

MAPPING DESIGN FOR INNOVATION IN WALES & SCOTLAND

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NOVEMBER 2014

**RESEARCH FUNDED BY
THE ARTS AND HUMANITIES
RESEARCH COUNCIL**

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CHAPTER 1



EXECUTIVE SUMMARY

Design is increasingly being recognised by governments across Europe as a factor for innovation in small to medium-sized enterprises, the public sector and society. In 2014, 15 of the 28 European Member States had design included in national innovation policy and explicit design strategies were in operation in Denmark, Estonia, Finland, France and Latvia.¹ The European Commission has also developed an Action Plan for Design-driven Innovation stating that:

‘A more systematic use of design as a tool for user-centred and market-driven innovation in all sectors of the economy, complementary to R&D, would improve European competitiveness.’²

This exploratory research, led by PDR at Cardiff Metropolitan University and funded by the Arts and Humanities Research Council, aims to understand how best to use design as a method for policy development and provide input for design policy actions jointly developed with design stakeholders. Design is an approach to problem-solving that can be used across the private and public sectors to drive innovation in products, services, society and even policy-making by integrating user needs. The European Commission’s action plan aims to accelerate the up-take of design in innovation policies at national, regional and local levels across Europe.

While design is steadily gathering momentum as a driver of innovation in national policy, there is a gap at regional and local policy levels. There are currently only a few regions with design integrated into innovation policy including, among others, Central Finland, Rhone-Alps in France and Silesia in Poland.³ Since design already features in some Welsh Government and Scottish Enterprise business support programmes, it could be argued that there is a real opportunity in Wales and Scotland to build on existing design infrastructure and lead the regional design policy agenda in Europe. In Wales, design already forms part of the Welsh Government strategy ‘Innovation Wales’:

‘We will direct our support towards the most important parts of the innovation process, being proactive rather than reactive, and stimulating demand for innovation activity, especially by underpinning design, research and commercial exploitation.’⁴

However, the policy has yet to be translated into an action plan. In Scotland, design is not formally part of policy; however, both Scottish Enterprise and the Scottish Government are using design as a route to innovation. Scottish Enterprise focuses on economic growth and business development and design is implicit within this, through the innovation strategy, rather than explicit. Design features as part of innovation support programmes in both Wales and Scotland; however, stakeholders felt that more could be done to support the use of design in enterprises and the public sector. This raises the fundamental question of how to develop better policies for design. Innovation policy is based on an analysis of the Innovation Ecosystem – the various actors, assets and initiatives supporting innovation in a country – so this research seeks to present the concept of Design Innovation Ecosystems and how their analysis can inform design policy development.

PDR has teamed up with the Welsh Government, Scottish Enterprise, Dundee University, Lancaster University and Rose-Innes Design to explore the Design Innovation Ecosystems in Wales and Scotland. Through four Design Policy Workshops and surveys of designers and SMEs, this research has mapped the Design Innovation Ecosystems in Wales and Scotland, analysed their strengths and weaknesses and co-developed a set of policy proposals for enhancing the performance of each system. This research used design-led methods to engage a variety of stakeholders – policy-makers, designers, academics, SMEs and support organisations – in jointly developing policy proposals.

Despite the unique and diverse actors and initiatives in place in Scotland and Wales, there are remarkable synergies between the strengths and weaknesses of the Design Innovation Ecosystems and the policy proposals. For example, respondents in both the Scottish and Welsh workshops identified that additional training for innovation experts in Scottish Enterprise and Welsh Government would be an effective approach to reaching SMEs. Both the Welsh Government and Scottish Enterprise have a team of innovation specialists who interface directly with companies and provide a broad range of support from funding to intellectual property as well as design. Further, participants identified that conducting research and collecting statistics on how companies use design could provide a more evidence-based approach to policy action and that collating case studies on design in Wales and Scotland and feeding back to the programme decision-makers and Ministers could improve understanding in government. Nevertheless, some proposals were unique to each nation, i.e. including design be a mandatory component of all Welsh Government innovation programmes, appointing design representatives to Welsh Government industry committees, appointing a design manager within the Welsh Government and setting up a Design and Development Grant to encourage start-ups. Unique proposals for Scotland included the recommendation to conduct a journey mapping exercise to understand how businesses access design support across the different programmes, integrating design into the Smart Exporter programme, promoting design to the public sector through the Scottish Leaders Forum, hosting design workshops for children through the V&A Dundee and developing an industry-led design strategy for Scotland. The purpose of the exercise was not to assess which Design Innovation System is stronger but to identify opportunities for shared learning and the transfer of good practices between Wales and Scotland.

It should also be acknowledged that this is exploratory research that reflects a snapshot in time of the knowledge of a small group of expert participants and therefore may not necessarily represent the entire design landscape in Wales and Scotland. Furthermore, we anticipated from the outset that the findings of the workshops

would be biased towards the types of participants contributing (including a higher ratio of academics to SMEs and designers). To counter this, and to validate the workshop findings, a survey was disseminated to Welsh and Scottish designers and SMEs. The survey among Welsh respondents (n53), revealed that over half – 58% - were not aware of the Welsh Government funded Design Advisory Service – the main design support programme in Wales. Furthermore, 57% were not aware that Welsh Government innovation credits could be spent on design. As such, 44% of participants asserted that the Welsh Government does not have a strategy to increase demand for design. A similar sentiment emerged among Scottish survey respondents (n78), with 39% of respondents believing that design is not explicitly promoted within innovation support programmes (compared with 10% who believe that it is) while 38% of participants believed that there is duplication of efforts from different support programmes. In addition, 32% of participants stated that the Scottish Government does not have strategy to increase demand for design (compared 11% who responded that it does).

The Welsh Government is currently exploring the feasibility of a Design and Development Grant to encourage start-ups to use design as well as the proposal of having a design manager in the Innovation Unit. For Phil Allen, Head of Knowledge Transfer at the Welsh Government:

“Design is a recognised factor for innovation in Wales and this research by PDR has enabled us to identify ways in which design can play a more effective role in Welsh Government innovation programmes.”

Similarly, Scottish Enterprise have already started to improve the understanding of opportunities that design can offer businesses through the work of their Innovation Specialists. They are also investigating the option of providing a grant to businesses to assist them to invest in design. Colin Meager, Innovation and Enterprise Lead at Scottish Enterprise highlighted the value in the methodology:

‘We found the methodology for the research a really useful way of gaining insight from different stakeholders and we will explore how to take some of the proposals forward.’

PDR will continue to work with the Welsh Government and Scottish Enterprise to support them in implementing some of the recommendations. The workshops were also video recorded and the film is available from the PDR website.

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¹ Whicher, A. (2014) ‘Design Policy Monitor 2014: Reviewing Innovation and Design Policies across Europe’, SEE bulletin 11, June 2014, PDR, Cardiff Metropolitan University, p.3. www.seeplatform.eu/publications

² European Commission (2013) ‘Implementing an Action Plan for Design-Driven Innovation’ Staff Working Document SWD(2013)380, Brussels, 23.09.13, p.4. ec.europa.eu/enterprise/policies/innovation/files/design/design-swd-2013-380_en.pdf

³ Whicher, A. (2014) ‘Design Policy Monitor 2014: Reviewing Innovation and Design Policies across Europe’, SEE bulletin 11, June 2014, PDR, Cardiff Metropolitan University, p.13.

⁴ Welsh Government (2013) ‘Innovation Wales’, Digital ISBN 9781473409156, p.26.

There is a vibrant design scene in Scotland and Wales but a feeling among design stakeholders that Scottish Enterprise and the Welsh Government are not capitalising on these strengths as factors for competitiveness. To contextualise the policy debate on design for Wales and Scotland, this section will touch upon two key issues: What is the link between design and innovation? How can policy-makers develop design-driven innovation policy?

Design is interpreted differently by its many stakeholders – designers, enterprises, researchers, educators, consumers and policy-makers. All too often, design is misunderstood narrowly as styling, but since the early 2000s definitions of design have expanded beyond pure functionality (Margolin, 1988; Buchanan, 1990; Friedman, 2000) to focus on problem-solving from a user perspective (Utterback et al., 2006; Brown, 2009;

Verganti, 2010)¹¹. As Brown (2009) observes: design ‘balances the perspectives of the users, technology and business, it is by its nature integrative. As a starting point, however, it privileges the intended user, which is why design is consistently referred to as a “human-centred” approach to innovation’.¹² Therefore, design is becoming more relevant for innovation because design and innovation are both becoming more people-centred.

Design is an approach to problem-solving that can be used across the private and public sectors to drive innovation in products, services, society and even policy-making by putting people first. By re-positioning design as a tool for business and the public sector, design has attracted the attention of policy-makers and is included in the UK innovation policy:

‘Design can be transformative for companies, through leading or supporting product and process innovation, for managing the innovation process itself, for the commercialisation of science, and the delivery of public services. Design thinking can play an important role in strengthening the public sector’s capacity to be an intelligent customer as it involves bringing together different perspectives, including industry and users of a service or product, to understand needs. The use of design can deliver cost savings and improved efficiency in the delivery of public services and help to generate solutions to societal challenges.’¹³

The Design Council have demonstrated that design can result in a return on investment in both the private and public sectors. Based on data from 249 companies involved in the Design Leadership Programmes between 2007 and 2012, ‘for every £1 invested in design, businesses can expect over £20 in increased revenue and a return of over £5 in increased exports’.¹⁴ In 2010, design was included for the first time in the European Commission’s innovation policy ‘Innovation Union’ and in 2011, design was yet again included in the UK’s ‘Innovation and Research Strategy for Growth’. Both Wales and Scotland have strong design sectors. According to Creative and Cultural Skills (2008), design represents the greatest proportion of the creative industries in Wales in terms of employment (22%) and gross value added (36%).¹⁵

Similarly, from a Design Council (2010) survey, there are over 11,000 designers operating in Scotland, which constitutes a 50% increase from 2003.¹⁶ If design has been integrated into EU and UK innovation policy and Wales and Scotland have design assets, what evidence do Scottish and Welsh policy-makers require in order to further embrace design as driver of innovation policy? Both the Welsh Government and Scottish Enterprise are making efforts to be design aware, but from discussions in the steering committee meetings the route to effective regional design capabilities is not clear, which is understandable as design-driven innovation policy is an emerging domain. Therefore, this research seeks to bridge this gap in knowledge.

A number of other governments across Europe, including Denmark, Estonia, Finland, France and Latvia have also developed dedicated design policies, strategies and action plans.¹⁷ Nevertheless, design does not feature broadly in innovation policy across Europe. Policy-makers require an economic rationale to justify policy intervention in favour of design and its integration into innovation policy. Since the 1980s, political theorists such as Freeman (1982) and Lundvall (1985) have instigated a shift in the justification for innovation policy away from the neo-classical market failure theory to embrace a broader systems failure theory.¹⁸ Innovation system theory refers to the framework conditions, actors and initiatives that contribute to innovation in a country. Innovation policy is based on an analysis of the innovation system and a number of academics are proposing that systems failure theory could also provide the economic rationale

for design policy (Love, 2007; Moultrie 2008; Raulik-Murphy and Cawood, 2009; Sun, 2010; Swann, 2010; Whicher and Cawood, 2012; Hobday et al., 2012; Finnish Ministry of Employment and the Economy, 2013; and Chisolm et al., 2013).¹⁹ Moultrie (2008) poses a question that strikes at the heart of this research: ‘The concept of a National Innovation System is well established, but can this concept be of use when considering design?’²⁰

An innovation system is a theoretical construct used by academics and policy-makers to examine the interplay between actors in a network and how this can inform targeted policy action to enhance the performance of the system. Ironically, design was a consideration in Freeman’s first address on National Innovation Systems presented to the OECD’s in 1982:

‘Sometimes, the term ‘creativity’ is reserved for those abilities of the scientist, which lead to new discoveries or of the artist, which lead to new works of art. These kinds of creativity are important for innovation too. But when we are considering national innovation systems then at least in the past they have not been so central to innovative success as those types of creativity which are characteristic of the engineer in the work of invention and design and of the entrepreneur.’²¹

¹¹ Margolin, V. (1988). “Expanding the Boundaries of Design: The Product Environment and the New User.” *Design Issues* 4(1/2): 59-64. Buchanan, R. (1990). “Myth and Maturity: Toward a New Order in the Decade of Design.” *Design Issues* 6(2): 70-80. Friedman, K. (2000) ‘Design research in a knowledge economy: context, content and continuity’, *Design Plus Research: Proceeding of the Politecnico di Milano Conference, May 18-20, 2000* p. 6. Utterback, J., Verdin, B.-A., Alvarez, E., Ekman, S., Walsh Sanderson, S., Tether, B., and Verganti, R. (2006) ‘Design-Inspired Innovation’, World Scientific Publishing Co., Singapore, p.1. Brown, T. (2009) ‘Change by Design. How Design Thinking Transforming Organizations and Inspires Innovation’, HarperCollins Publishers, New York, USA, p.36. Verganti, R. (2009) ‘Design Driven Innovation: Changing the Rules of Competition by Radically Innovating What Things Mean’, Harvard Business School Publishing Corporation, USA, p.8.

¹² Brown, T. (2009) ‘Change by Design. How Design Thinking Transforming Organizations and Inspires Innovation’, HarperCollins Publishers, New York, USA, p.229.

¹³ BIS (2011) ‘Innovation and Research Strategy for Growth’, Department for Business, Innovation and Skills, London, p.35 & p.85.

¹⁴ Design Council. (2012) ‘Design delivers for business. A summary of evidence from the Design Council’s Design Leadership Programme’, London, September 2012, p.2.

¹⁵ Creative and Cultural Skills (2008) ‘Creative and Cultural Industries Economic and Demographic Footprint’, p.4.

¹⁶ Design Council (2010) ‘Design Industry Research 2010’, London, p.43. www.designcouncil.org.uk/sites/default/files/asset/document/DesignIndustryResearch2010_FactSheets_Design_Council.pdf

¹⁷ Whicher, A. (2014) ‘Design Policy Monitor 2014. Reviewing Innovation and Design Policies across Europe’, SEE bulletin 11, June 2014, p.6. www.seeplatform.eu/publications

¹⁸ Freeman, C. (1982) ‘Technological infrastructure and international competitiveness’, Paper submitted to the OECD Science, Technology and Competitiveness Group, August 1982. Lundvall, B.-Å. (1985) ‘Product Innovation and User-Producer Interaction’, Aalborg University Press, Denmark.

¹⁹ Love, T. (2007) ‘National Design Infrastructures: The Key to Design-driven Socio-economic Outcomes and Innovative Knowledge Economies’, International Association of Societies of Design Research (IASDR07), Hong Kong, 12-15 November 2007, p.3. J Moultrie, J. & Livesey, F. (2009) ‘International Design Scoreboard: Initial indicators of international design capabilities’, Institute for Manufacturing, Cambridge University, UK, p.16. Raulik-Murphy, G., & Cawood, G. (2009) ‘National Design Systems – A Tool for Policy-making’, Research Seminar - Creative industries and regional policies: making place and giving space, University of Birmingham, UK, 23-24 September 2009, p.8. Sun, Q. (2010) ‘Design Industries and Policies in the UK and China: A Comparison’, *Design Management Review*, 21(4), p.74. Swann, P. (2010) ‘The economic rationale for a national design policy’, BIS occasional paper 2, London, p.4. Whicher, A. & Cawood, G. (2012) ‘European Design Systems and Innovation Policy’, SEE policy booklet 5, PDR, Cardiff Metropolitan University, p.9. Hobday, M., Boddington, A., & Grantham, A. (2012) ‘Policies for design and policies for innovation: Contrasting perspectives and remaining challenges’, *Technovation* 32, p.277. Finnish Ministry of Employment and the Economy (2013) ‘Design Finland Programme. Proposals for Strategy and Actions’, Helsinki, p.21. Chisolm, J., Mortati, M., & Villari, B. (2013) ‘DeEP Glossary. Describing the system of European Design Policy’, Design in European Policy project, p.11.

²⁰ Moultrie, J. (2009) ‘Developing an International Design Scoreboard’, SEE bulletin 1, PDR, Cardiff Metropolitan University, UK, August 2009, p.4.

²¹ Freeman in Sharif, N. (2006) ‘Emergence and development of the National Innovation System concept’, *Research Policy* 35, p.751.

Here Freeman highlights the growing importance of design and creativity in the innovation process. Although design and creativity made their debut appearance in this very early conception of innovation systems, among innovation circles it has largely been overlooked due to the difficulties in measuring the impact of

design activities. Nevertheless, as academic and policy interest in design as a driver of innovation began to grow in the late 2000s, design researchers adapted innovation system theory to provide an economic rationale to integrate design into innovation policy. According to Raulik-Murphy (2010):

‘By applying theory from National Innovation Systems, the notion of National Design Systems transfers established theory to the design domain and advocates that it could enable researchers to better inform policy-making by identifying insufficient interaction between stakeholders, which may be contributing to the limited use of design resources in national economies’.²²

The terminology has evolved from ‘Design Infrastructures’ (Love, 2007) to ‘National Design Systems’ (Moultrie 2008; Raulik-Murphy and Cawood, 2009; Sun, 2010; Swann, 2010; Hobday et al., 2012; Whicher et al., 2012), to ‘Design Ecosystems’ (Finnish Ministry of Employment and the Economy, 2013; Chisolm et al., 2013) to what this research is calling a design-driven innovation ecosystem or ‘Design Innovation Ecosystem’. This hinges on the rationale that the design system should not operate in isolation from the broader innovation system in the country or region.

It should be holistically integrated like biological ecosystems. In the policy arena, Finland was the first country to adopt the concept of a National Innovation System to inform innovation policy in 1992²³ (Sharif, 2006) and it was also the first country to adopt the concept of a ‘Design Ecosystem’ to inform national design policy in 2013 (Finnish Ministry of Employment and the Economy, 2013). The term ecosystem implies a more organic network of interactions. Design is already a component within the UK innovation ecosystem:

‘The UK innovation ecosystem contains deep and varied capabilities in science and technology, creativity and design, intellectual property and metrology.’²⁴

Academic theory on innovation systems is well established for informing innovation policy. Therefore, the question arises: can design-driven innovation ecosystems – or Design Innovation Ecosystems – be a useful concept for design-driven innovation policy? And if so, what components are included in a Design Innovation Ecosystem? Table 1 deconstructs the components of the design system models proposed by Love, Moultrie, Raulik-Murphy and Cawood, Sun, Whicher and Cawood and the Finnish Ministry of Economy and Employment in order to test a framework in this research.

Table 1: Components of a Design System

Model	Components
Love (2007)	1) Design businesses, 2) design centres, 3) design education services, 4) design promotion organisations, 5) design research investment, 6) design researchers, 7) design support technologies, 8) design support technology suppliers, 9) design teams, 10) designers, 11) design-focused investment, 12) distribution services, 13) drive to improvement in society, 14) government policy organisations to support design and design research, 15) manufacturing, 16) marketplace for designed ideas and services, 17) organisations commissioning and funding design research, 18) organisations educating design researchers, 19) organisations representing design research, 20) organisations undertaking design research, 21) prototyping services, 22) research in other fields, 23) design certification, 24) cultural support for innovation
Moultrie (2008)	1) Firms, 2) education, 3) design agencies, 4) government bodies, 5) academia
Raulik-Murphy and Cawood (2009)	1) Funding source, 2) design policy, 3) design education, 4) design support, 5) design promotion, 6) research and development, 7) professional associations
Sun (2010)	1) Designers, 2) public sector, 3) private sector, 4) trade associations, 5) government, 6) higher education institutions, 7) design promotion
Whicher and Cawood (2012)	1) Design users (public and private), 2) design support, 3) design promotion, 4) design actors (design centres, associations, networks and clusters), 5) the professional design sector, 6) design education, 7) research and knowledge exchange, 8) Design policy, governance and regulation, 9) design funding
Finnish Ministry of Economy and Employment (2013)	1) Design policy, 2) funding, 3) public sector, 4) design centres, 5) businesses, 6) citizens, 7) research and education, 8) design promoters

²² Raulik-Murphy, G. (2010) ‘National Design Systems’ SEE bulletin 4, PDR, Cardiff Metropolitan University, UK, October 2010, p.10.

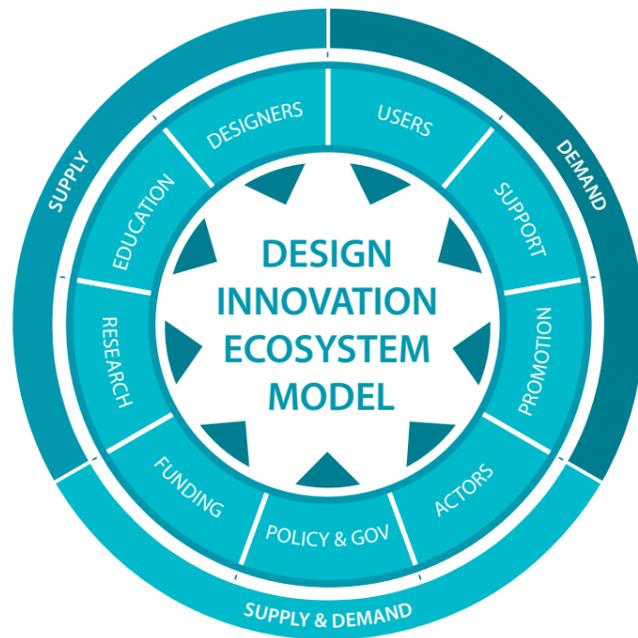
²³ Sharif, N. (2006) ‘Emergence and development of the National Innovation System concept’, Research Policy 35, p.752.

²⁴ BIS (2011) ‘Innovation and Research Strategy for Growth’, Department for Business, Innovation and Skills, London, p.46.

To model a national design system, Love (2007) lists 24 sub-system elements of 'national design infrastructures', Moultrie (2008) depicts five agents within a simplified 'national design system', Raulik-Murphy and Cawood (2009) offer a comprehensive model with seven drivers, Sun (2010) also identifies seven components – some overlapping. There is a high degree of commonality between components of the different systems – each model identifies education, research, promotion and government as core elements of the system. Raulik-Murphy and Cawood as well as Sun offer the most comprehensive models of a national design system. However, both overlook components identified by other models.

For example, the Raulik-Murphy and Cawood model excludes the professional design sector itself as well as design users, which arguably are core components and included by Sun. Alternatively Sun, excludes funding sources and design support that are integral to the Raulik-Murphy and Cawood model. Therefore this research combines the models to create a framework that will be tested within this project called the Design Innovation Ecosystem (see figure 1). The implications being that by modelling design systems, investigating the interactions between components of the systems, researchers and policy-makers can assess the performance of a design system and propose policy actions.

Figure 1: Design Innovation Ecosystem



Innovation Ecosystems research is a recognised academic field and is well advanced for informing policy, but the theory of design-driven innovation ecosystems is still nascent and has not yet been subject to academic validation. This research seeks to test, refine and validate a framework for Design Innovation Ecosystems to advance the understanding of innovation research regarding how design can contribute to innovation policy. Through validating design innovation ecosystems theory, this research is looking to generate academic evidence to make a more compelling case for the integration of design into innovation policy.

The aim of this research is to create a framework for policy-makers and academics across the UK and Europe to map and analyse their Design Innovation Ecosystems to provide input for evidence-based policy-making. This will be achieved through:
 1) testing, refining and validating the Design Innovation Ecosystems framework; 2) mapping the Design Innovation

Ecosystems in Wales and Scotland to provide input for evidence-based policy-making; and 3) positioning Design Innovation Ecosystems theory within mainstream Innovation Ecosystems research. Design is increasingly being recognised by governments as a key factor for innovation and there is an opportunity for research to influence the innovation policy process. To test the framework, this research will map and analyse the Design Innovation Ecosystem in Wales and Scotland with a view to supporting the Welsh Government and Scottish Enterprise to integrate design more holistically within existing innovation programmes and policies. Wales and Scotland have unique initiatives and infrastructures to support design and there is already political will to enhance the use of design as a tool for competitiveness. By mapping and analysing how these innovation ecosystems integrate design, insight will be generated to support other countries and regions in analysing the strengths and weaknesses of their Design Innovation Ecosystems to provide evidence-based input for policy-making.

CHAPTER 3

METHOD

PDR is an applied design research institution based at Cardiff Metropolitan University that is interested, inter alia, in understanding how the effective use of design can be encouraged by local, regional and national governments. This interest is based on a body of knowledge that indicates that the effective use of design is an efficient driver of innovation and thus contributes to competitiveness and economic prosperity. PDR houses a Design Policy research group that has worked on a number of large European funded projects²⁵ that have sought to understand which European governments are actively supporting design, how that support is enacted, and, when and how design support

is effective. The results of such investigations led to the creation of a conceptual model for understanding the Design Innovation Ecosystems. The AHRC project that is reported here uses PDR's conceptual model as a departure point to begin to explore the development of design policies that are applicable to the socio-economic context of the regions in which they will be implemented. The project is exploratory and investigated how the use of the tool in two regions (Wales and Scotland) can lead to appropriate policy recommendations for the relevant governments.

In order to achieve this aim it was necessary to engage with the organisations and people that will potentially be affected by any resultant policies. Due to the solution driven nature of the project, and the necessity to empathise with the needs of stakeholders, a Design Research approach was identified as appropriate. In summary, this approach consisted of:

- Examining the components of the Design Innovation Ecosystem;
- Conducting stakeholder identification and representative stakeholder selection;
- Facilitating stakeholder engagement in four Design Policy Workshops to:
 - o Test and refine the conceptual model;
 - o Identify the wider actors and initiatives within the Design Innovation Ecosystems;
 - o Identify the positive and negative aspects of the regional ecosystems;
 - o Co-develop policy recommendations.
- Analysing the results from the Design Policy Workshops;
- Validating stakeholder research results with wider stakeholder population through surveys;
- Analysing the results from the surveys in Wales and Scotland;
- Reviewing the effectiveness of the conceptual model as well as the research method in preparation for larger-scale research.

Examining the components of the Design Innovation Ecosystem

The project was guided by a steering committee that consisted of primary stakeholders relevant to the project aims, that is: policy-making representatives from the Welsh Government and Scottish Enterprise (policy-makers with responsibilities for innovation policies and programmes); representatives from the design industry (a practicing designer and the leader of a design industry forum); and interested external academics from Dundee and Lancaster (researchers active in the field of design and innovation). Without prior knowledge of PDR's conceptual model of a Design Innovation Ecosystem, the steering group members were asked to identify what components might form part of a Design Innovation Ecosystem to inform policy. There was significant synergy between the components identified by the steering group and those identified by the investigators. All the components in the Design Innovation Ecosystem conceptual model were identified by at least one of the steering committee members. The conceptual Design Innovation Ecosystem model was then presented to the committee. The nine components in the model are:

- Design users
- Design support
- Design promotion
- Design actors
- Design education
- Design research
- Design sector
- Design funding
- Design policy

The experts were then asked to rank the components identified by PDR in the literature review in order of importance. This was the first step in the consensus-building exercise to consolidate the Design Innovation Ecosystem construct.

The expert panel also advised on the format of the exploratory workshops, academic rigor, relevance to policy-making, identifying stakeholders for the stakeholder mapping exercise and recommended participants for the workshops.

Conducting stakeholder identification and representative stakeholder selection

The steering committee considered the previously identified nine components of the conceptual Design Innovation Ecosystem model as a starting point for the identification of a wider stakeholder group that would likely be affected through the creation of new design policies. The process of stakeholder identification was based firstly around identification of roles, and secondly around the identification of individuals that met those roles. To ensure a robust candidate selection criteria for

the workshops, an initial stakeholder mapping was conducted with the steering committee members to ensure representation by policy-makers, designers, SMEs, academics and support organisations. Given the range of expertise within the steering group it was possible to create an appropriate list of individuals from personal contacts. The following table presents the breakdown of stakeholders that participated in the workshops and the domains they represented:

	Policy-makers	Designers	SMEs	Academics	Other	Total
Bangor 22.04.14	3	2	2	6	1	14
Cardiff 19.05.14	2	2	1	10	3	18
Glasgow 21.05.14	5	2	1	7	0	15
Dundee 23.05.14	6	1	2	7	1	17
	16	7	6	30	5	64

Participants in the Welsh workshops included, among others, representatives of the Welsh Government, Enterprise Consulting, Creative and Cultural Skills, Nesta, Business Wales, the Design Wales Forum and Rose-Innes Design. Participants in the Scottish

workshops included, among others, representatives of Scottish Enterprise, the Scottish Government, Creative Scotland, V&A Dundee, Skills Development Scotland, the Lighthouse, MAKLab, Taylor Haig and DPT Urban Design.

²⁵ SEE Platform (2012-2015) co-funded by the European Commission, SEE project (2008-2011) co-funded by INTERREG IVC and SEEdesign (2005-2007) co-funded by INTERREG IIIC.

Facilitating stakeholder engagement in four Design Policy Workshops

The research seeks to synthesise the positions of a broad range of stakeholders and therefore has used creative techniques to engage participants in active discussion. The engagement took place through two phases of activity: 1) Design Policy Workshops and 2) Survey of Design Supply and Demand.

Design policy workshops took place in Bangor, Cardiff, Glasgow and Dundee. The purpose of these workshops was to examine the proposed Design Innovation Ecosystem components and map stakeholders and initiatives against these; to identify the strengths and weaknesses of the ecosystems; and, to co-develop policy proposals to capitalise on the strengths and tackle the weaknesses. The workshops were composed of three exercises: 1) Mapping stakeholders and initiatives; 2) Identifying the strengths and weaknesses of the Design Innovation Ecosystem and 3) Co-developing policy proposals. The workshops employed design-led techniques to engage participants in constructive dialogue using A1 posters. The workshops began with an overview of design at the European policy level as well

as an overview of design and innovation policy in the region provided by the Welsh and Scottish policy-makers. These presentations provided context for the session. The icebreaker exercise was a brainstorming exercise to give the participants an opportunity to circulate. The workshops took four hours each. 64 individuals participated in the four Design Policy Workshops including 16 policy-makers, 7 designers, 6 SMEs, 30 academics and 5 individuals classified as 'others'. Of course, it should be acknowledged that the heavy bias towards academia will have influenced the nature of the outcomes. Nevertheless, the academics selected are very involved in knowledge exchange between the design sector and industry and therefore were well positioned to feed into the workshops. Although many designers and SMEs expressed interest in the research, they felt unable to attend the workshop due to time pressure demands. As such, a survey was also developed to validate the workshop findings. While the workshop captured the depth, the survey was intended to ensure breadth of consultation.

1 Mapping Design Stakeholders

In both Wales and Scotland a multitude of design activities already exist ranging from government design support programmes, to sector-led promotion initiatives, a strong professional design sector through to design networks, knowledge transfer into industry and design-led businesses. This first exercise mapped the stakeholders and initiatives in the 'Design Innovation Ecosystem' according to the nine components.

This provided insight into the state of the art or stock-taking of current initiatives to enable participants to build on existing design infrastructure. The delegates were divided into groups of three to five people mixing delegates from different backgrounds to cover the various perspectives. Participants had one hour for this exercise including presenting the posters to the group.

2 Exploring the Design Innovation Ecosystem

In the same groups and using the same poster tool, the participants identified a minimum of one strength and one weakness for each component of the Design Innovation Ecosystem. This exercise built on the previous one and enabled delegates to assess the level of systemic interaction between

actors and initiatives in the system to identify gaps and opportunities. This SWOT analysis of the Design Innovation Ecosystem would form the basis of the third exercise. Participants had one and a half hours for this including presenting their assessment to the other groups.

3 Co-developing policy proposals

Based on the stakeholder mapping and the SWOT analysis of the Design Innovation Ecosystem, the workshop participants brainstormed policy proposals for tackling gaps in the system. As we had representatives from government, the design sector, industry, academia and third sector organisations the proposals synthesised the perspective of these different stakeholders meaning that the proposals were tangible and realistic.

Following the initial brainstorm, the proposals were clustered thematically and refined. This co-development process engaged delegates in constructive and inclusive debate and resulted in a consolidated list of concrete policy proposals. To capture the data from the workshop, the posters were photographed, transcribed and processed using content analysis.

Validating stakeholder research results with wider stakeholder population through surveys

To validate the workshop conclusions two surveys were developed for designers and SMEs in Wales and Scotland. The survey focused on validating the outcomes from exercises two and three. In Wales, the survey was disseminated through the Design Wales Forum and South Wales Chamber of Commerce and in Scotland, through Scottish Enterprise and the Design in Action network. The survey results are listed in annex 2 of this report.

In Wales, there were 53 respondents, including 25 categorising themselves as designers and 27 as enterprises and 1 as 'other'. This represents 2.8% of the members of the Design Wales Forum (889) and 2.3% of the South Wales Chamber of Commerce (1,200) equivalent to a response rate of 2.5%.

In Scotland, there were 78 respondents, including 39 categorising themselves as designers and 39 as enterprises. This represents 13% of the companies (301) and 26% of the designers (152) in the Design in Action network equivalent to a response rate of 17%.

Therefore a total of 202 stakeholders (64 in the workshops, 131 in the surveys and 7 in the steering committee) were involved in this research.

CHAPTER 4

RESULTS



PDR facilitated four Design Policy Workshops two in Wales (on 22 April 2014 in Bangor and on 19 May in Cardiff) and two in Scotland (on 21 May in Glasgow and on 23 May in Dundee). A film of the workshops is available on the PDR website. The workshops engaged 64 people including 16 policy-makers, 7 designers, 6 SMEs, 30 academics and 5 third sector organisations. The three workshop exercises focused on 1) mapping the stakeholders and initiatives in the Design Innovation Ecosystems in Wales and

Scotland, 2) identifying the strengths and weaknesses and 3) co-developing policy proposal to tackle the systemic gaps and capitalise on the strengths. This section presents the outcomes from the workshops, which are then analysed in the discussion section. The workshop results were validated through a survey disseminated through design and business networks in Wales and Scotland. This section also provides an overview of the survey results (full survey results are listed in the appendix).

Mapping the stakeholders in the Design Innovation Ecosystem

To map the existing design initiatives and infrastructure, the workshop participants identified actors and initiatives across the nine components of the Design Innovation Ecosystem: 1) design users, 2) design support, 3) design promotion, 4) design actors, 5) the professional design sector, 6) design education, 7) research and knowledge exchange, 8) policy, governance and regulation and 9) funding. The purpose of the exercise was not to assess which Design Innovation Ecosystem is stronger but to identify opportunities for shared learning and the transfer

of good practices between Wales and Scotland. For example, does Wales have a particularly effective support mechanism for the professional design sector or does Scotland have an effective design support programme to enable SMEs to use design? The findings from this exercise created a map or stock-taking of the players and programmes in the Design Innovation Ecosystem in order to form the basis of the second exercise, the SWOT analysis.

Performing the SWOT analysis of the Design Innovation Ecosystem

An effective design policy could look to mobilise the actors identified in the stakeholder mapping exercise and ensure synergy and collaboration. There are a number of top-down and grassroots-led design initiatives happening across Wales and Scotland including business support programmes, peer-to-peer learning initiatives and internationally renowned education programmes. By performing a SWOT analysis of the Design Innovation Ecosystem, policy-makers and stakeholders can

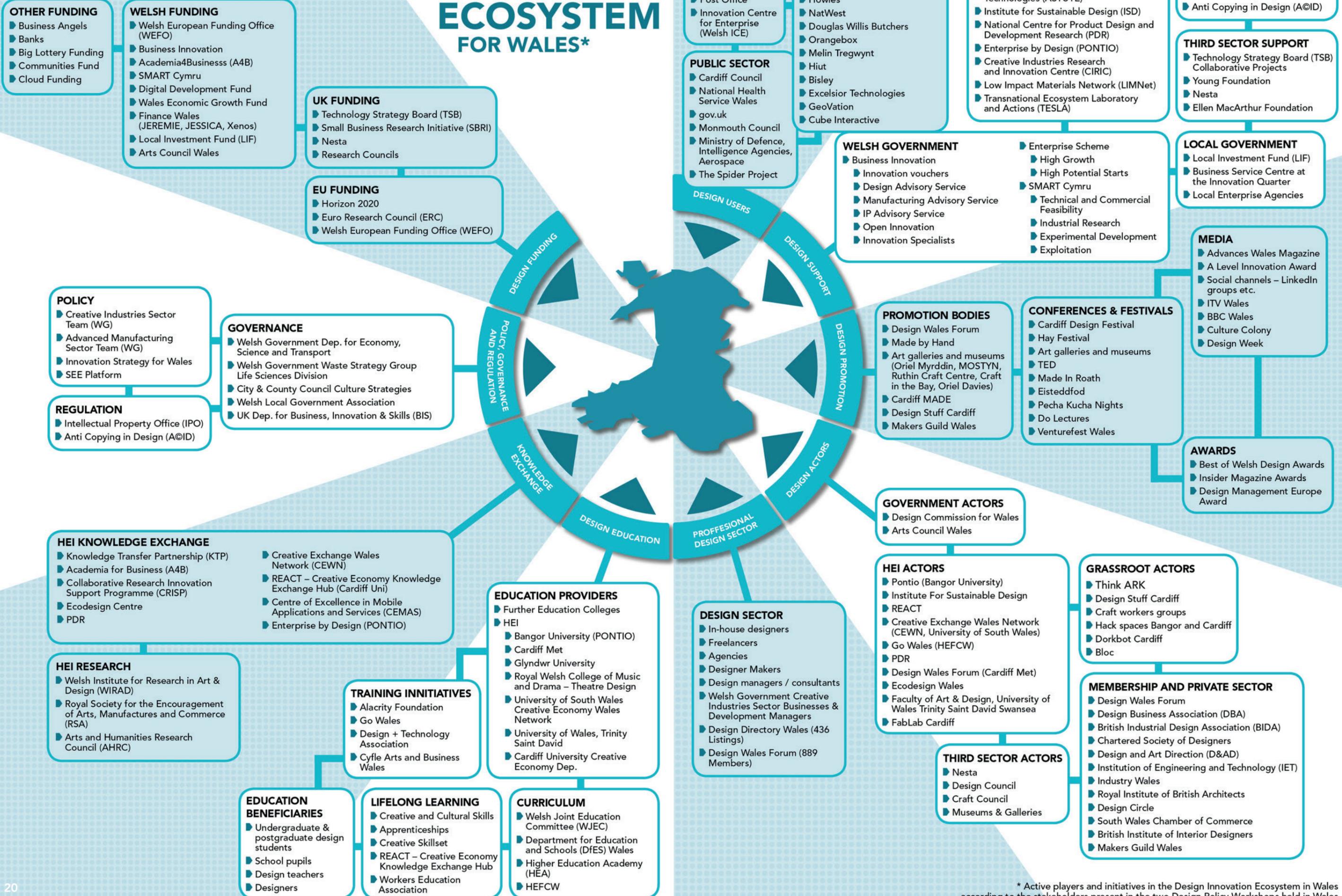
identify insufficient interaction between components of the system. For example, education should feed the professional design sector and design centres and promotion activities should stimulate demand for design expertise in the private and public sectors. Based on the SWOT analysis policy-makers can jointly develop policy actions with stakeholders to ensure joint ownership and responsibility for implementation.

Co-developing Policy Proposals

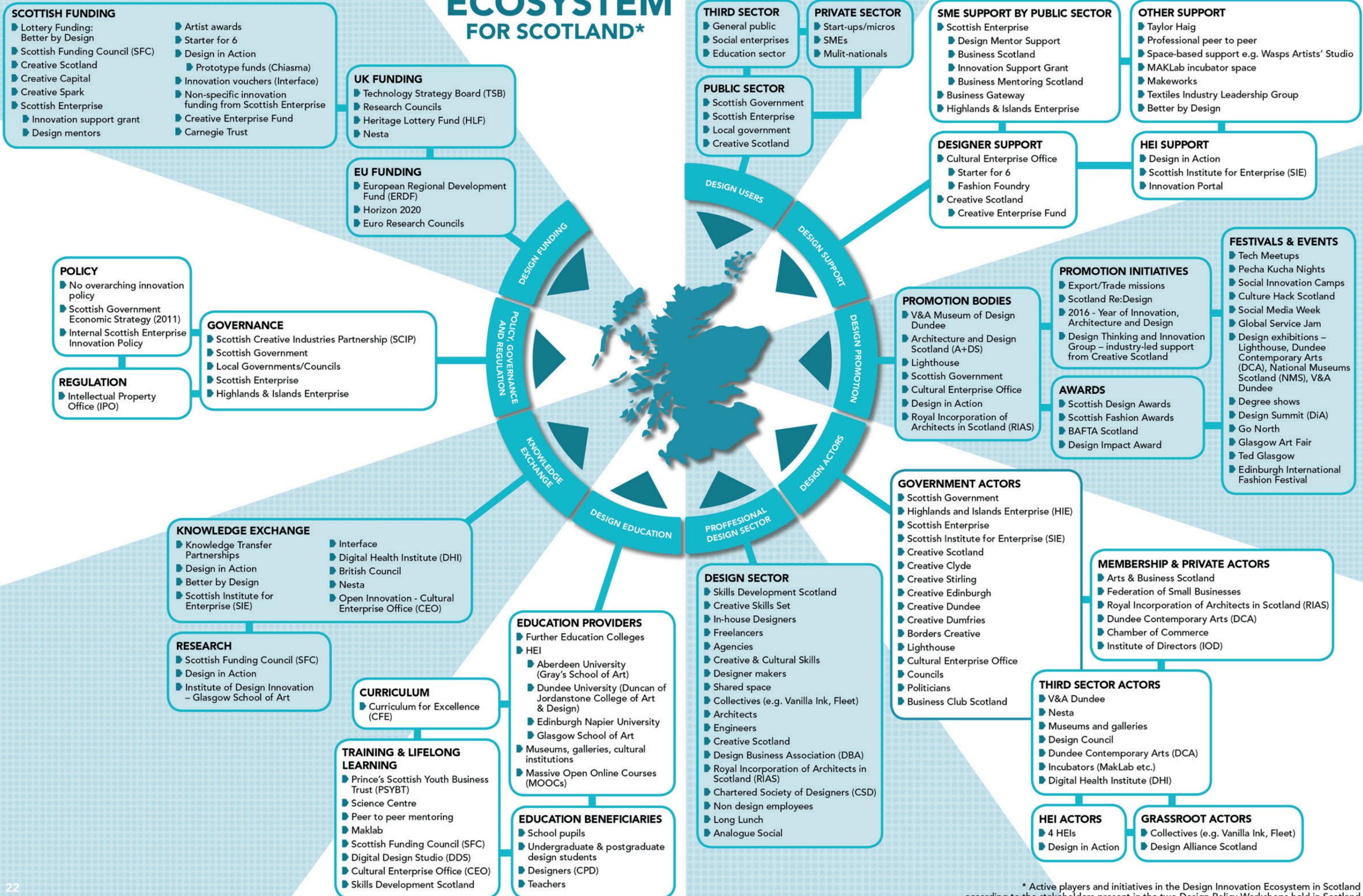
Based on the stakeholder mapping exercise as well as the SWOT analysis, the workshop participants then jointly developed policy proposals with the representatives of the Welsh Government and Scottish Enterprise. Initially the groups brainstormed a longer list of policy actions to bridge the weaknesses and capitalise on the strengths for each component of the Design Innovation Ecosystem.

The proposals were then clustered thematically and refined and consolidated into a shorter list that reflected both the ambitions of the design representatives as well as the realities of the policy environment. PDR then worked with representatives of the Welsh Government and Scottish Enterprise to identify which policy proposals could be taken forward in the short time and which proposals could be explored in the longer term.

DESIGN INNOVATION ECOSYSTEM FOR WALES*

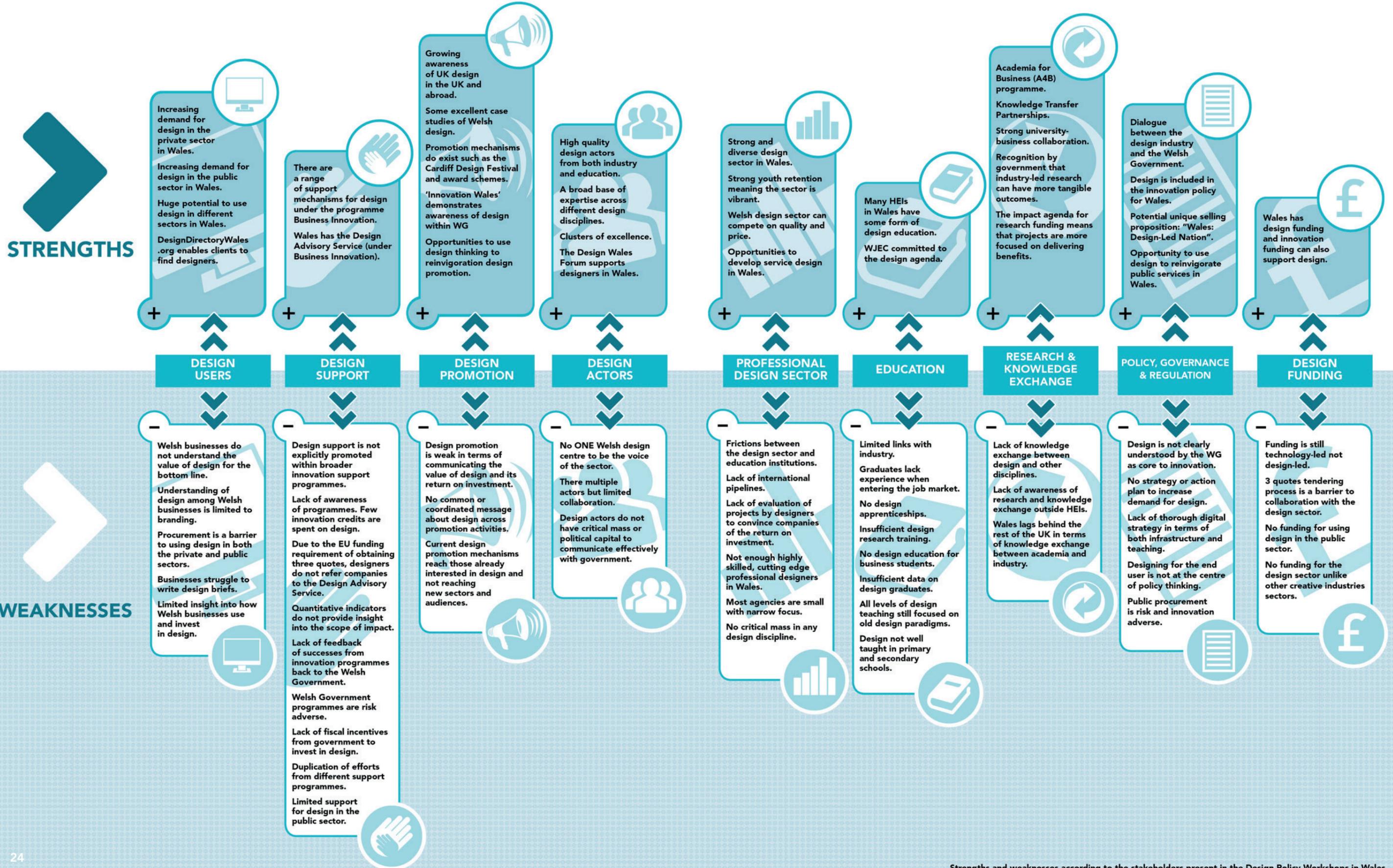


DESIGN INNOVATION ECOSYSTEM FOR SCOTLAND*



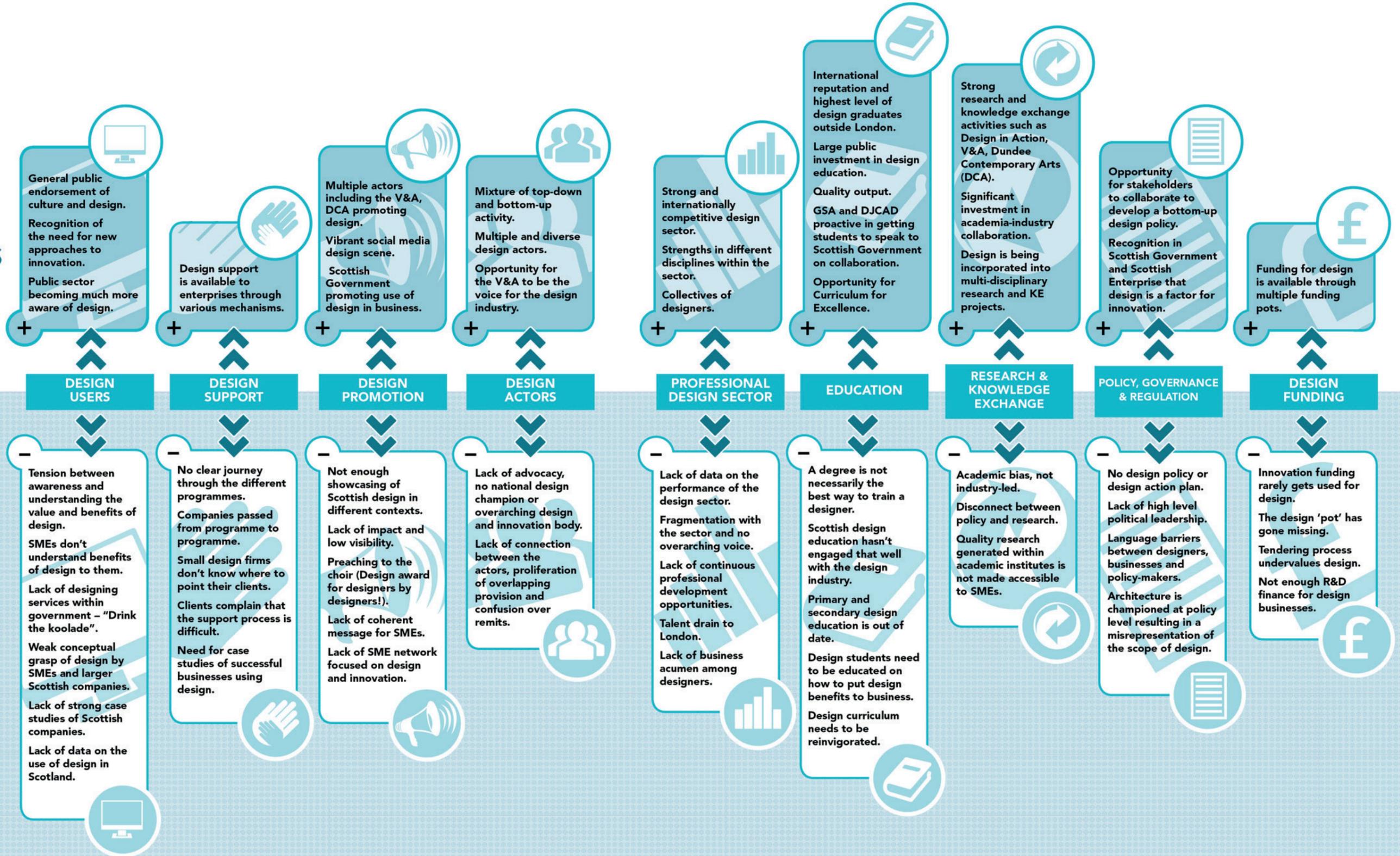
* Active players and initiatives in the Design Innovation Ecosystem in Scotland according to the stakeholders present in the two Design Policy Workshops held in Scotland

EXAMINING THE STRENGTHS AND WEAKNESSES OF THE DESIGN INNOVATION ECOSYSTEM IN WALES



EXAMINING THE STRENGTHS AND WEAKNESSES OF THE DESIGN INNOVATION ECOSYSTEM IN SCOTLAND

STRENGTHS



WEAKNESSES

	Wales	Scotland
DESIGN USERS	<ul style="list-style-type: none"> Collate case studies on design in Wales and feedback to the Welsh Government & Ministers Conduct research and collate statistics on how Welsh SMEs use & invest in design 	<ul style="list-style-type: none"> Collate case studies on design in Scotland and feedback to Scottish Enterprise, Scottish Government & Ministers Conduct research and collate statistics on the understanding of design among Scottish SMEs
DESIGN SUPPORT	<ul style="list-style-type: none"> Provide additional training to Welsh Government Innovation Specialists in the value of design & design thinking Include design as a mandatory component of innovation programmes & explicitly promote design within all programmes Signpost SMEs to Welsh Government innovation support programmes 	<ul style="list-style-type: none"> Provide additional training to the 12 Scottish Enterprise Innovation Specialists in the value of design & design thinking Promote design within innovation programmes more explicitly Conduct a journey mapping exercise to understand how businesses access design support across the different programmes Host workshops for SMEs to explore the use of design within business models Ensure that design and innovation support is streamlined and addresses the A-Z of the innovation process Link design into the Smart Exporter programme
DESIGN PROMOTION	<ul style="list-style-type: none"> Appoint design representatives to Welsh Government industry committees and panels such as the Creative Industries Sector Skills Panel as well as the Innovation Panel Develop a design promotion campaign that taps into business networks and innovation intermediaries Set up a Welsh Government award for successful design and innovation projects 	<ul style="list-style-type: none"> Promote design to the public sector by hosting an event through the Scottish Leaders Forum Identify Scottish design champions to communicate design to industry and government Create a design portal with a section for SMEs, designers, academics and policy-makers to share information such as case studies, a directory of designers, funding opportunities, etc Signpost Scottish Enterprise funding to designers Create a 'Good Design Scotland' stamp
DESIGN ACTORS	<ul style="list-style-type: none"> Provide mandates for centres of excellence in design 	<ul style="list-style-type: none"> Appoint a single body to be the voice of design in Scotland
DESIGN SECTOR	<ul style="list-style-type: none"> Support continuous professional development opportunities in business management and service design for designers 	<ul style="list-style-type: none"> Support continuous professional development opportunities in business management and service design for designers Explore collaboration with the Design Wales Forum to conduct a feasibility study for transferring the model to Scotland Develop a design directory of Scottish designers and design agencies Develop a mentoring network

	Wales	Scotland
DESIGN EDUCATION	<ul style="list-style-type: none"> Support design apprenticeships Encourage multi-disciplinary underand post-graduate courses and competitions Support primary education in design 	<ul style="list-style-type: none"> Encourage multi-disciplinary underand post-graduate courses and competitions Support primary education in design Host design workshops for children through the V&A Dundee Reinvigorate the primary and secondary school design curriculum Re-train design and technology teachers in design and design thinking to link early years problem-solving to design Promote a centre of excellence in postgraduate design education
RESEARCH & KNOWLEDGE EXCHANGE	<ul style="list-style-type: none"> Continue to fund the Academia for Business (A4B) programme 	<ul style="list-style-type: none"> Promote the Interface academia-industry collaboration programme more broadly
POLICY & GOVERNMENT	<ul style="list-style-type: none"> Appoint a design manager within the Welsh Government Train Welsh Government officials in design thinking Send Welsh Government officials on a study visit to the Cabinet Office Policy Lab Pilot a Policy Lab using design methods for policy-making the Welsh Government Develop and implement a Design and Digital Strategy Develop an implementation plan for the policy Innovation Wales Tender for a multi-disciplinary team to re-design the procurement process to make it more accessible for SMEs 	<ul style="list-style-type: none"> Develop an industry and stakeholder-led design manifesto for Scotland Advocate design to the Scottish Government Improve design awareness among senior Scottish Enterprise officials Pilot a design project within five local authorities & evaluate to create case studies
FUNDING	<ul style="list-style-type: none"> Set up a Design and Development Grant to encourage start-ups Tender for a multi-disciplinary team to re-design the innovation funding application process to make it more user-friendly 	<ul style="list-style-type: none"> Set up a grant to assist SMEs in investing in design Fund post-graduate opportunity in design Increase design awareness through innovation funding mechanisms

Validating the workshop findings through surveys

To validate the workshop findings, two surveys were disseminated to Welsh and Scottish designers and SMEs. The survey among Welsh respondents (n53) was disseminated through the Design Wales Forum as well as the South Wales Chamber of Commerce. The survey among Scottish respondents (n78) was disseminated

to companies and designers in the Design for Action network. While the workshops were intended to generate depth of insight among a small number of participants, the surveys were developed to capture breadth of insight among a larger number of stakeholders.

Survey results for Wales

- 82% of respondents believed that there is an increase in demand for design in private sector versus only 50% who believe there is an increase in demand for design in the public sector in Wales.
- 76% of respondents felt that Welsh businesses do not understand the value of design for the bottom line.
- 50% of respondents felt that the Design Wales Forum supports designers in Wales with 42% responding 'don't know' and 8% answering 'no'.
- 47% of participants believed that there are a range of support mechanism for design available in Wales with 42% responding 'don't know' and 11% selecting 'no'.
- Over half of survey respondents – 53% - were not aware of the Welsh Government funded Design Advisory Service. Similarly, 57% were not aware that Welsh Government innovation credits could be spent on design. In line with this, 76% of designers have not referred a client to the Design Advisory Service.
- 65% of respondents were aware of Welsh design promotion activities such as the Cardiff Design Festival versus 35% who were not aware. Alternatively 35% responded that Welsh Design promotion activities do not communicate a common message.
- 56% of respondents were aware of the Welsh Government policy 'Innovation Wales' and 50% were aware that design is included in the policy. Nevertheless, 43% asserted that the Welsh Government does not have a strategy to increase demand for design.
- 63% of respondents concurred that there should be a single 'centre' proving the voice for design in Wales.
- 42% of respondents identified that there is not an effective relationship between design education and the design sector in Wales compared with 32% who believe there is.
- 40% of respondents stated that design education does not reflect the contemporary understanding of design. Equally 48% asserted that design graduates do not have an appropriate level of experience when entering the job market.
- 40% of respondents agreed that Wales does not perform as well as the rest of the UK in terms of knowledge exchange between academia and industry.
- When asked whether Wales has a proportion of designers working at the cutting edge of the practice, 33% respondent 'yes', 33% responded 'no' and 33% also responded 'don't know'.

Survey results Scotland

- 59% of respondents believed that there is a growing awareness of design in the public sector in Scotland.
- 50% of respondents felt that design users do not understand the benefits of design.
- 46% of participants agreed that the Scottish Government recognises the potential of design in improving public services while 34% disagreed.
- 54% of respondents stated that procurement is a barrier to the private and public sectors using design while 20% believed it is not.
- 51% of participants believed that there is a range of support mechanisms for design available in Scotland with 20% disagreeing.
- 39% of respondents believed that design is not explicitly promoted within innovation support programmes (compared with 10% who believe that it is).
- 57% of respondents claimed not to know where to point a client to access design support versus 23% who do.
- 38% of participants believed that there is duplication of efforts from different support programmes (compared with 15% who believe that there is not).
- 57% of respondents were aware of Scottish design promotion activities versus 41% who were not aware. Alternatively 45% responded that Scottish design promotion activities do not communicate a common message.
- 53% of respondents concurred that there should be a single 'centre' proving the voice for design in Scotland versus 42% who disagree.
- 42% of representatives stated that the Scottish design industry is unable to communicate the return on investment in design compared with 23% who felt that it could.
- 63% of respondents agreed that Scotland has an international reputation for good design higher education.
- 36% of respondents asserted that there is not enough public investment in design education while 24% stated that the level is appropriate.
- 54% of respondents do not believe that there is enough of a link between design education and industry in Scotland.
- 55% asserted that design graduates do not have an appropriate amount of experience when entering the jobs market.
- 33% of respondents stated that design education reflects the contemporary understanding of design compared with 20% who believed it does not.
- 54% of respondents agreed that Scotland performs as well as the rest of the UK in terms of knowledge exchange between academia and industry compared with only 9% who believed that it does not.
- 32% of participants stated that the Scottish Government does not have strategy to increase demand for design compared with 57% who responded 'don't know' and 11% who responded 'yes'.
- 51% of participants felt that the Scottish Government does not have an appreciation of the broader capabilities of design.
- 60% of respondents were not aware of public funding to support the use of design versus 33% who stated that they were aware.
- Of the survey respondents, 72% had not accessed design-related funding compared with 28% who had.

CHAPTER 5

DISCUSSION



1 Design users

According to the survey respondents, 82% believe that there is an increase in demand for design in the private sector in Wales compared with 60% who believe the same for Scotland. Alternatively, 59% of Scottish respondents felt that there is growing demand for design in the public sector compared with 50% in Wales. From the workshops in both Wales and Scotland respondents reported a lack of clarity of understanding among both the private and public sectors regarding design. The Scottish Government is looking to lead by example in using design thinking to improve public services and policy through the Creativity Team. The Creativity Team collaborates with external partners to develop internal expertise in using design thinking in policy development and implementation. It also supports networking for co-design in the public sector in Scotland and provides specific project support for policy and People Directorate (formerly HR) services. The Welsh Government appears to be slower to embrace design as an approach to public sector innovation. Two Welsh Councils – Cardiff and Monmouth – were highlighted as design users, both testing design as an approach to service development. This highlights a need for more case studies on Welsh and Scottish companies and public

authorities using design successfully in order to communicate the value of design to other SMEs and government officials. According to research by the Design Council, only 17% of Welsh and 8% of Scottish companies use product design.²⁶ These figures date from 2007 and there is a need for further research and data on how companies and the public sector use design. For example, has design use by companies increased since then as a result of government programmes and grass-root promotion? If so, how did government programmes stimulate demand and how can it enhance demand in the future? There was remarkable synergy between the systemic strengths and weaknesses identified by workshop participants in Wales and Scotland as well as overlap in the policy proposals generated. To enhance the strategic understanding of design among businesses, stakeholders in all four workshops proposed to collate a series of case studies demonstrating the impact of design in different industry sectors. Both groups also independently arrived at the proposal to conduct research on how companies use design – whether purely for branding and communication, for product design or more strategically as part of their business model.

2 Design support

Design support programmes have traditionally focused on enabling SMEs to use design by providing mentoring, assistance in writing briefs for designers, advice on procuring design and guidance on managing the design process. More recently, an array of different design support mechanisms have arisen including tax credit schemes, subsidy and voucher schemes and export promotion programmes. In Wales, the main business support mechanism is the programme Business Innovation (£35 million over five years), which includes a number of sub-programmes including Innovation Vouchers, in which design is an eligible cost as well as the Design Advisory Service operating since 1994. The Design Advisory Service is a three-year contract currently worth £794,000 per year with targets to assist 150 companies per year. However, over half of survey respondents – 53% – were not aware of the Welsh Government funded Design Advisory Service. In line with this, 76% of designers have not referred a client to the Design Advisory Service due to the perceived barrier of the ‘three quotes’ tendering process. Similarly, 57% were not aware that Welsh Government innovation credits could be spent on design. As such, it was proposed that design should be a mandatory component of all innovation funding programmes to encourage companies to find out about design by having to include it in all funding applications.

Additional design support is provided through the Service Design Programme, focused on the traditional manufacturing sector and led by PDR; a design management programme called ISD involving University of Wales, Trinity Saint David and PDR as well as the Enterprise by Design programme delivered by PONTIO at Bangor University.

In Scotland, Scottish Enterprise supports innovation in a variety of ways including: advisor support such as innovation, ICT, organisational development, sustainability; workshops on topics such as new product development, business model generation, developing a culture of innovation and a variety of funding mechanisms such as R&D. Much of this support stimulates increased and improved design within businesses. In addition, Scottish Enterprise provides a number of programmes of support that explicitly mention design, such as a design thinking and design-led approach to new Product and Service Development and Design Mentor Support. In 2010 and 2012, over 40 Scottish SMEs were taken through two prototyping pilots, which included attending awareness raising workshops followed up with two days of 1-2-1 support from a design expert to help identify design opportunities and develop a design brief. A budget of £216,000 was allocated to this.

²⁶ Design Council (2007) 'Value of Design Factfinder Report', London, p.97 www.designcouncil.org.uk/sites/default/files/asset/document/TheValueOfDesignFactfinder_Design_Council.pdf

Design Mentor Support is the current means of delivering design to SMEs and uses SE's Innovation Support Grant light-touch feasibility to appoint a Design Mentor to work with the company for up to five days. This is offered to SE Account Managed or Business Gateway pipeline businesses and outcomes include supporting the business to identify the right design project and provide guidance to develop a robust project brief. According to SE, every £1 spent in 2013-14 delivering the SE service could generate a return of between £2 billion and £3 billion of net additional Gross Value Added for the Scottish economy over the next ten years. It is expected that for every £1 spent in 2014-15, the Scottish Enterprise service could generate a return of between £1.9 billion and £2.9 billion of net additional Gross Value Added for the Scottish economy over the next ten years.²⁷

Another key Scottish business support mechanism for start-ups is the Business Gateway (£96 million over six years) delivered on behalf of the Scottish Government. In 2013/2014, Business Gateway supported 7,500 businesses and every £1 spent delivering the Business Gateway service generated £7.20 of additional Gross Value Added for the Scottish economy.²⁸ Design is an eligible cost within Business Gateway but data on how companies use design through the programme was not available. Other initiatives include Starter for 6, an investment

3 Design promotion

In Wales, the Design Wales Forum is the main design promotion body ensuring that the design sector has a voice in industry and government and is funded by the Welsh Government. Of the Welsh survey respondents, 50% felt that the Design Wales Forum supports designers in Wales with 42% responding 'don't know' and 8% answering 'no'. A number of the Welsh HEIs also promote design in Wales through various activities such as the Cardiff Design Festival and Venturefest Wales. Furthermore, 65% of respondents were aware of Welsh design promotion activities such as the Cardiff Design Festival versus 35% who were not aware. Alternatively 35% responded that Welsh Design promotion activities do not communicate a common message. In addition to Welsh Government and HEI sponsored activities, there are a significant number of grassroots promotion initiatives including the Eisteddfod, Dorkbot, Design Stuff Cardiff and Cardiff MADE, among others. There are also a number of design award schemes in operation including the Best of Welsh Design Awards, Insider Magazine Awards and the Design Management Europe Award. In Wales, policy proposals included appointing Design Thinking Ambassadors to different Welsh Government industry committees, setting up a WG award for successful design projects and feeding successful case studies back to the civil service and to Ministers.

programme for creative industry entrepreneurs (£600,000 over four years).²⁹ Of the Scottish survey respondents, 57% claimed not to know where to point a client to access design support versus 23% who do. In addition, 38% of participants believed that there is duplication of efforts from different support programmes. Furthermore, 39% of respondents believed that design is not explicitly promoted within Scottish innovation support programmes (compared with 10% who assert that it is). It should be acknowledged that 50% of the Scottish survey respondents classified themselves as designers and 50% as enterprises. Survey results in both Wales and Scotland would suggest that there is a communication gap in promoting design within business support programmes and that the programme landscape is not easy to navigate. Workshop participants in Scotland identified that Scottish Enterprise could conduct a journey mapping exercise to ascertain how businesses access design support across the different programmes. There was a feeling that companies 'bounced' between business support programmes and therefore, design should be more explicitly promoted within innovation programmes. It was also proposed by participants that additional provision of training to the Scottish Enterprise Innovation Specialists and Welsh Government Innovation Managers in the value of design would ensure more effective promotion of design to companies.

There is an array of design promotion bodies in Scotland – Creative Scotland, the Lighthouse, Architecture and Design Scotland and of course, the eagerly anticipated V&A Museum of Design Dundee. There are also a number of active promotion initiatives such as Scotland Re:Designed, Social Innovation Camps, Tech Meetups, Pecha Kucha Nights, Culture Hack Scotland and the Design Thinking and Innovation Group, to name a selection. In addition, 2016 will be the Year of Innovation, Architecture and Design in Scotland. The Design in Action project funded by the AHRC has also played a significant role in promoting design across Scotland including through their Scottish Design Summit in May 2014. From the survey, 57% of respondents were aware of Scottish design promotion activities versus 41% who were not aware. Alternatively 45% responded that Scottish design promotion activities do not communicate a common message. Policy proposals included promoting design to the public sector via the Scottish Leaders Forum - a network of top civil service executives, creating an online portal with case studies, funding opportunities and design resources for SMEs, the public sector, designers and academics as well as creating a 'Good Design Scotland' stamp.

4 Design actors

In Wales, design representation is dominated by the six design-active HEIs such as Bangor, Cardiff Met, Glyndwr, Royal College of Music and Drama, University of South Wales and the University of Wales Trinity St David's Swansea. PDR at Cardiff Met is home to the Design Wales Forum, Design Directory Wales and Ecodesign Centre. A similar situation can be diagnosed for Scotland with four design-active HEIs on the scene although there are a larger number of publicly financed institutions such as Creative Scotland, the Lighthouse, the Cultural Enterprise Office and Architecture and Design Scotland (A+DS). In terms of Welsh Government funded organisations, these are limited to the Design Commission for Wales, which focuses predominantly on architecture and the built environment and Arts Council Wales that also has a small design portfolio. A number of other actors are also now enhancing their focus on design such as Creative and Cultural Skills and the Wales-based branch of Nesta. In both Wales and Scotland there are also an array of business and innovation networks that have an intermittent interest in design such as the South Wales Chamber of Commerce as well as

Institute of Directors Scotland. There is an opportunity for design stakeholders to cooperate more systematically with these players. In this way, design can move from the periphery of the innovation debate to a more central role. The issue of a single actor being the voice of design in Wales and Scotland was a contentious one. In Wales, 64% of respondents thought that there should be a single 'centre' proving the voice for design in Wales compared with 53% of Scottish respondents asserting that there should be a single 'centre' proving the voice for design in Scotland. Workshop participants in Scotland were supportive of the idea to appoint a single body to represent design in Scotland to not only support designers but also to raise awareness among enterprises. A number of possible actors were discussed including the V&A Dundee, Lighthouse and GSA. In Wales, it was proposed to appoint a number of centres of excellence in design across Wales. In both Wales and Scotland there appears to be a dearth of design champions from industry promoting design to companies and the public sector.

5 The professional design sector

In Wales, the professional design sector is represented by the Design Wales Forum with 889 members (at the time of publication). According to research by the Design Council in 2010, there are 11,147 designers in Scotland – an increase of 51% since 2003 while in Wales, there are 3,865 designers – a decrease of 8% on 2003.³⁰ There is no equivalent of the Design Wales Forum and the Design Directory Wales in Scotland; however, such a function could in the future be performed by one of a number of stakeholders. There is a drive in both Wales and Scotland to upskill designers – particularly regarding service design expertise – in Scotland, design is a focus for Skills Development Scotland. Design has been incorporated into the skills agenda in Wales

through a move by Creative and Cultural Skills to set up design apprenticeships as an alternative to higher education. When asked whether Wales has a proportion of designers working at the cutting edge of the practice, 33% responded 'yes', 33% responded 'no' and 33% also responded 'don't know'. For Scotland, 42% of representatives stated that the Scottish design industry is unable to communicate the return on investment in design compared with 23% who felt that it could. Therefore proposals in both Wales and Scotland focused on continuous professional development opportunities for designers focused on service design and business processes.

6 Design education

In Wales, there are six HEIs currently active in design and in Scotland, there are four HEIs deemed to be strategically active in design – the Universities of Aberdeen (Gray's School of Art), Dundee (Duncan of Jordanstone College of Art & Design), Edinburgh Napier (Faculty of Engineering, Computing & Creative Industries) and Glasgow School of Art. Concerns were raised by Welsh and Scottish workshop participants about the relationship between academia and industry, whether design education reflects current practice and the capability of design graduates. For example, 42% of respondents identified that there is not an effective relationship between design education and the design sector in Wales compared with 32% who believe there is. Alternatively in Scotland, 54% of respondents do not believe that there is enough of a link between design education and industry in Scotland. Equally 48% of Welsh respondents and 55% of Scottish respondents asserted that design graduates do not have

an appropriate level of experience when entering the job market. Of the Scottish survey respondents, 63% agreed that Scotland has an international reputation for good design higher education. From the workshops and surveys it was clear that design education needs to better understand SME requirements both in terms of course content and practical capabilities of graduates. As education is a devolved power, Wales and Scotland are in a position to revise the primary and secondary school curriculums in design, which participants felt required an overhaul. This could involve re-training design teachers to link early years problem-solving to design. At HEI level, more cross-fertilisation between design and other disciplines was proposed particularly as part of multi-disciplinary real world challenges. Specifically to Wales it was proposed that design apprenticeships could be an alternative to a degree and this is already being explored by Creative and Cultural Skills.

²⁷ Scottish Enterprise Impact Model 2013 and 2014.

²⁸ Business Gateway (2014) 'Annual Review 2013/14', p.2 and p.5. www.bgateway.com/media/254942/bg-ar13-national-18jun14.pdf

²⁹ www.culturalenterpriseoffice.co.uk/website/default.asp?menu=s46&page_sel=s46&menu_2_sel=1&menu_3_sel=0

³⁰ www.designcouncil.org.uk/sites/default/files/asset/document/DesignIndustryResearch2010_FactSheets_Design_Council.pdf

7 Research and knowledge exchange

According to 40% of respondents, Wales does not perform as well as the rest of the UK in terms of knowledge exchange between academia and industry. Alternatively, 54% of respondents agreed that Scotland performs as well as the rest of the UK in terms of knowledge exchange between academia and industry compared with only 10% who believe that it does not. In Wales, the main academia-industry collaboration programme is Academia4Business and in Scotland it is Interface. While both of these initiatives are successful, workshop participants felt that more design-related activities could be conducted through these programmes and a proposal included promoting design more explicitly within these initiatives. In Scotland, the AHRC funded project Design in Action has been effective in creating

an active dialogue between academia and industry. In Wales, the ASTUTE project (Advanced Sustainable Manufacturing Technologies) is a partnership across nine Welsh universities, led by Swansea University, to embed advanced technologies into Welsh manufacturing by combining engineering, science, business and design expertise.³¹ The £27 million project is part-funded by the European Regional Development Fund operating from 2010 to 2014. While world class research is being generated through these projects, participants questioned whether the insight generated through academia is accessible to companies. Therefore, universities should perhaps be more proactive in embedding research more broadly within industry.

8 Policy, governance and regulation

Design already features as part of innovation policy in Wales but not in Scotland. In addition, 56% of respondents were aware of the Welsh Government policy 'Innovation Wales' and 50% were aware that design is included in the policy. Nevertheless, 43% asserted that the Welsh Government does not have a strategy to increase demand for design. While the policy represents a vision for design in Wales, the policy has yet to be linked to an action plan. Nevertheless, this research has proposed a series of actions that could form part of such a strategy. These proposals have been presented to the Welsh Government and plans have been made to further examine the feasibility of the proposals to appoint a design manager within the Welsh Government innovation team, train Welsh Government officials in design thinking and appoint a design representative to Welsh Government industry sector panels. These actions form part of a drive to raise awareness of design more generally within the Welsh Government. The Welsh Government already co-finances the INTERREG IVB project SPIDER (Supporting Public Sector Innovation using Design in European Regions) led by PDR at Cardiff Met. SPIDER is implementing two service design pilots with Cardiff Council one focused on getting young people back into employment and the other on independent living for dementia patients. As part of the project, 100 civil servants will attend service design training in 2015.

In Scotland, 32% of participants stated that the Scottish Government does not have strategy to increase demand for design compared with 11% who believe that it does. In addition, 51% of participants felt that the Scottish Government does not have an appreciation of the broader capabilities of design. Although design does not formally feature within Scottish policy, the Lighthouse and Scottish Enterprise are collaborating to advocate design as a strategic tool for innovation to the Scottish Government. Workshop participants proposed to develop a stakeholder-led manifesto for design in Scotland that could feed into a distinct design strategy for Scotland separate from the innovation policy. Workshop participant felt that design could be a driving force for innovation in the public sector in Scotland and supported the action of piloting design methods within five local authorities to create case studies of design impact in public service and policy development. This approach should be combined with a more general design awareness and training exercise among Scottish Enterprise and Scottish Government officials. For example, policy-makers from Wales and Scotland could participate in a study visit to the Cabinet Office Policy Lab and Government Digital Service. The Cabinet Office Policy Lab, launched in April 2014, is piloting design as an approach to public service and policy development in five central government departments over one year. In Scotland, the Creativity Team already uses design methods to enhance inclusive policy-making and in Wales, Nesta is establishing a Public Service Innovation Lab to use design methods to tackle policy and public service issues in Wales. Workshop participants in both Wales and Scotland stated that Policy Labs in government would be an effective way to introduce design thinking and inclusive policy-making to the civil service.

9 Funding

The resounding message from workshop participants and survey respondents in Wales and Scotland was the funding landscape for design is complicated. In Scotland, 60% of respondents were not aware of public funding to support the use of design versus 11% who stated that they were aware. In line with this, 72% had not accessed design-related funding compared with 28% who had. Funding mechanisms can act as a means to promote design to companies. For example, the proposal in Wales to set up a Design and Development Grant to encourage start-ups to invest in design is currently under consideration and Scottish Enterprise are also considering a grant to enable SMEs to invest in design. Respondents in both Wales and Scotland proposed to appoint

a multi-disciplinary team to re-design the innovation funding application process to make it more user-friendly. However, public procurement rules must comply with EU regulations and therefore cutting red tape for accessing innovation financing is more complex than re-designing the application process. In Scotland, a number of financing mechanisms exist such as the Prototype Funds issued through the Design in Action initiative, Starter for 6, innovation vouchers through Interface and more general financing from Scottish Enterprise. It was proposed that both Scottish Enterprise and the Welsh Government review innovation and design financing mechanisms in order to be able to more effectively signpost potential applicants.

³¹ www.astutewales.com/en/

CHAPTER 6

CONCLUSION



TO BEGIN TO ADDRESS THESE ISSUES, WE INTEND TO CONDUCT FURTHER RESEARCH WITH INDUSTRY PARTNERS, ACADEMIC COLLEAGUES AND GOVERNMENT POLICY-MAKERS AROUND THE WORLD.

Many parts of the UK have initiatives to support design but they operate outside the mainstream innovation ecosystem and therefore are not reaching their full potential. To implement effective policies and programmes for design, policy-makers require insight into the design landscape, the active players and the operating conditions of the Design Innovation Ecosystem. Therefore, this research sought to ascertain how design fits into innovation ecosystems theory and how it applies in practice so that policy-makers can develop design-driven innovation infrastructure in an informed way. By mapping the design infrastructure in Wales and Scotland, this research has validated theory on Design Innovation Ecosystems by providing concrete examples of how design can achieve innovation policy priorities. By being directly involved in the process, the framework enabled policy-makers to take a more holistic view of the interaction within the innovation environment and subsequently to develop more targeted policies and support mechanisms. Not only was the Design Innovation Ecosystem framework a useful tool for conceptualising the environment in which design operates, but policy-makers also found the methodology engaging. While co-design methods are familiar to researchers active in the field, methods that visualise complex systems and facilitate constructive dialogue between diverse stakeholders is not common among government officials. The feedback from policy-makers was that both the framework and the method were beneficial in constructing a shared understanding of user needs and policy constraints between stakeholders. This approach resulted in new ideas for and from policy-makers, demonstrating the usefulness of the Design Innovation framework and co-design method. For example, participants in both the Scottish and Welsh workshops proposed additional training in the value of design for innovation specialists within the Welsh Government and Scottish Enterprise to further promote design as an approach to innovation for SMEs. Other recommendations that the Welsh Government will consider is making design a mandatory component of all Welsh Government innovation programmes to encourage the up-take of design by SMEs, appointing design representatives to Welsh Government industry committees, recruiting a design manager within the Welsh Government and setting up a Design and Development Grant to encourage start-ups to invest in design. The workshop participants also proposed that Scottish Enterprise could conduct a journey mapping exercise to understand how businesses access design support across the different programmes, ensure that design is an eligible cost within the Smart Exporter programme, set up grant for SMEs and promote design to the public sector through the Scottish Leaders Forum. This would suggest that while there may be significant synergies between regional Design Innovation Ecosystems in the UK, or indeed in other EU countries, there are also unique operating conditions and therefore, this framework and method could be replicated to support evidence-based policy-making elsewhere.

As with any research, there are limitations. This research has benefited from having design aware policy-makers within the Welsh Government and Scottish Enterprise participating in the process. These government 'design champions' have been instrumental in steering the research, contributing to the workshops, and translating workshop outputs into implementable policies. Further research should examine the levels of prior design awareness required within government to facilitate this design approach to policy development (whether that be policy

that examines design and innovation or any other aspect of policy development). It is perhaps obvious that the policy beneficiaries – those upon which the policy will impact – should also be well represented during stakeholder engagement activities related to policy development. As such, this exploratory research reflects a snapshot in time of the knowledge of a small, yet expert, group and therefore may not necessarily represent the entire design landscape in Wales and Scotland. Perhaps the policy proposals would have been different with a greater participation of SMEs and designers in the workshops. However, it is understandable that SMEs cannot see the value of attending such workshops given the commercial and resource pressures that they face. For this research, the lower rate participation by SMEs and designers was mitigated by surveys. In further research, potentially more effective means of SME engagement should be explored, which could take the form of incentives for workshop attendance, presenting policy developments at industry events, or a broader set of surveys and industry visits to explore needs in more depth.

This research could open up new opportunities for influencing policy at regional and national level in the UK and across Europe. With design prioritised as a driver of innovation in the European Commission's policy Innovation Union, governments across Europe are looking to understand how design can achieve innovation policy priorities. This is particularly relevant in the context of the growing emphasis on smart specialisation strategies where the creative industries, and within it, design, are being highlighted as a powerhouse for European competitiveness. As such, the UK has the opportunity to lead on this policy agenda. The framework and method could be implemented on a wider scale to influence policy not only in the Department for Business, Innovation and Skills but also other ministries like the Department for Communities and Local Government, Department for Culture, Media and Sport and even the Department for Health. Design, as an approach to problem-solving, is relevant to all these policy domains. There is already growing interest in design within central government with the launch of the Cabinet Office Policy Lab in April 2014. The Policy Lab is one year pilot to examine how design thinking can redefine policy challenges and there are discussions to set up a similar initiative in Wales. Crucially, governments require evidence of how SMEs are using design and how it adds value to a company. For example, by involving designers at the outset of the innovation process, is the return on investment of the product or service greater than if the designer is only involved at the end of the process for styling and packaging? What aspects of design do companies invest in – is it limited to branding and communication or are more companies investing in design as a driver of innovation in services? How is the public sector, from central government through to local authorities, investing in design? To influence policy changes, government requires not only the qualitative insight gained from a co-design method with policy beneficiaries but also the quantitative insight generated from empirical evidence of design investment by both the private and public sectors. From such research it could be identified whether an empirical or co-design approach is more effective for policy development or how to instigate an effective balance of the two. It could be surmised that current quantitative approaches to policy development would be enhanced and become more user-focused if supplemented by a co-design approach to policy formulation.

CHAPTER 7



ACKNOWLEDGEMENTS

PDR, the National Centre for Product Design and Development Research, is part of Cardiff Metropolitan University. PDR has been conducting research on policies and programmes for design for design since 2005 (www.seeplatform.eu). This work has been funded by the Arts and Humanities Research Council through Research Development Funding. PDR would like to thank all the workshop participants, the survey respondents and the steering committee members for their contributions:

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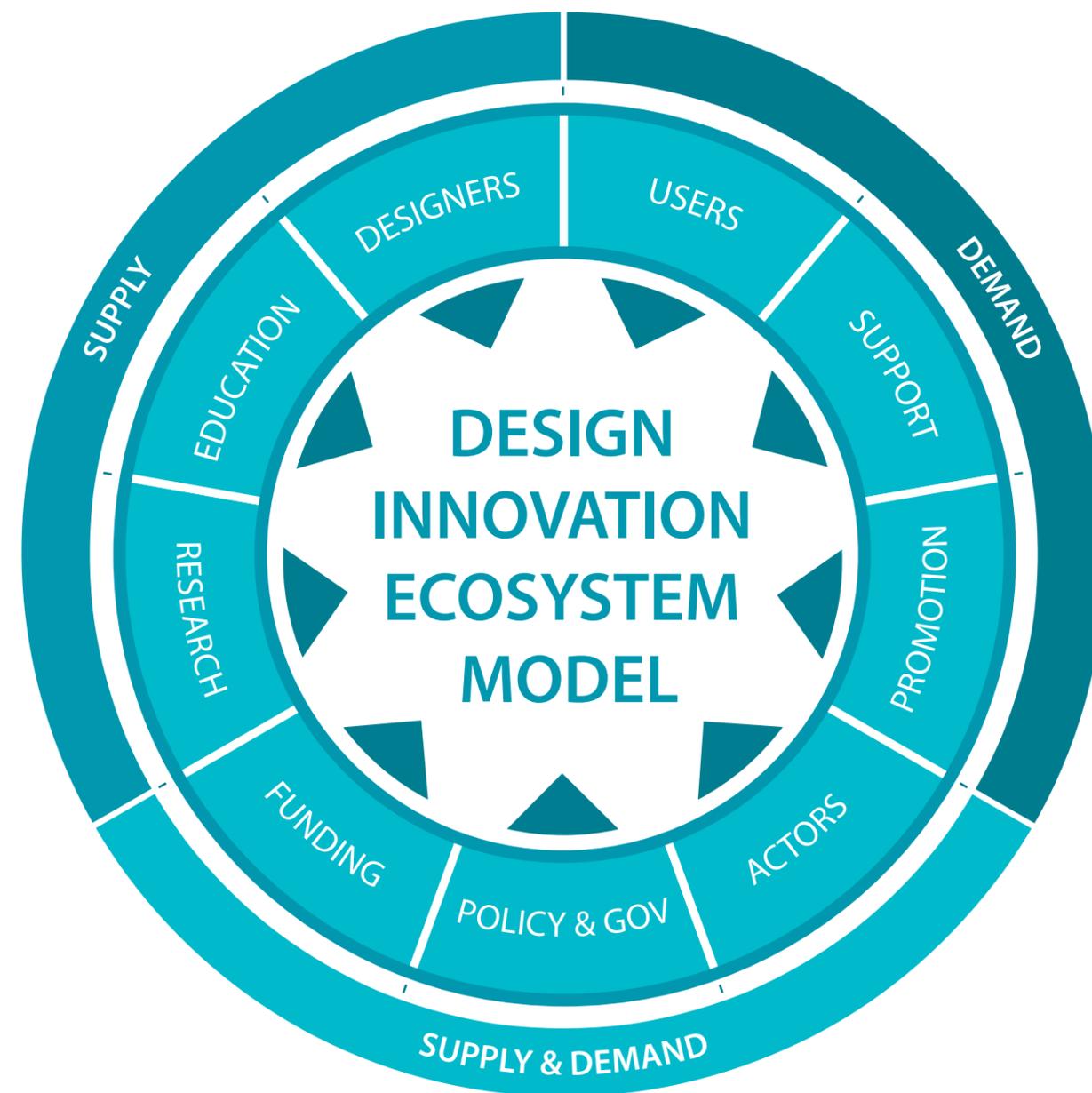
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CHAPTER 8

APPENDICES



ECO System Model



Survey responses from Wales

Question	Yes	No	Don't know
Do you think that there is increasing demand for design from the private sector in Wales?	78,9	9,6	11,5
Do you think there is increasing demand for design from the public sector in Wales?	50	28,85	21,15
Do you think that the Design Wales Forum supports designers in Wales?	55,8	9,6	34,6
Do you think that the DesignDirectoryWales.org is effective in helping clients to find designers?	30,8	23,1	46,1
Do you think that Welsh businesses understand the value of design to their bottom line?	9,8	80,4	9,8
Is Welsh business understanding of design limited to Branding?	35,3	37,25	27,45
Is procurement a barrier to using design in both the private and public sectors?	56,9	15,7	27,4
Do businesses struggle to write design briefs?	82,4	9,8	7,8
Is there a range of support mechanisms for design available in Wales?	41,7	18,7	39,6
Are you aware of the Design Advisory Service?	41,7	58,3	0
Is design support explicitly promoted within broader innovation support programmes?	8,3	37,5	54,2
Are you aware that innovation credits can be spent on design?	31,9	57,5	10,6
If you are a designer: has your business ever referred a client to the Design Advisory Service? If you are a non-design SME: has a designer ever referred you to the Design Advisory Service?	11,1	77,8	11,1
Does the Welsh Government provide incentives for investment in design?	22,9	27,1	50,0
Do you think there is duplication of efforts from different support programmes?	29,2	10,4	60,4
Are you aware of Welsh design promotion activities, (e.g. the Cardiff Design Festival)?	66,7	33,3	0
Are you aware of the Welsh Government's "Innovation Wales"?	55,6	44,4	0
Do Welsh design promotion activities provide a common or coordinated message?	11,1	35,6	53,3
Should there be a single 'centre' providing the voice of design in Wales?	64,3	26,2	9,5
Do design representatives in Wales collaborate effectively?	16,7	35,7	47,6
Do design representatives in Wales communicate effectively with government?	7,1	28,6	64,3
Is there an effective relationship between design education and the design industry in Wales?	31,7	41,5	26,8

Question	Yes	No	Don't know
Does Wales have an appropriate proportion of designers working at the 'cutting-edge' of design practice?	25,0	37,5	37,5
Is design education considered at primary/secondary level in Wales?	24,4	31,7	43,9
Does design education in Wales link well enough with industry?	19,5	58,5	22,0
Do design graduates have an appropriate amount of experience when entering the jobs market?	17,5	52,5	30,0
Does the content of design courses reflect the contemporary understanding of design?	17,1	36,6	46,3
Do you think Wales performs as well as the rest of the UK in terms of knowledge exchange between academia and industry?	26,8	29,3	43,9
Do you think there is an appropriate level of dialogue between the design industry and the Welsh Government?	12,2	43,9	43,9
Are you aware that Design is included in the Innovation Policy for Wales?	51,2	41,5	7,3
Do you think positioning Wales as a Design-led nation is a realistic ambition?	68,3	19,5	12,2
Do you think design could have a role in reinvigorating public services in Wales?	87,8	4,9	7,3
Do you think that the Welsh Government have an understanding of design that is core to innovation?	19,5	53,7	26,8
Do you think that the Welsh Government has a strategy to increase demand for design?	12,2	43,9	43,9
Within Welsh Government, do you think that designing for the end user is at the centre of policy making?	2,4	53,7	43,9
Do you think public procurement is overly risk averse?	39,0	41,6	46,4
Do you think Welsh Government funding for innovation is typically technology-led?	56,1	14,6	29,3
Is the 'three quotes' tendering process a barrier to collaboration with the design industry?	39,0	22,0	39,0

Survey responses from Scotland

Question	Yes	No	Don't know
Do you think that there is increasing demand for design from the private sector in Scotland?	60,3	32,0	7,7
Do you think that users of design in Scotland recognise a need for a new approach to innovation?	50,6	33,8	15,6
Do you think there is growing awareness of design in the public sector in Scotland?	59,0	24,3	16,7
Do you think that design users in Scotland understand the benefits of design to them?	50,0	30,3	19,7
Do you think that the Scottish government recognises the potential of design in creating and improving services?	46,1	34,2	19,7
Are you aware of any data that exists on the design use in Scotland?	10,4	77,9	11,7
Is procurement a barrier to using design in both the private and public sector?	54,0	19,7	26,3
Do businesses struggle to write design briefs?	66,2	5,2	28,6
Is there a range of support mechanisms for design available in Scotland?	50,7	20,3	29,0
Is design support explicitly promoted within broader innovation support programmes?	10,2	39,1	50,7
If you are a designer: do you know where to point your clients for design support? If you are a non-design SME: has a designer ever referred you to a design support organisation?	23,3	56,7	20,0
Can quantitative indicators provide insight into the scope or impact of design?	68,7	3,0	28,3
Do you feel that the Scottish support programmes take the right approach to risk?	10,4	38,8	50,8
Does Scottish Enterprise provide incentives for investment in design?	16,2	25,0	58,8
Do you think there is duplication of efforts from different support programmes?	38,2	14,7	47,1
Are you aware of Scottish design promotion activities?	57,4	41,0	1,6
Do Scottish design promotion activities provide a common or coordinated message?	11,7	45,0	43,3
Should there be a single 'centre' providing the voice of design in Scotland?	52,8	41,5	5,7
Do design representatives in Scotland collaborate effectively?	22,7	24,5	52,8
Do design representatives in Scotland communicate effectively with government?	11,3	30,2	58,5

Question	Yes	No	Don't know
Do you agree that Scotland has an international reputation for good design Higher Education?	63,3	10,2	26,5
Is there appropriate public investment in design education in Scotland?	24,0	36,0	40,0
Is design education considered at primary/secondary level in Scotland?	26,6	36,7	36,7
Does design education in Scotland link well enough with industry?	22,0	54,0	24,0
Do design graduates have an appropriate amount of experience when entering the jobs market?	12,2	55,1	32,7
Does the content of design courses reflect the contemporary understanding of design?	32,7	20,4	46,9
Do you think there is strong university-business collaboration in design in Scotland?	39,1	37,0	23,9
Do you think Scotland performs as well as the rest of the UK in terms of knowledge exchange between academia and industry?	54,3	8,7	37,0
Do you think that the Scottish Government have an understanding of design that is core to innovation?	9,1	50,0	40,9
Do you think that the Scottish Government has a strategy to increase demand for design?	11,4	31,8	56,8
Are you aware of a Scottish Design Policy or Action Plan?	11,1	77,8	11,1
Do you think that the Scottish Government has an appreciation of the broader meaning/capabilities of design?	15,6	51,1	33,3
Are you aware of public funding that can support the use of design?	33,3	60,0	6,7
Have you ever accessed innovation funding for a design project?	27,9	72,1	0

