies to measure Creative Workforce and Creative Businesses

Table 7: The alignment between the WIPO groupi	ngs and CCI Levels of Participation Filter
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	Corresponding Selection using the Abstract Spine				
WIPO Category	CCI Spine Segments	CCI Participation Level	CCI Stages	Comment	
Core Copyright Industries	A11 Music A12 Radio A22 Film & TV A31 Services A32 Software A33 Interactive Content A41 Performing Arts A51 Publishing A52 Composition A62 Visual Arts A6112 Graphic Arts A6113 Jewellery Design A6114 Fashion Design	XA and XS Value Web Participants	1 and 2	Close alignment	
Interdependent		Tools of Stage and		Not counted by	
Copyright Industries	All Segments	Consumed Input to VW	All	CCI	
Partial Copyright Industries	A6110 Architecture A6111 Drafting A6115 Interior Design A6116 Product Design A6117 Landscape Design A6118 Urban Design A6119 Furniture Design A6120 Marine Architecture A6121 Industrial Design	XA and XS Value Web Participants XC External Services	1 and 2	Architecture, Interior Design and Museums are treated as part of the core value chain by CCI	
	All Segments	Relevant non-core dependent Production	3		
Non-dedicated Support Industries	A9999 Not CI	Not relevant to CI	3 and 4	Not counted by CCI but included in value web analysis	

### 7.3 Measurement of Creative Activity in the Economy

A first level approach to measuring the impact of Creative activities is to estimate the number of people employed within firms in a given bundle of industry classifications. We used the finest level of industry classifications to obtain 28 industry subsector categories (within the 1993 Australian and New Zealand Standard Industry Classification) that we considered comprised the grouping of firms specialising in the production of creative goods and services (see Appendix 1). Using the Australian 2001 Census data and on the basis of an individuals main job, we estimated the total employment within the specialist *Creative Industries* to be 299,916.

An alternative approach has been to count the number of people employed in Creative occupations within the highest resolution Australian Standard Classification of Occupation codes There were 89 relevant classifications at six digits used at the 2001 Australian Census that we defined as specialist *Creative Occupations* (see *Appendix 1*). On this basis we estimated the total Australian employment in *Creative Occupations* across the whole economy to be 271,467.

Through analysis of a custom matrix of data extracted from the Census of population consisting of the number of people employed in every occupation in every industry at the finest level of occupation and industry classification coding available (at six and four digits respectively) we broke down the specialist Creative

### Using the CCI Methodologies to measure Creative Workforce and Creative Businesses

Industry employment into two components: those within specialist occupations and those performing other (business management and *Support*) roles within these firms (see the table below).

Table 8: Specialist Creative and other employment in Businesses within the 28 industry classifications comprising the Creative Industries

Australian Employment 2001 Population Census	Employment within 28 Creative Industries
People employed in "Creative Occupations"	134,450
People employed in Support and management occupations	165,466
Total Creative Industries	299,916
Proportion in specialist Creative Occupations	44.8%

Source: Ana

Analysis by CCI of custom ABS 2001 Census tables

We also examined the broad employment pattern in all specialist *Creative Occupations* across the economy. The table below shows their disposition within the specialist *Creative Industries* and within other (non-creative) industries.

Table 9: Specialist and Embedded employment in Creative Occupations classifications – Total Economy

Employment 2001	Employment within 28 Creative Industries	Employment within Other Industries	Total Creatives	Embedded Proportion
Employment of people in 89 specialist Creative Occupations	134,450	137,017	271,467	50.9%

Source:

Analysis by CCI of custom ABS 2001 Census tables using the Creative Trident methodology

The CINMP terms the combination of these two approaches into a single table the *Creative Trident*, which is the total of *Creative Occupations* within the core *Creative Industries* (*Specialists*), plus the *Creative Occupations* employed in other industries (*Embedded*), plus the non-creative occupations employed in *Creative Industries* (*Support*). According to our estimates, the total employment relevant to Creative activities is the total of *Creative Industries* employment (299,916) plus *Embedded* employment (137,017) which, in 2001, totalled 436,933 people.

Table 10: The size of the Creative Workforce across the Creative Tridente

Employment 2001	Employment within Creative Industries	Creative Employment within Other Industries	Total Creatives	Embedded Proportion
Employment of people in 89 specialist <b>Creative Occupations</b>	134,450	137,017	271,467	50.5%
Business and Support Workers	165,466		165,466	
Total Industry	299,916	137,017	436,933	35.7%
Creative Occupation Proportion	44.8%		62.1%	

Source:

Analysis by CCI of custom ABS 2001 Census tables using the Creative Trident methodology

### Using the CCI Methodologies to measure Creative Workforce and Creative Businesses

The Trident aids the visualisation of all the creative activity of a country, city or region. This Trident analysis can also be done for a specific creative segment, reducing the likelihood of duplication or missing of parts of the relevant activity.

While the Trident we developed is conceptually similar (after rotation) to the methodology developed by Desmond Hui for the Hong Kong Baseline Study, it differs in that we include business and other support workers as they are essential to production. In contrast, the Hong Kong Study specifies the technical support occupations.

The methodology underpinning the Trident is particularly flexible and as a consequence it has two particular advantages over the methodologies used by Hui and others:

- 1/ The CCI Trident utilises combined occupation and industry matrices and uses its toolset to enable two or three dimensional analysis by specifying the industries and occupations that are part of the core segment or sector of interest. The remaining industries and occupations do not have to be specified but the level of employment within them is included.
- 2/ The CCI Trident uses much higher resolution classifications to select the occupations and industries of interest and excludes those that are too broad or include a significant proportion of activities that are not core creative ones.

The *Trident* is also an advance on the UK Economic Estimates approach of reporting *Creative Industries* employment plus estimates of *Embedded* employment as the Trident explicitly details the specialist employment and business occupations employment within the *Creative Industries*. Given the fluidity with which many people move between *Specialist*, *Support* and *Embedded* employment it is important to be able to monitor such trends as they can reveal significant patterns within a segment or sector.

Another advantage of the Trident approach is that it compensates for many of the coverage weaknesses in national industry classifications as it is able to integrate the employment from the often more finely grained *Creative Occupations* – particularly useful within the design groupings.

The CCI methodology can be used to analyse the data on employment to reveal the distribution of occupations across Creative Industry sectors and the economy more generally. Employment and other economic activities can also be analysed over time or with respect to location - results of this analysis with respect to Australian data are presented in the companion paper, *Australia's Creative Economy: Basic Evidence on Size, Growth, Income and Employment* and associated fact sheets. As shown below, with appropriate alignment of the various classification systems used on the data it is also possible to examine some long term trends.

The extent of embedded employment of creative occupations (50%) determined by CCI's methodology is not inconsistent with the findings of survey based research conducted for the Department of Communications, IT and the Arts (DCITA). The surveys on ICT production by Australian SMEs across the economy<sup>13</sup> have consistently found that some 80% of the SME's producing ICT were not specialist ICT businesses. This ICT production was for internal business use e.g. web design, for incorporation into final (non ICT) goods and services as well as being sold directly in the market as ICT goods and services.

One could also argue that the Creative Trident methodology still undercounts the Creative Workforce because it does not measure the extent of business roles that directly support the people in Creative Occupations embedded in the non-Creative Industries. While it is impossible to explicitly determine the extent of this from national statistics, the level could be established from a survey of the nature of creative department employment.

Sensis, Sensis Business Index special report – ICT production in Australian SMEs, 2006, Department of Communications, Information Technology and the Arts (DCITA), <a href="http://www.dcita.gov.au/communications\_and\_technology/publications\_and\_reports/2005/july/ict\_production\_in\_australian\_smes/ict\_production\_in\_australian\_smes,\_a\_sensis\_business\_index\_special\_report\_2006>

Using the CCI Methodologies to measure Creative Workforce and Creative Businesses

### 7.4 Applying the National Mapping Project Framework to Creative Segments

From our analyses of the patterns of employment and businesses across the range of creative activities, we proposed the conceptual division of the Creative activity in the economy into six Creative Segments:

- · Music and Performing Arts Segment
- Film, TV, Radio Segment
- Advertising and marketing Segment
- · Software, Web and Multimedia development Segment
- · Writing, Publishing and Print Media Segment
- · Architecture, Design and Visual Arts Segment

Activities of specialist businesses and employment across the three modes of the Creative Trident can be estimated for each of these segments. However, to enable more consistent comparisons between the activities and occupations within these groups we proposed to focus our analysis:

- at the preservation, creation and publishing stages of the creative value chain where the intangible symbolic value is generated (Pre-Creation Stage); and
- in the direct Value Chain consisting of the core creative activities and direct support activities value chains and dedicated venues (Creation Stage).

The above segments have been selected because they are practical synthesis of a theoretical definition of the segments and the pragmatic grouping of activities that may shift between different industries or occupations in the course of a year. As previously discussed our sizing analysis methodology does not address the dedicated manufactureing, distribution and retailing stages of the value chain unless a specific activity classification also encompass the creation stages. Nor does it include those occupations or activities on indirect value chains.

This type of analysis (on the basis of the industry dimension using data from the Australian 2001 Census) is presented in Table 11.

Table 11: Employment in businesses in Industry Classifications derived from the Abstract Spine Creative Segments grouping

			Filter 2			
Creative Segment	Filter 1 Participation level	Industry (under ANZSIC93)	1 Pre- creation Stage	2 Creation Stage	Total	
Advertising & Marketing	XA VW Creative Participant	7851 Advertising Services		25,353	25,353	
		2941 Jewellery & Silverware Manufacturing		5,497	5,497	
	XA VW Creative Participant	7821 Architectural Services		26,288	26,288	
		7852 Commercial Art & Display Services		14,558	14,558	
Architecture, Design & Visual		9240 Arts, undefined		860	860	
Arts		9523 Photographic Studios		4,769	4,769	
		9242 Creative Arts		9,037	9,037	
	XS VW Direct Participant	9220 Museums	5,383		5,383	

# Using the CCI Methodologies to measure Creative Workforce and Creative Businesses

			Filter 2			
Creative Segment	Filter 1 Participation level	Industry (under ANZSIC93)	1 Pre- creation Stage	2 Creation Stage	Total	
		9100 Motion Picture, Radio & Television Services, undefined		171	171	
		9110 Film & Video Services, undefined		342	342	
Film, TV & Radio	XA VW Creative	9111 Film & Video Production		7,541	7,541	
riiii, i v & Radio	Participant	9120 Radio & Television Services, undefined		743	743	
		9121 Radio Services		5,792	5,792	
		9122 Television Services		17,219	17,219	
	XA VW Creative	2430 Recorded Media Manufacturing & Publishing		2,131	2,131	
	Participant	9241 Music & Theatre Productions		10,642	10,642	
Music &	XS VW Direct	9250 Services to the Arts, undefined		214	214	
Performing Arts	Participant	9259 Services to the Arts N.E.C.		2,819	2,819	
	XD VW	9251 Sound Recording Studios		902	902	
	Dedicated venues	9252 Performing Arts Venues		1,672	1,672	
		2420 Publishing, undefined		2,318	2,318	
	XA VW Creative	2421 Newspaper Printing or Publishing		25,275	25,275	
	Participant	2422 Other Periodical Publishing		8,627	8,627	
Publishing		2423 Book & Other Publishing		8,848	8,848	
T donishing	XS VW Direct	9200 Libraries, Museums & the Arts, undefined	132		132	
	Participant	9210 Libraries	11,322		11,322	
		2413 Services to Printing		5,713	5,713	
Software & Interactive Content	XA VW Creative Participant	7834 Computer Consultancy Services		95,748	95,748	
SubTotal			16,837	283,079	299,916	
Subtotal All Other	Subtotal All Other Industries					
All Industries					8,103,019	

Source: Analysis by CCI of custom 2001 Census data-set from the Australian Bureau of Statistics

The Segment grouping on the basis of the occupation dimension using the classifications in effect at the 2001 Census (ASCOv2) and the 2006 Census (ANZSCO) are shown in Appendix 2.

### The Resolution and Modernity of Classifications Matters

## 8. The Resolution and Modernity of Classifications Matters

Our methodology involves a conservative selection of the appropriate industry and occupation classifications for use in measuring various Creative activities. With the possible exception of software, classifications are excluded if the majority of that category's activity is not Creative.

The iterative process of allocating classifications to the spine, analysing the available data at various levels of detail reveals some important lessons for researchers. The level of detail at which the available data is classified and the alignment of the statistical classification system can make a substantial difference to the results. In general, the more recent classification systems permit a closer identification of Creative activities.

The important point of the following two tables (12 and 13) and the four detailed tables (14-17) is not the actual level of employment but the difference in the number of classifications available to determine employment and the resultant proportional change in level of employment determined.

The effect of the conservative selection of industry classifications and changes to the classification system are illustrated in table 12 below. This analysis uses data from the 2006 New Zealand Census as this is the only dataset available using the newly released ANZSIC06 for industry and ANZSCO for Occupation.

The impact of resolution in the industry classification is illustrated in the table rows and the impact of increasing alignment of the newer classification systems is shown in the table columns. For example, under ANZSIC93, our methodology uses 21<sup>14</sup> classifications at the four digit level and only 9 at the three digit level. Under ANZSIC06 the 28 relevant classifications at four digits reduce to 14 at three digits.

While some of the difference is due to finer subdivision of the 3 digit codes, some 3 digit codes are excluded because they contain only a small proportion of Creative activities. This activity can often be identified at the 4 digit level. Thus the estimate of Creative activity at the 3 digit level is only 78% of the activity identified when data tagged with 4 digit classifications was used.

The shift from the 14 year old ANZSIC93 classification to ANZSIC 2006 shows a 5% increase in employment because more industries can be selected. It is expected that a similar impact of the level of detail and the modernity of classification would be seen when analysing data on Creative businesses. The patterns of the impact within the industry segments can be seen in table 14

Table 12: Comparison of the number of relevant industry classifications available at the detail (4 digit) and subtotal (3 digit) levels and their impact on employment analysis

Classification Scheme	Number of Rele	Ratio of	
Industry Axes	at 4 digit (detail)	at 3 digit(sub-total)	Subtotal/Detail Employment
ANZSIC93 Total (NZ 2006)	21	9	78%
ANZSIC06 Total (NZ 2006)	28	14	79%
Change in Level of employment through Classification	105%	107%	

Source: Statistics New Zealand Census of Population 2006

Occupation classifications (table 13) show a similar pattern. The drop in resolution to four digits sees only a quarter of the classifications being available as at six digits (from 87 to 21 classifications at ASCO v2). Of most concern is the employment jumps 22% with the drop in resolution as some occupation subtotals (at the 4 digit level) bring in high levels of extraneous employment but not enough to invalidate the selection of the subtotal. The more modern ANZSCO classification fares better dropping from 86 to 24 classification with only a 5% reduction in the employment coverage.

<sup>14</sup> The difference between the 28 ANZSIC 4 digit previously cited and the 21 used in NZ occurs because Statistics New Zealand does not use some of the broader but relevant industry classifications that the ABS does.

### The Resolution and Modernity of Classifications Matters

Table 13: Comparison of the number of relevant occupation classifications available at detail (6 digit) and subtotal (4 digit) levels and the impact on employment analysis

Classification Scheme	Number of Rele	Ratio of	
Occupation Axes	at 6 digit (detail)	tail) at 4 digit(sub-total) Subtotal Employ	
ASCOv2 (Australia 2001)	87	21	122%
ANZSCO (NZ 2006)	86	24	95%

Source: ABS Census of Population 2001 and Statistics New Zealand Census of Population 2006

The impact of the resolution of industry classification is greater in some Creative segments than others. Publishing shows no impact in employment, while our estimates of employment in Film, TV and Radio are 17% higher when the data is selected using the more detailed statistical codes. Others such as Music and Performing Arts or Architecture, Design and Visual Arts are strongly affected, with a 40% and 70% reduction respectively. Advertising disappears with its four digit code a very minor part of business services and therefore not counted.

Table 14: For each Industry segment the comparison of the number of relevant ANZSIC93 classifications available at detail and subtotal levels and the impact on employment analysis

	Number of Relevant Classifications		l	er Employed ealand 2006)	3 digit Coverage of Employment	
ANZSIC93	at 4 digit	at 3 digit	at 4 digit at 3 digit		(% of 4 digit employment)	
Advertising & Marketing	1	Nil	5,571	Nil		
Architecture, Design & Visual Arts	7	2	23,364	6,897	30%	
Film, TV & Radio	3	2	9,561	11,151	117%	
Music & Performing Arts	5	2	3,108	1,818	58%	
Publishing	4	2	14,679	14,679	100%	
Software & Interactive Content	1	1	21,672	25,992	120%	
ANZSIC93 Total	21	9	77,955	60,537	78%	

Source: Statistics New Zealand Census of Population 2006

In the new release of Industry classifications there is more consistency - three segments have almost no change in employment between the estimates based on the data coded at the two levels of detail. Film, TV and Radio have the same increase in employment as under the older classification. Architecture, Design and Visual Arts again is significantly lower with the 3 digit codes (64%), and Music and Performing Arts shows an even sharper drop (86%). Some of this is due to its activities being incorporated in the 3 digit Film, TV and Radio classification.

Table 15: For each Industry segment the comparison of the number of relevant ANZSIC06 classifications available at detail and subtotal levels and the impact on employment analysis

	Number of Relevant			Employed		
	Classi	ifications	(New Zeal	land 2006)	3 digit Coverage	
ANZSIC06	at 4 digit	at 3 digit	at 4 digit	at 3 digit	of Employment	
Advertising & Marketing	1	1	5,568	5,568	100%	
Architecture, Design & Visual Arts	6	2	22,200	7,890	36%	
Film, TV & Radio	5	3	9,516	11,103	117%	
Music & Performing Arts	5	1	2,364	321	14%	
Publishing	5	2	14,298	14,355	100%	
Software & Interactive Content	6	5	24,321	25,575	105%	

### The Resolution and Modernity of Classifications Matters

	Number	Number of Relevant Number			
	Classifications (New Zealand 2006)		3 digit Coverage		
ANZSIC06	at 4 digit	at 3 digit	at 4 digit	at 3 digit	of Employment
ANZSIC06 Total	28	14	81,537	64,812	79%

Source: Statistics New Zealand Census of Population 2006

Examining the Occupation segments two segments are relatively unchanged under ASCO classifications but two, Advertising and Marketing and Software and Interactive Content showing significant uplift in numbers 50% and 70% respectively.

Table 16: For each Occupation segment the comparison of the number of relevant ASCO v2 classifications available at detail and subtotal levels and the impact on employment analysis

Segments of Creative Occupations using	Number of Relevant		Number Employed		4 digit as
ASCO	Classi	fications	(Australi	a 2001)	% of 6 digit
ASCO	at 6 digit	at 4 digit	at 6 digit	at 4 digit	Employment
Advertising and Marketing	5	2	28,011	42,059	150%
Architecture, Design and Visual Arts	27	7	84,344	76,046	90%
Film, TV and Radio	22	3	20,164	15,674	78%
Music and Performing Arts	16	5	21,050	24,760	118%
Publishing	13	3	43,618	44,899	103%
Software and Interactive Content	4	1	72,917	125,112	172%
Total Creative Occupations	87	21	270,104	328,550	122%

Source: ABS Census of Population 2001

Similarly to Industry the new occupation classification shows more consistency with four segments' employment being relatively unchanged with a drop in resolution. In a reversal to industry, Film, TV and Radio is the big loser with a 65% drop and Music the winner with a 63% increase from a change in resolution.

Table 17: For each Occupation segment the comparison of the number of relevant ASCO v2 classifications available at detail and subtotal levels and the impact on employment analysis

Segments of Creative Occupations using	Number of Relevant Classifications			Employed land 2006)	4 digit as	
ANZSCO	at 6 digit	at 4 digit	at 6 digit	at 4 digit	% of 6 digit Employment	
Advertising and Marketing	4	1	10,929	8,193	75%	
Architecture, Design and Visual Arts	22	8	23,313	21,879	94%	
Film, TV and Radio	18	1	4,743	1,683	35%	
Music and Performing Arts	14	4	4,176	6,810	163%	
Publishing	11	6	12,996	14,283	110%	
Software and Interactive Content	17	4	23,361	22,320	96%	
Total Creative Occupations	86	24	79,518	75,168	95%	

Source: Statistics New Zealand Census of Population 2006

### 9. Conclusion

The development of the CCI tools, methodology and the *Creative Trident* concept has substantially increased the ability of researchers to more consistently and accurately analyse and therefore understand the employment characteristics of creative activity. CCI's research has shown that Creative production activities can be analysed in employment terms from a census based data matrix that combines the employment within the specialist creative industry activity and the specialist occupations in a way that neither double counts nor excludes people or businesses because of shortcomings in occupation and industry classification schemes

The application of the Abstract Spine to sophisticated statistical repositories has helped reduce the potential complexity of implementing the analysis over shifting classifications when conducting time-series analysis or between different axes or dimensions such as occupations and industry classifications.

From this research CCI is confident in asserting that when it comes to measuring the Creative Workforce and Creative Buinesses two things are critical: that data available in the highest possible resolution of classification and in the most up to date classification. Low resolution can lead to an error rate within segments of 70% and between 20% and 30% in total. Modern Classifications exhibit less variability from resolution changes at the segment level and in total as well as being able to grow measurable employment by around 7%.

How the combined impact of resolution and modernity impact when analysing combined occupation and industry employment tables cannot be determined until the release of the 2006 Australian Census data late in 2007. CCI's analysis of the data from previous censuses does indicate that the Trident approach ameliorates but doesnt eliminate the variations from resolution shifts but this needs to be validated via the more relevant classifications systems. used in the past three Australian Censuses.

### **Further information**

The methodology and the issues surrounding the measurement of the *Creative Industries* are explored in greater depth on the Creative Industries National Mapping Project web site at <a href="http://wiki.cci.edu.au/">http://wiki.cci.edu.au/</a>>.

<a href="https://wiki.cci.edu.au/display/NMP/NMP+Publications">https://wiki.cci.edu.au/display/NMP/NMP+Publications</a>

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# **Appendix 1: Standard Classifications Encoded to the CCI Abstract Spine**

Acronym	Standard Name	Year	Issuer	Domain	Jurisdiction
ANZSCO	Australian and New Zealand Standard Classification of Occupations	2006	ABS, SNZ	Occupation	Australia, New Zealand
ASCED	Australian Standard Classification of Education	2000	ABS	Qualification	Australia
ASCO V2	Australian Standard Classification of Occupations, Second Edition	1997	ABS	Occupation	Australia
ASCO V1	Australian Standard Classification of Occupations, First Edition	1986	ABS	Occupation	Australia
CCLO V2	Classification and Classified List of Occupations Second Edition	1976	ABS	Occupation	Australia
ABSCQ	ABS Classification of Qualifications	1993	ABS	Qualification	Australia
ANZSIC06	Australian and New Zealand Standard Industrial Classification	2006	ABS, SNZ	Industry	Australia, New Zealand
ABIC06	Australian Business Industrial Classification	2006	ATO	Industry	Australia
ABIC93	Australian Business Industrial Classification	1993	ATO	Industry	Australia
ANZSIC93	Australian and New Zealand Standard Industrial Classification	1993	ABS, SNZ	Industry	Australia, New Zealand
ASIC83	Australian Standard Industrial Classification	1983	ABS	Industry	Australia
ASIC78	Australian Standard Industrial Classification	1978	ABS	Industry	Australia
ASIC69	Australian Standard Industrial Classification	1969	ABS	Industry	Australia
NZSCO	New Zealand Standard Classification of Occupations	1999	SNZ	Occupation	New Zealand
SIC	Standard Industrial Classification	1992	ONS	Industry	UK
SIC2003	Standard Industrial Classification	2003	ONS	Industry	UK
SOC	Standard Occupation Classification	2000	ONS	Occupation	UK

**Appendix 2:** The Occupation Classifications included within the Creative Segments Definition

	Segments Definition	
Segment Name	Occupation in ASCO_V2 (prefix e_)	Occupation in ANZSCO (prefix f_)
	e_222100 Marketing and Advertising Professionals	f_131111 Advertising and Public Relations Manager
ng ing	e_222113 Marketing Specialist	f_212411 Copywriter
Advertising & Marketing	e_222117 Advertising Specialist	f_225111 Advertising Specialist
	e_253419 Copywriter	f_225113 Marketing Specialist
Ac	e_599511 Desktop Publishing Operator	(becomes part of specialised design)
	e_212100 Architects and Landscape Architects	f_139911 Arts Administrator or Manager
	e_212111 Architect	f_211311 Photographer
	e_212113 Landscape Architect	f_211411 Painter (Visual Arts)
	e_212921 Naval Architect	f_211412 Potter or Ceramic Artist
	e_252311 Urban and Regional Planner	f_211413 Sculptor
	e_253000 Artists and Related Professionals Nfd	f_211499 Visual Arts and Crafts Professionals n.e.c.
	e_253100 Visual Arts and Crafts Professionals	f_224211 Archivist
ts	e_253111 Painter (Visual Arts)	f_224212 Gallery or Museum Curator
Ar	e_253113 Sculptor	f_232111 Architect
sual	e_253115 Potter or Ceramic Artist	f_232112 Landscape Architect
Vis	e_253179 Visual Arts and Crafts Professionals Nec	f_232311 Fashion Designer
Architecture, Design and Visual Arts	e_253211 Photographer	f_232312 Industrial Designer
gn (	e_253300 Designers and Illustrators	f_232313 Jewellery Designer
esi	e_253311 Fashion Designer	f_232411 Graphic Designer
e, Cl	e_253313 Graphic Designer	f_232412 Illustrator
tare	e_253315 Industrial Designer	f_232511 Interior Designer
itec	e_253317 Interior Designer	f_232611 Urban and Regional Planner
rch	e_253319 Illustrator	f_233916 Naval Architect
$\forall$	e_254911 Conservator	f_234911 Conservator
	e_254921 Museum or Gallery Curator	f_312111 Architectural Draftsperson
	e_312113 Architectural Associate	f_399311 Gallery or Museum Technician
	e_399913 Museum or Art Gallery Technician	f_399411 Jeweller
	e_498300 Jewellers and Related Tradespersons	f_399915 Photographer's Assistant
	e_498311 Jeweller	
	e_498381 Apprentice Jeweller	
	e_599917 Photographer's Assistant	

Segment Name	Occupation in ASCO_V2 (prefix e_)	Occupation in ANZSCO (prefix f_)
	e_129600 Media Producers and Artistic Directors	f_212111 Artistic Director
	e_129611 Media Producer	f_212112 Media Producer (Excluding Video)
	e_129613 Artistic Director	f_212113 Radio Presenter
	e_253415 Television Journalist	f_212114 Television Presenter
	e_253417 Radio Journalist	f_212311 Art Director (Film, Television or Stage)
	e_253515 Script Editor	f_212312 Director (Film, Television, Radio or Stage)
	e_253600 Film, Television, Radio and Stage Directors	f_212313 Director Of Photography
	e_253611 Art Director (Film, Television or Stage)	f_212314 Film and Video Editor
dio	e_253613 Director (Film, Television, Radio or Stage)	f_212315 Program Director (Television or Radio)
Film, TV and Radio	e_253615 Director Of Photography	f_212317 Technical Director
pun	e_253617 Film and Video Editor	f_212318 Video Producer
5	e_253621 Program Director (Radio or Television)	f_212399 Film, Television, Radio and Stage Directors Nec
л, Т	e 253623 Technical Director	f 212414 Radio Journalist
ili	e 253679 Film, Television, Radio and Stage Directors	f 212416 Television Journalist
	e_253711 Music Director	f_399511 Broadcast Transmitter Operator
	e_253900 Media Presenters	f_399512 Camera Operator (Film, Television or Video)
	e_253911 Radio Presenter	f_399517 Television Equipment Operator
	e_253913 Television Presenter	f_599912 Production Assistant (Film, Television, Radio or Stage)
	e_499213 Camera Operator (Film, Television or Video)	
	e_499215 Television Equipment Operator	
	e_499217 Broadcast Transmitter Operator	
	e_499223 Production Assistant (Film, Television or Radio)	
	e_253619 Stage Manager	f_211111 Actor
	e_253700 Musicians and Related Professionals	f_211112 Dancer or Choreographer
	e_253713 Singer	f_211113 Entertainer or Variety Artist
	e_253715 Instrumental Musician	f_211199 Actors, Dancers and Other Entertainers Nec
Arts	e_253717 Composer	f_211211 Composer
	e_253779 Musicians and Related Professionals Nec	f_211212 Music Director
mir	e_253800 Actors, Dancers and Related Professionals	f_211213 Musician (Instrumental)
rfor	e_253811 Actor	f_211214 Singer
Pel	e_253813 Dancer or Choreographer	f_211299 Music Professionals Nec
and	e_253879 Actors, Dancers and Related Professionals Nec	f_212316 Stage Manager
sic 8	e_499200 Performing Arts Support Workers	f_399513 Light Technician
Music and Performing	e_499211 Sound Technician	f_399514 Make Up Artist
_	e_499221 Light Technician	f_399516 Sound Technician
	e_499225 Production Assistant (Theatre)	f_399599 Performing Arts Technicians Nec
	e_499227 Make Up Artist	
	e 499279 Performing Arts Support Workers Nec	

Segment Name	Occupation in ASCO_V2 (prefix e_)	Occupation in ANZSCO (prefix f_)
	e_229211 Librarian	f_212211 Author
	e_229915 Archivist	f_212212 Book or Script Editor
	e_253400 Journalists and Related Professionals Nfd	f_212412 Newspaper or Periodical Editor
	e_253411 Editor	f_212413 Print Journalist
	e_253413 Print Journalist	f_212415 Technical Writer
Publishing	e_253421 Technical Writer	f_212499 Journalists and Other Writers Nec
lish	e_253479 Journalists and Related Professionals Nec	f_224611 Librarian
qnc	e_253500 Authors and Related Professionals	f_399312 Library Technician
<b>-</b>	e_253511 Author	f_599711 Library Assistant
	e_253513 Book Editor	f_599913 Proof Reader
	e_399711 Library Technician	
	e_619211 Library Assistant	
	e_619911 Proof Reader	
	e_223113 Systems Designer	f_225211 ICT Account Manager
¥	e_223115 Software Designer	f_225212 ICT Business Development Manager
ıten	e_223117 Applications and Analyst Programmer	f_232413 Multimedia Designer
VOL	e_223119 Systems Programmer	f_232414 Web Designer
De		f_261111 ICT Business Analyst
dia		f_261112 Systems Analyst
Me		f_261211 Multimedia Specialist
ive		f_261212 Web Developer
ract		f_261311 Analyst Programmer
nteı		f_261312 Developer Programmer
I pt		f_261313 Software Engineer
e aı		f_261399 Software and Applications Programmers Nec
var		f_263211 ICT Quality Assurance Engineer
Software and Interactive Media Devontent		f_263213 ICT Systems Test Engineer
$\infty$		f_263299 ICT Support and Test Engineers Nec
		f 313113 Web Administrator

# **Appendix 3: Resolution Matters: Examples of Industry Classifications**

### At the Subtotal and Detailed levels under ANZSIC93

Industry	Spine Segment	participation level	Employed 2001	Share of Parent
n_782 Technical Services			100,342	
n_7820 Technical Services, undefined	A95 STM	XZ	2,618	3%
n_7821 Architectural Services	A61 Design	XA VW Creative Participant	26,288	26%
n_7822 Surveying Services	A61 Design	XC External Services to VW	7,745	8%
n_7823 Consultant Engineering Services	A95 STM	XC External Services to VW	50,119	50%
n_7829 Technical Services N.E.C.	A95 STM	XZ	13,572	14%

Only 21% of ANZSIC93 3 digit classification n\_785 Marketing and Business Management Services is acountable by CCI to Creative Industries through 7851 Advertising Services

Industry4	Spine Segment	participation level	Employed 2001	Share of Parent
n_785 Marketing and Business Management Se	121,272			
n_7850 Marketing & Business Management Services, undefined	A31 Services	XW Broadly Defined	2,513	2%
n_7851 Advertising Services	A31 Services	XA VW Creative Participant	25,353	21%
n_7852 Commercial Art & Display Services	A61 Design	XA VW Creative Participant	14,558	12%
n_7853 Market Research Services	A31 Services	XC External Services to VW	11,623	10%
n_7854 Business Administrative Services	A31 Services	XW Broadly Defined	9,598	8%
n_7855 Business Management Services	A99	XC External Services to VW	57,627	48%

On the other hand 80% of ANZSIC93 3 digit classification 783 Computer Services is acountable by CCI to Creative Industries through 7834 Computer Consultancy Services

Industry4	Spine Segment	participation level	Employed 2001	Share of Parent
n_783 Computer Services			120,083	100%
n_7830 Computer Services, undefined	A32 Software	XW Broadly Defined	6,437	5%
n_7831 Data Processing Services	A32 Software	XC External Services to VW	9,005	7%
n_7832 Information Storage & Retrieval Services	A32 Software	XC External Services to VW	2,694	2%
n_7833 Computer Maintenance Services	A32 Software	XC External Services to VW	6,199	5%
n_7834 Computer Consultancy Services	A33 Interactive Content	XA VW Creative Participant	95,748	80%

# Appendix 4: Resolution Matters: The Relevance of 4 Digit Occupations under ASCO V2

Legend for the segment codes:

- CG 1 Music & Performing Arts
- CG\_2 Film, TV & Radio
- CG 3 Advertising & Marketing
- CG 4 Software & Digital Content
- CG 5 Publishing
- CG\_6 Architecture, Design & Visual Arts

code	code6	name	segment code	Creative Employed at 4digit#	Creative	Not Creative
1296	1296	Media Producers And Artistic Directors	CG_2	6,440		
	129600	Media Producers And Artistic Directors	CG_2		95	
	129611	Media Producer	CG_2		6,144	
	129613	Artistic Director	CG_2		201	
1296 Sum				6,440	6,440	
2121	2121	Architects And Landscape Architects	CG_6	12,880		
	212100	Architects And Landscape Architects	CG_6		29	
	212111	Architect	CG_6		11,135	
	212113	Landscape Architect	CG_6		1,716	
2121 Sum				12,880	12,880	
2129	212900	Other Building And Engineering Professionals	Not relevant			36
	212911	Aeronautical Engineer	Not relevant			816
	212913	Agricultural Engineer	Not relevant			212
	212915	Biomedical Engineer	Not relevant			505
	212917	Chemical Engineer	Not relevant			2,271
	212919	Industrial Engineer	Not relevant			821
	212921	Naval Architect	CG_6		249	
	212979	Building And Engineering Professionals Nec	Not relevant			911
2129 Sum					249	5,572
2221	2221	Marketing And Advertising Professionals	CG_3	40,190		
	222100	Marketing And Advertising Professionals	CG_3		567	
	222111	Public Relations Officer	Not relevant			11,842
	222113	Marketing Specialist	CG_3		21,243	
	222115	Market Research Analyst	Not relevant			3,108
	222117	Advertising Specialist	CG_3		3,430	
2221 Sum				40,190	25,240	14,950
2231	2231	Computing Professionals	CG_4	125,112		
	223100	Computing Professionals Nfd	Not relevant			10,690
	223111	Systems Manager	Not relevant			23,130
	223113	Systems Designer	CG_4		17,127	
	223115	Software Designer	CG_4		21,792	

code	code6	name	segment code	Creative Employed at 4digit#	Creative	Not Creative
	223117	Applications And Analyst Programmer	CG_4		29,631	
	223119	Systems Programmer	CG_4		4,367	
	223121	Computer Systems Auditor	Not relevant			848
	223179	Computing Professionals Nec	Not relevant			17,527
2231 Sum				125,112	72,917	52,195
2292	2292	Librarians	CG_5	10,193		
	229211	Librarian	CG_5		10,193	
2292 Sum				10,193	10,193	
2299	229900	Other Business And Information Professionals	Not relevant			127
	229911	Health Information Manager	Not relevant			880
	229913	Records Manager	Not relevant			1,393
	229915	Archivist	CG_5		765	
	229917	Policy Analyst	Not relevant			6,580
	229919	Intelligence Officer	Not relevant			1,180
	229979	Business And Information Professionals Nec	Not relevant			3,328
2299 Sum					765	13,488
2523	2523	Urban And Regional Planners	CG_6	5,373		
	252311	Urban And Regional Planner	CG_6		5,373	
2523 Sum				5,373	5,373	
2529	252900	Other Social Professionals	Not relevant			70
	252911	Historian	Not relevant			600
	252913	Interpreter	Not relevant			2,047
	252915	Translator	Not relevant			919
	252979	Social Professionals Nec	Not relevant			1,390
2529 Sum						5,026
2530	2530	Artists And Related Professionals	CG_6	3,861		
	253000	Artists And Related Professionals Nfd	CG_6		3,861	
2530 Sum				3,861	3,861	
2531	2531	Visual Arts And Crafts Professionals	CG_6	9,552		
	253100	Visual Arts And Crafts Professionals	CG_6		411	
	253111	Painter (Visual Arts)	CG_6		2,641	
	253113	Sculptor	CG_6		696	
	253115	Potter Or Ceramic Artist	CG_6		1,427	
	253179	Visual Arts And Crafts Professionals Nec	CG_6		4,377	
2531 Sum				9,552	9,552	
2532	2532	Photographers	CG_6	6,687		
	253211	Photographer	CG_6		6,687	
2532 Sum				6,687	6,687	
2533	2533	Designers And Illustrators	CG_6	33,576		
	253300	Designers And Illustrators	CG_6		3,198	

code	code6	name	segment code	Creative Employed at 4digit#	Creative	Not Creative
	253311	Fashion Designer	CG_6		2,547	
	253313	Graphic Designer	CG_6		20,823	
	253315	Industrial Designer	CG_6		1,864	
	253317	Interior Designer	CG_6		3,667	
	253319	Illustrator	CG_6		1,477	
2533 Sum 2534	2534	Journalists And Related Professionals	CG_1	33,576 16,317	33,576	
	253400	Journalists And Related Professionals Nfd	CG_5		1,361	
	253411	Editor	CG_5		3,875	
	253413	Print Journalist	CG_5		5,436	
	253415	Television Journalist	CG_2		933	
	253417	Radio Journalist	CG_2		605	
	253419	Copywriter	CG_3		902	
	253421	Technical Writer	CG_5		1,644	
	253479	Journalists And Related Professionals Nec	CG_5		1,561	
2534 Sum			_	16,317	16,317	
2535	2535	Authors And Related Professionals	CG_2	4,019		
	253500	Authors And Related Professionals	CG_5		84	
	253511	Author	CG_5		3,139	
	253513	Book Editor	CG_5		660	
	253515	Script Editor	CG_2		136	
2535 Sum				4,019	4,019	
2536	2536	Film, Television, Radio And Stage Directors	CG_2	6,712		
	253600	Film, Television, Radio And Stage Directors	CG_2		126	
	253611	Art Director (Film, Television Or Stage)	CG_2		210	
	253613	Director (Film, Television, Radio Or Stage)	CG_2		2,149	
	253615	Director Of Photography	CG_2		285	
	253617	Film And Video Editor	CG_2		1,369	
	253619	Stage Manager	CG_1		549	
	253621	Program Director (Radio Or Television)	CG_2		1,003	
	253623	Technical Director	CG_2		199	
	253679	Film, Television, Radio And Stage Directors	CG_2		822	
2536 Sum				6,712	6,712	
2537	2537	Musicians and Related Professionals	CG_1	8,801		
	253700	Musicians and Related Professionals	CG_1		227	
	253711	Music Director	CG_2		392	
	253713	Singer	CG_1		1,264	
	253715	Instrumental Musician	CG_1		6,530	
	253717	Composer	CG_1		321	

code	code6	name	segment code	Creative Employed at 4digit#	Creative	Not Creative
	253779	Musicians And Related Professionals Nec	CG_1		67	
2537 Sum				8,801	8,801	
2538	2538	Actors, Dancers And Related Professionals	CG_1	5,991		
	253800	Actors, Dancers And Related Professionals	CG_1		92	
	253811	Actor	CG_1		1,957	
	253813	Dancer Or Choreographer	CG_1		1,363	
	253879	Actors, Dancers And Related Professionals Nec	CG_1		2,579	
2538 Sum				5,991	5,991	
2539	2539	Media Presenters	CG_1	2,522		
	253900	Media Presenters	CG_2		106	
	253911	Radio Presenter	CG_2		2,073	
	253913	Television Presenter	CG_2		343	
2539 Sum				2,522	2,522	
2549	254900	Other Professionals	Not relevant			54
	254911	Conservator	CG 6		393	
	254913	Electorate Officer	Not relevant			1,700
	254915	Patents Examiner	Not relevant			246
	254917	Oenologist	Not relevant			1,168
	254919	Recreation Officer	Not relevant			3,774
	254921	Museum Or Gallery Curator	CG_6		836	
	254979	Professionals Nec	Not relevant			1,314
2549 Sum 3121	312100	Building, Architectural And Surveying Associate Professionals	Not relevant		1,229	8,256 204
	312111	Building Associate	Not relevant			21,155
	312113	Architectural Associate	CG_6		6,353	-
	312115	Surveying And Cartographic Associate	Not relevant			1,535
	312117	Building Inspector	Not relevant			2,957
	312119	Plumbing Inspector	Not relevant			310
	312121	Plumbing Engineering Associate	Not relevant			193
3121 Sum					6,557	26,150
3996 Sum					-	3,424
3997	3997	Library Technicians	CG_5	6,082		-
	399711	Library Technician	CG_5		6,082	
3997 Sum			_	6,082	6,082	
3999	399900	Other Miscellaneous Associate Professionals	Not relevant			115
	399911	Interior Decorator	Not relevant			1,391
	399913	Museum Or Art Gallery Technician	CG_6		229	
	399915	Radio Operator	Not relevant			1,963
	399917	Private Investigator	Not relevant			1,190

code	code6	name	segment code	Creative Employed at 4digit#	Creative	Not Creative
	399919	Security Adviser	Not relevant			769
	399979	Associate Professionals Nec	Not relevant			3,296
3999 Sum					229	8,724
4983	4983	Jewellers And Related Tradespersons	CG_6	4,117		
	498300	Jewellers And Related Tradespersons	CG_6		28	
	498311	Jeweller	CG_6		3,599	
	498313	Gem Cutter And Polisher	Not relevant			285
	498381	Apprentice Jeweller	CG_6		205	
4983 Sum				4,117	3,832	285
4992	4992	Performing Arts Support Workers	CG_1	9,968		
	499200	Performing Arts Support Workers	CG_1		215	
	499211	Sound Technician	CG_1		3,600	
	499213	Camera Operator (Film, Television Or Video)	CG_2		1,408	
	499215	Television Equipment Operator	CG_2		344	
	499217	Broadcast Transmitter Operator	CG_2		317	
	499219	Motion Picture Projectionist	Not relevant			894
	499221	Light Technician	CG_1		854	
	499223	Production Assistant (Film, Television Or Radio)	CG_2		904	
	499225	Production Assistant (Theatre)	CG_1		64	
	499227	Make Up Artist	CG_1		748	
	499279	Performing Arts Support Workers Nec	CG_1		620	
4992 Sum				9,968	9,074	894
5910	591000	Advanced Numerical Clerks, nfd	Not relevant			118
5995	5995	Desktop Publishing Operators	CG_3	1,869		
	599511	Desktop Publishing Operator	CG_3		1,869	
5995 Sum				1,869	1,869	
5996	599600	Travel Attendants	Not relevant			58
	599611	Flight Service Director	Not relevant			200
	599613	Flight Attendant	Not relevant			7,235
	599679	Travel Attendants Nec	Not relevant			589
5996 Sum						8,082
5999	599900	Other Miscellaneous Advanced Clerical And Service	Not relevant			66
	599911	Radio Despatcher	Not relevant			2,033
	599913	Auctioneer	Not relevant			937
	599915	Visual Merchandiser	Not relevant			2,636
	599917	Photographer's Assistant	CG_6		523	
5999 Sum					523	5,672
6192	6192	Library Assistants	CG_5	8,288		
	619211	Library Assistant	CG_5		8,288	

code	code6	name	segment code	Creative Employed at 4digit#	Creative	Not Creative
6192 Sum				8,288	8,288	
6199	619900	Other Intermediate Clerical Workers	Not relevant			157
	619911	Proof Reader	CG_5		530	
	619913	Debt Collector	Not relevant			9,487
	619915	Mail Supervisor	Not relevant			1,204
	619917	Court Orderly	Not relevant			1,302
	619919	Bailiff Or Sheriff	Not relevant			627
	619921	Coding Clerk	Not relevant			1,792
	619979	Intermediate Clerical Workers Nec	Not relevant			5,037
6199 Sum					530	19,606
Grand Total				328,550	270,308	7,689,554

# Appendix 5: The relevance of 3 digit Industry Classifications under ANZSIC06

ANZSIC06	Industry at Three Digits		Creative Industry Proportion
o_694	Advertising Services	5568	100%
o_541	Newspaper, Periodical, Book and Directory Publishing	10443	100%
o_542	Software Publishing	54	100%
o_552	Sound Recording and Music Publishing	321	100%
o_561	Radio Broadcasting	2316	100%
o_562	Television Broadcasting	2712	100%
o_570	Internet Publishing and Broadcasting	60	100%
o_591	Internet Service Providers and Web Search Portals	927	100%
o_601	Libraries and Archives	3912	100%
o_700	Computer System Design and Related Services	21669	100%
o_891	Museum Operation	2238	100%
o_900	Creative and Performing Arts Activities	5652	100%
o_551	Motion Picture and Video Activities	6075	74%
o_592	Data Processing, Web Hosting and Electronic Information Storage Services	2865	54%
o_699	Other Professional, Scientific and Technical Services	3192	51%
o_692	Architectural, Engineering and Technical Services	34500	39%
o_259	Other Manufacturing	4617	27%

