Title of Paper: **Australia's Creative Employment – An Analysis**

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Abstract

Despite being formally recognised for almost 20 years, only recently have researchers and policy-makers, both in Australia and overseas, begun to establish common ground in how to best define and measure the creative industries. Creative industries are commonly described as those economic activities that are characterised by new forms of cultural production. While all industries have embedded in them a degree of creativity, the creative industries can be distinguished because 'creativity' is their primary source of value.

To define and measure creative industries according to a fixed set of industry sectors or codes is insufficient to measure the true extent of Australia's creative workforce. Rather than being separate sectors of the economy, creative industries are a pervasive input to many, if not all industries. This fact is reflected in the statistical analysis presented in this paper which, besides measuring employment in creative industries, also identifies the employment of creative workers (by occupation) 'embedded' in other 'non-creative' industry sectors.

The analysis presented herein follows recent findings in the UK, by the National Endowment for Education, Science, Technology and the Arts (NESTA), which has broken new ground in the way creative occupations and industries are selected in an effort to improve accuracy in measuring the creative workforce. NESTA's analysis focuses on activities that define core creative production capacity and thereby excludes those manufacturing, distribution and retailing functions where these are able to be separated from the core creative industries and occupations.

The objective of this paper is to apply the NESTA methodology to the Australian system of industry and occupation classifications (as defined by the Australian Bureau of Statistics), to measure the size and growth of Australia's creative workforce.

Using the NESTA methodology for defining the creative workforce, this paper measures the creative industries' share of the Australian workforce according to the 'Creative Trident'. The creative trident focusses on the activities that define creative production capacity in both occupations and industries. It includes three categories: (1) creative occupations within the core creative industries (what we term 'specialists'); (2) creative occupations employed in other (non-creative) industries (termed 'embedded' creatives); and (3) non-creative occupations ('support staff') employed in the creative industries.

The findings reveal that over 530,000 workers are employed in creative jobs throughout Australia, representing 5.29% of the workforce. Of those, approximately 370,000 or 70% are employed in the creative industries while 30% or about 162,000 are 'embedded' creatives working in other (non-creative) industry sectors. The data also reveals that, on the whole, Australia's creative workforce is growing. According to our analysis of ABS Census data, Australia's total trident creative employment grew at an average annual rate of 2.8% between 2006 and 2011, compared to 2.0% for all industries.

However, performance varies across creative segments and between states and territories, as the findings demonstrate.

Research objective

In the UK the National Endowment for Education, Science, Technology and the Arts (NESTA) has broken new ground in the way the set of creative occupations and industries are selected in an effort to improve accuracy in measuring the creative workforce. NESTA's analysis focuses on the activities that define creative production capacity and thereby excludes those manufacturing, distribution and retailing functions where these are able to be separated from the core creative industries and occupations.

The objective of this paper is to apply the NESTA methodology to the Australian system of industry and occupation classifications as defined by the Australian Bureau of Statistics (ABS), to measure the size and structure of Australia's creative workforce.

NESTA has defined creative occupations by assessing each occupation under a five-point scale of factors that are indicative or predictive of creative roles. Rather than the previous approach of selecting industry classifications on the basis of their perceived correctness, the NESTA methodology looks at every industry's 'creative intensity', that is, the share of the industry's employment held by creative occupations.

Using the NESTA methodology for defining the creative workforce, this paper measures the creative industries' share of the Australian workforce according to the 'Creative Trident'. The creative trident focusses on the activities that define creative production capacity in both occupations and industries. It includes three categories: (1) creative occupations within the core creative industries (what we term 'specialists'); (2) creative occupations employed in other (non-creative) industries (termed 'embedded' creatives); and (3) non-creative occupations ('support staff') employed in the creative industries.

The findings reveal that over 530,000 workers are employed in creative jobs throughout Australia, representing 5.29% of the workforce. Of those, approximately 370,000 or 70% are employed in the creative industries while 30% or about 162,000 workers are 'embedded' creatives working in other (non-creative) industry sectors. The data also reveals that, on the whole, Australia's creative workforce is growing. According to our analysis of ABS Census data, Australia's total trident creative employment grew at an average annual rate of 2.8% between 2006 and 2011, compared to 2.0% for all industries.

However, performance varies across creative segments and between states and territories, as our findings demonstrate.

Defining Creative Industries

Terms like 'the creative economy', 'creative employment' and 'creative industries' are still relatively new phrases in government policy, industry and academic discourse. As the United Nations (2008) explains, the creative industries concept "is of relatively recent origin, emerging in Australia in 1994 with the launching of the report, *Creative Nation*. It was given wider exposure by policy-makers in the United Kingdom in 1997, when the Government, through the Department of Culture, Media and Sport, set up the Creative Industries Task Force".

The creative industries are those areas of practice that turn original creativity into social and commercial outcomes. They draw on new ideas to produce artistic, cultural and aesthetic-functional products and services for local, national and international markets.

In terms of accurate statistical analysis, a challenge for researchers and policy-makers in Australia, is allocating the Australian Bureau of Statistics' detailed 'ANZSIC'[1] industry classifications into the commonly-accepted creative industry segment definitions.

Following the work of the ARC Centre of Excellence for Creative Industries and Innovation and

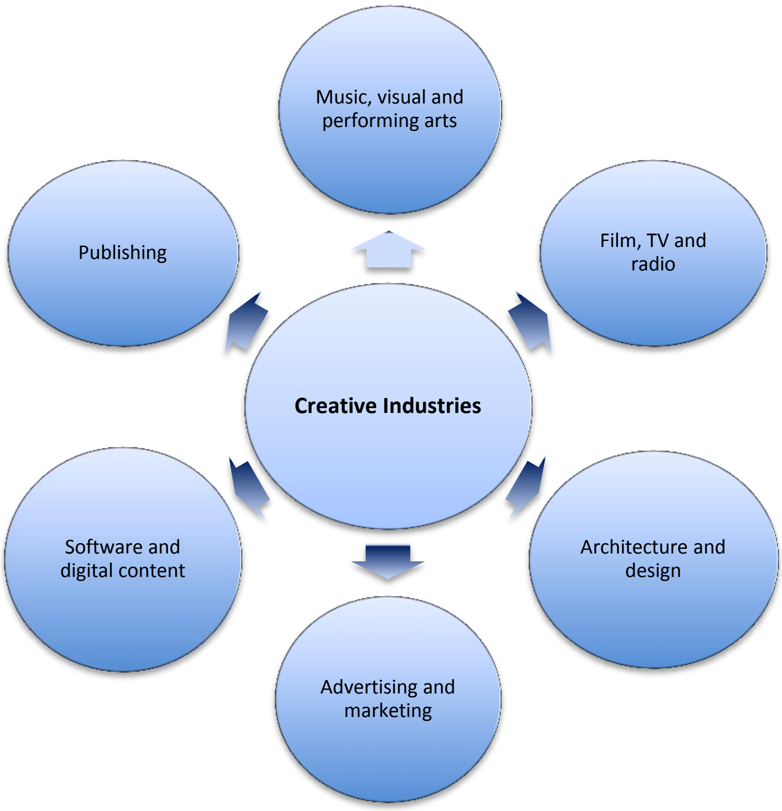
[1] Australian and New Zealand Standard Industrial Classification

others, in Australia, the accepted definition of 'creative segments' (or what are sometimes more simply referred to as creative industries), at least for the purpose of statistical analysis, consists of:

- Music, visual and performing arts;
- Film, TV and radio;
- Advertising and marketing;
- Architecture and design;
- Software and digital content; and
- Publishing.

This is a widely-accepted grouping which has improved upon earlier iterations by more accurately categorising industry sectors according to the role of 'creativity' as their primary source of value. It follows the methodology for categorising creative industries and creative occupations as determined in the UK by NESTA.

Figure 1: Creative Segments



Measuring Creative Employment

NESTA's most recent research paper, *A Dynamic Mapping of the UK's Creative Industries*[2], has broken new ground in the way the set of creative occupations and industries are selected in an effort to improve accuracy and to reduce distortions introduced by special interests and perpetuation of erroneous selections in previously used definitions.

The NESTA analysis focuses on the activities that define core creative production capacity and thereby excludes those manufacturing, distribution and retailing functions where these are able to be separated from the core creative industries and occupations. Hence, for example, the analysis counts employment in publishing businesses but not printers nor book stores; it also counts employment in post-production services and TV broadcasters but not providers of television transmission towers, and so on.

There is no standard definition of what makes up Australia's creative industries or occupations. Two major studies, *The Economic Contribution of Australia's Copyright Industries* by the Australian Copyright Council and the Australian Bureau of Statistics' *Employment in Culture Australia, December 2012* have different approaches to that used in this paper.

The ABS's 'cultural employment' definition of industries has until now, been much broader than that contained herein, as it includes zoos, botanical gardens, nature reserves, religious and funeral services, arts education, wholesaling and retailing activities. Conversely, it does not count elements of digital media and software development critical to cultural and creative production and consumption in Australia. However, the ABS has just released a discussion paper on the feasibility of establishing a Satellite Account for Cultural and Creative Industries. A number of Australian states are using the release of the results from the 2011 Census to update their creative employment estimates to better inform the 'refresh' of their creative industries development strategies.

The Copyright Industries report is broader again in its industry focus as its definition is based on the World Intellectual Property Organisation (WIPO) approach and includes wholesaling and retailing such as bookshops, newsstands and cinemas and the manufacture and wholesale of TV sets, computers, musical instruments, photographic materials, photocopiers, blank DVDs and paper, while it only counts part of architectural services, interior design and museums and galleries.

In this paper, we use the NESTA method for defining and measuring creative employment, which focuses on the activities that define core creative production capacity in both occupations and industries. Following the methodology developed for NESTA, the data presented in this paper, is based on an evaluation of Australia's occupation classifications using five criteria – those scoring 4 or 5 are considered 'creative occupations' (refer to Appendix 1 for an explanation of the five criteria). It then calculates the share of employment that creative occupations account for in each of the standard (ANZSIC) industry classifications to generate what it terms 'creative intensity'. Industry classifications with a creative intensity above a statistically determined threshold are deemed 'creative'.

The 'Creative Trident'

Measuring the creative industries' share of the Australian workforce needs to include 'specialist' creative activity and 'creatives' employed in other sectors of the economy. To capture the full range of employment types the 'Creative Trident' has been developed. It includes three categories:

1. Creative occupations within the core creative industries (what we term 'specialists');
2. Creative occupations employed in other (non-creative) industries (termed 'embedded'

[2] http://www.nesta.org.uk/about_us/assets/features/a_dynamic_mapping_othe_uks_creative_industries

creatives); and

3. Non-creative occupations (‘support staff’) employed in the creative industries.

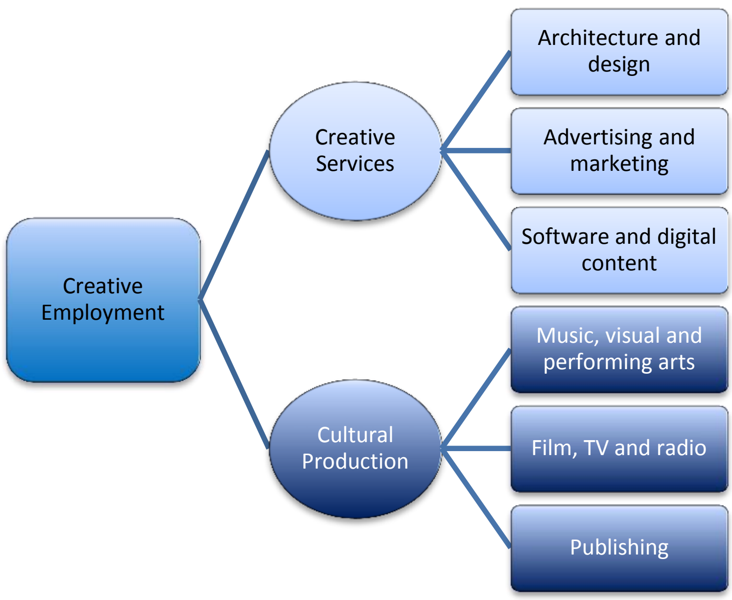
While the commonly-accepted ‘creative segment’ categorisations shown in Figure 1 are valid and also very useful for the purpose of statistical analysis, ‘creativity’ extends beyond rigid industry groupings. This is because, as Hartley (2005) notes, the creative industries depend on “some decidedly anti-industrial folk”. Rather than being separate sectors of the economy, creative industries are a pervasive input to many, if not all industries. This fact is reflected in the statistical analysis presented in this paper which, besides measuring employment in creative industries, also identifies employment of creative workers (by occupation) ‘embedded’ in other (non-creative) industry sectors.

Creative Services and Cultural Production Segments

Broadly speaking, the six creative segments fall into one of two sub-groups. One is the ‘creative services’ segments which include: architecture and design; advertising and marketing; and software and digital content. Creative services enterprises and (e.g. self-employed) individuals provide inputs that are central to businesses across many industries, from manufacturing and construction to retailing and entertainment. Representing what is in effect, a ‘creative services economy’, creative enterprises and individuals add value to production through design, technical performance, packaging and branding.

The ‘cultural production’ segments on the other hand include: film, TV and radio; music, visual and performing arts; and publishing. These sectors embody the role of arts and cultural assets as contributors to quality of life and community well-being and as important contributors to economic activity and economic development in their own right.

Figure 2: Creative services and cultural production segments



Using the Census data

Census data has a number of benefits for creative employment analysis. Firstly, it is an authoritative and inclusive source of data. Secondly, scaling factors, which can expose any results to challenge, have not been used either by the data gatherers or the analysts. The census does provide comprehensive and relatively accurate data that allows us to track changes from census to census, but it has a number of limitations.

The main limitations of census data for measuring creative employment arise directly because they are national datasets and are therefore, required to use standardised classifications to access the data. The census questions, the answers given, and the processes used to encode them, also shape the data. For instance, in the census data a person's industry of employment can only be encoded with one out of the approximately 600 standard industry codes that encompass all economic activity. Likewise an individual's occupation of employment can be classified with approximately 1,000 occupations of which some 90 are considered to be 'creative'.

Some occupation codes are quite specific, e.g. "landscape architect" while others may include a mix of occupations that from some points of view seem relatively unrelated - for example, the ANZSCO[3] code 211499 Visual Arts and Crafts Professionals n.e.c (not elsewhere classified) includes New Media Artist, as well as Leadlighter and Textile Artist.

The census gathers information on a person's main job only through a series of questions such as "In the main job held last week, what was the person's occupation?" with a similar question for the industry of employment. Unfortunately, we can't use census data to calculate how many people were also working in a second job in a creative or non-creative field and the only data available, from the Throsby series of surveys for the Australia Council[4], addresses cultural production occupations and not those in creative services. Throsby data indicates that some 37% of artists have only a single job, 33% have an additional arts-related job and 23% have an additional non-arts job while 8% have three jobs.

Another limitation is that income is gathered on total personal income from all sources which could include first and second jobs, grants and investment income. So, unfortunately, there is no way of knowing if the first job provides the bulk of the income for an individual and if the creative component of overall income is improving or reducing.

Despite these limitations, the census data is a valuable and authoritative source of data for assessing the quantum and growth of creative employment in Australia and for making direct comparisons between states/territories, cities and regions. To this end, this paper uses the NESTA method for defining and measuring Australia's creative industries explained above. Comparisons are made, where relevant, between states and territories.

Australia's creative employment – an overview

Using the trident method of analysis, as summarised in Table 1, according to the 2011 Census of Population and Housing, in total, 531,907 workers are employed in creative jobs throughout Australia, representing 5.29% of the workforce. Of those, 369,872 or 70% are employed in the creative industries; 30% or 162,035 workers are 'embedded' creatives working in other (non-creative) industry sectors.

[3] Australian and New Zealand Standard Classification of Occupations

[4] Throsby, C.D. and Hollister, V. (2003)

Table 1: Australia's creative employment across the creative trident, 2011

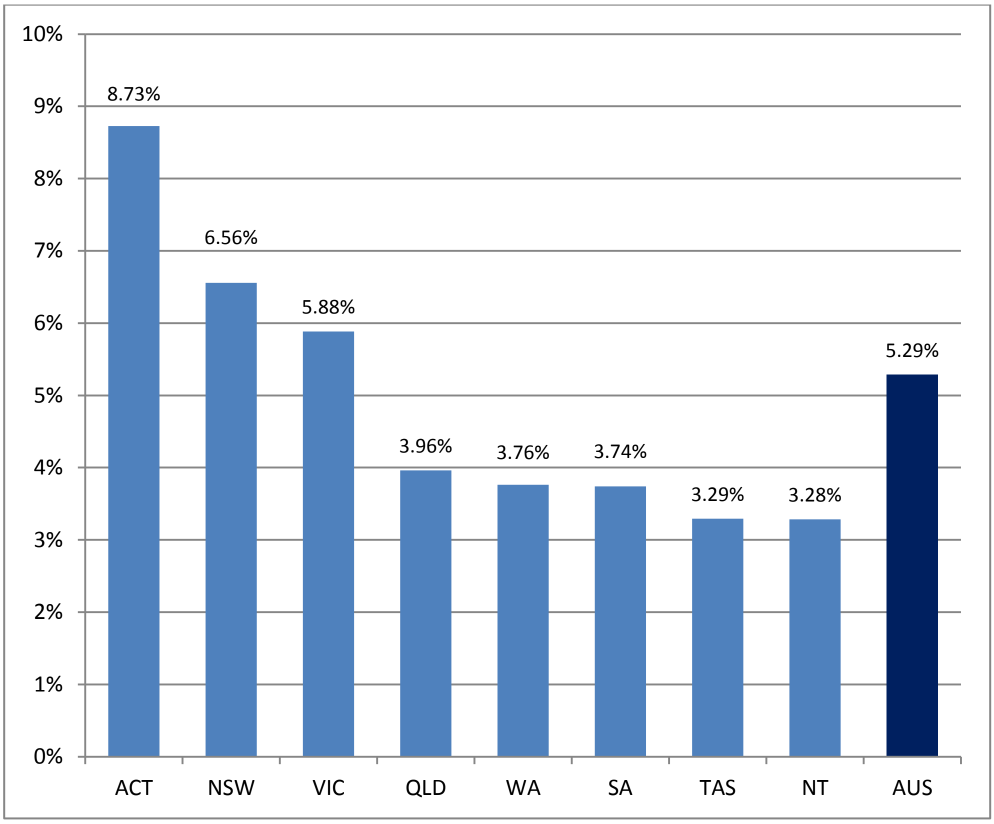
		In Creative Industries	In Other Industries	Total Workforce	Total (Trident) Creative Employment
Occupation of Employment	In creative occupations	148,222	***162,035***	310,257	
	In other occupations	221,650	9,525,238	9,746,888	
	Total Employment	***369,872***	9,687,273	10,057,145	**531,907**

Source: ABS Census of Population and Housing (2011) customised tables with analysis by the authors

As illustrated in Figure 3, the size of the creative workforce as a proportion of the total workforce differs between state and territory. The size of the creative workforces of the ACT, New South Wales and Victoria is greater than the national average in proportional terms. The ACT has the largest creative workforce is proportional terms, at 8.73% of the total, compared to the national average of 5.29%.

All of the remaining states and territories by comparison sit below the national average with respect to the size of their creative workforce as a proportion of total employment. The Northern Territory displays the smallest creative workforce in proportional terms, at 3.28% of the territory's workforce.

Figure 3: Creative employment as a proportion of the workforce, Australia's states and territories, 2011



Source: ABS Census of Population and Housing (2011) customised tables with analysis by the authors

Australia's creative trident employment by segment

Table 2 details Australia's trident creative employment in 2011, which is also illustrated in Figure 4. Creative employment falls into one of two sub-groups: one is the 'creative services' category, which includes: architecture and design; advertising and marketing; and software and digital content. The other is the 'cultural production' category, which includes: film, TV and radio; music, visual and performing arts; and publishing.

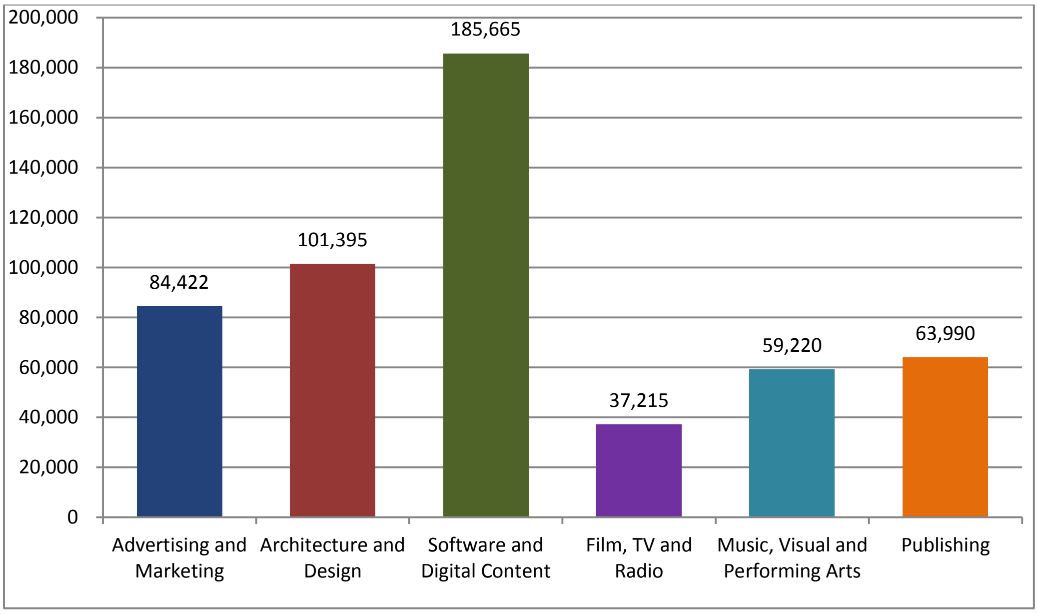
Table 2: Australia's creative trident employment summary by segment, 2011

	Creative Services segments				Cultural Production segments				
Australia's Creative Employment 2011	Advertising and Marketing	Architecture and Design	Software and Digital Content	**Total Creative Services segments**	Film, TV and Radio	Music, Visual and Perf. Arts	Publishing	**Total Cultural Production segments**	**Total Creative Workers**
Specialists	13,009	39,196	35,073	87,278	17,250	24,702	18,992	60,944	148,222
Support staff	17,448	26,390	109,766	153,604	16,703	20,739	30,604	68,046	221,650
Embedded	53,965	35,809	40,826	130,600	3,262	13,779	14,394	31,435	162,035
Total Creative Employment	**84,422**	**101,395**	**185,665**	**371,482**	**37,215**	**59,220**	**63,990**	**160,425**	**531,907**

Source: ABS Census of Population and Housing (2011) customised tables with analysis by the authors

Australia's largest creative segment is Software and digital content, which accounts for 185,665 jobs (specialist, support and embedded), or 35% of the Australia's total creative employment. This is followed by Architecture and design, which accounts for 101,395 jobs or 19% of Australia's creative employment. Australia's smallest creative segment is Film, TV and radio with 37,215 jobs or 7% of total creative employment in Australia.

Figure 4: Australia's creative trident employment by segment, 2011



Source: ABS Census of Population and Housing (2011) customised tables with analysis by the authors

Creative trident employment by segment and occupation type

Figure 5 illustrates the breakdown of Australia's creative employment by occupation type for each segment.

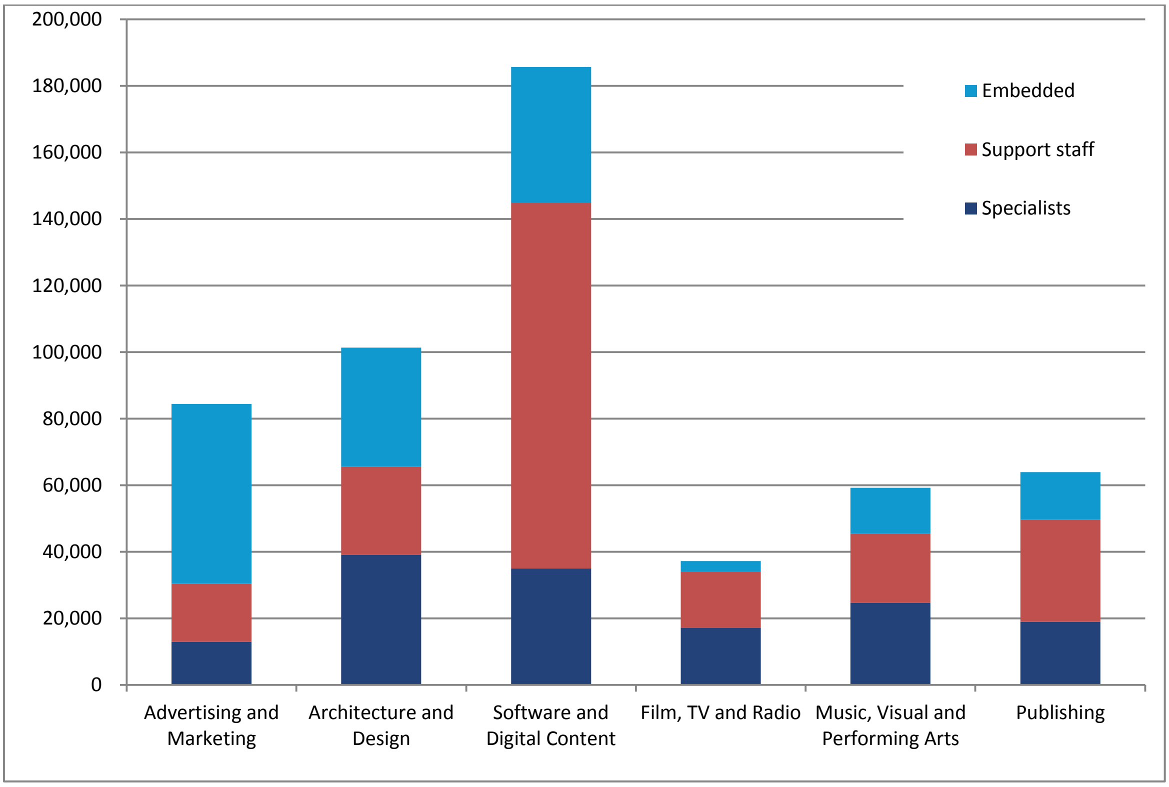
A large share of Australia's creative services workers are employed in other (non-creative) sectors. Around two-thirds (64%) of Australia's Advertising and marketing workers are embedded in other (non-creative) industries. Around one-third of Architecture and design workers are embedded in other industries. However, only 22% of Software and digital content workers are employed in other (non-creative) sectors.

Across the three cultural production segments, far fewer workers are employed in industries other than the cultural production segments themselves: 23% of Music, visual and performing arts employees are embedded in non-creative industries; 22% of Publishing workers; and just 9% of Film, TV and radio employees are employed in other non-creative industries.

The Film, TV and radio and Music, visual and performing arts segments employ the highest proportion of specialist creatives with 46% and 42% of total employment respectively.

The creative services segments of Advertising and marketing and Software and digital content employ the lowest proportions of specialist creatives with just 15% and 19% respectively.

Figure 5: Australia's creative trident employment breakdown by occupation and segment, 2011



Source: ABS Census of Population and Housing (2011) customised tables with analysis by the authors

Trends in Australia's creative employment

Table 3 summarises Australia's trident creative employment and average annual growth between 2006 and 2011. It shows that while Australia's total trident creative employment grew at an average annual rate of 2.8% between 2006 and 2011, creative employment in creative industries (excluding embedded) increased at the higher rate of 3.2% per annum over the period.

Table 3: Australia's creative trident employment growth summary, 2006 to 2011

Average Annual Growth Rate in Employment 2011		**In Creative Industries**	**In Other Industries**	**Total Workforce**	**Total Creative Employment**
2006	In creative occupations	123,120	***147,889***	271,009	
	In other occupations	192,994	8,639,114	8,832,108	
	Total 2006	***316,114***	8,787,003	9,103,117	***464,003***
2011	In creative occupations	148,222	***162,035***	310,257	
	In other occupations	221,650	9,525,238	9,746,888	
	Total 2011	***369,872***	9,687,273	10,057,145	***531,907***
Average Annual Growth Rate, 2006-2011	In creative occupations	3.8%	1.8%	2.7%	
	In other occupations	2.8%	2.0%	2.0%	
		3.2%	**2.0%**	**2.0%**	**2.8%**

Source: ABS Census of Population and Housing (2011) customised tables with analysis by the authors

Comparing states and territories, between 2006 and 2011, Western Australia, along with Victoria, experienced the nation's highest average annual rate of growth in trident creative employment, at 3.2%.

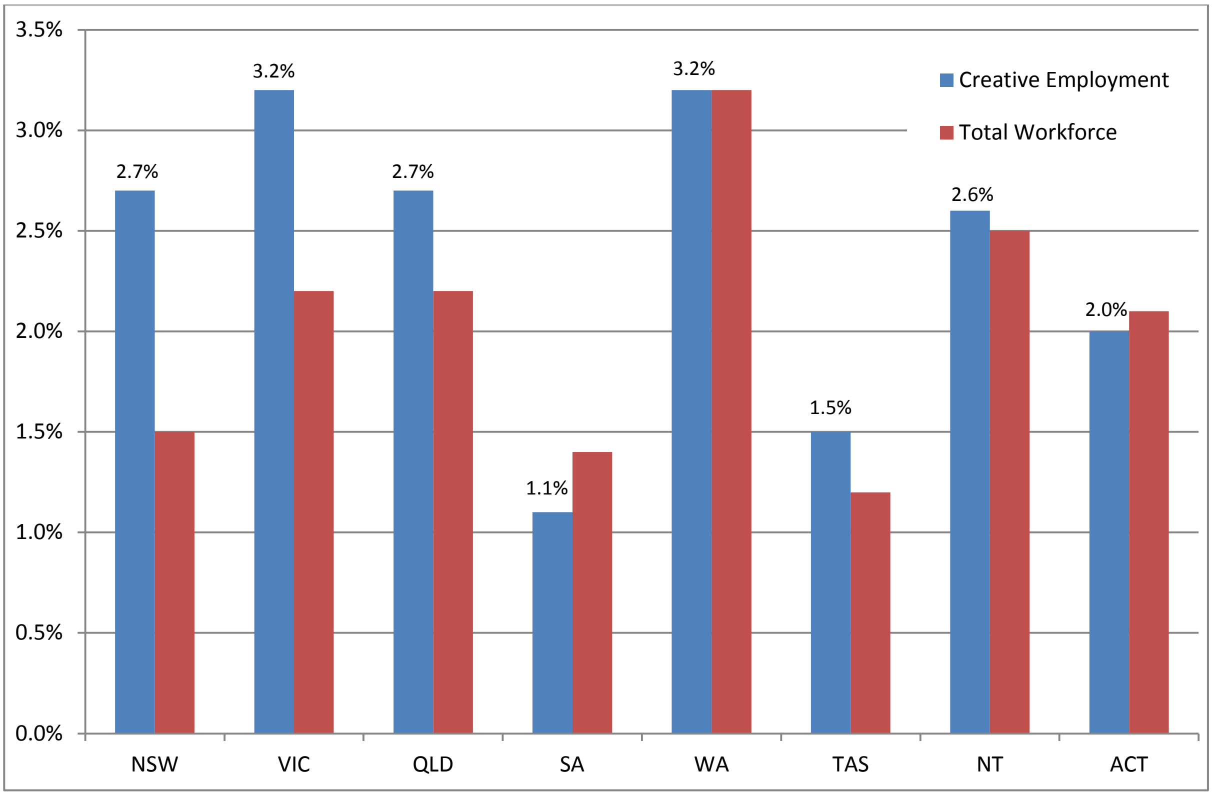
Western Australia's creative employment growth was on par with its total workforce growth over the period. In all other states and territories with the exception of South Australia and the ACT, creative employment growth exceeded the rate of total workforce growth over the five years to 2011.

Nationally, the creative services experienced the strongest growth between 2006 and 2011, with the Software and digital content segment showing the highest average annual rate of growth, of 4.6%, followed by Architecture and design, which grew at an average annual rate of 3.1% and Advertising and marketing, which grew by 2.9% per annum over the period.

Nationally, the cultural production segments did not perform as strongly as the creative services. Employment in Australia's creative services grew at an average annual rate of 3.8% between 2006 and 2011. Australia's cultural production segments on the other hand experienced relatively little change in employment at 0.2% per annum.

Music, visual and performing arts (1.8%) grew at a rate below the nation's average workforce growth between 2006 and 2011 while employment in Publishing actually fell by 1.1% per annum. Film, TV and radio on the other hand increased at a rate marginally above the national workforce growth rate, at 2.1% per annum over the period.

Figure 6: Average Annual Growth in Creative Employment by State/Territory, 2006 to 2011



Source: ABS Census of Population and Housing (2011) customised tables with analysis by the authors

Trends in Australia's creative employment by state and territory

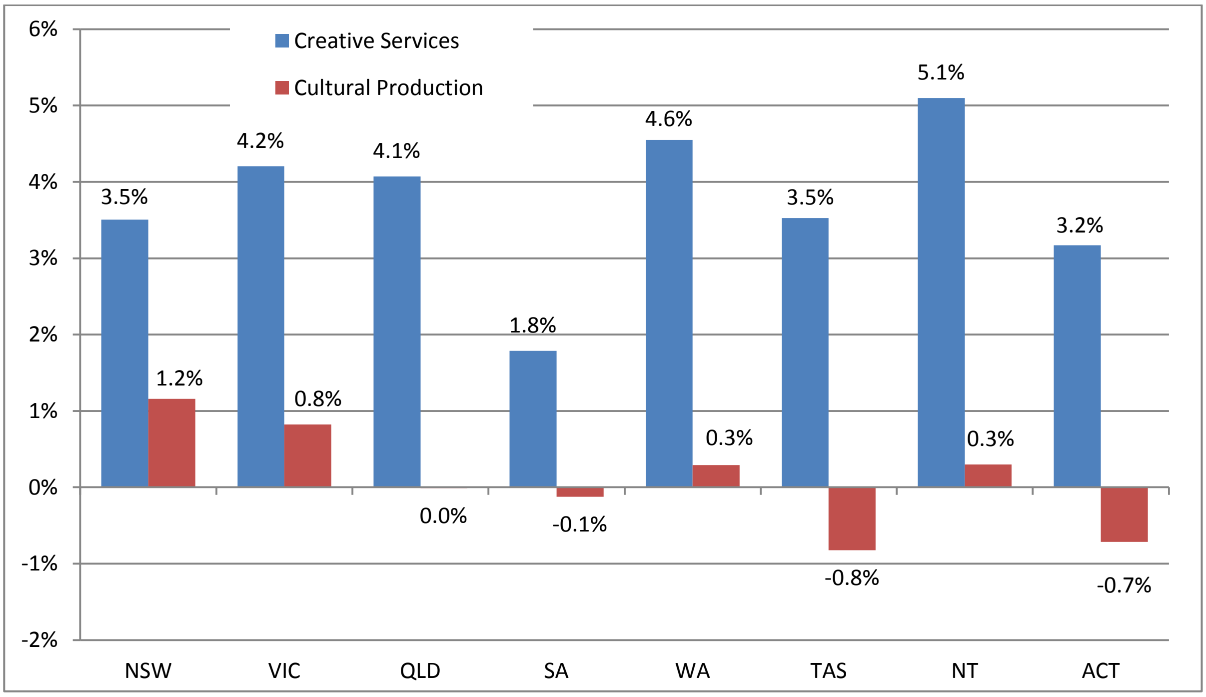
Figure 7 illustrates average annual growth rates by state and territory for both the creative services and cultural production segments. It shows that perhaps with the exception of South Australia, all states and territories experienced a healthy rate of growth in creative services employment with all at close to or above the national average.

Figure 7 also illustrates the relatively poor rates of growth in employment in the cultural production segments nation-wide, with only New South Wales showing a rate of growth above 1 per cent per annum over the five years to 2011.

Figure 8 provides a more detailed illustration of creative employment growth by segment for each state and territory. In all states and territories, the Software and digital content segment displayed the strongest rates of employment growth over the period (particularly in Queensland), with the exception of the ACT where Advertising and marketing showed the highest rate of employment growth.

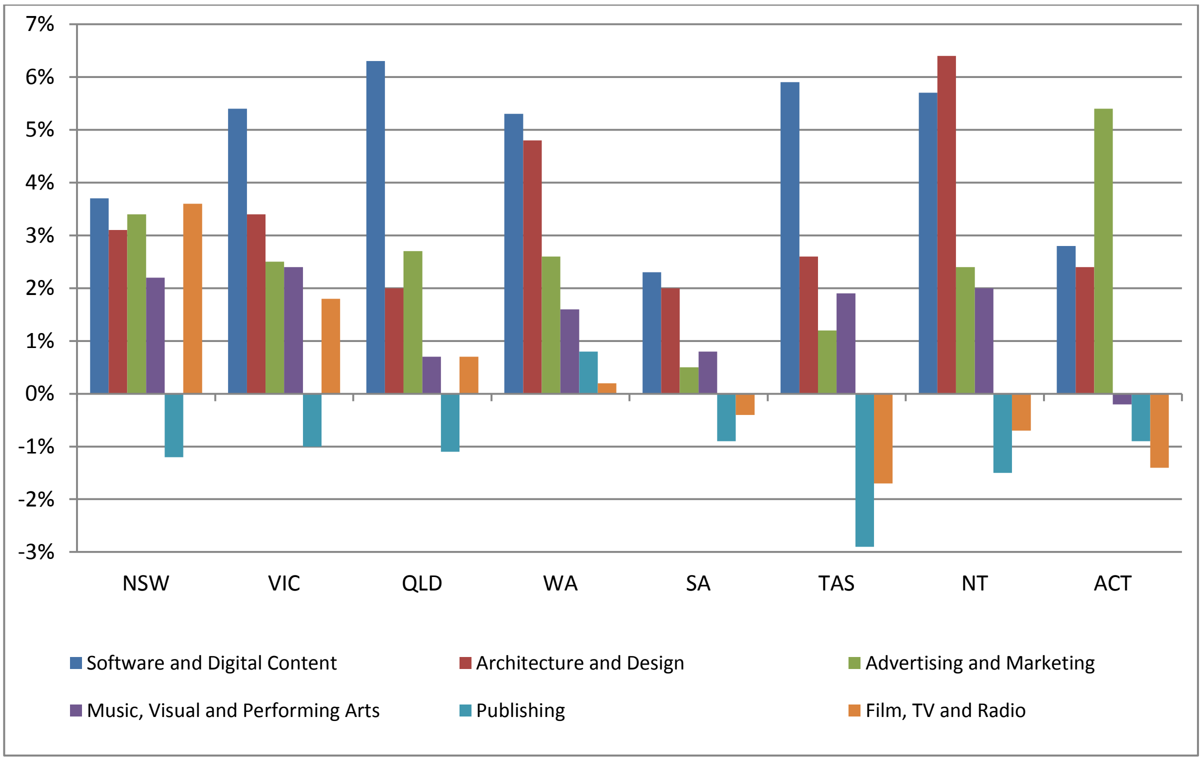
Figure 8 also shows that with the exception of Western Australia, the Publishing segment experienced a decline in employment over the five years to 2011. In fact, nationally, Western Australia was the only state where creative employment growth was either static or positive across all segment totals including Publishing.

Figure 7: Average Annual Growth in Creative Services and Cultural Production Employment by State/Territory, 2006 to 2011



Source: ABS Census of Population and Housing (2011) customised tables with analysis by the authors

Figure 8: Average Annual Growth in Creative Employment by Segment by State/Territory, 2006 to 2011



Source: ABS Census of Population and Housing (2011) customised tables with analysis by the authors

Growth in creative occupations: top ten nationally

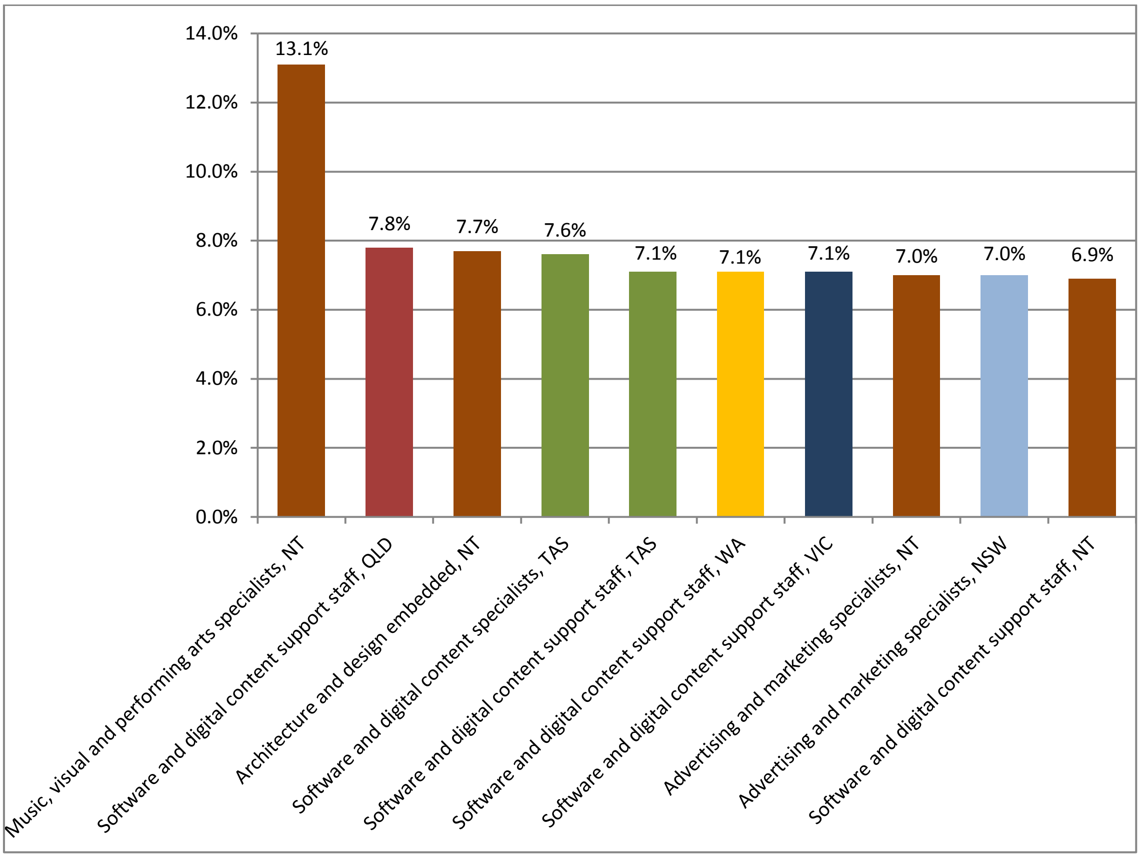
Figure 9 shows the average annual rates of growth in employment for the top ten creative occupations by segment nationally.

With the exception of specialist creatives in the Northern Territory's Music, visual and performing arts segment, which grew from a very small base, the majority of creative occupations which displayed comparatively high employment growth throughout Australia were in the creative services economy.

The majority of the top ten performers in terms of employment growth were either support staff or specialists in the creative services.

The Software and digital content sector has been the most prominent creative industries growth segment nationally, led by Queensland with an average annual growth rate of 7.8%.

Figure 9: Average Annual Growth in Australia's Creative Employment: Top Ten Occupations by Segment, 2006 to 2011



Source: ABS Census of Population and Housing (2011) customised tables with analysis by the authors

Conclusions

To define and measure creative industries according to a fixed set of industry sectors or codes is insufficient to measure the true extent of Australia's creative workforce. Rather than being separate sectors of the economy, creative industries are a pervasive input to many, if not all industries. This fact is reflected in the statistical analysis presented in this paper which, besides measuring employment in creative industries, also identifies the employment of creative workers (by occupation) 'embedded' in other 'non-creative' industry sectors.

This paper has applied the NESTA methodology to the Australian system of industry and occupation classifications (as defined by the ABS), to measure the size and growth of Australia's creative workforce. NESTA's methodology improves on previous attempts to measure Australia's creative workforce by focusing on activities that define core creative production capacity in industries and occupations.

Applying NESTA's methodology, the analysis shows that approximately 532,000 workers are employed in Australia's creative segments. Of those, 369,872 or over two-thirds (69%) are employed in the creative industries as 'specialist' creatives or support staff; 31% or approximately 162,035 are 'embedded' creatives working in other (non-creative) industry sectors such as public administration, professional services, education and manufacturing.

The creative workforce represents 5.29% of Australia's total workforce. Approximately 70% of all creative occupations in Australia are in the 'creative services economy' with 30% employed in the 'cultural production' segments. This 70/30 split between creative services and cultural production segments is typical of most of Australia's states and territories.

Australia's creative workforce grew at an average annual rate of 3.2% or by approximately 68,000 workers, from 464,003 in 2006 to 531,907 in 2011. This rate of change in employment in the creative economy is substantially higher than the rate of Australia's total workforce growth, of 2% per annum over the same period. Throughout Australia, creative employment growth has been strongest in the creative services.

It is clear from the preceding analysis that the creative workforce comprises an eclectic group of industries and occupations, each of which vary in size and recent employment growth. Importantly, the findings presented herein introduce a new and more accurate way of measuring creative employment to inform a renewed approach to Australia's creative industries research as well as creative industries policy and strategy formulation, both nationally and at the regional levels.

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Appendix

NESTA's five criteria for defining creative occupations

NESTA's Dynamic Mapping report defined creative occupations as "those roles that utilise a range of 'creative and design skills' to create new or significantly different or enhanced services, artefacts and products of value, irrespective of the industries in which they do this. These creative skills involve a combination of original thought – with the most creative skills involving inspired problem-solving – within defined processes to deliver or realise the output. This combination of inspiration and implementation, we argue, also makes these roles more resistant to mechanisation."

This definition was constructed not on the basis of some abstract schema but by looking at how creatives actually functioned in the creative economy. It is based, in short, on an economic model. The analysis focuses on the activities that define core creative production capacity and thereby excludes those manufacturing, distribution and retailing functions where these are able to be separated from the core creative industries and occupations. Hence, for example, the analysis counts employment in publishing businesses but not printers nor book stores; it also counts employment in post-production services and TV broadcasters but not providers of television transmission towers, and so on.

Importantly, using the NESTA methodology, creative employment includes both 'specialist' creative activity and 'creatives' employed in other (non-creative) sectors of the economy.

The NESTA definition of 'creatives' – the specialists working in the core creative segments and the 'embedded' creatives in other (non-creative) industries - was operationalised into five criteria:

1. **Non-Uniformity** – Is the 'output' associated with the occupation likely to vary each time it is created because of the interplay of factors, skills, creative impulse and learning? A journalist's stories are never the same while a printer on a newspaper press is producing the 100,000 copies of the same product within every print run.
2. **Creative Output** – Is the output of the occupation mostly perceived as novel or creative irrespective of the context in which it is produced - one such context being the industry (and its standard classification) of the organisational unit that hosts or employs the role? For example, a musician working on a cruise ship (a transport industry) is still considered creative while a printer working within a bank is probably operating printing technology and hence would be considered mechanistic and not creative.
3. **Not mere transformation** – Does the role merely 'shift' the service or artefact's form or place or time? For instance, a draftsperson/CAD technician takes an architect's series of 2D sketches or perspective drawings and renders them into a 3D model of the building. While great skill and a degree of creative judgement is involved in this task, arguably the bulk of the novel output is generated by the architect and not by the draftperson. Similarly a cinema operator is responsible for operating a machine to convert images on film or hard disk, through a projector, on to a screen. Both occupations are important in their respective ecosystems - but they are shifting the format if you will and not making crucial creative decisions.

4 **Novel process** – Does the role most commonly solve a problem or achieve a goal, even one that has been established by others, in novel ways? Even if there exists a well-defined process for achieving a solution, is creativity exhibited at many stages of the process? So not only is the output novel (point 1), but also the process that is gone through is very often novel.

5 **Mechanisation-resistant** – Creative occupations are arguably less exposed to substitution through mechanisation.

With the experience gained in scoring each of the UK classifications on the five criteria described above, we undertook the same exercise for the Australia and New Zealand Standard

Classification of Occupations (ANZSCO) that was released in 2006.

The ANZSCO specification has 998 classifications at the 6-digit level – that is, the most fine-grained classification of occupations - but the data from the most recent ABS Census of Population and Housing (2011) has 1,534 unique occupation classifications. This is the difference resulting from the ABS's strategy for managing the uncertainty in how a job description on a specific Census form should be classified if it doesn't clearly fit an established 6-digit occupation.

In practice the ABS has created some 500 broader classifications (coding bins) by adding trailing zeros at the Major Group, Sub-Major Group, Minor Group and Unit Group levels of occupation classification to bring the number of digits to 6. All occupations that were likely to be within the scope of the grid scoring criteria were analysed and the total score calculated. Occupations with a grid score of 4 or 5 were deemed creative.

The main difference between the creative occupations calculated this way (using the NESTA methodology) from the previous definition is that a number of technician and other creative support roles - 231 in all - have been deemed not creative. These occupations include Architectural Draftsperson, Web Administrator, Gallery, Library and Museum Technicians, Performing Arts Technicians, Broadcast Transmitter Operator, Camera Operator (Film, Television or Video), Light Technician, Sound Technician, Television Equipment Operator, Performing Arts Technicians n.e.c (not elsewhere classified), Photographer's Assistant, Library Assistants and Proof Reader. Conversely, applying the NESTA methodology, three occupations related to Public Relations were added as they met or exceeded the minimum grid score criteria to be deemed creative.