



The role and value of design

Working paper: Measuring and defining design

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05 August 2015



1. Introduction

Currently celebrating its 70th anniversary, Design Council is at the forefront of championing the role and importance of design. Following the launch of the Design Economy series, Design Council asks:

"In an age of austerity, rising inequality, urbanisation and ageing populations, climate change, the redefinition of the role of the state, big data and ubiquitous surveillance, how are we, as a society, to assess the risks and opportunities found in design's ascendancy?"

Design Council News 27th April 2015¹

Research is a key aspect of this. In the context of recent updates to the Department for Culture, Media and Sport's (DCMS) Creative Industries Economic Estimates² and detailed sub-sector reports on economic impact across other aspects of the creative industries, Design Council has identified the need to update, and expand upon, its 2005, 2008 and 2010 industry research in order to articulate a robust and complete picture of the value of design. To this end, TBR has been commissioned to undertake research to measure the economic impact of design in the UK economy.

1.1 Aim and core research questions

The aim of this research is to articulate the value of and investment in design in the UK. This will be done by assessing the contribution of design to the UK economy, including gross value added (GVA), productivity, turnover, employment and exports of goods and services. Further specific aims include focussing on the contribution of micro-businesses, the value of design across sectors, and a regional breakdown of the design sector.

The core research questions that the study will address are:

1. What is the value of design to the UK economy in terms of GVA, productivity, turnover and exports (products and services) across all sectors including, but not limited to, the Creative Industries?
2. How much of a contribution does design make to exports?
3. How many designers are employed in UK?
4. What proportion of designers are employed in-house, in design consultancies and in zero-class businesses (micro-businesses and sole traders under the VAT threshold)?
5. Where, in the UK, are designers and design businesses located?
6. In which sectors and regions is design under-used?
7. What are the demographics of the design workforce?
8. How has the design sector changed over time?
9. What is the value of design to UK localities?
10. Where are design clusters located across the UK?
11. What is the comparative performance of design-active firms?
12. What is the return on design investment for an organisation?

¹ See: designcouncil.org.uk/news-opinion/design-economy-series-how-design-transforming-way-we-live-work-and-play-forever - last accessed 30th July 2015

² See: gov.uk/government/collections/creative-industries-economic-estimates - last accessed 30th July 2015

1.2 Research approach

The majority of previous research looking at the direct economic value of design has been undertaken by Design Council, Creative & Cultural Skills or as part of the DCMS Creative Industries Economic Estimates. Creative & Cultural Skills and DCMS have tended to draw on secondary data from the Office for National Statistics (ONS), interrogated using Standard Industrial and Occupational Classification codes (SIC and SOC codes). In the past, the Design Council has followed broadly the same approach, but tended to accompany this with extensive primary research (usually in the form of a quantitative CATI³ survey).

A key aim in this project is to use a methodology which makes best possible use of existing secondary data from the ONS. The advantage of this is that it puts Design Council in the position of having an approach to valuing the direct impact of design that draws solely on secondary data, and therefore can be updated more regularly. Use of secondary data also removes the previous reliance on primary research, which is more costly and limited in coverage. Crucially, this approach also allows analysis of the design sector to be directly contextualised with the wider economy (other sectors as well as the Creative Industries).

A further benefit is that a secondary data approach aligns Design Council's research much more closely with the DCMS - 'talking the same language'. The research will follow (as closely as possible) the methodology used in the Creative Industries Economic Estimates, and draw on the same ONS data sources. However, it will build upon the DCMS approach to expand the coverage of the design footprint, include measures and use data sources that do not currently feature as part of the Economic Estimates. This follows the format of the Craft Council's recent Craft Economy research⁴, also delivered by TBR.

The desire to put in place an approach using existing secondary data is the key under-pinning rationale for the research methodology employed. The first ten of the research questions above will be addressed through the analysis of existing data from the ONS, including (but not necessarily limited to):

- Annual Population Survey (APS)
- Annual Business Survey (ABS)
- Inter-Departmental Business Register (IDBR)
- Business Population Estimates (BPE)
- Business Register and Employment Survey (BRES)
- International Trade in Services Survey (IT IS)
- UK Trade in Goods by class of Product Activity (UK TGPA)
- Supply and Use Tables

The final two questions will be addressed by taking a case study approach to analysing the financial performance of a specific cohort of design active firms and comparing this to average firm. Where appropriate/necessary, the ONS data sets will be supplemented with existing industry data, business directory data and records from Companies House.

The main drawback to this approach (outweighed by the benefits) is that the study is necessarily restricted by the structures of the data sources used. This means that some measures used will be different to those previously covered (as the project will not be designing its own questionnaires) and that the definition of design must follow standard approaches to classification used by the data sets. Specifically, the project will need to be underpinned by a definition of design based on Standard Industrial Classification (SIC) and Standard Occupational Classification (SOC) codes.

³ Computer-Assisted Telephone Interviewing

⁴ TBR for the Crafts Council (2014) *Measuring the Craft Economy*: craftscouncil.org.uk/downloads/measuring-the-craft-economy

For more information and detailed descriptions of SIC codes see:

ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/standard-industrial-classification/index.html

For more information and detailed descriptions of SOC codes see:

ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/soc2010/index.html

1.3 What is design?

Design is most often defined using a textual description, which emphasises its broad spectrum as a creative methodology for many purposes, with the Chief Design Officer of Design Council going so far as saying 'everything man-made has been designed, whether consciously or not'⁵.

The 2005 Cox Review considered design to be the link between creativity and innovation, shaping ideas into practical and attractive propositions, and suggested that design could be described as creativity deployed to a specific end⁶.

A proposal from Design Council's industry sounding board at the outset of the study is that 'design is the creation of a proposition in a medium, using tools as part of a process'. Whilst all design is innately creative, the nature of each element of this definition has the potential differ between different types of designers⁷.

The aim of this project is to consider the full spectrum of design, from human-centred design (in which the process of design begins with the people being designed for and ends with solutions tailored to meet their needs) and technical design (in which the process is around the design and specification of an item, component or system).

Coverage of this spectrum is particularly important in order to encapsulate design in a manufacturing context, where the introduction of new products involves a range of design activities. However, it can be difficult in this area to draw the line between design and engineering, as a great deal of high level of engineering goes into aesthetics/usability. Research by Design Council into design in High Value Manufacturing⁸ provides a useful indicator, in finding that the further away from the end user an item/component/object, the more prescriptive and technical the design is likely to be.

The key challenge in this project is that, whilst helpful in communicating what design is, these textual descriptions are not easily aligned with the SIC/SOC systems. Having reviewed definitions of design used in previous research projects, along with the textual descriptions above, the following section outlines a best fit SIC/SOC definition for capturing design to take forward in the study.

⁵ Hunter, M. (2014) *What is design and why it matters*. thecreativeindustries.co.uk/uk-creative-overview/news-and-views/view-what-is-design-and-why-it-matters

⁶ Cox, G. (2005) *Cox Review of Creativity in Business: building on the UK's strengths*. webarchive.nationalarchives.gov.uk/20130129110402/http://www.hm-treasury.gov.uk/d/Cox_review-foreword-definition-terms-exec-summary.pdf

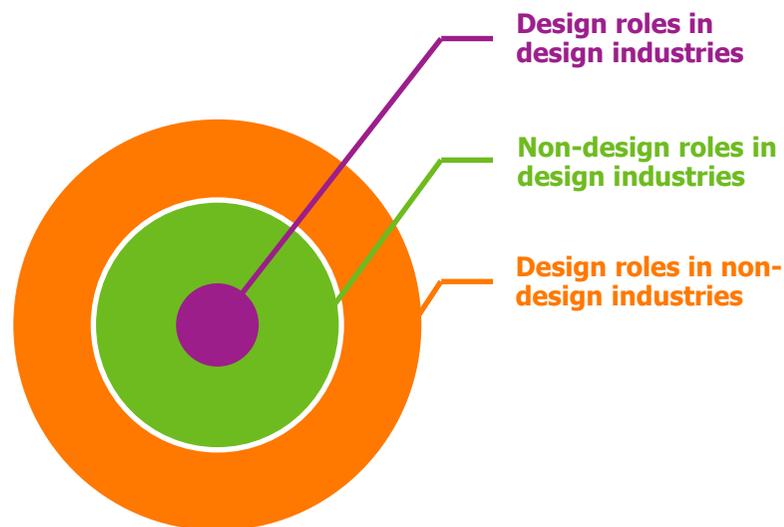
⁷ The proposition may be objects that are visible (a building, a dress, a kettle) or invisible (software code, policy, process). Likewise, the medium may also take various forms. For example: physical (pencil sketch, 3D model, painting), spatial (a building, a street grid) digital (computer game, app, sound), temporal (a process or sequence). The tools designers use (whether a pencil, a knife, a keyboard) will also vary in creative and reflective/analytic modes. Finally, the process designers may include one or more means of design inspiration and design review, working alone or in collaboration with others.

⁸ Design Council (2015) *Leading Business by Design: High value manufacturing* designcouncil.org.uk/resources/report/leading-business-design-high-value-manufacturing

2. A definition to take forward

Previous attempts to define and measure design in the UK using SIC and SOC codes have tended to be narrow and failed to capture the wide extent of design's contribution to the UK economy (see appendix, section 1, page 12). In particular, the DCMS Economic Estimates do not include those businesses outside of the creative industries which prominently feature design in their work. The aim of this project is to create a broader definition of design within the SIC/SOC systems, to encapsulate the full spectrum of design and be able to describe components within it in order to reflect the full design economy. Those working in design industries but also those in design roles outside of design industries, as per Figure 1 below.

Figure 1: The design economy



The approach to identifying codes follows the methodology used by the DCMS. Firstly we identify relevant design occupations (SOCs). We then assess how many people are employed in those occupations in different industries (SICs). Where there is a high concentration or 'intensity' of those people, the industry is considered to be a design industry. We use the same intensity threshold as the DCMS; 30% or more of the workforce in an industry must be employed in a design occupation in order for it to be considered a design industry.

2.1 Design occupations

Taking into account the SOCs used in previous studies and by identifying additional design relevant occupations through a detailed search of the occupation index, the SOC definition for designers is presented in Table 1 below. The table groups the SOCs into design sectors, provides summary notes on the reason for inclusion and also highlights where the SOC already forms part of the DCMS definition, albeit in most cases in a sector other than design. In some cases, the review raises the question of whether a whole SOC should be included, this is noted and discussed below the table. SOCs considered for inclusion but rejected are detailed along with reasons why in the appendix, section 4 (page 21).

Table 1: SOC definition for design roles

Design sector	SOC	SOC Description	Notes on inclusion	Sector in DCMS definition
Architecture & Built Environment	2121	Civil engineers	Description of SOC includes description of designing activity, researching and specifying: leading on design process. Also Noted by IPO as design intensive.	
Architecture & Built Environment	2431	Architects	Noted by IPO as design intensive. Clear need to include as part of architecture & built environment.	Architecture
Architecture & Built Environment	2432	Town planning officers	Clear need to include as part of architecture & built environment.	Architecture
Architecture & Built Environment	2435	Chartered architectural technologists	Clear need to include as part of architecture & built environment.	Architecture
Architecture & Built Environment	3121	Architectural and town planning technicians	Clear need to include as part of architecture & built environment also noted by IPO as design intensive.	Architecture
Architecture & Built Environment	3122	Draughtspersons	Important aspect of as part of architecture & built environment. Noted by Design Industry Sounding Board. Description of SOC makes reference to design activity and preparation of detailed technical design drawings/plans.	
Architecture & Built Environment	5113	Gardeners and landscape gardeners	Landscaping gardening important as an aspect of architecture & built environment. Noted by Design Industry Sounding Board. Challenge in that many of those employed in the SOC as Gardeners are likely to be less relevant. Consider including only part of SOC, see discussion below table.	
Design (Fashion & Textiles)	3422	Product, clothing and related designers	Classified as design in all previous research and current DCMS data.	Design: product, graphic and fashion design
Design (Fashion & Textiles)	5414	Tailors and dressmakers	Noted by IPO as design intensive. Description of SOC incorporates design and making of items.	

Design sector	SOC	SOC Description	Notes on inclusion	Sector in DCMS definition
Design (Advertising)	2473	Advertising accounts managers and creative directors	Noted by Design Industry Sounding Board. Description of SOC incorporates design and direction of campaigns.	Advertising and marketing
Design (Craft)	5211	Smiths and forge workers	Noted by IPO as design intensive. Designer-Makers noted by Design Industry Sounding Board as important to include.	Crafts
Design (Craft)	5411	Weavers and knitters	Noted by IPO as design intensive and part of pre-2014 DCMS definition. Designer-Makers noted by Design Industry Sounding Board as important to include.	Crafts
Design (Craft)	5441	Glass and ceramics makers, decorators and finishers	Noted by IPO as design intensive. Designer-Makers noted by Design Industry Sounding Board as important to include. Description of SOC incorporates design input into process of making.	Crafts
Design (Craft)	5442	Furniture makers and other craft woodworkers	Noted by IPO as design intensive. Designer-Makers noted by Design Industry Sounding Board as important to include.	Crafts
Design (Craft)	5449	Other skilled trades n.e.c.	Noted by IPO as design intensive. Designer-Makers noted by Design Industry Sounding Board as important to include. Description of SOC incorporates design input into process of making.	Crafts
Design (Digital)	2135	IT business analysts, architects and systems designers	Flagged through search of occupation index. Description of SOC incorporates descriptions of system design and the design process.	IT, software and computer services
Design (Digital)	2136	Programmers and software development professionals	Flagged through search of occupation index. Description of SOC incorporates descriptions of programme and software design and the design process.	IT, software and computer services
Design (Digital)	2137	Web design and development professionals	Flagged through search of occupation index. Clear need to include as important part of design. Description of SOC incorporates description of the design process.	IT, software and computer services
Design (Graphic)	3411	Artists	Flagged through search of occupation index and part of pre-2014 DCMS definition. Whilst this is clearly an important part of design, it is challenging to include all in this SOC as many will be working in art environments. Consider including only part of SOC, see discussion below table.	Music, performing and visual arts
Design (Graphic)	3421	Graphic designers	Classified as design in all previous research and current DCMS data.	Design: product, graphic and fashion design

Design sector	SOC	SOC Description	Notes on inclusion	Sector in DCMS definition
Design (Product/Industrial)	2122	Mechanical engineers	Noted by IPO as design intensive. Description of SOC includes, designing activity, determining, specifying, leading on the process, rather than following another's designs. The key space in which automotive/aircraft design is captured within the SOC system.	
Design (Product/Industrial)	2126	Design and development engineers	Noted by IPO as design intensive, part of pre-2014 DCMS definition and included by Creative & Cultural Skills. Description of SOC reflects the design process.	
Design (Product/Industrial)	2129	Engineering professionals n.e.c.	Flagged through search of occupation index. Engineers of many types are included in the SOC, many will not be relevant. However, it will capture those working in roles with a strong design engineering focus . E.g. aerospace. Consider including only part of SOC, see discussion below table.	

Where the review has suggested that only part of an SOC should be included the following actions will be taken:

- 5113 Gardeners and landscape gardeners.** The SIC/SOC system is particularly un-helpful when attempting to isolate landscape architecture and design. The occupation index points to SOC 5113 and the industrial index points to SIC 71.11/2 Urban planning and landscape architectural activities, which is a component of a much broader SIC 71.11 Architectural activities. As such, the logical solution would be to include only those people working as gardeners and landscape gardeners in SIC 71.11.

However, the latest data⁹ show that there are just over 145k people employed in SOC 5113, but of these only 830 are employed within 71.11. The vast majority of people employed within SOC 5113 (110k) work in SIC 81.30 Landscape service activities, with the rest (approx. 34k) distributed across a range of industries, likely to be reflecting care of grounds. Whilst the industrial index explicitly states that SIC 81.30 does not include landscape design and architecture activities (as they are covered in 71.11), the low proportion of people from SOC 5113 working in SIC 71.11 is illogical and suggests that it is important to include those also working within SIC 81.30 to ensure that this crucial part of the workforce is captured.

Solution: Include employment in SOC 5113 only where this occurs within SIC 71.11 and 81.30. This removed the 34k of employees who are most likely to be undertaking planting and maintenance, rather than planning and design. Whilst there is a risk that a proportion of those in

⁹ Annual Population Survey 2014 (Jan14-Dec14)

SIC 81.30 may not be undertaking planning and design work, there is no straightforward way to delineate between those who are and are not, removing the SOC as a whole risks excluding an important part of the sector footprint.

- **3411 Artists.** The description of this SOC clearly outlines important elements of the design process and design activity. However, many of those employed will be working as artists, rather than designers. There are currently just over 45k people employed in this SOC, the majority of which (31k) are employed in SIC 90.03 Artistic Creation. Whilst this SIC does contain some relevant design activities (e.g. animator, cartoonist), this is likely to be the area in which those people working purely as artists are captured.

Solution: Include employment in SOC 3411 only where people are working outside of SIC 90.03. Also exclude those working in an educational setting. This will capture artists working in alternative industrial settings, who are more likely to be involved in the process of design.

- **2129 Engineering professionals not elsewhere classified (n.e.c).** Just over 100k engineers of many types are included in this SOC. The category includes types of engineer that are clearly of relevance to the study (e.g. those working in the manufacture of air and spacecraft) and those who would not (e.g. those working in plumbing, heat and air-conditioning installation).

Solution: In order to include those engineers who are likely to making a design contribution, include only those working in product and industrial manufacturing industries (SIC 13-32), other creative industries (as per the DCMS definition) or those identified as design industries in the next section of this report.

2.2 Design industries

Using the SOCs identified in Table 1 above, the intensity of employment in each SIC within the classification system was calculated. The intensity is the proportion of people employed within the SIC that classified within one of the relevant design SOCs. For example, the first row in Table 2 (below) shows that SIC 71.11 has a design intensity of 70%. This means that 70% of people employed in SIC 71.11 are working in one of the relevant design roles listed in Table 1.

As noted above, following the DCMS approach, any industry with an intensity of 30% or above is considered to be a design industry. The final SIC definition for design industries is presented in Table 2 below. The table groups the SICs into design sectors, provides summary notes on the reason for inclusion and also highlights where the SOC already forms part of the DCMS definition, albeit in most cases in a sector other than design. SICs that were highlighted by having a high design intensity but were rejected for inclusion are detailed along with reasons why in the appendix, section 4 (page 21).

Table 2: SIC definition for design industries

Design Council Sector	SIC07	SIC description	Total Employment	Design Intensity	Notes on inclusion	DCMS CI Sector
Architecture & built environment	71.11	Architectural activities	100,283	70%	Very high intensity and natural to include as part of Architecture & built environment.	Architecture
Design	74.10	Specialised design activities	129,818	57%	Very high intensity and natural to include as part of core design sector.	Design
Design (Craft)	23.41	Manufacture of ceramic household and ornamental articles	8,731	47%	High intensity and included in Crafts Council definition as a key designer-maker industry.	
Design (Craft)	32.12	Manufacture of jewellery and related articles	7,701	62%	Very high intensity and included in Crafts Council definition as a key designer-maker industry.	Craft
Design (Digital)	58.21	Publishing of computer games	1,515	50%	High intensity and important part of digital design.	IT, software & computer services
Design (Digital)	58.29	Other software publishing	21,246	39%	High intensity and important part of digital design.	IT, software & computer services
Design (Digital)	62.01	Computer programming activities	269,312	45%	High intensity and important part of digital design.	IT, software & computer services
Design (Fashion & Textiles)	14.19	Manufacture of other wearing apparel and accessories	7,369	46%	High intensity and important part of fashion & textile design.	
Design (Product & Industrial)	16.29	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	11,740	36%	Although just above the threshold a large proportion of employment in 5442 and other relevant occupations are reflected.	

Design Council Sector	SIC07	SIC description	Total Employment	Design Intensity	Notes on inclusion	DCMS CI Sector
Design (Product & Industrial)	26.40	Manufacture of consumer electronics	6,833	29%	Although just under the threshold. The activity and range of occupations employed fits well with the product design process.	

Table 3 on the following page provides a simple overview of the design economy SIC/SOC definition to be applied in this study.

It is important to recognise that this is a best fit definition and that some elements of design will be more explicitly represented than others. For example, interior and exhibition design has been included as a specific category in previous Design Council research. In the SOC system this is embedded in SOC 3422: Product, clothing and related designers and in the SIC system 74.10 Specialised design activities. Both of these codes include a range of different design activities that is impossible to disaggregate. As such, it will not be possible to isolate interior design within the study.

A similar issue exists with service design. This is a newly emerging field and definition of the term is contested. Definitions have been suggested, including that service design:

- Is an approach concerned with the design of services. Service design can be both tangible and intangible, and can involve communication, environment and behaviours.¹⁰
- Addresses the functionality and form of services from the perspective of the user.¹¹
- Is the application of design within an interdisciplinary context.¹²
- Is the activity of planning and organizing people, infrastructure, communication and material components of a service in order to improve its quality and the interaction between service provider and customers.¹³

However, the various attempts at a definition of service design cannot be easily translated into a separate category measurable using the classification systems. As such, this activity remains embedded and measured within in the codes used.

¹⁰ Design Council (2010) Design Industry Insight

¹¹ Madano Partnership, for AHRC, Design Council & ESRC (2012) *Scoping study on service design*.

¹² Ibid.

¹³ service-design-network.org

Table 3: Overview of design economy definition

Design group	Design sector	SOC/ SIC	SOC Description/ SIC Description
Architecture & Built Environment	Architecture and Built Environment	2121	Civil engineers
		2431	Architects
		2432	Town planning officers
		2435	Chartered architectural technologists
		3121	Architectural and town planning technicians
		3122	Draughtspersons
		5113	Gardeners and landscape gardeners*
		71.11	<i>Architectural activities</i>
Design	Design	3422	Product, clothing and related designers
		74.10	<i>Specialised design activities</i>
	Design (Advertising)	2473	Advertising accounts managers and creative directors
	Design (Craft)	5211	Smiths and forge workers
		5411	Weavers and knitters
		5441	Glass and ceramics makers, decorators and finishers
		5442	Furniture makers and other craft woodworkers
		5449	Other skilled trades n.e.c.
		23.41	<i>Manufacture of ceramic household and ornamental articles</i>
		32.12	<i>Manufacture of jewellery and related articles</i>
	Design (Digital)	2135	IT business analysts, architects and systems designers
		2136	Programmers and software development professionals
		2137	Web design and development professionals
		58.21	<i>Publishing of computer games</i>
		58.29	<i>Other software publishing</i>
		62.01	<i>Computer programming activities</i>
	Design (Fashion & Textiles)	5414	Tailors and dressmakers
		14.19	<i>Manufacture of other wearing apparel and accessories</i>
	Design (Graphic)	3411	Artists*
		3421	Graphic designers
	Design (Product/Industrial)	2122	Mechanical engineers
		2126	Design and development engineers
		2129	Engineering professionals n.e.c.*
		16.29	<i>Manufacture of other products of wood etc</i>
		26.40	<i>Manufacture of consumer electronics</i>

* Subject to the exclusions described below Table 1, page 6.

3. Appendix I: Previous definitions of design

This appendix contains a review of definitions of design since DCMS’s seminal mapping of the creative industries in 1998 and up to the revised Creative Industries Economic Estimates. In order to focus on approaches that seek to use official statistics, this review has focussed on methodologies that use SIC and/or SOC codes, with the exception of the original 1998, and the 2001 iteration of, Creative Industries Mapping documents, which provide important context and have informed the subsequent definitions.

3.1 DCMS (1998 & 2001)

In 1998, the UK Department for Culture, Media and Sport defined the creative industries as ‘those industries which have their origin in individual creativity, skill and talent and which have the potential for wealth and job creation through the generation and exploitation of intellectual property.’¹⁴ Based on this definition, DCMS created mapping documents in 1998, updated in 2001, which were the first attempt to quantify the economic contribution of these industries. The 1998 documents were important for the creative industries, as they raised awareness of the industries and their importance, and aimed to also identify the issues and opportunities they faced¹⁵. These mapping documents categorised the creative industries into 13 sectors:

- Advertising
- Architecture
- Art and Antiques Market
- Crafts
- Design
- Designer Fashion
- Film and Video
- Interactive Leisure Software
- Music
- Performing Arts
- Publishing
- Software and Computer Services
- Television and Radio

The design sector, according to the 1998 mapping documents, included the activities and industries outlined in Table 4 below¹⁶:

Table 4: 1998 Creative Industries mapping document definition of Design

Core Activities	Related Activities	Related industries	Peripheral activities
Design consultancies	Fine art	Public relations and management consultancy	Manufacturing industry
The design component of industry	Graphic design	Architecture	Research and development within industry
	Fashion design		Modelling and prototype
	Crafts (eg small scale furniture makers)		
	Multimedia design		

¹⁴ Bakhshi, H., Hargreaves, I. & Mateos-Garcia, J. (2013) A Manifesto for the creative economy. Nesta. Pg 26-27. nesta.org.uk/sites/default/files/a-manifesto-for-the-creative-economy-april13.pdf

¹⁵ DCMS (2001) Creative Industries Mapping Documents: Foreword. gov.uk/government/publications/creative-industries-mapping-documents-2001

¹⁶ DCMS (1998) Creative Industries Mapping Documents: Design. gov.uk/government/uploads/system/uploads/attachment_data/file/193576/Creative_Industries_Mapping_Document_Design.pdf

Appendix I: Previous definitions of design

In the 2001 update to the Creative Industries Mapping, the design sector had broadened, largely due to recognition of advances in technology and the subsequent development of new design fields¹⁷:

Table 5: 2001 Creative Industries mapping document definition of Design

Core Activities	Related Activities	Related industries
Design consultancies	Fine art	Public relations and management
The design component of industry	Graphic design	Architecture
Interior and environment design	Fashion design	Packaging
	Crafts (eg small scale furniture makers)	Designer fashion
	Multimedia design	Advertising
	Television graphics	Furniture and furnishings
	Interactive and digital design	Personal care products
	Manufacturing industry design	Transportation
	Research and development within industry	Medicine
	Modelling and prototype making	Electronics
		Fashion/luxury goods
		Finance
		Telecommunications
		Pharmaceuticals
		Public sector
		Food and drink
		Consumer goods
		Retail

¹⁷ DCMS (2001) Creative Industries Mapping Documents: Design.
gov.uk/government/uploads/system/uploads/attachment_data/file/183549/2001Design2001.pdf

3.2 DCMS (2002 – 2015)

This Creative Industries Mapping Document definition formed the basis of the DCMS Creative Industries Economic Estimates, which were published annually between 2002 and 2012. This methodology recognised the need to include not only the contribution of the creative industries, but also those employed in creative (design) occupations, in other sectors, to comprise the whole creative economy.

Table 6: 2007 Creative Industries Economic Estimates Design definition

SOC 2000	Description	SIC 2003	Description
2126	Design and development engineers	9 codes	Clothing manufacture
3411	Artists	74.87	Other business activities n.e.c.
3421	Graphic Designers		
3422	Product, clothing and related designers		
5411	Weavers and knitters		

The revisions to the definition used in the DCMS Economic Estimates, put in place in 2014 following consultation in 2013, have narrowed the definition of design, with the most recent update including only one SIC and two SOC codes¹⁸:

Table 7: 2015 Creative Industries Economic Estimates Design definition

SOC 2000	Description	SIC	2007	Description
3421	Graphic Designers	74.10		Specialised design activities
3422	Product, clothing and related designers			

3.3 Creative and Cultural Industries Sector Skills Council (2004)

Creative & Cultural Skills (when still the Creative and Cultural Industries Sector Skills Council) conducted a profile of Craft and Design in the UK in 2004¹⁹. The report proposed a definition for design (see table below), but acknowledged that its definition did not provide full coverage of relevant occupations, since an unknown number of related workers will fall into other occupational groups. It was chosen to not include other occupations as that would have also included workers who were not design related.

Table 8: Creative & Cultural Industries Sector Skills Council definition of Design

SOC 2000	Description
3421	Graphic Designers
3422	Product clothing and related designers

3.4 Creative & Cultural Skills (2006 - 2013)

In 2006 Creative & Cultural Skills commissioned TBR to deliver the first economic and demographic mapping project; the Footprint. The aim of this research was to produce baseline data that was robust, replicable, and sustainable and that resonated with Creative & Cultural Skills' many stakeholders. The Footprint project was repeated in 2006, 2008, 2010 and 2012.

¹⁸ DCMS (2015) Creative Industries Economic Estimates. <https://www.gov.uk/government/statistics/creative-industries-economic-estimates-january-2015>

¹⁹ This document is not available online

Table 9: SIC and SOC codes in Creative & Cultural Skills Footprint: Design

Standard Industrial/Occupational	Segment	Sub-Segment
Industries		
74.10: Specialised design activities	Communications, Interior and Exhibition	Design Consultancies
90.02: Support activities to performing arts	Stage and Set Design	Stage and Set Design
Occupations		
2126: Design and Development Engineers	Product and Industrial Design	Internal Design Engineers
3421: Graphic Designers	Communications, Interior & Exhibition	Graphic Designers
3422: Product clothing and related designers	Product and Industrial Design	Internal Product Designers

3.5 Intellectual Property Office (2012)

A report for the Intellectual Property Office (IPO) highlighted that the nature of design-intensive industries – the businesses that practice and sell design – is remarkably hard to pin down, and sought to contribute to an evidence base for improving the intellectual property system for design. The report also identified that there is no SIC that neatly captures all design-intensive industries, partly because design takes different forms, and features in different industries. They go on to identify six sectors considered to be design-intensive²⁰:

- Design services,
- Architectural and engineering services,
- Computer and telecommunications services,
- Printing and publishing,
- Fashion and craft,
- Advanced manufacturing

The following occupations are included in in IPO's definition:

Table 10: codes in IPO Design definition

SOC (2000) code	Occupation
2126	Design and development engineers
2431	Architects
3421	Graphic designers
3422	Product, clothing and related designers
2121	Civil engineers
2122	Mechanical engineers
2123	Electrical engineers
2124	Electronics engineers
2125	Chemical engineers
2127	Production and process engineers
2128	Planning and quality control engineers
3113	Engineering technicians
3114	Building and civil engineering technicians

²⁰ Intellectual Property Office (2012) UK design as a global industry: International trade and intellectual property

Appendix I: Previous definitions of design

SOC (2000) code	Occupation
3121	Architectural technologists and town planning technicians
5211	Smiths and forge workers
5224	Precision instrument makers and repairers
541 (all subsets)	Textiles and garments trades
5421	Originators, compositors and print preparers
5491	Glass and ceramics makers, decorators and finishers
5492	Furniture makers and other craft woodworkers
5493	Pattern workers (moulds)
5494	Musical instrument makers and tuners
5495	Goldsmiths, silversmiths, precious stone workers
5496	Floral arrangers, florists
5499	Hand craft occupations n.e.c.

The definition of design-intensive industries used in this report builds on the approach taken in a previous IPO paper²¹, which involved identifying the industries in which designers work, and considering the contribution they make to value-added in that industry. There are a number of different occupations that can be considered "designers", and these designers work across a range of different industries.

The 2012 IPO report goes on to identify the industries in which designers work, and calculated the percentage of employees within each sector who are either core designers who work in design-related occupations:

Table 11: IPO 2012, sectoral workforce proportion in design occupations

Sector	Share of sectoral workforce who are designers or design-related
Fashion and craft	24%
Advanced manufacturing	10%
Printing and publishing	7%
Other production	4%
Telecoms and computer services	6%
Design services	20%
Architecture	30%
Other services	1%

²¹ Haskel, J. & Persole, A. (2011) Design services, design rights and design life lengths in the UK. Intellectual Property Office. http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/310627/ipresearch-designsreport1-201109.pdf

3.6 Summary of design definitions

It is clear from the definitions used in previous studies, and the textual descriptions, that a definition of design is most effectively approached through identification of those working in relevant design occupations. Design is function that cuts across industries and as such, whilst there does exist a group of firms that are explicitly engaged in the sale of design expertise, the identification of designers (regardless of by whom they are employed) should be the primary step. Table 12 summarises all of the SOC codes that have been used in the various definitions to identify designers alongside the definition used in this study.

Table 12: Summary of SOC codes used in previous definitions

SOC 2000 code	SOC 2010 code	SOC 2010 Description	DCMS 2002 - 2012	DCMS 2014 & 2015	TBR / CCS footprint 2006 - 2012	IPO 2012	Design Council 2015
	2121	Civil engineers				Y	Y
	2122	Mechanical engineers				Y	Y
	2123	Electrical engineers				Y	
	2124	Electronics engineers				Y	
2125		Chemical Engineers				Y	
	2126	Design and development engineers	Y		Y	Y	Y
	2127	Production and process engineers				Y	Y
2128		Planning and quality control engineers				Y	
	2129	Engineering professionals n.e.c					Y*
	2135	IT business analysts, architects and systems designers					Y
	2136	Programmers and software development professionals					Y
	2137	Web design and development professionals					Y
	2431	Architects				Y	Y
	2432	Town planning officers					Y
	2435	Chartered architectural technologists					Y
	2473	Advertising account managers and creative directors					Y
	3113	Engineering technicians				Y	
	3114	Building and civil engineering technicians				Y	
	3121	Architectural and town planning technicians				Y	Y
	3122	Draughtspersons					Y
	3411	Artists	Y				Y*
	3421	Graphic designers	Y	Y	Y	Y	Y
	3422	Product, clothing and related designers	Y	Y	Y	Y	Y
	5113	Gardeners and landscape gardeners					Y*
	5211	Smiths and forge workers				Y	Y
	5224	Precision instrument makers and repairers				Y	
	5411	Weavers and knitters	Y			Y	Y
	5412	Upholsterers				Y	
	5413	Footwear and leather working trades				Y	
	5414	Tailors and dressmakers				Y	Y
	5419	Textiles, garments and related trades n.e.c.				Y	

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SOC 2000 code	SOC 2010 code	SOC 2010 Description	DCMS 2002 - 2012	DCMS 2014 & 2015	TBR / CCS footprint 2006 - 2012	IPO 2012	Design Council 2015
	5421	Pre-press technicians				Y	
5491	5441	Glass and ceramics makers, decorators and finishers				Y	Y
5492	5442	Furniture makers and other craft woodworkers				Y	Y
5496	5443	Florists				Y	
5499	5449	hand craft occupations n.e.c				Y	Y

* Whole SOC not included, see discussion following Table 1, page 6.

3.7 Other SOCs for consideration

To identify additional SOCs which could potentially be included in a definition, a key word search of the full SOC list (including additional and industry qualifier comments) was conducted, searching for 'design'. Table 13 displays the SOC codes which are not included in any of the definitions used in previous research, but do include 'design' in either the description. Some of them have been included in our new definition as explained in Table 1. Others have been excluded as explained in Table 14.

Table 13: SOC codes not included in the reviewed definitions, but featuring 'design'

SOC 2010	Title	Example occupations
1259	Managers and proprietors in other services n.e.c.	Manager - design, graphic Manager - studio, design Owner (design consultancy)
2134	IT project and programme managers	Leader - project (software design)
2135	IT business analysts, architects and systems designers	Designer - applications (computing) Designer - computer, data, systems Engineer, design, computer
2136	Programmers and software development professionals	Consultant - technical (software design) Designer - computer games, software Engineer - design, software
2137	Web design and development professionals	Consultant - web design, media interactive design Designer - web, website
2139	Information technology and telecommunications professionals n.e.c.	Designer, network Engineer, design, network
2150	Research and development managers	Manager, design
3122	Draughtspersons	Assistant / designer – CAD Designer - engineering, mechanical, piping Designer-draughtsman
3417	Photographers, audio-visual and broadcasting equipment operators	Designer, lighting

Appendix I: Previous definitions of design

SOC 2010	Title	Example occupations
3531	Estimators, valuers and assessors	Designer, systems, fire
5113	Gardeners and landscape gardeners	Designer, garden
5432	Bakers and flour confectioners	Designer (flour confectionary manufacture)
8121	Paper and wood machine operatives	Designer-cutter (paper foods manufacture)
8129	Plant and machine operatives n.e.c.	Cutter, design (printing)

4. Appendix II: SOCs and SICs considered and excluded

Over the process of review, the following SOCs were considered as design occupations (either having been included in a piece of previous research or having been flagged through a search of the occupation index), but were ultimately excluded from the definition.

Table 14: SOCs considered but excluded

SOC	Description	Reason for exclusion
1259	Managers and proprietors in other services n.e.c.	Flagged through search of occupation index. Whilst likely that this will cover some managers in design businesses, the SOC description is too tenuously linked to design.
2123	Electrical engineers	Noted by IPO as design intensive. Although high level description includes research and design, most of the activities imply executing rather than specifying processes. Relevant design activities covered by engineering SOCs that are included.
2124	Electronics engineers	Noted by IPO as design intensive. Although high level description includes research and design, most of the activities imply executing rather than specifying processes. Relevant design activities covered by engineering SOCs that are included.
2127	Production and process engineers	Noted by IPO as design intensive. Only a small element of design and the rest investigating and implementing procedures.
2134	IT project and programme managers	Flagged through search of occupation index. Much more about planning and co-ordination rather than design.
2139	Information technology and telecommunications professionals n.e.c.	Flagged through search of occupation index. Very process oriented: system testing, security, quality. No real reference to design process.
2150	Research and development managers	Flagged through search of occupation index. SOC description does make some reference to design process, in a supporting capacity. However, including this could lead to the need to including a whole range of other supporting roles.
3113	Engineering technicians	Noted by IPO as design intensive. Description more reflective of following another's designs/processes.
3114	Building and civil engineering technicians	Noted by IPO as design intensive. Description more reflective of following another's designs/processes.
3417	Photographers, audio-visual and broadcasting equipment operators	Flagged through search of occupation index. Whilst likely that this will cover some designers the SOC description was too tenuously linked to design.
3531	Estimators, valuers and assessors	Flagged through search of occupation index. Not really relevant, very much about materials assessment and specification.
5224	Precision instrument makers and repairers	Noted by IPO as design intensive. Description more reflective of following another's designs.
5413	Footwear and leather working trades	Noted by IPO as design intensive. Description more reflective of doing rather than designing.
5419	Textiles, garments and related trades n.e.c	Noted by IPO as design intensive. However, description Much more about following patterns than setting them.
5421	Pre-press technicians	Noted by IPO as design intensive. Description suggests more likely to be executing another's design or executing procedural tasks.
5421	Upholsterers	Noted by IPO as design intensive. Description quite mechanical and to do with fitting rather than designing.
5432	Bakers and flour confectioners	Flagged through search of occupation index. Whilst element of cake design may be relevant, this is a very minor aspect of the SOC description.

Appendix II: SOCs and SICs considered and excluded

SOC	Description	Reason for exclusion
8121	Paper and wood machine operatives	Flagged through search of occupation index. SOC description very procedural.
8129	Plant and machine operatives n.e.c.	Flagged through search of occupation index. SOC description very procedural.

When calculating the intensities the following SICs were identified high intensity industries. However, detailed reflection led to them being excluded.

Table 15: SICs considered but excluded

SIC	SIC description	Total Employment	Design Intensity	Notes
13.20	Weaving of textiles	5,078	27%	Excluded. Relatively distributed workforce, no real concentrations in design.
14.13	Manufacture of other outerwear	17,589	34%	Right on the edge of the threshold. Includes large number of sewing machinists and other more manufacturing oriented roles.
14.20	Manufacture of articles of fur	563	28%	Excluded. Right on threshold and very small in number.
23.64	Manufacture of mortars	862	61%	Excluded. Some employment in SOC 2129 drives design intensity, but only interested in the SOC, which will be captured through that strand of analysis. Very small.
24.46	Processing of nuclear fuel	966	54%	Excluded. Some employment in SOC 2129 drives design intensity, but only interested in the SOC, which will be captured through that strand of analysis. Very small.
32.13	Manufacture of imitation jewellery and related articles	2,312	45%	Driven by half of employment being in 5449 (1037 emp total). Rest of employment in irrelevant SOCs (apart from small amount in Marketing which is DCMS occupation). Exclude, relevant people included in SOC data.
32.20	Manufacture of musical instruments	4,622	44%	Technically should include as just under half of employees within 3 relevant SOCs (5449, 3122, 2126). However, DCMS doesn't include this and no direct linkage to design footprint, so exclude.
63.99	Other information service activities n.e.c.	3,017	31%	Excluded. Small total employment, which is distributed across a range of SOCs, no particular emphasis on design roles. DCMS also exclude it, although high intensity.
81.30	Landscape service activities	146,265	77%	Very high design intensity driven by SOC 5113. However, including only part of this SOC as per comments below Table 1.
90.03	Artistic creation	82,300	41%	Excluded. A difficult one to claim as a design industry as so much of it is really about artistic creation. As per discussion in report, only include artists where they don't work in 90.03.
95.24	Repair of furniture and home furnishings	13,216	37%	Excluded. This is included in the Crafts Council definition, but that also includes upholsterers, which make up a large proportion of employment here. Description don't emphasise design.
95.29	Repair of other personal and household goods	7,682	28%	Excluded. Right on threshold, but focussed on repair.