# Institute for Sustainable Design

...driving innovation

# End of Term Evaluation Report

UNDEB EWROPEAIDD
EUROPEAN UNION

Llywodraeth Cymru
Welsh Government

**Cronfa Datblygu Rhanbarthol Ewrop**
**European Regional Development Fund**

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| **Prepared by:** | **Dr Dylan Henderson** |
| **Checked by:** | **Meirion Thomas** |

CM International, CBTC, Senghenydd Road, Cardiff, CF24 4AY, United Kingdom
Tel: 029 2038 9597, Fax: 029 2064 7009
E-mail: d.henderson@cm-intl.co.uk

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## Introduction

The report sets out CM International's end of project evaluation of the Institute for Sustainable Design (ISD), covering the period 2011 to 2015.

The objective of the end of project evaluation is to assess the achievements of the project, its management and delivery, impacts, value for money; and provide recommendations for future delivery.

The methodology employed includes analysis of project monitoring records, interviews with project management, delivery staff and stakeholders, and a business survey supplemented with case studies.

## Project overview

ISD was funded under the ERDF Operational Programme for the Convergence region of Wales. Its aims were to:

> *'…support the development of a sustainable, innovation led, design and manufacturing industry which will significantly increase Wales' capacity to meet the Government's objective of building an economy based upon knowledge transfer, innovation and entrepreneurship'. (P.12)*

It responded to identified needs to provide design and innovation support to both the design and non-intensive design businesses (and individuals) in key sectors in Wales, and catalyse growth in the Welsh economy and wider environmental sustainability. The project addressed key strategic priorities for Wales including Innovation Wales, Science for Wales and For our Future.

In order to deliver against the ISD objectives, the support activities provided by the project primarily targeted graduates and new and existing businesses, and included,

- Facilitating growth in graduate entrepreneurship
- Engaging and advising SMEs and individual innovators in R&D and innovation
- Developing and facilitating collaborative research activities
- Supporting inward investment opportunities

Demand for ISD was developed through a number of sources including workshops and events, publicity, referrals and so on. Eligible businesses and individuals were able to access design and enterprise advice, and collaborative R&D support. All beneficiaries were also supported via the SBBS Sustainability HealthCheck – an online diagnostic tool provided by arrangement with Bangor University, and follow-on support.

The agreed project budget for ISD in the full period was £4,710,076.

## Management and delivery

The management structure for the project comprised a Project Steering Group responsible for overall delivery, a Project Director and Project Manager to coordinate and manage the project on a day-to-day basis. A Knowledge Transfer Team delivered technical and business support of the project, and were split across UWTSD and Cardiff Metropolitan University sites.

## Final outputs

The final outputs of ISD indicate that the project performed strongly against the agreed activity targets, including success in achieving the targeted volume of businesses assisted and in conducting collaborative R&D projects. It has also exceeded key economic and innovation indicators such as the number of gross new jobs created, and number of new products, processes and services registered and launched.

Despite this positive performance there are two areas where performance was below target, namely, profit benefit and investment induced. This is indicative of the ongoing development of many new products, the state of the economy for an important part of the project's delivery, and the generally small size of the businesses supported. The end of project evaluation survey and case studies further indicate that many individuals and companies have yet to fully launch their products, processes or services. This, to a large extent, is consistent with and reflects the long-term nature of the innovation and commercialisation process including where design inputs are a key factor.

As anticipated for a project specifically targeting environmentally focused businesses, performance against the cross-cutting themes was below target the original target of 20% of total enterprises assisted. However, ISD did achieve 80% of the target for enterprises adopting or introducing environmental action plans achieved (22), and a similar proportion/number improving equality strategies and monitoring systems (77%, 21). This is apparent shortfall can be offset by the fact that the project more than doubled its target for enterprises assisted.

The SBBS HealthCheck represents an innovative approach to delivering the cross-cutting themes, ensuring that they are integrated into the project at an early stage, and is being sourced by other projects where collaborations with the WISE Network are in place e.g. SEACAMS, Wales Centre for Behaviour Change and the Institute for Sustainable Design. The HealthCheck is also being considered as a potential service for a wider range of projects in the next round of Structural Funding in Wales. The adoption of the SBBS HealthCheck provided the added value of a Welsh Language survey. Though not universally adopted many ISD clients completed the Welsh Language survey alongside the Sustainability and Equality sections.

## Impacts achieved

The project has produced a range of economic, design and innovation, and environmental and social impacts.

Of these, the cumulative economic impact of the project is estimated to be £9.7 million and some 53 net additional jobs (by June 2015). These figures can be expected to increase as additional products, processes and services are commercialised in future.

The design and innovation impacts, as noted above, are evident both in the registration of intellectual property and launch of some new products, processes and services, as well as the ongoing investment in R&D and collaboration reported between businesses and universities. For the most part, however, these continue to be under development for the majority of companies, suggesting the potential for future (as of yet) unknown benefits. Positive impacts are, however, evident in the development of positive attitudes towards design and innovation, including greater confidence, knowledge and ambition for design and innovation. Potential wider benefits are also related to skills for design and innovation and the creation of new design businesses, and expectations for ongoing use of ISD facilities and expertise by a high proportion of beneficiaries.

Environmental and social impacts are illustrated by the ISD case studies, support for projects that address important environmental challenges reduction of carbon footprint of businesses, and protection of wildlife. Social impacts are also evident with respect to initiatives supporting innovative healthcare solutions.

In each of the areas the evidence of the business survey and case studies indicates that many impacts are likely to grow further as projects and activity reaches fruition. This suggests that greater project benefits will only be discernible after the formal end of the project.

## Value for money

*Economy*

The budget for the project was determined by the ISD team based on an extensive planning period by its managers, and a strong focus on achieving value for money. Project expenditure at the end of project evaluation point amounted to £4.2 million (based on expenditure claims at March 2015).

*Effectiveness*

Against the original objectives of the project the results suggest that the project has supported the creation of new design and innovation capacity, particularly at UWTSD, which has enable it to deliver support principally to individuals and businesses in the South Wales area.

Based on the design support the project has been effective in generating additional design and innovation activity, promoting innovation attitudes and skills, developing of new intellectual property, as well as new products, processes and services (with many more still under development), and creating a number of design intensive businesses.

The ISD project has not, however, been able to deliver on support to Welsh Government inward investment promotion, with its focus placed on its core activities.

*Efficiency*

The results suggest that the project has achieved £2.24 net additional cumulative GVA to the Welsh economy for every £1 spent. It has also created 68.3 net additional jobs, with a cost per job ratio of £61.6 thousand.

ISD management and delivery model has supported delivery through good working relationships between delivery partners, appropriate project management structures, a robust data collection system, synergies between the project and other related ERDF projects and a strong focus on delivering cross-cutting benefits.

## Strategic added value

The evaluation indicates that ISD's main area of strategic added value, has been in its development of synergies across design and innovation support activities where ISD has developed a distinct offering, and taken sensible steps to ensure that synergies are maximised, and overlaps minimised.

ISD has also exhibited some success in strategic leadership and strategic influence, notably in the local area of Swansea and adjoining Counties, although this leadership and influence is less visible in the wider Convergence area, while the profile and engagement generated by the iSustain programme does show good promise for the future. Similarly, engagement with SMEs and others achieved by ISD has been largely limited to the South West Wales sub region. However, for UWTSD in particular this offers potential for future activities at a strategic and operational level.

## Strengths and weaknesses

ISD has strengthened the capacity and infrastructure for design and innovation in (south) Wales and has complemented existing innovation and knowledge transfer priorities and supports through the provision of specialised product support.

One of ISD's key strengths has been to support the development of commercialisation outputs (products registered and launched, enterprises created), while helping to build confidence, knowledge and ambition in products and their design.

Finally, ISD has demonstrated important strength in respect of its focus on contribution to meeting the cross-cutting themes agenda for ERDF. The project also took on the additional challenge of introducing businesses to the recommendations of the Welsh Language Act.

The main area of weakness for ISD project is related to its ability to fully implement the aims and objectives of the project logic model, including securing a true pan-Wales focus to its activity, and fully engaging in inward investment activity.

## Future developments

The future sustainability of ISD is currently being considered by the project partners. CMI understand that it is unlikely that there will be a project bid for funding of the same nature

of the ISD project, however, there are a number of areas where the ISD project has provided opportunities and options for further activity and development.

In summary, these are:

1. **To rebalance the funding model** to embrace a mixed funding model – comprising a balance of charges for commercial services, research grants and University core funding - so that a sustainable funding position is developed over the long term (5 years +).
2. **To build on the legacy assets provided by the ISD project** including hardware and software; the skills and awareness to use these assets and the enhanced research capacities and confidence to engage and commercialise developed at the two Universities as a result of ISD activities.
3. **To capitalise on the SME engagements** that ISD activities have been able to foster, including networking and clustering activities and the iSustain events and awards.
4. **To meet specific niche sectoral needs and opportunities** by applying the design and innovation skills and technology and the wide engagement with businesses nurtured by ISD. These are likely to include the life sciences sector, ageing population technologies and applications and building components and architectural product design, in line with the current Smart Specialisation agenda for innovation and technology in Wales.

# 1 Introduction

This report provides the findings of CM International's (CMI) end of term evaluation of the Institute for Sustainable Design (ISD) project. ISD is funded by the European Regional Development Fund (ERDF) in the Convergence region of Wales, and was delivered by the University of Wales Trinity Saint David, in partnership with Cardiff Metropolitan University.

ISD began operation in December 2011, and was funded under Priority 1 - Building the Knowledge Economy, Theme 1 - Research, Development, Innovation and Technology of the ERDF Operational Programme. It provided support to businesses with the aim of developing design and innovation capacity, primarily, in the manufacturing sector. The support offered by ISD included delivery of workshops, seminars and demonstrations, mentoring and collaborative R&D projects.

The evaluation of ISD builds on an earlier mid-term evaluation[1], and specifically focuses on the end of term outputs, outcomes and impacts of the project, as well as recommendations for future development.

## 1.1 Objectives of the evaluation

The detailed objectives of the evaluation are set out in the evaluation specification. They include analysis of:

- The provision of expertise against the needs identified by the enterprises assisted and R&D collaboration projects.
- Integration with other support to businesses, including the number of referrals to other projects supported by structural funds.
- The quality of the projects undertaken (in delivering the desired economic impacts and structural change).
- The appropriateness of the project indicators and targets.
- The project's contribution to the cross cutting themes.
- The ongoing market need for the project, including whether the market need for the project is the same now as when it was envisaged and, if not, are there any gaps that could be exploited?
- Whether the project activity duplicates existing private sector support and/or result in market displacement?
- Progress towards an exit strategy and future development of the project.

[1] Trilein Regeneration (2014) 'Mid-term evaluation of the Institute for Sustainable Design'

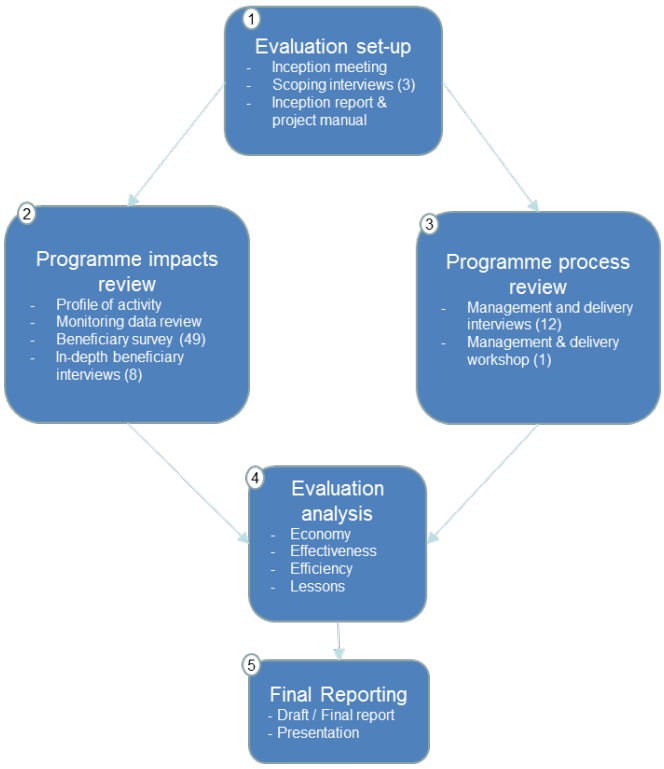
The evaluation specification also set the requirement for it to be informed by a review of existing financial and operational data, as well as interviews with stakeholders, key staff and a comprehensive SWOT analysis.

## 1.2 Research methodology

The end of term evaluation was based around five work stages and built on monitoring data collected by the ISD team, alongside a small number of interviews and a workshop with ISD management delivery staff, and a survey of individual and business beneficiaries.

A summary of the approach adopted can be found in *Figure 1* below detailing the focus and scale of the fieldwork undertaken for the evaluation. Further details of the approach adopted can be found in Annex I, including details of the impact methodology adopted.

***Figure 1. End of term evaluation work stages***




The evaluation research for the final evaluation stage was undertaken in the period March to June 2015.

## 1.3 Structure of the report

An overview of the ISD project logic model and its underpinning assumptions is provided (section 2), followed by a profile of funding and expenditure at the end of term stage (section 3).

The main focus of the report is found in sections 4 and 5, where the final outputs and impact of ISD. This is followed by an assessment of the project's Value for Money, (section 6), Strategic Added Value (section 7) and future delivery options (section 8).

The report concludes by summarising the key evaluation findings (section 9).

# 2 Overview of the project

ISD was launched in late 2011 and was intended to operate until the end of June 2015. This section of the report provides an overview of the ISD project, setting out the operating model employed by the project, and informs the analysis in the latter sections of the report.

## 2.1 Aims and objectives

The aims of ISD, as set out in the Business Plan (80576), were to:

- Create a pan-Wales design infrastructure based upon the recognized strengths of Wales' two leading centres of design education and knowledge transfer;
- Establish expanded research and development infrastructure in support of the design and manufacturing sectors in Wales;
- Increase the number of individuals and firms applying high end industrial design skills and knowledge in their businesses and establish a sustainable design innovation community in the Convergence region;
- Enhance the contribution of design to the economy of Wales - with the goal of ensuring that the project delivers maximum benefits to the knowledge in the region and Wales as a whole by creating a steady flow of design led enterprises to bolster the private sector;
- Enhance design innovation - by advancing intellectual understanding of the theory and practice of design and to nurture those innovative skills and attitudes to ensure Wales develops a sustainable design innovation culture – economically, environmentally and culturally.

To deliver against these aims, the project created an outreach team of expert staff – split between the two partner institutions - experienced in all aspects of the design industry and initiated support through a combination of workshops, one to one mentoring and collaborative research and development projects. This was intended to:

- Provide a conduit for transfer of knowledge to ISD clients in the context of the specific priority themes;
- Initiate projects to stimulate applied research and knowledge transfer resulting in the development of sustainable products, processes and services based upon low-carbon innovation;
- Develop a strategic campaign of Research & Development and Design & Development to support the development of a robust design cluster in the Convergence region and utilise links with Government agencies to promote the sector internationally;

- Ensuring that all businesses realise the potential of high end design in developing new products, processes and management practices which maximise the use of ICT;
- Strengthening the technology base of SMEs in key design sectors to facilitate the successful commercial exploitation of good new ideas from wherever they emerge.

These aims and objectives highlight the importance placed by ISD on the role of design within the wider innovation process. They also highlight the intended role in helping to build activity that has the potential to produce new products, alongside capacity building and wider sector development. This highlights the potential of ISD to produce long lasting impact on companies and sector beyond the life of the project.

## 2.2 Rationale and need for the project

The rationale for ISD was set out in its Business Plan[2]. This highlights the project's intension to contribute towards the strategic research, design and development infrastructure in Wales, and to support sustainable innovation by firms in the convergence region. In particular this sought to support the design and innovation needs of companies operating in key sectors – automotive, product design and architectural glass. In these areas the project intended to assist the upgrading of capacity and expertise with the potential for assisted businesses to become more economically and environmentally sustainable.

The rationale for ISD is further supported by its focus on supporting innovation. This has been identified as an important driver of growth, as expressed by the latest Innovation Wales policy statement[3]. This document highlights the importance of research and design as important underpinning factors in the innovation and commercialisation process. ISD's objectives, with a focus on providing individual and business support for key priority areas such as energy and environment, life sciences, advanced manufacturing is therefore consistent with these important strategic priorities.

Design has increasingly been identified as an important component of the innovation process, providing '*the connection'* between creativity and the development of new products and processes.[4] In this respect, design *'provides a series of methodologies, tools and techniques that can be used at different stages of the innovation process to boost the value*

[2] ISD (2011) 'The Institute for Sustainable Design: Business plan', version 10a.

[3] Welsh Government (2013) 'Innovation Wales'. Available from: http://gov.wales/docs/det/publications/140313innovationstrategyen.pdf

[4] Design Council (2011) 'Design for Innovation: facts, figures and practical plans for growth'. Available from: https://www.designcouncil.org.uk/sites/default/files/asset/document/DesignForInnovation_Dec2011.pdf

*of new products and services.*'[5] The importance of design has, in recent years, been embedded in strategic policy statements and initiatives across Europe.

At the same time, innovation has long been identified as essential to the UK's future economic prosperity with businesses acting as its key driver. Within this, universities are recognised as important sources of knowledge and expertise, with the potential to support businesses through access to knowledge and collaborative R&D.

While knowledge transfer between businesses and higher education has been identified as important in generating new products, processes and services, evidence points to the challenges that many businesses face in accessing academic expertise. This includes difficulties of identifying appropriate information on sources of experience, and of capturing the results. These factors suggest that without specific additional assistance companies will tend to under-invest in design and innovation projects. This is given some support by the comparatively low levels of expenditure on business R&D in Wales (0.6% of regional Gross Value Added[6], compared to the UK average of 1.9%).

In this respect, the evidence of comparatively low levels of innovation expenditure, allied to barriers to access expertise and support within universities, provides strong evidence of business need for an intervention such as provided by ISD. Evidence presented in the ISD business plan further identifies independent evidence of significant demand for a strategic research, design and development infrastructure to support sustainable innovation by firms in the convergence region (p. 40).

The rationale for ISD is also related to its contribution towards **strategic priorities in Wales.**

To this end the project was designed to contribute to key economic strategies such as the Economic Renewal Plan (2010), as well as important Science (Science for Wales), and higher education priorities (For our Future, 2009). The project also contributes towards the wider Welsh Government Programme for Government (2011), and the recent Innovation Wales strategy (2013), although neither were published at the time when the business plan was first developed.

These strategic priorities illustrate the potential for ISD to contribute to multiple policy agenda's, economic, innovation and knowledge transfer. Of these Innovation Wales[7] demonstrates the closest alignment with the priories of ISD, with its focus on innovation and

[5] European Commission (2013) http://ec.europa.eu/enterprise/policies/innovation/files/design/design-swd-2013-380_en.pdf

[6] Office for National Statistics (2014) 'Regional Economic Indicators. Available from: http://www.ons.gov.uk/ons/rel/regional-trends/regional-economic-indicators/july-2014/rep-regional-economic-indicators.html#tab-Innovation

[7] Welsh Government (2013) 'Innovation Wales'. Available from: http://wales.gov.uk/docs/det/publications/130714innwalesen.pdf

the underpinning role of design. The document highlights the importance of policy makers adopting a broad definition of innovation to include factors such as design (p.21). It also identifies the role of universities in economic development in Wales, arguing that:

> *'Higher and Further Education institutions will be required to confirm and reinforce the role of knowledge transfer and commercialisation in their core strategies, providing a long term commitment to these activities as a condition of Welsh Government support'.*

Innovation Wales and Science for Wales both identify 'grand challenge' priorities:

- Life sciences and health
- Low carbon energy and environment
- Advanced engineering and materials
- ICT and the digital economy

These and other priorities noted in this section highlight the strong strategic synergy that ISD had with a range of policy areas in Wales. The success of ISD in supporting strategic added value is considered in section 7 of this report.

## 2.3 Context for the project

A number of contextual factors have had an effect on the development and delivery of ISD. These have included institutional changes and external challenges as well as the effect of the general economic downturn. The key points of context within which ISD has been delivered are as follows:

- The project has been delivered throughout a period of economic downturn and recession which has an effect on the business fortunes and investment opportunities available to the target SME base of Wales in general and the Convergence area in particular. As a result, securing discretionary investment by SMEs in design and innovation activities has been a particularly challenge for the project staff.
- The host institutions of ISD have themselves been through a period of flux in respect of their governance arrangements as well as in their senior leadership and staffing. For ISD, this has meant that a number of senior champions of ISD in its gestation period, were no longer available to support the development and delivery of the project.
- Finally, an external challenge to the work of ISD arose from a network of private sector design consultants based largely outside of the Convergence area. The result of this challenge was that WEFO were required to investigate the potential for market duplication and displacement from the ISD project support for design and innovation in Convergence area SMEs. Inevitably, while the challenge and the investigation ensued it caused a diversion of management and staff attention at a crucial point of ISD launch and

activity. It also impacted on the ability of the programme to market itself fully across its original target sectors.

## 2.4 Project activities

To deliver against its project objectives, ISD offered SMEs and individual innovators in the Convergence region access to design expertise and facilities in a range of manufacturing and related subject areas. This included access to bespoke business assistance and the opportunity for companies to work with on a collaborative R&D project.

The project activities therefore included four main strands of activity:

***I. Facilitating growth in graduate entrepreneurship***

This activity built on a series of UWTSD initiatives, including the School of Industrial Design's Intellectual Property strategy, and the Swansea Metropolitan University Design Graduate Enterprise (SMUDGE) programme. This drew together design and business graduates and experts in the field of new business development, innovation and enterprise together for a week of intensive workshops to help forge new business relationships. ISD sought to expand this work by rolling out the SMUDGE concept across the convergence area.

***II. Engaging and advising SMEs and individual innovators in R&D and innovation***

This activity engaged with companies to support their R&D activities, with a particular focus on providing:

- Sector-specific business development expertise and advice, supporting the commercialisation of science, as well as assisting entrepreneurs and existing businesses.
- Industrial Design Innovation and Research collaboration opportunities: Identifying potential opportunities between businesses and with academia to develop new research collaborations.
- Opportunity Development, including feasibility studies of ideas and opportunities, levering in relevant academic and commercial expertise.
- Product and Service Development including advice on design, technical and commercial aspects of challenges in the three core sectors of Automotive Design, Product Design and Architectural Glass.
- Prototyping and Development Activities, including assistance in scoping projects to demonstrate and validate products and services.
- Network and Partnership Brokering, including assistance for SMEs to matchmaking other technical and commercial opportunities.

- Regulatory Requirements and Approvals assistance: advice to companies on the challenges and approaches to addressing requirements of regulations that relate to their products and services.

***III. Developing and facilitating collaborative research activities***

This activity sought to develop collaborative research projects, levering the expertise and facilities of the University partners. It was anticipated that these research collaborations would result in opportunities for parallel initiatives such as A4B, the TSB KTP programme and the University of Wales Prince of Wales Scholarships.

***IV. Supporting inward investment opportunities***

This activity sought to exploit the expertise, facilities and reputation of the university partners, and links to Welsh Government, in helping to bring inward investors to Wales.

ISD support was available to new and existing SMEs and individual innovators in the Convergence area, and was intended to provide the benefit of strong links to regional partners with an interest in the Welsh economy, producing sustainable innovation benefits.

In addition, the ISD project was intended to develop research and design capacity within the partner institutions, contributing towards the wider development design capacity and activity in key sectors in Wales.

In parallel to the enterprise assistance activities companies also underwent a sustainability *HealthCheck* service (Synnwyr Busnes - Business Sense - SBBS). This was based on a self-completed online questionnaire, with follow-up support for those companies seeking support in relation to equality and diversity and environmental management tools and systems. Such support formed part of ISD team's response to the cross-cutting theme targets for the Convergence area.

## 2.5 Project funding and targets

As noted in the introduction, the ISD project was funded through the EU Convergence programme, with match funding provided by the university partners. The total funding package over the period October 2011 to June 2015 is outlined in table 1 below:

***Table 1. ISD project funding (80576)***

| Source | £ |
|---|---|
| ERDF | £2,683,791 |
| Match funding (university & private enterprise) | £2,026,285 |
| **Total** | **£4,710,076** |

This represented an intervention rate of 57%.

Monitoring of the ISD project was undertaken through a suite of output and result indicators. This includes both final targets, and profiled forecasts covering the full period of the project.

The final targets (original and revised) set for the ISD project are set out in table 2 below.

***Table 2. ISD project targets (80576)***

| Description | Target | Revised target |
|---|---|---|
| Enterprise assisted | 60 | 120 |
| Individuals assisted | 50 | 100 |
| Collaborative R&D | 8 | 16 |
| Gross jobs created | 40 | 40 |
| Products processes or services registered | 20 | 30 |
| New or improved products processes or services launched | 40 | 40 |
| Enterprises created | 8 | 8 |
| Investment induced | £1,500,000 | £1,000,000 |
| Profit benefit | £1,500,000 | £500,000 |
| Initiatives addressing barriers to ICT uptake | 1 | 1 |
| Enterprises adopting or improving Environmental Action Plans | 12 | 30 |
| Enterprises adopting or improving Equality Strategies and Monitoring Systems | 12 | 30 |

These performance indicators were subject to a revision request to WEFO in 2015, based on the delivery experience of the project. It is understood that these revised targets are likely to be agreed.

Together, these performance indicators have provided the opportunity to monitor both the delivery of ISD and the achievement of subsequent results by the individual and business beneficiaries.

## 2.6 Project management and staffing

ISD's project management structure comprised the following:

- A Steering Group with oversight of all activity within the project was established made up of a mix of senior University staff and two external members.
- A Project Director / Manager responsible for operational overview and management of the project on a day-to-day basis.

- The Knowledge Transfer Team delivered the technical and business support for the programme, and included:
    - Design Advisors – provided generic support to businesses to help them focus on clear goals around design and innovation;
    - Technical Officers – provided specific advice around technologies (e.g. 3-D printing or CAD)
    - Marketing and Administration Officers – to ensure the smooth running and promotion of ISD

The Design Advisors and Marketing and Administration roles were split across the two partners of UWTSD and Cardiff Metropolitan University. The Technical Officers, however, were based solely in Swansea.

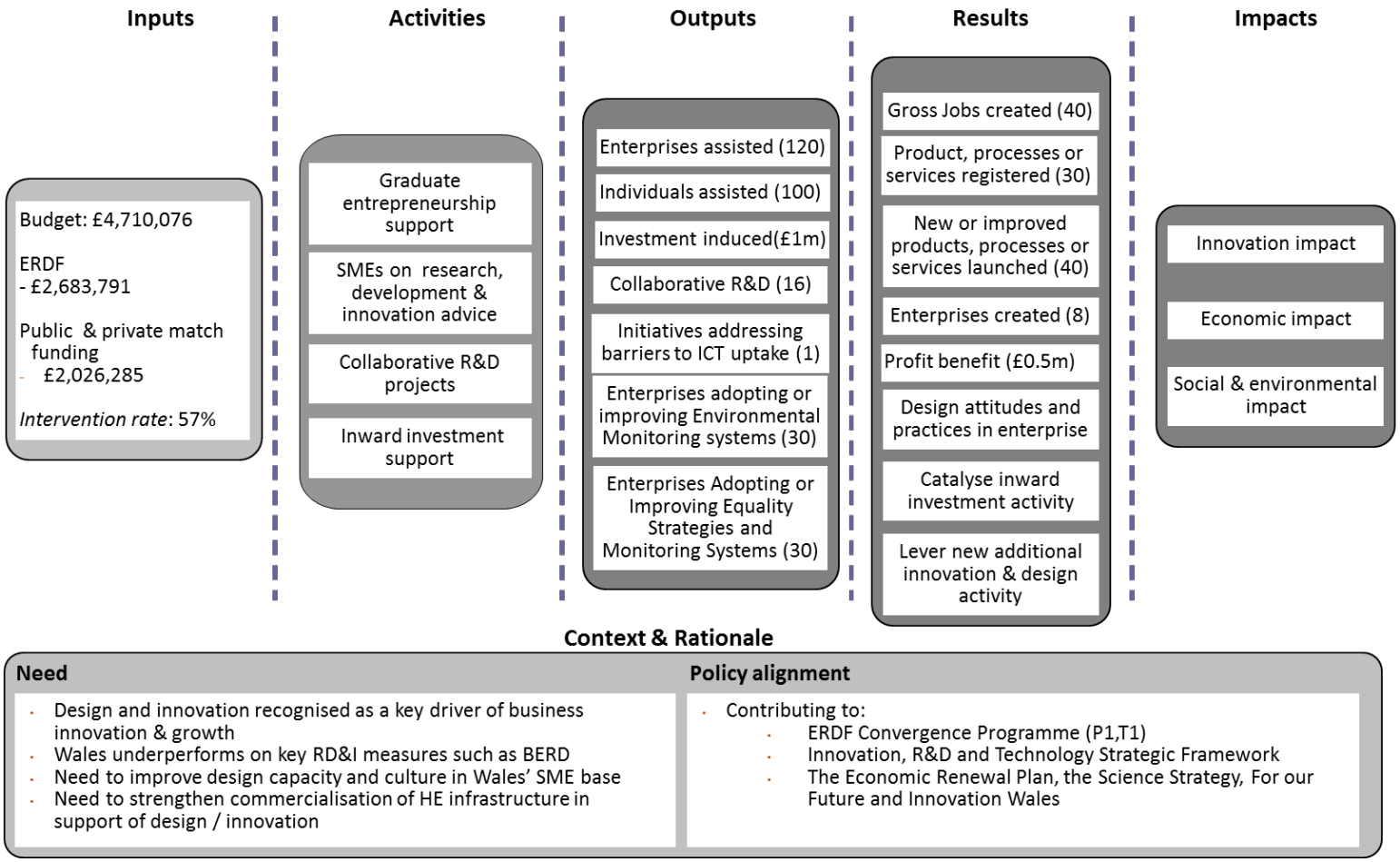
Initially, the role of project manager was undertaken by Dr Ian Walsh, however, as his role at the University developed further, and he took on more departmental responsibilities, the project manager role was effectively taken over by Ian Williams, one of the core departmental staff, with Dr Ian Walsh providing an oversight and guidance across the project.

## 2.7 Project Logic model

The project logic model (Figure 2 below) demonstrates a logical flow from an identified need, a set of delivery activities and intended outputs, through to the achievement of outcomes and impacts in both the Convergence area. This, in particular, demonstrates a strong approach to the cross-cutting themes, with a clear process to engage and support companies around the themes. The model is summarised in the logic model diagram as shown in Figure 2 below[8]:

[8] Based on the final reprofiled funding and targets, agreed with WEFO.

***Figure 2. ISD project logic model[9]***




[9] Based on the revised targets submitted to WEFO in 2015.

# 3 Project achievements against profile and targets

This section of the report provides an assessment of project performance of ISD at the end of project stage. It makes reference to the projected spend/income and outputs targets (based on March 2015 data) and considers performance to date, and prospects for future impacts where possible.

The ISD project is monitored according to the financial position and the project indicators. The following analysis examines project expenditure against the forecast targets.

## 3.1 Project expenditure

Table 3 below sets out the expenditure of the project to date (March 2015) broken down to expenditure type. It also compares the actual spend with the forecast spend to date and the total forecast project cost.

***Table 3. Cumulative expenditure (to March 15)***

| Expenditure Type | Cumulative expenditure to date | Cumulative forecast profile to date | % Delivery profile to date spent | Total forecast project cost | % Total forecast project cost spent | Budget remaining |
|---|---|---|---|---|---|---|
| **Capital** | | | | | | |
| Accommodation | £260,474.86 | £334,474.00 | 78% | £334,474 | 78% | £73,999 |
| ICT | £378,233.45 | £305,000.00 | 124% | £305,000 | 124% | -£73,233 |
| **Total Capital** | **£638,708.31** | **£639,474.00** | **100%** | **£639,474.00** | **100%** | **£765.69** |
| **Revenue** | | | | | | |
| Staff | £3,314,968.48 | £3,462,363.00 | 96% | £3,714,946 | 89% | £399,978 |
| Marketing and Promotion | £192,950.11 | £196,750.00 | 98% | £208,000 | 93% | £15,050 |
| Legal and Professional | £32,109.80 | £78,000.00 | 41% | £92,000 | 35% | £59,890 |
| Travel and Transport | £26,314.68 | £29,000.00 | 91% | £32,000 | 82% | £5,685 |
| **Total Revenue** | **£3,566,343.07** | **£3,766,113.00** | **95%** | **£4,046,946.00** | **88%** | **£480,603.00** |
| **Grand Total** | **£4,205,051.38** | **£4,405,587.00** | **95%** | **£4,686,420.00** | **90%** | **£481,368.62** |

Total project expenditure up to March 2015 was £4.2 million. This was five per cent below the profiled target of £4.4m. The final cost of the project is expected to be circa £4.7 million which means expenditure to date is 10% below the total forecast cost with just under £500k of the budget remaining as the project moved into the final quarter (April – June 2015).

This table shows that only £639K was capital expenditure which represents 15% of the total expenditure. The remaining 85% (£3.6m) was revenue expenditure.

Table 3 above also provides details on the different areas of expenditure. The table shows the main area of expenditure has been on staff which accounts for £3.3m of the £4.2m spent

to date (79%). This is 4% below the forecast spend set out in the business plan. ICT capital investment was the only area of overspend with £378k spent compared to the forecast of £305k (24% overspend).

Figure 3 provides a breakdown of expenditure to date on the respective Cardiff Metropolitan University and University of Wales Trinity Saint David project activities.

***Figure 3. Project expenditure – breakdown of CMU and UWTSD (to March 2015)***

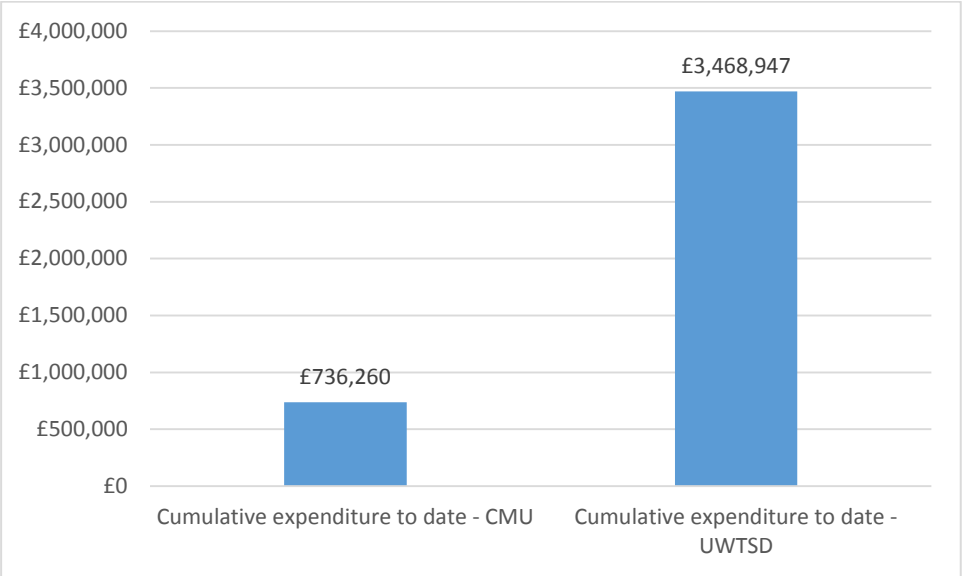



Figure 3 shows the majority of spending has been on UWTSD project activities which accounts for £3.5m of the total spend to date (82%) whereas expenditure on CMU activities has been £736k (18%).

## 3.2 Project income

Table 4 demonstrates the key income indicators. This illustrates the:

- ERDF contribution
- Match funding from the university partners

The table sets out cumulative income to date, the forecasted income target to date, project final target and the percentage of forecast income to date and final forecast achieved. This includes income up to quarter 14 (March 2015).

***Table 4. Cumulative income (to January 15)***

| Source of income | Cumulative income to date (eligible) | Cumulative forecast income to date | % of forecast income to date received | Total forecast project income | % of total forecast income received |
|---|---|---|---|---|---|
| Cardiff Metropolitan University | £336,208 | £315,462 | 107% | £337,995 | 99% |
| University of Wales Trinity Saint David | £1,487,769 | £1,556,907 | 96% | £1,686,720 | 88% |
| **Total Match Funding** | **£1,823,976** | **£1,872,369** | **97%** | **£2,024,715** | **90%** |
| ERDF | £2,381,075 | £2,328,513 | 102% | £2,649,393 | 90% |
| **Total Funding** | **£4,205,051** | **£4,200,882** | **100%** | **£4,674,108** | **90%** |

Total cumulative income to date in terms of match funding accounts for £1.8 million of the total income including circa £1.5m from UWTSD and 300k from CMU. This is 3% below the forecasted match funding income to date and 10% below the total forecast income.

In terms of the contribution from ERDF, a total of £2.4 million income has been received to date which is 3% more than forecasted to date and 10% below the final forecast. This represents an intervention rate of 57%.

As for the project as a whole, cumulative income at quarter 14 is in line with the forecast to that point and is 10% below the total forecast income.

The results of this analysis suggests that the project will be delivered broadly in line with that forecast in the business plan.

## 3.3 ISD gross project outputs

The monitoring of the ISD project's performance was based around twelve key project indicators, as set out in table 5. This sets out ISD's success in achieving its key performance indicator targets.

Table 5 compares the outputs achieved to date (up to 22nd June 2015) against the original targets from the ISD business plan, as well as the proposed revised targets.

The table suggests ISD has performed well in most areas, achieving all but two of the original KPI targets and all but three of the proposed reforecast targets.

*Table 5. Output indicators (to 30th June 2015)*

| | Achieved | Original Target | Proposed Target | % of original target achieved | % of proposed target achieved |
|---|---|---|---|---|---|
| Enterprises Assisted | 137 | 60 | 120 | 228% | 114% |
| Individuals Assisted | 91 | 50 | 100 | 182% | 91% |
| Collaborative R&Ds | 19 | 8 | 16 | 238% | 119% |
| Gross Jobs | 67 | 40 | 40 | 168% | 168% |
| Enterprises Created | 9 | 8 | 8 | 113% | 113% |
| Profit Benefit | £87,292 | £1,500,000 | £500,000 | 4% | 11% |
| Products, processes or services registered | 31 | 20 | 30 | 155% | 103% |
| New or improved products processes or services launched | 68 | 40 | 40 | 165% | 165% |
| Investment Induced | £743,965 | £1,500,000 | £1,000,000 | 50% | 74% |
| Initiatives addressing barriers to ICT uptake | 1 | 1 | 1 | 100% | 100% |
| **Cross cutting themes** | | | | | |
| Enterprises adopting or improving equality strategies and monitoring systems | 22 | 27.4 (20% of firms assisted) | 34.25 (25% of firms assisted) | 77% | 61% |
| Enterprises adopting environmental action plans | 21 | 27.4 (20% of firms assisted) | 34.25 (25% of firms assisted) | 80% | 64% |

## Performance against original targets

In terms of its activity targets, such as enterprises / individuals assisted and collaborative R&D projects supported, ISD surpassed all the original targets by some distance.

The project has achieved more than double the numbers of enterprises assisted compared to its original targets with 137 assists, compared to a target of 60 (228% of original target achieved). It has also achieved more than double its target for the number of collaborative R&D projects supported, with 19 supported compared to an original target of eight (238% of original target achieved) while it has also almost achieved double its original target for individuals assisted, with 91 assisted compared to an original target of 50 (182% of target achieved).

In terms of the outcomes from providing this support, the project has surpassed its original targets for registering products, processes or services and the launch of new or improved products processes or services with 31 registered compared to an original target of 20 (155% of original target achieved) and 68 products processes or services launched compared to a target of 40 (165% of original target achieved).

In addition, ISD exceeded its original target for gross jobs created with 67 achieved compared to a target (original and revised) of 40 (168% of target achieved) as well as the number of enterprises created with nine created compared to a target of eight (113% of target achieved). ISD has also met the original target for initiatives to address barriers to ICT uptake (one).

However, the project has not achieved two other economic outputs. Achieving only half of the target of investment induced (£744k against a target of £1.5m), and only 4% of the profit benefit target (£87k compared to an original target of £1.5m).

## Performance against proposed revised targets

ISD targets were reviewed and a reprofile proposed in 2014. This resulted in the creation of a new set of targets based on performance up to that point. This resulted in increased targets for four of the 10 KPIs while the targets were decreased for two. No change was made to the remaining four KPI targets.

Against these proposed (revised) targets ISD has met or exceeded its new targets for seven KPIs. In the case of the target for individuals assisted, however, doubling the target from 50 to 100 has meant achievement is 9% below the target.

In addition, as a result of the challenge in achieving the original targets for profit benefit and investment induced, both of these targets were lowered in the new proposal, although achievement has remained disappointing for these targets. Against the proposed targets, 74% of the investment induced revised target has now been achieved (compared with 50% of the original target) and 11% of the profit benefit revised target has been achieved (compared to 4% of the original target).

## Cross cutting themes

In addition to the outputs as outlined above, the ISD project also included targets for achieving cross cutting themes in environmental sustainability and equal opportunities.

Of the enterprises assisted, ISD aimed to ensure 20% of firms adopted or improved equality strategies and monitoring systems, and also aimed to ensure 20% of firms assisted would adopt an environmental action plan. This translates to a target of 27.4 for both cross cutting themes. In the proposed revised targets, however, this increased to 25% of firms assisted which translates to 34.25 of the firms assisted implementing these new strategies, monitoring systems, and action plans.

To date, as shown in Table 5, 21 enterprises have adopted or improved their equality strategies and monitoring systems and 22 have adopted environmental action plans. This means that ISD has achieved 77% of its original target and 62% of the proposed revised target for the former, and 80% of its original target and 64% of the proposed revised target for the latter.

## Breakdown of UWTSD and CMU outputs

This section provides a breakdown of the outputs reported in terms of the two partners managing the project.

***Table 6. Comparison of UWTSD and CMU outputs***

| | Achieved by UWTSD | Achieved by CMU | Total achieved | UWTSD - % of total achievement | CMU - % of total achievement |
|---|---|---|---|---|---|
| Enterprises Assisted | 93 | 44 | 137 | 68% | 32% |
| Individuals Assisted | 64 | 27 | 91 | 70% | 30% |
| Collaborative R&Ds | 12 | 6 | 18 | 67% | 33% |
| Gross Jobs | 62 | 5 | 67 | 92.5% | 7.5% |
| Enterprises Created | 9 | 0 | 9 | 100% | 0% |
| Profit Benefit | £87,292 | 0 | £87,292 | 100% | 0% |
| Products, processes or services registered | 29 | 2 | 31 | 94% | 6% |
| New or improved products processes or services launched | 40 | 28 | 68 | 59% | 41% |
| Investment Induced | £741,790 | £2,175 | £743,965 | 99.7% | 0.03% |
| Cross cutting themes | | | | | |
| Enterprises adopting or improving equality strategies and monitoring systems | 20 | 1 | 21 | 95% | 5% |
| Enterprises adopting environmental action plans | 21 | 1 | 22 | 95% | 5% |

Table 6 confirms that UWTSD has clearly had a far heavier involvement in the ISD project activity than CMU assisting 68% of the enterprises (93 of 137) and 70% of individuals (64 of 91) in addition to supporting 67% (12 of 18) of the collaborative R&D projects. This means that, as could be expected, UWTSD has also generated the vast majority of results.

UWSTD was responsible for all the enterprises created (nine out of nine) and the profit benefit, 94% of products, processes, or services registered (29 of 31), and 92.5% of jobs created (47 of 52).

UWTSD was responsible for the vast majority of investment induced (99.7%). CMU, however, contributed significantly towards the number of new or improved products processes or services launched with 41% generated by the University (28 of 68).

In terms of the cross cutting themes, UWTSD was also responsible for all but one of the enterprises adopting or improving equality strategies and monitoring systems (21 of 22 or 95%) and enterprises adopting environmental action plans (20 of 21 or 95%). In addition UWTSD also provided translation support to ensure the project met its Welsh Language commitments.

## Profiling of beneficiaries

ISD supported a wide range of beneficiaries from a number of locations and business sectors. It supported enterprises of different sizes and individuals of different ages. The profile of these beneficiaries are set out below.

As might be expected, in terms of the locality of ISD beneficiaries, as figure 4 illustrates, the majority were based in the Swansea area. Overall 70% of beneficiaries (159 of 228) were based in either Swansea or its two neighbouring counties with 117 of the 228 beneficiaries (51%) were based around ISD in the Swansea area. There were also an additional 24 businesses (11%) based in Carmarthenshire and 18 (8%) based in Neath Port Talbot. The remaining beneficiaries are spread out across Wales in a number of counties.

***Figure 4. Location of ISD beneficiaries***

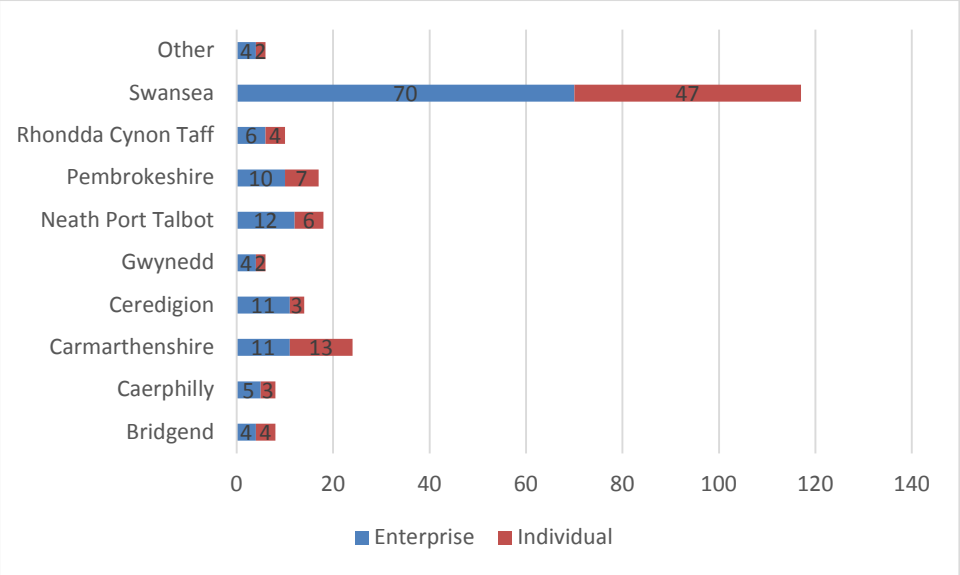
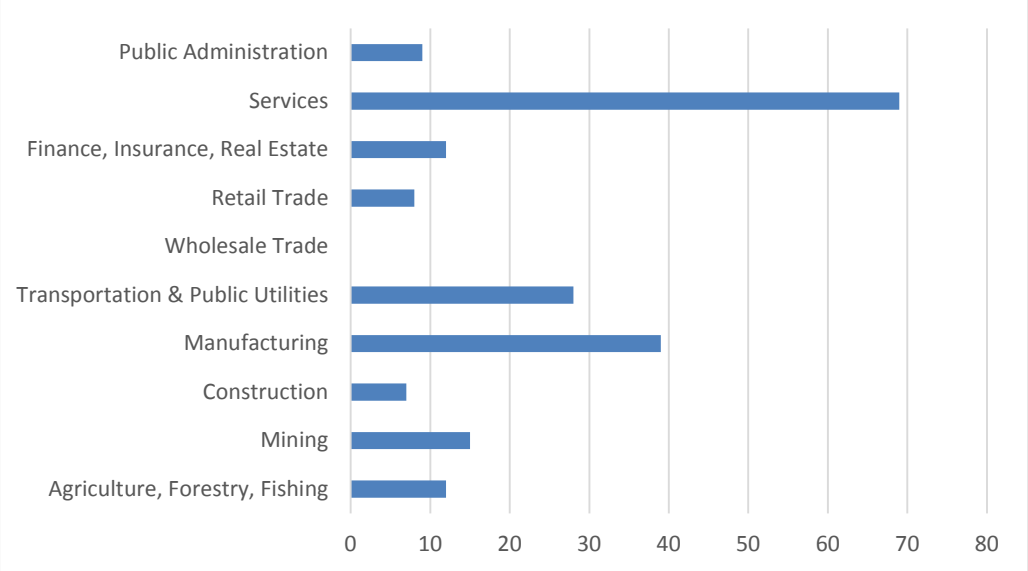



Figure 5 illustrates ISD participation according to broad sector groups.

***Figure 5. Sector of ISD beneficiaries***



This suggests that the largest group of beneficiaries operated in the services sector[10] with 69 or 35% of all beneficiaries with a reported services SIC code in ISD beneficiary database. This is followed by 39 in manufacturing (20%) and 28 in transportation & public utilities (14%).

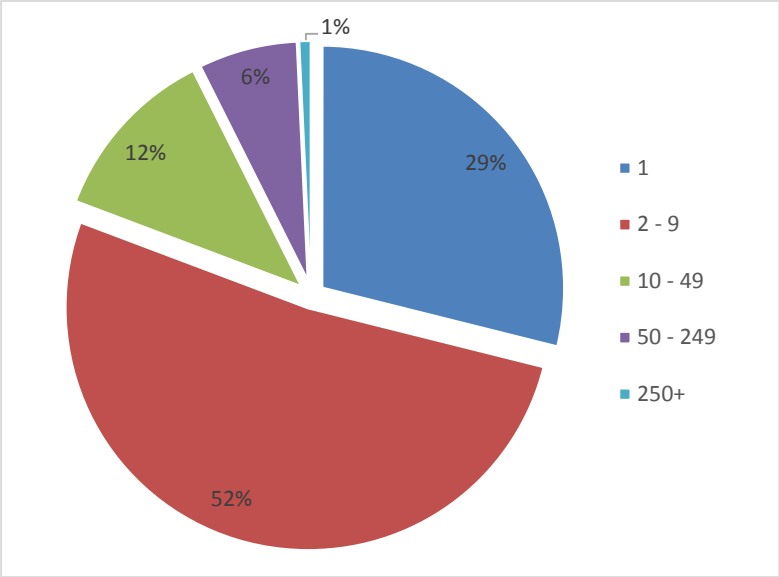
Within the programme's priority sectors – automotive, product design and glass , approximately 20% can linked directly by SIC code. However, given the nature of the priority sectors, many companies may not associate themselves solely or even mainly with these sectors, particularly when they serve a range of different sectors, for example, companies supplying to the wider automotive supply chain. For this reason there may be more businesses active in the priority sector than indicated solely by their SIC code.

The results shown in the table do, however, suggest that the programme adopted a much broader sectoral focus than originally anticipated. This was confirmed by the stakeholder interviews, which highlighted a range of challenges faced in work in the target sectors, for example, the limited presence of automotive businesses in the Convergence area, the nature of the supply chain in the target automotive sector that typically allows very limited scope for design and innovation activity in the lower tiers of supplier, and the impact of the displacement complaint and its investigation which necessitated the programme adopting a stronger focus that was initially envisaged on individuals and non-intensive design businesses where the private sector complainants were unlikely to be operating.

As for the size of enterprises involved in ISD programme, Figure 6 illustrates that the vast majority (81%) were micro-enterprises with less than 10 employees.

[10] This division includes establishments primarily engaged in providing a wide variety of services for individuals, business and government establishments, and other organizations. Hotels and other lodging places; establishments providing personal, business, repair, and amusement services; health, legal, engineering, and other professional services; educational institutions; membership organizations, and other miscellaneous services, are included. (http://siccode.com/en/siccodes/70-89/services)

***Figure 6. Size of ISD enterprises***



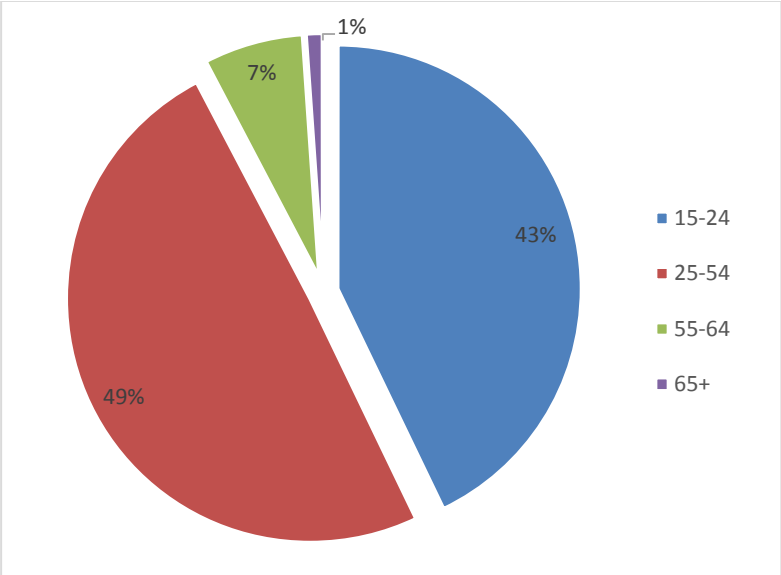

81% of companies receiving support from ISD (109 of 135) were micro-sized enterprises (i.e. fewer than 10 persons) including 29% of beneficiaries (39 of 135) who had only one person working at the company and a further 52% with between 2 and 9 employees.

12% of beneficiaries (16 of 135) were small-sized enterprises (fewer than 50 persons) while only 6% (nine of 135) were identified as being medium-sized enterprises (fewer than 250 persons). Finally, only one company (1%) was identified as being a large-sized enterprise (250 persons or more).

As for the individuals supported by ISD, Figure 7 indicates that a substantial proportion were young individuals with 43% (39 of 91) in the 15-24 age group.

A further 49% (45 of 91) were in the 25-54 age group while the older generations had few participations in ISD with only 8% (seven of 91) in the above 55 age groups.

***Figure 7. Age of ISD individuals***




## 3.4 Summary

The results of the analysis contained in this section suggest that the ISD project has been delivered to a budget that is 5% lower than that originally set out in its business plan[11].

The final outputs for the project also indicate that it has performed strongly against the key targets indicator of Enterprise Assists, Collaborative R&D projects, gross jobs, new products, process or services registered and launched, and enterprises created. These indicators represent core economic, research, development and innovation indicators and suggest that the project has supported ongoing development activity, as well as the commercialisation processes for a number of new and existing businesses.

The project, however, has performed less strongly against some of its economic growth indicators including investment induced and profit benefit, as well as its targets for the cross-cutting themes.

Businesses supported by ISD have tended to be small enterprises and individual innovators, located in the areas around the university partners, notably UWTSD with few businesses supported in North Wales. In relation to the sectors supported the most important sector was services. Comparatively few companies, according to SIC code, were supported in priority sectors such as automotive. This points to a far broader target group than originally anticipated.

[11] Based on financial data available to March 2015.

# 4 Business experiences and achievements

This section of the report examines the results of ISD based on an online survey of business and individual beneficiaries.

## 4.1 Business survey results

This section of the report examines the results of the project based on a short online survey of business and individual innovator beneficiaries.

The survey was sent out to all ISD beneficiaries where an accurate email address was available. This resulted in a survey population of 168 from the 211 beneficiaries (43 beneficiaries had incorrect contact details). A total of 49 beneficiaries subsequently completed the survey, representing a response rate of 29%.

The survey examined the following areas:

- Experience of engagement prior to and following interaction with the project
- Support received
- Achievements from ISD assistance and project impact
- Satisfaction with the project and areas for development
- Project additionality

### Profile of the sample

Figure 88 suggests the survey sample is consistent with the overall structure of the ISD project, with 73% reporting the University of Wales Trinity Saint David as their primary partner.

***Figure 8. ISD University partner***

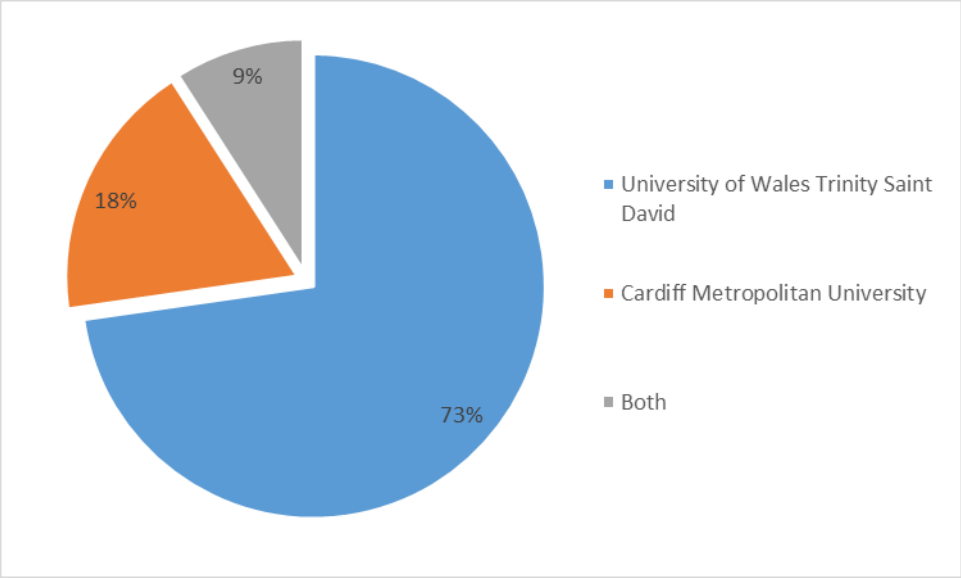
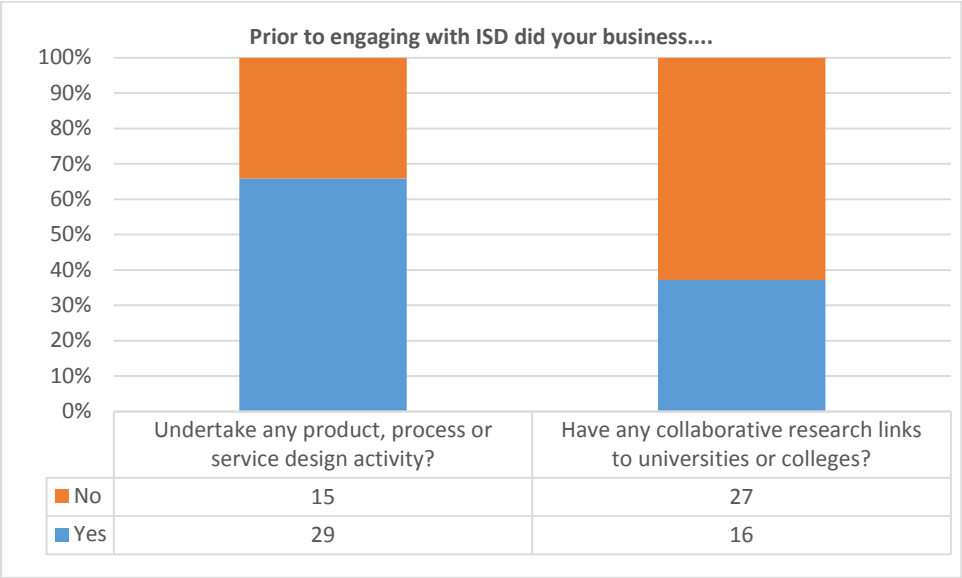


Figure 9 suggests the vast majority of ISD beneficiaries 66% (29 of 44) undertook product, process or service design activity before participating in the ISD project.

The survey results also suggests that beneficiaries generally undertook these activities on their own with only 37% (16 of 43) reporting they had collaborative research links to universities or colleges beforehand.

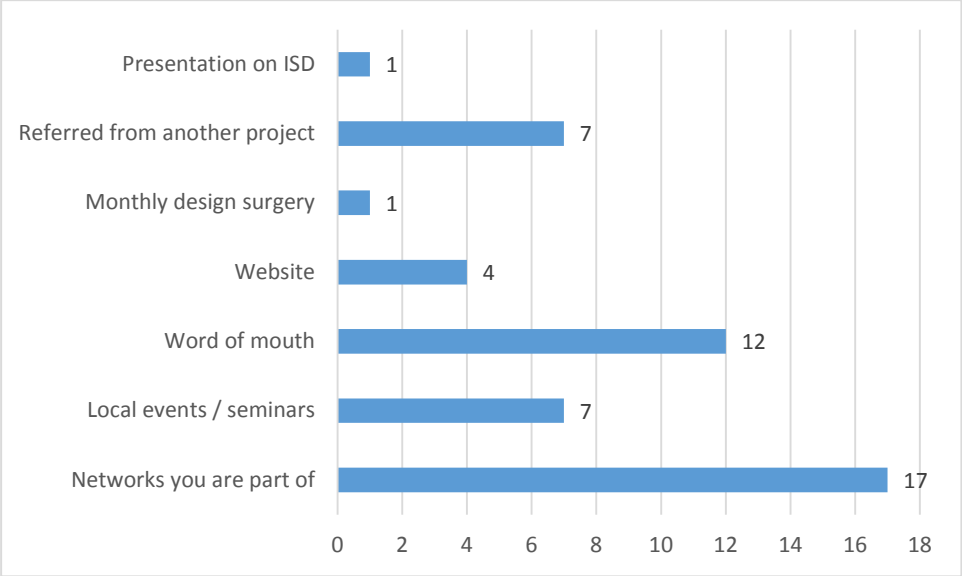
***Figure 9. Prior R&D activity and collaborative engagement with universities or colleges***




## Contact with the ISD project

The response to how organisations became aware of ISD is shown in Figure 10.

***Figure 10. Initial awareness of ISD was via…***



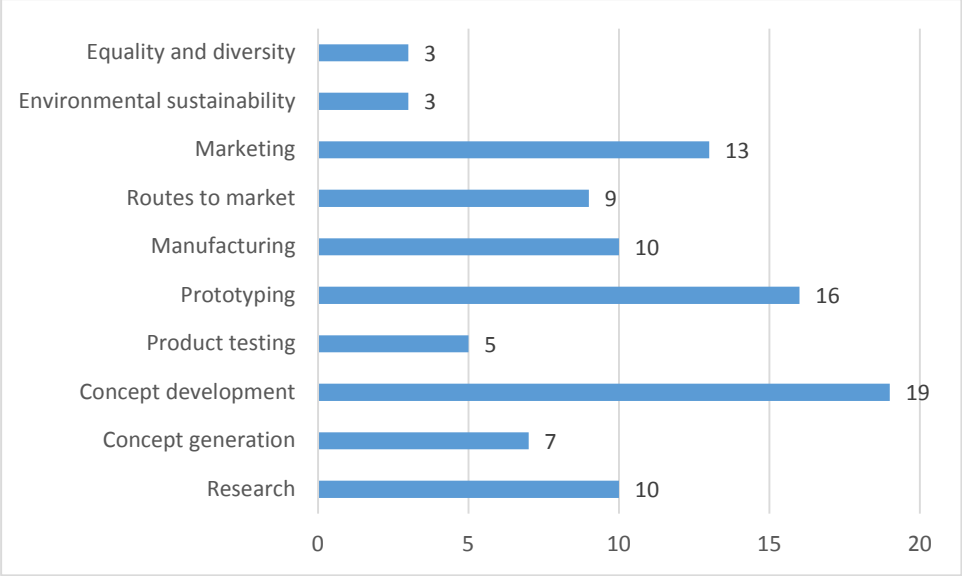

Beneficiaries mostly became aware of ISD through networks they were part of and through word of mouth with 17 (40%) and 12 (29%) reporting this respectively.

Some also became aware of the project through local events / seminars (17%), referrals from other projects (17%), and through the ISD website (10%).

## Support received

ISD provided a wide range of design supports to beneficiaries as illustrated by Figure 11. These results are consistent with the project activities outlined in the ISD business plan covering opportunity development activities including concept generation and development, through to prototyping and manufacturing, as well as marketing and routes to market support.

***Figure 11. Type of support received***




Concept development support was sought more often than any other activity with 19 respondents (44%) reporting this. This is followed by 16 (37%) reporting they sought support for prototyping activities and 13 (30%) seeking support for their marketing activities.

Apart from the cross-cutting theme activities of equality and diversity and environmental sustainability supports, both of which were sought by three respondents (7% each), product testing was the type of support the survey respondents sought least often with only five (12%) seeking it. This is despite the fact product and service development is one of the core activities focussed on by ISD in the attempt to engage with and advise SMEs in R&D and innovation (as shown in the business plan).

Finally, some respondents reported they sought other types of support from ISD with two seeking networking opportunities through ISD workshops.

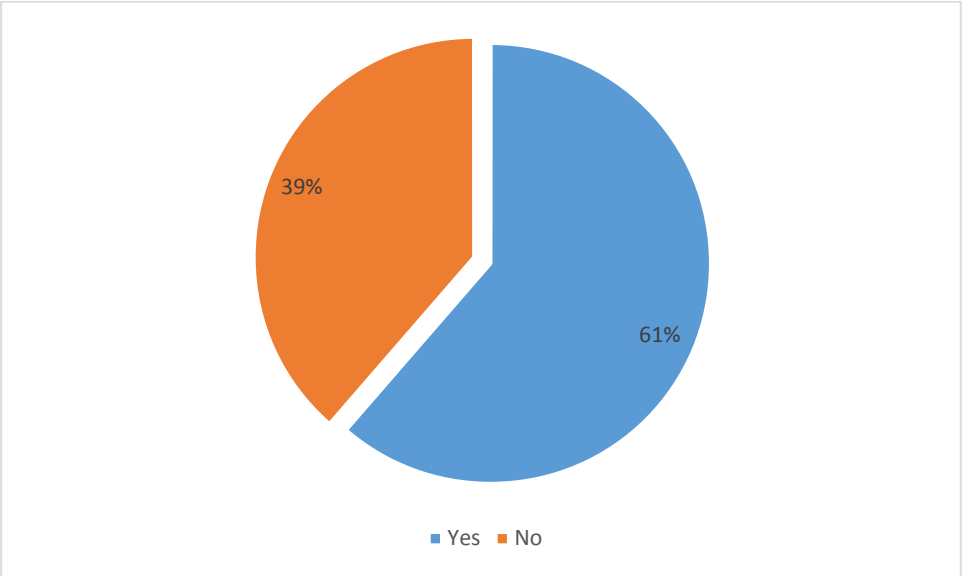
## Achievements from ISD assistance and project impact

The survey results suggest ISD has led to positive results for many of the beneficiaries.

Figure 12 shows whether beneficiaries had developed or launched new products, processes or services as a result of the support received from ISD. Here, 63% of survey respondents (29 of 46) stated they had with 62% of those reporting they had already launched their

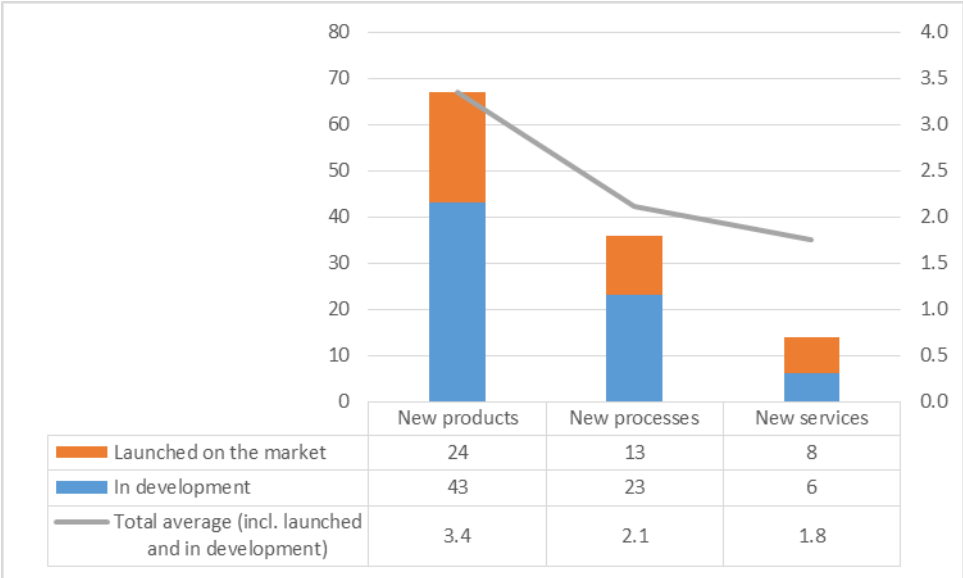
innovations on the market (18 of 29) while 38% had their innovations in development (11 of 29).

***Figure 12. New products, processes or services developed or launched as a result of the support provided by ISD***




In total, 67 new products (24 launched and 43 in development), 36 new processes (13 launched and 23 in development), and 14 new services (eight launched and six in development) were reported. This indicates that survey respondents reporting these results developed or launched an average of 4.5 product, process or service.

***Figure 13. Number of new products, processes or services developed or launched***



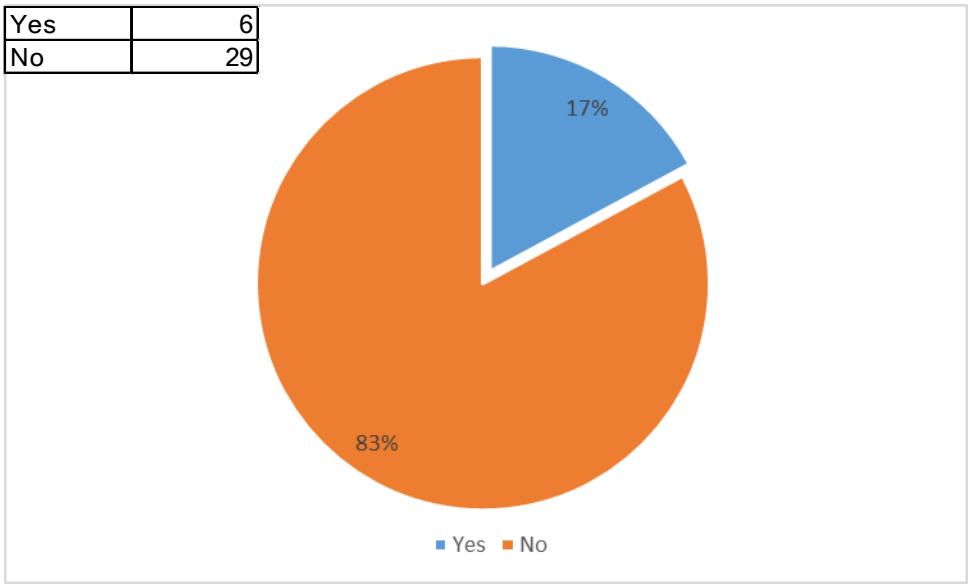

| | New products | New processes | New services |
|---|---|---|---|
| Launched on the market | 24 | 13 | 8 |
| In development | 43 | 23 | 6 |
| Total average (incl. launched and in development) | 3.4 | 2.1 | 1.8 |

Figure 14 illustrates the number of new environmental management policies or equality / diversity practices that have been established as a result of ISD support.

Here, the majority (83% or 29 ) had not introduced new environmental management policies or equality / diversity practices while only six respondents (17%) reported they had established new practices including three reporting they had established both new environmental management and equality / diversity practices as well as three reporting new environmental management practices established only.

***Figure 14. New environmental management or equality / diversity practices as a result of ISD***

| | |
|---|---|
| Yes | 6 |
| No | 29 |

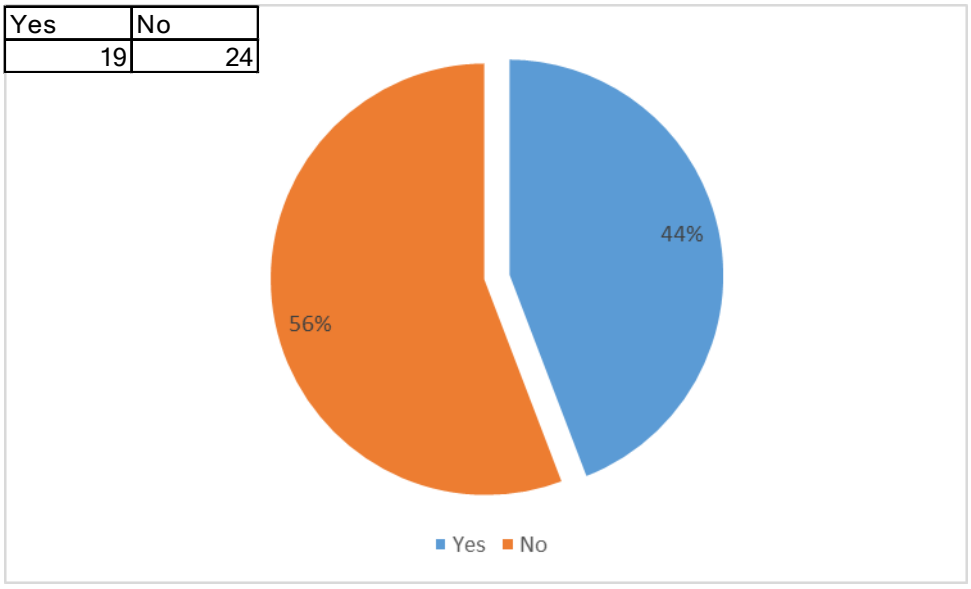



Of those who reported that they had not established these new practices, four reported the equality / diversity practice did not apply as they were sole traders while one reported they already had these practices in place.

In respect of the additional sales reported by beneficiaries surveyed as contingent on the support from ISD, almost 50% of beneficiary respondents reported they had experienced an increase in sales to date as a direct result of their work with ISD with 44% (19 of 43) reporting this (see Figure 15).

***Figure 15. Additional sales as a result of ISD***

| Yes | No |
|---|---|
| 19 | 24 |



The survey results do suggest however that these were modest increases with six respondents reporting the value of additional sales, totalling up to £372,100. This represents £62,016.67 of additional sales on average per beneficiary. This figure is also skewed by one respondent reporting additional sales of £300k, the additional sales reported by the other five respondents was only £14,420 per beneficiary on average.

Beneficiaries also reported some unexpected benefits received from their participation in ISD with four beneficiaries reporting they received more information than they were expecting and this provided them with new opportunities. One of these gained knowledge of 3D printers and has since purchased a more affordable printer for its own use. Another respondent reported the support had led to:

> *'a more pragmatic and informed perspective of the many roles which design can play in devising better ways of doing business'*

Three respondents reported the support provided good networking opportunities and three reported the support gave them more confidence in their product. Furthermore, one beneficiary reported he had set up a separate company as a result of this support while another was nominated for an ISD iSustain Award for commercialisation which was an *'unexpected bonus'* and facilitated additional awareness and profile for both the product and the company.

## Project Impacts

The respondents were asked to state to what extent they agreed with a series of statements in relation to the impact of ISD on their attitudes. A scale of 1-5 was used where 1 was 'strongly disagree' and 5 'strongly agree' and these statements are set out in Table 7 below, ranked by average level of agreement.

***Table 7. Impact of support on attitudes***

| Rank | Impact of support | Average Score [12] |
|---|---|---|
| 1 | I am more knowledgeable about the potential of design and the role it can play in my/our business | 4.1 |
| 2 | I feel more confident to develop design ideas in the business | 4.0 |
| 3 | The business is more ambitious and we see greater potential in ourselves and our products | 4.0 |
| 4 | I feel confident of using the skills I have learned from ISD on my own in the business | 3.9 |
| 5 | I understand the steps involved in the design process and getting a product to market | 3.6 |
| 6 | I feel more connected to other businesses involved in design | 3.5 |

[12] The scale is as follows: 1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4=Agree, 5=Strongly agree). Respondents who reported the different statements as not applicable were also deemed to be 'strongly disagree' for the purpose of the scoring.

| | | |
|---|---|---|
| 7 | I am much more likely to draw on the skills of my wider staff to help develop design ideas | 3.3 |
| 8 | As a graduate I am more likely to remain in Wales | 2.6 |

The results suggest ISD has had a positive impact in providing knowledge and confidence to beneficiaries in their design activities.

The main impact that beneficiaries agreed with was that they were more knowledgeable about the potential of design as a result of ISD support, scoring 4.1 on average. Also scoring highly were beneficiaries agreeing they were more confident in developing design activities as a result of the support, as well as agreeing they are more ambitious and see greater potential in their company and products as a result (both of these scored 4.0 on average).

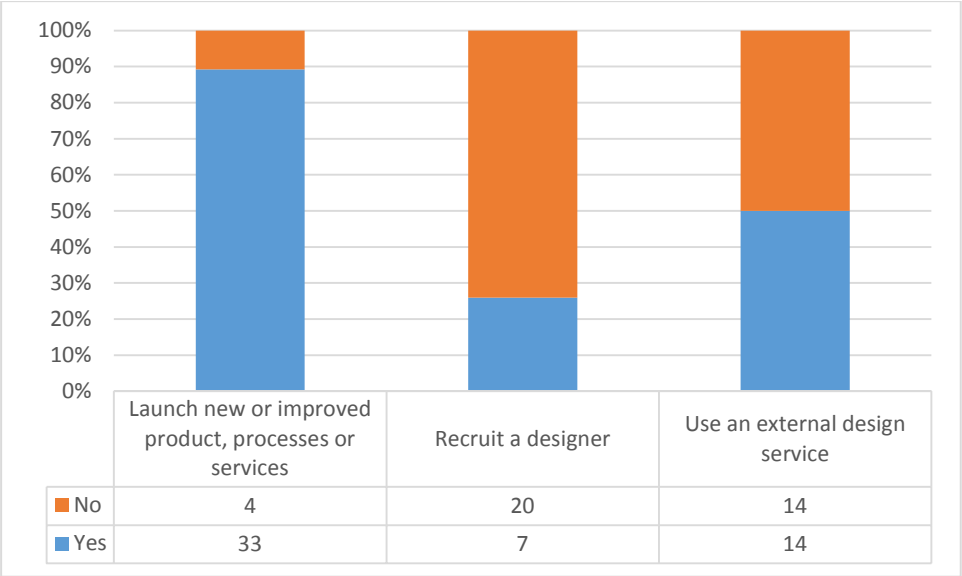
These impacts directly relate to the aims and objectives set out by ISD of increasing the number of individuals and firms applying high end industrial design skills and knowledge in their businesses, as well as developing an innovation culture in Wales by advancing the understanding of design and nurturing innovative skills and attitudes.

The statement receiving least amount of agreement was in relation to the programme leading to graduates remaining in Wales with and average score of 2.5. This received a comparatively low score with 45% of respondents reporting it as 'not applicable' as they were not graduates.

In terms of future impacts, Figure 16 illustrates that the vast majority of respondents (87%) expect to launch new or improved product, processes or services in the next three years as a result of ISD support. Half of the respondents (15 of 30) also reported they expect to use an external design service in the next three years as a result of the support and 28% (eight of 29) went as far as reporting they expected to recruit a designer as a result of their experience with ISD.

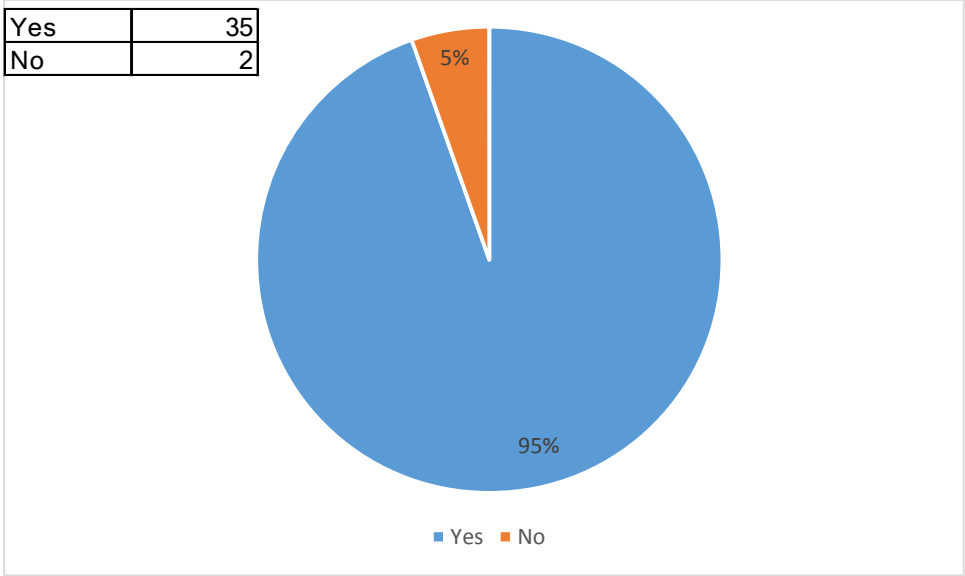
These results again suggests the project has had a significant impact on individuals and firms' attitude towards and appreciation of design activities which is one of the aims it set out to achieve.

***Figure 16. Future impacts***




92% of respondents (36 of 39) reported they intend to continue collaborating with ISD in future (see Figure 17) which suggests beneficiaries have been satisfied with the support and see value in seeking further support from the project.

***Figure 17. Intention of beneficiaries to continue collaborating with ISD***




Many respondents reported they were seeking future collaboration with ISD as there was more work to do on their project, while others reported they were seeking support for new projects. One respondent, for example, reported that future projects *'will need the assistance of ISD due to their expertise in the design field'*. Others reported they would seek support from ISD *'as projects dictate'*.

## Satisfaction with the ISD project and areas for development

Table 8 further suggests beneficiaries have been satisfied with ISD with each element of the support scoring highly on the scale of satisfaction (1=very dissatisfied to 5=very satisfied). Respondents were satisfied with the quality and suitability of the support (scoring 4.4 each

on average), the outcomes of the project (scoring 4.3 on average) and the quality of research and support from the University (scoring 4.2 on average).

***Table 8. Satisfaction with ISD support***

| Rank | Element of support | Average Score |
|---|---|---|
| 1 | Quality of support | 4.4 |
| 2 | Suitability of support for your company | 4.4 |
| 3 | Outcomes of the project | 4.3 |
| 4 | Quality of research and support from the University or College | 4.2 |
| 5 | Support for environmental management / equality and diversity (including the HealthCheck) | 3.9 |

Two respondents reported the usefulness of having an external input with one reporting it was *'great to have an external perspective and expertise at the start of our new venture'* while another reported ISD were a *'great sounding board'*.

In terms of improvements that could be made to ISD, the most frequently cited issue by respondents was the need for extra resource within the project. Many beneficiary respondents reported that more ISD staff were required as there was a high demand for the support and waiting times were felt to be too long. One respondent reported that the support they received *'felt rushed'* and it was, at times, difficult to get in contact with ISD staff.

In addition, two respondents commented that they felt that a clearer strategy and more visible leadership would have been beneficial with one reporting their experience seemed *'ad hoc and unclear'* and suggested there should be a more formal arrangement such as a *'quasi terms of reference, service level agreement, agreed objectives and/or action plan'*.

Furthermore, one respondent reported that ISD may have had an unintended effect of duplicating the activities of companies who provide similar services. The same respondent also suggested that ISD could have incorporated a form of means testing to assess which businesses could afford to pay for services from the private sector with only those businesses unable to pay able to access ISD support. Another respondent commented it would have been useful if ISD could host their start-up operation to be spun out at a later point in time.

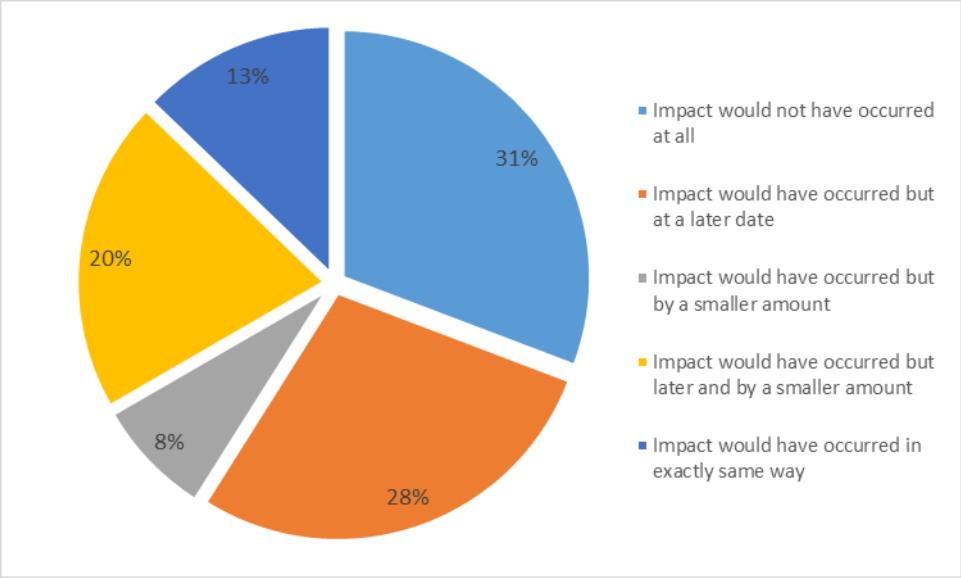
Finally, many respondents suggested communication with beneficiaries should be improved while another reported there should be more expertise in CAD and another reported the support should be more widely advertised.

## Additionality

Although, as illustrated throughout this section, many results and impacts were reported by beneficiaries clearly some of these might have been achieved regardless of the support from ISD. It is therefore important for the evaluation to consider to what extent the impact of ISD support has been additional to what would have been achieved anyway.

Figure 18 shows the response of beneficiary respondents when asked what they would have done were it not for ISD support.

***Figure 18. Additionality of the impact of ISD support***




These results suggest a high level of additionality associated with ISD support as the vast majority of beneficiaries rep[orted that they would not have received any impact or would only have received a partial impact were it not for ISD support.

31% (12 of 39) reported the project impact was completely additional as the impact would not have occurred at all were it not for the project. Further to this, 56% (22 of 39) reported the impact would not have occurred in full as it would have occurred at a later date (reported by 28%), by a smaller amount (reported by 8%), or both (reported by 21%).

This means that taken together, 87% (34 of 39) feel that they would not have received any impact or would have received only a partial impact were it not for the support received from ISD.

Only 13% (five of 39) reported there was no additionality as the impact would have occurred in exactly same way.

## 4.2 Case-study analysis

Detailed evaluation case study analysis were undertaken with eight businesses and individual innovators.

The aim of the case studies was to gain a more detailed understanding of the support provided and results achieved on eight projects, and to identify business benefits gained, as well as wider impacts where identifiable (economic, environmental, social, innovation and so on) at the end of the project.

The following section provides an integrated overview of each case study, drawing on interviews with a key member of the business / individual innovators. To reflect the full extent of the project's support these case studies were selected from ISD's collaborative R&D projects. They include:

1. **Recliners Ltd** – design, development and manufacture of bespoke rise and recline furniture
2. **HOS Hire Ltd** – independent hire firm for non-mechanical plant hire
3. **Innovative Glass Products** – a manufacturer of bespoke solutions for glass in architecture and interiors
4. **Adam Harris** – an architectural supervision service
5. **Beate Gegenwart**– a designer of bespoke jewellery and decorative items
6. **Sylvie Vandenbeele** – a nascent entrepreneur with expertise in animal behaviour and tracking
7. **My Smart Ideas** – a developer of product solutions to 'everyday' problems
8. **Cerebra** - a charity dedicated to helping children with neurological conditions

The full results of the case studies can be found in the annex 2. A summary of key findings from the case studies is set out below:

- The case studies illustrate ***product, and to a lesser extent, process developments*** as a result of ISD support. This includes examples of products that have reached market (My Smart Ideas, Beate Gegenwart), new product prototypes (Adam Harris, Sylvie Vandenabeele) and other products requiring further development (Adam Harris, Recliners). This is consistent with the long-term and iterative nature of the R&D process, and suggests the prospects for potential future impacts from the programme (see section 5).
- While the commercialisation process as a result of ISD projects has some way to development, the evidence of the case studies is that the project is ***helping to build important capabilities*** in relation to design knowledge and understanding (HOS Hire / Tresselform and Innovative Glass Products). While the ISD project appears to have supported knowledge acquisition on the part of the owner or sole trader (individual) in most cases, others point to consideration of recruiting additional specialist staff (My Smart Product) and equipment (Innovative Glass Products).
- The evidence of the case studies points to entrepreneurial impacts with the ***creation of a number of new business activity*** (HOS Hire / Tresselform) and commercial activity on the part of a number of sole traders (Beate Gegenwart). Here the project has helped not only to build skills and knowledge through design support, it has also helped to develop the confidence of individual entrepreneurs to start new business activity.
- ***Important pre-conditions for R&D and design capacity*** are also evident in the case studies with a strong degree of prior research and teaching knowledge amongst both individuals and businesses (Sylvie Vandenabeele). In these cases ISD has provided support which builds of pre-existing design expertise, with important technical know-how and facilities to help individuals or companies product prototypes (Recliners, Innovative Glass Products, Adam Harris). They also indicate some businesses with limited

design expertise, looking to access a design solution (HOS Hire) and integrate this within their existing product offering and expertise.

- In addition to technical support the case studies illustrate the ***role of ISD in providing important softer support***. Both Adam Harris and Beate Gegenwart, for example point to the benefits of gained with respect of business model advice from ISD. Others highlight ISD's role in supporting skills development (Beate Gegenwart) and referral contacts (My Smart Ideas). These results illustrate the potential for ISD to produce lasting enterprise benefits.
- In relation to ***cross-cutting themes support*** a number of the case studies illustrate the role of ISD in helping to design and develop products with a focus on sustainability (Innovative Glass Products, HOS Hire, Adam Harris, for example). Few of the individuals and businesses saw environmental management or equality and diversity practices as a specific element is ISD for the support (for example, Sylvie Vandenabeele, My Smart Product), suggesting it was well integrated within the overall ISD offer.
- ***Unexpected benefits*** were evident in a small number of case studies with examples cited include stimulated interest in new techniques (3D modelling – Innovative Glass Products), Creation of a new spin-off company (HOS Hire / Tresselform), and promotional benefits (My Smart Product won an iSustain award helping to raise awareness).
- ***Case study businesses, on the whole, indicated that they would not have gone ahead with their project activities had it not been for ISD support.*** This suggests the results have been achieved with a strong level of additionality. Here case studies point towards factors such as the riskiness of investing in R&D, the cost of specialist support and knowledge of where to access this. Others, however, exhibit partial additionality (My Smart Product) suggesting some of the case studies would have achieved the same level of results, but over a longer period of time.
- While the case studies highlight a ***good overall level of satisfaction*** with the project, a number of ***potential improvement suggestions*** were made. These related to differing expectations, and included better management of timescales and speed of reaction (Recliners, Sylvie Vandenabeele), and better clarity over access time and terms of use of equipment (Innovative Glass Products).

## 4.3 Summary

The evidence from the survey and case studies indicate that businesses / individual innovators were highly satisfied with the support provided by ISD. They sought out this support to access design support to develop new products, and were generally satisfied with the delivery and expertise provided by the project.

A significant proportion of these businesses tended to have some level of prior R&D activity. Just over one third also reported earlier collaborative engagement with universities or colleges (37%). They found out about the project from a range of sources, the most important of which were existing networks (41%) and word of mouth (32%). In this respect the results support the notion that prior research, development or innovation activity, is important to the likelihood of engaging with a project such as ISD.

The survey and case study research confirms that the results achieved on the basis of ISD support have been positive, with the launch of some new products, processes and services, as well as future launch plans reported. New environmental management practices and equality and diversity practices were also evident. A number of the case studies, however, illustrate that R&D is often a medium-to-long term and uncertain process, with further development work required before reaching full commercialisation. This is consistent with the medium to long-term nature of the innovation process.

The results further indicate that ISD has helped to produce positive attitudes towards design and innovation, providing knowledge and confidence in the role of design in their business, as well as their skills, and was highlight additional. That is, without ISD support many of the benefits would not have been achieved.

# 5 Project impacts

In light of the gross outputs reviewed above the following section assesses (net) impacts in the following areas:

- Economic
- Design and innovation
- Environmental

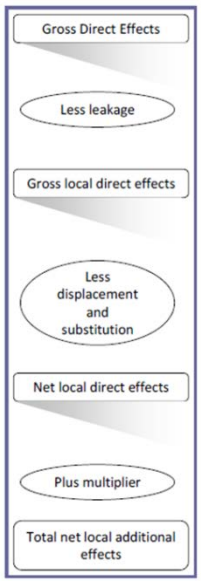
This analysis uses established impact calculation methods, details of which can be found in the annex).

## 5.1 Economic Impacts

A key aim of the Institute for Sustainable Design project was to support businesses to grow and produce economic impacts for the Welsh economy, including the creation of new jobs, launch of new products, processes and services, and so on.

The primary measure of sub-national economic impact used in the UK is Gross Value Added (GVA). This is a measure in economic value of goods and services produced in an area. In order to calculate the GVA developed or likely to be developed by ISD, estimates are produced based on the number of jobs created by the project, and adjusted for a series of factors to produce a net additional GVA impact.

This analysis draws on gross jobs reported by the project (to June 2015). These jobs have then been adjusted for a series of factors to allow a calculation to be made of net additional economic impacts achieved by the ISD project in the period to date (termed 'Actual'), their persistence (termed 'Cumulative') and 'future potential'.




$$AI = [GI \times (1-L) \times (1-Dp) \times (1-S) \times M] - [GI^* \times (1-L^*) \times (1-Dp^*) \times (1-S^*) \times M^*]$$

Where:
AI = Net additional impact
GI = Gross impact
L = Leakage
Dp = Displacement
S = Substitution
M = Multiplier

* Denotes reference case and hence deadweight

The diagram outlines, in brief, the process for calculating the future potential net additional impact from gross jobs results (details are fully explained in annex 1):

**Deadweight** is a measure of how different employment would have been without the project. Based on answers to the survey question *'Thinking about the impacts that have been experienced as a result of the project, what would have happened if your business had not engaged with ISD?'* a **composite deadweight figure of 32% was calculated**.

**Displacement (Dp)** is the proportion of economic impacts that are displaced outside of the target through support from the project. No evidence was found to suggest displacement through ISD projects, and a **figure of 0% is assumed**.

**Leakage (L)** is the proportion of benefits achieved that have leaked outside of Wales. **A 0 % discount factor is assumed for leakage**, as the jobs that have been created are likely to be based within the target areas.

**Multipliers (M)** take into account the level of usage by each company of suppliers in Wales. On the basis of additionality guidance prepared by English Partnerships (English Partnerships, 2008) to calculate the level of multipliers **a composite multiplier of 1.5 has been applied** to the additionality calculation representing a medium level of local benefits anticipated to the wider supply chain.

It is further been assumed that the economic impacts achieved by ISD will **persist** for three years.

Following this method, produces a **net economic impact** of:

- **Net additional jobs** – 68.29 FTE
- **Actual net additional GVA benefits** - £4 million
- **Cumulative net additional GVA** - £11.7 million

Given the likelihood that future economic benefits will be generated from projects that reach their full commercialisation, the future GVA and jobs contribution of the project is likely to be in excess of those results reported above. (In order to establish the details of such impacts, however, further more detailed survey work would be required)

## 5.2 Design and innovation impacts

The production of design and innovation impacts was a core objective of the ISD project.

Here, the output indicators indicated that the project has performed strongly against its targets for new products, process or services registered or launched, and enterprises created. This strong performance is also found in the business survey and case study results, with a large proportion of beneficiaries using their design support to commercialise new products and processes – 63 products, 35 new produces and 14 new services either launched or under development. The evidence further suggests that many beneficiaries are continuing to develop products beyond their period of support.

There is evidence of ISD projects contributing towards positive attitudes towards design and innovation activity. This included greater confidence, knowledge of and ambition for design and innovation. These factors point towards lasting design attitudes and skills capabilities, which have the potential to leave so-called ‘legacy’ benefits beyond the life of the project. In this respect more than half of the survey beneficiaries indicated that they expected to use an external design service in the next three years as a result of the support, with a smaller

number 26% indicating they were considering the recruitment of a designer. These results again point towards the project addressing its core aims.

The project has helped to produce a number of new design-led enterprises. A number of these have resulted from ISD's graduate support programme. Such companies have been able to access design and innovation support, with a number reporting the benefits of softer enterprise advice. Such support illustrates the role of ISD in helping to build a design active cluster.

For the most part ISD beneficiaries have tended to have pre-existing R&D, and collaborative links to the university sector. This knowledge provides beneficiaries with the basis to build on their pre-existing capability, with specialist support and facilities from ISD. Other beneficiaries, however, have had approached the project with limited expertise in the area of design and have used ISD support to help them innovate. These experiences point towards the flexibility of the ISD project logic model in supporting design and innovation.

## 5.3 Environmental and social impacts

The sustainability focus of ISD largely relates to its model of building capacity and support for design and innovation. Environmental impacts are linked to the implementation of new practices within business, as well as in the new products generated by the project. Here ISD monitoring data indicates that 22 businesses (16% of enterprise assists, against a 'proposed' target of 25%) have received adopted or implemented environmental action plans.

Similarly, the case study interviews suggest a number of areas of both actual and potential environmental impacts resulting from ISD, including:

- **Adam Harris** - developing new concrete mixing techniques which have helped the business reduce its carbon footprint
- **Sylvie Vandenabeele** - developing a streamlined harness to aid the rehabilitation of oiled birds
- **My Smart Ideas** - improved knowledge of recyclable materials

*Social impacts* are evident, in ISD's output data suggesting that 21 new equality and diversity practices have been introduced with the support of ISD (15% of enterprise assists, against a 'proposed' target of 25%). Social impacts are illustrated in a number of case studies, for example:

- **Cerebra** - developing products to help in the daily lives of children with neurological conditions
- **Recliners** - development of a new solution to back support and postural management
- **My Smart Ideas** - developing products that offer '…functional and engaging products…to everyday problems', including pet, kitchen and bedding accessories

As not all of these products have been fully commercialised these impacts have the potential to grow further in future.

## 5.4 Summary

The results of the impact analysis suggest that ISD has produced actual and potential economic, design and innovation, environmental and social impacts. Of these the economic impacts, to date are relatively strong, however the innovation nature of projects supported by ISD indicates that there is strong future potential for economic impacts to emerge. Similarly, while some new design-led business have been created, and new product, processes or services launched, there is also evidence that many products, processes and service continue to be under development. This suggests future innovation capacity and results potential, a point which is consistent with the long-term nature of R&D.

Alongside these tangible impacts the results of the survey and case studies, examples such as My Smart Products, point to the project helping to build softer awareness and attitudinal benefits (towards design and innovation). This, again, suggests results in respect of capacity development and potential for future impacts.

Environmental and social impacts are also evident in the case studies, benefitting from the project's strong service for cross-cutting themes, provided by Bangor University's SBBS HealthCheck. Although not explicitly addressed by ISD the project team aimed to deliver as much of their outputs bilingually as possible. This included directing businesses to complete the Welsh Language questions built into the SBBS. Encouraging micro-enterprises to adopt Welsh Language Policy proved to be very challenging.

# 6 Value for money

This section of the report considers the value for money of the ISD project using the so-called '3 Es' approach:

- Economy - *How much has the intervention cost; how was this decided on; have the funds been used for the stated activities and, what additional funds have been levered in?*
- Efficiency - *Have activities been delivered in line with expectations including: were the funded activities delivered in line with the plan; what additional activities were delivered; was the cost of delivery as expected?*
- Effectiveness - *Have the funded activities achieved the expected results or outcomes; what additional outcomes have been achieved, if any; and, how has effectiveness been maximised?*

## 6.1 Economy

The ISD project was delivered to a projected total budget of £4,710,076. The ERDF contribution to the overall project costs is projected to be £2,649,393. ERDF representing 57 per cent of the overall project budget. Actual expenditure to March 2015 was £4,205,051, some 5% below the final budget target.

The budget for the project was determined by the ISD team based on an extensive planning period by the operational management group. The Business Plans for the project suggests that reasonable steps have been taken by managers to ensure the accurate planning of the programme and its 'economy'. This has included the following:

- Funding is fixed in terms of public grant aid application through WEFO
- All aspects of the project were procured in compliance with applicable regulations designed to ensure maximum value for money
- Synergy sought with other ERDF-funded projects such as ASTUTE
- Strong focus on the cross-cutting themes, based on its integration within the project logic model

## 6.2 Efficiency

The key indicators of overall project efficiency is its return on investment. Here the evaluation results suggest that for every £1 in total project expenditure to March 2015 ISD has achieved £2.79 net additional cumulative GVA to the Welsh economy.

It has also created 68.3 net additional jobs, with a cost per job ratio of £61.6 thousand.

The ISD management and delivery process involved a series of stages, including application support, project evaluation and appraisal, ongoing monitoring and financial management.

These stages were delivered both within and across the partners, requiring administration and project management capacity within the project.

Key features exhibited by the ISD project that have supported the efficiency of the delivery process include good working relationships between the delivery partners that have been facilitated by prior project relationships (A4B) and regular networking amongst the management teams at the respective institutions. These features have contributed towards sharing of knowledge and coordination of activity. In addition, synergies between the project and related ERDF projects were established and project activities were planned to align with existing projects such as ASTUTE, as well as existing networks such as the Design Wales Forum.

External conditions have had an effect on the efficiency of ISD project delivery. For example, the ISD project developed a management structure based on PRINCE2 principles, with day-to-day management and oversight structures (Steering Group). In addition, regular meetings were held to enable the monitoring of the project. However, the impact of institutional mergers and further issues arising from the challenges made by private sector design consultants to WEFO resulted in a diversion of management attention for a time. For a short period, there was some concern amongst ISD staff that the project was not as closely managed as had been the case. However, the underlying robustness of the project management structures and arrangements seem to have enabled this period of 'turbulence' to be navigated more or less successfully.

The ISD project was also able to provide a strong focus on delivering cross-cutting benefits. This was a key component of the ISD delivery model, and one that can be considered as a good practice in Wales. The cross-cutting theme support is integral to the delivery process – and not a 'bolt on element'. It does so through a 'HealthCheck' process, which emphasises to the enterprises, the business, environmental and social benefits that can be achieved, and providing a streamlined tool to capture data and signpost to dedicated thematic support. The 'HealthCheck' is used by a number of other ERDF projects in Wales including: e Software Alliance Wales (SAW), Sustainable Expansion of the Applied Coastal and Marine Sectors (Seacams), and Centre for NanoHealth (CNH).

Efficiency of delivery also benefitted from the mid-term evaluation process, in which recommendations were made and subsequently addressed. This led to ISD developing processes to ensure a greater likelihood of achieving and capturing higher value outcomes and priorities support (via a filtering tool, workshops, follow-ups etc.). It also saw the review of communications through the production of a new brochure, and strengthened activity to target businesses in North Wales. ISD's quarterly progress reports suggest that all recommendations were considered and relevant actions developed.

## 6.3 Effectiveness

The aims of ISD are set out in the Business Plan, were to:

> *'…support the development of a sustainable, innovation led, design and manufacturing industry which will significantly increase Wales' capacity to meet the Government's objective of building an economy based upon knowledge transfer, innovation and entrepreneurship'. (P.12)*

In assessing effectiveness against these goals the results of the business survey, case studies and indicators point to a range of end of project impacts including:

- *Developing a pan-Wales design infrastructure* – here the evidence points to the development of new facilities, equipment and expertise in support of the design needs of businesses and individuals. This builds on the prior capacity of both university partners, with a particular focus on UWTSD. It provides the basis for ongoing support of both universities beyond the life of the project.
- *Enhance contribution to the economy of Wales through a steady flow of design led enterprises* – the project monitoring indicators suggest that nine such design led enterprises have been created as a result of the project, alongside new jobs. Here the role of the project is illustrated in the case studies, where several point to the project's support in helping to build confidence, knowledge and expertise in relation to entrepreneurship, design and innovation. The case studies highlight such entrepreneurship both in terms of graduate/postgraduates, but also in supporting staff entrepreneurship.

  In supporting the Welsh economy the project also sought to deliver on this aim through support the Welsh Government's inward investment promotion, as a mechanism for strengthening the economy. Here the evidence does not point to significant activity in support of such promotion.
- *Increasing the number of individuals and firms applying high end industrial design skills and knowledge in Wales* – here the project has supported 130 firms and 90 individuals. In addition to the evidence of product, processes and services registered (31) or launched (64). The evidence from the survey further indicates that beneficiaries are knowledgeable and confident in developing design ideas in their business. They are also confident in using the skills they have learned from ISD in their own businesses.
- *Enhance design innovation…nurturing a sustainable design innovation culture* – while cultural development is a difficult concept to measure the results of the survey, as noted above, point to the role of the project in helping to support workshops and networks activities for businesses to interact around design and innovation topics. They also indicate the development of positive attitudes towards design and innovation amongst beneficiaries. These are potentially lasting benefits, and have the potential to be further developed through further use of the skills developed.

- *Building collaborative linkages* – here ISD has produced many examples of new collaborations with businesses and individuals (including 16 collaborative R&D projects). The survey results further indicate that a large proportion of beneficiaries intended to seek future collaboration opportunities with ISD partners (95%). The relatively low level of investment induced, however, points towards the challenge of beneficiaries funding future collaborative work.

The results of this analysis suggests that ISD has achieved results against each of its key aims and objectives.

## 6.4 Summary

The results of this analysis suggest that the ISD project achieved a good level of project economy, efficiency and effectiveness. Its approach to the management and delivery has been robust and benefitted from the partnerships established despite some contextual challenges.

The project addressed, to a greater or lesser extent, all but one of its core aims. Its support for the Welsh economy through the development of a design-led cluster, new products, processes and services, and new design attitudes and skills, attitudes and practices is evidenced. This activity has also benefitted from the establishment of new design support infrastructure in Wales and the development of collaborative linkages.

Comparatively limited support, however, has been achieved for Welsh Government's inward investment activities.

# 7 Strategic added value

The concept of Strategic Added Value (SAV) seeks to identify the effects of the wider co-ordinating, catalytic and influencing role of a project, which is not captured in the outputs of direct project support.

The key aspects of SAV has primarily been applied to the work of regional economic development agencies, and can be summarised as[13]:

- *Strategic leadership and catalyst:* Articulating and communicating regional development needs, opportunities and solutions to partners and stakeholders in the region and elsewhere;
- *Strategic influence:* Carrying out or stimulating activity that defines the distinctive roles of partners, gets them to commit to shared strategic objectives and to behave and allocate their funds accordingly.
- *Leverage:* Providing financial and other incentives to mobilise partner and stakeholder resources – equipment, people as well as funding
- *Synergy*: Using organisational capacity, knowledge and expertise to improve information exchange and knowledge transfer and coordination and/or integration of the design and delivery of interventions between partners;
- *Engagement:* Setting up the mechanisms and incentives for more effective and deliberative engagement of stakeholders in the design and delivery of regional and sub-regional priorities and programmes

With regard to **strategic leadership and strategic influence**, ISD has exhibited some success notably in the local area of Swansea and adjoining Counties, although this leadership and influence is less visible in the wider Convergence area. Some clustering and extensive networking has been evident and relatively successful although, to date, it is not possible to identify sustainable clusters that have been stimulated by ISD. However, the profile and engagement generated by the iSustain programme does show good promise for the future if it can be sustained and receive further support and investment.

The evidence of investment induced that was obtained from the evaluation analysis suggests that the **leverage** of resources including investment and activity achieved by the ISD project has not been as significant as envisaged. Therefore the conclusion must be that the SAV of ISD in this aspect is limited. However, the potential for persistence in the impact of the support provided by ISD offers some hope that the long term leverage effect may be greater than can be identified to date.

[13] DTI (2006) 'Evaluating the impact of England's Regional Development Agencies: Developing a Methodology and Evaluation Framework'. Available from: http://www.berr.gov.uk/files/file21900.pdf

ISD's primary area of SAV relates to its role in supporting design in the innovation process. In this respect the project's activities have potential to promote further **synergies** with a range of existing supports for innovation, technology and knowledge transfer in Wales and beyond, and to provide an additional option for businesses (and individuals) seeking support for their projects. This includes working alongside projects such as ASTUTE, Institute of Life Sciences and Business Innovation (Design), and referring businesses to other forms of specialised support.

The ISD project appears therefore to have contributed towards SAV in Wales, notably in the areas of promoting synergy between design, R&D and innovation, where ISD has developed a distinct offering, and taken sensible steps to ensure that synergies are maximised, and overlaps minimised.

As with the assessment of strategic leadership, the SAV of **engagement** with SMEs and others achieved by ISD is, almost certainly, limited to the South West Wales sub region. There is therefore only limited evidence of SAV in this respect for Wales as whole. However, it is clear that the engagement with SMEs and design focused individuals achieved for UWTSD in particular offers significant potential for future activities at a strategic and operational level.

# 8 Options for the future

The future sustainability of ISD is currently being considered by the project partners. CMI understand that it is now (June 2015) unlikely that there will be a project bid for funding of the same nature of the ISD project. We understand that UWTSD aims to maintain a core ISD staff of two Senior Research Associates, beyond the life of the funded project. These will undertake near to market post-doctoral research in support of innovative and sustainable businesses.

However, there are a number of other considerations that are relevant and offer potential options for future ISD related activity.

A key requirement going forward will be to **rebalance the funding model** for ISD-type activities so that the University's ability to successfully charge commercial (or near commercial) rates for in-depth advise and support to SMEs is not undermined by a wholly grant funded model. While this is highly unlikely to be achieved in the short term, a mixed funding model – encompassing commercial fees, research grants and University core funding - is a more realistic ambition for the next funding period. To achieve this, demonstrating consistency of activities and a strategy that is working towards financial sustainability over the long term will be important so that funders – whether internal or external – can be confident that a sustainable funding position is capable of being developed over the long term (5 years +).

The ISD project has provided the University partners with a **legacy** that can act as a springboard for the future. For example, the hardware and software assets in which UWTSD

in particular has been able to invest and to mobilise in support of the SME clients and graduate business opportunities. Clearly, related to the use of these assets, the skills and awareness of staff, graduates, researchers and businesses on the use of the hardware and software are an important element of the legacy that will remain in place after the end of the ISD project. Finally, the ISD project has left a legacy for the University partners in respect of the development of their research capacities and their confidence to engage and commercialise. These have been enhanced as a result of collaborative research projects and can be built on in the future.

ISD activities will, going forward, provide an opportunity for the University partners to individually **capitalise on the SME engagements** that ISD activities have been able to foster. Among these are the embryonic but important networking and clustering activities related to design and innovation that ISD has supported in the South Wales Convergence areas, including the momentum of the iSustain events and awards. Going forward these engagements can allow the Universities, notably UWTSD, to offer more networking and engagement activity, raising and maintaining awareness of design and innovation opportunities, while shaping more in-depth and impactful design advice and support services that could be charged at, or approaching, commercial rates.

In discussion with stakeholders, it is clear that the experience of the ISD project and the work successfully completed particularly in the collaborative R&D projects (see case studies) have sharpened the focus of UWTSD and CMU managers on applying the design and innovation skills and technology and the wide engagement with businesses nurtured by ISD to meet **specific niche sectoral needs and opportunities**. These include the life sciences sector, ageing population technologies and applications and building components and architectural product design. CMI also understands that UWTSD intend to build on their activities in the area of health and social care.

The approach of building activities around specific niche sectoral needs and opportunities is well aligned with a core strand of the University's knowledge transfer activity, This approach will be in line with the current Smart Specialisation agenda for innovation and technology in Wales and will offer the possibility for building new and productive relationships with new partners therefore '*spreading the word*' further and wider about the importance of design and innovation. A proposal to establish an ERDF funded Assistive Technologies Innovation Centre (ATIC). We also understand that UWTSD is part of consortium nominated as a preferred bidder for a National Construction and Building College for Wales. Both activities will clearly contribute towards UWTSD's ambition to develop the University's research and provide clear opportunities to build on the legacy of ISD.

# 9 Conclusions

This section provides a summary of the final evaluation conclusions. The evaluation findings reported are based on analysis of project documentation, interviews with the management, delivery team and stakeholders, the survey of business beneficiaries and case study interviews.

The results of this analysis suggest that the project was established with a **robust, but ambitious, project logic model**, based on an identified need, clear objectives and support focused on establishment of design infrastructure allied to design and enterprise assistance, plus collaborative research. The logic model was ambitious in that it sought to establish new design capabilities and create a pan Wales infrastructure from a South Wales base. It also sought to contribute towards wider objectives such as inward investment activity, without any clearly specified mechanisms.

The project has **generally performed well against its core delivery indicator targets**, exceeding its targets for Enterprises assisted and Collaborative Research and Development projects. These outputs exceed both the original and revised targets, and highlight the success of the project in building a pipeline of businesses and individuals, and providing design assistance and collaborative research. Output indicators for the cross-cutting themes are also reasonably strong, albeit below targets.

The findings suggest ISD has **helped individuals and businesses to create new intellectual property (product registrations) and launch new products (both are above targets)**. In both these areas of the project has exceeded its targets. The role of ISD is evident in the survey and case study results, with businesses reporting a large number of products that are being developed over the coming years. Businesses and individuals also report positive attitudes towards design and innovation, including their confidence, knowledge and ambitions for their products and business prospects. Stakeholders report that they are confident that ISD activities have provided the opportunity to develop and embed design and innovation in manufacturing and some service sectors thereby allowing businesses to take advantage of design skills and capabilities based in the two partner Universities.

ISD's support has **produced economic, design and innovation, environmental and social impacts**. Here the project's logic model is built on building a pipeline of potential businesses and individuals through workshops and events, and providing enterprise and technical assistance and collaborative R&D projects leading to successful commercialisation. These impacts have been underpinned by the positive attitudes and skills reported by beneficiaries. The results, as noted above, point to this support producing economic benefits with respect to net additional jobs (67 FTE) and net additional GVA (£4.9 million cumulative GVA, through persistence of benefits). These figures are likely to under-report the true potential scale of ISD impacts, given the survey evidence that many products remain under development at the time of the evaluation.

On the basis of the evaluation findings the **project has addressed its overall aims** through the creation of design infrastructure in Wales, contributing towards the development of design-led enterprises, and supporting the use of design skills as part of a wider design culture. A number of stakeholders noted that ISD has been a 'flagship' for the interaction with businesses in the area of design and innovation for UWTSD in particular.

The main weaknesses identified for ISD, however, relate to the difficulties faced in fully developing a pan-Wales focus to its activities, and contributing towards Wales' inward investment. The overall aims of ISD remained valid throughout the life of the project, and the wider Convergence area, based on the ongoing weakness of R&D expenditure in Wales[14].

Demand for ISD's design support have continued to develop throughout the life of the project. Evidence from the survey further suggests that many businesses and individuals intend to use ISD facilities and support in future. Stakeholders and managers are also looking forward to the development of next generation ISD activities focused on some key sectoral opportunities that have been evidenced by ISD activity to date.

In relation to **value for money** of the results of the evaluation suggest that ISD has achieved a good level of project economy based on strong financial management practices. It was delivered in a relatively efficient manner, with the business survey results and case studies point to effectiveness in important design and innovation, economic impacts, social and environmental impacts.

The key findings in relation to the **project's strengths** include:

- *Strengthening the infrastructure for design and innovation in (south) Wales.* This has enabled the development of both technical facilities and business networks and collaboration which have the potential in future years.
- *Complementing existing innovation and knowledge transfer priorities and supports* through the provision of specialised product support. This, as noted, above has helped to broaden the innovation support offer in Wales, and strengthen the support available to both the design and non-design intensive sectors.
- *Supporting development of commercialisation* outputs (products registered and launched, enterprises created), while helping to build confidence, knowledge and ambition in products. These benefits point to capacity building and potential culture change.
- *Contributing towards the cross-cutting themes agenda for ERDF, and evidence of strategic added value to other EU projects in Wales*. The project's SBBS HealthCheck is an efficient tool for supporting enterprises in the area of the cross-cutting themes. This

[14] Welsh Government (no date) 'Research and development (R&D) expenditure', StatsWales. Available from: http://wales.gov.uk/statistics-and-research/research-development-expenditure/?lang=en

benefits from the project's success in building the HealthCheck in as an integral element in the process.

**The main area of weakness** related to ISD's ability to fully implement the aims and objectives of the project logic model, including securing a true pan Wales focus to its activity, fully engaging in inward investment activity, and achieving participation from one of its key sectors - automotive.

In terms of its contribution via **Strategic Added Value (SAV)**, ISD has exhibited some success in strategic leadership and strategic influence, notably in the local area of Swansea and adjoining Counties, although this leadership and influence is less visible in the wider Convergence area, while the profile and engagement generated by the iSustain programme does show good promise for the future.

The evidence of investment induced suggests that ISD activity has not been able to achieve the leverage of resources envisaged. However, there is the potential for the long term leverage effect to be greater.

ISD's primary area of SAV relates to its role in supporting and promoting further synergies with a range of existing supports for design in the innovation process in Wales and beyond, where ISD has developed a distinct offering, and taken sensible steps to ensure that synergies are maximised, and overlaps minimised.

Engagement with SMEs and others achieved by ISD has been largely limited to the South West Wales sub region. However, for UWTSD in particular this offers potential for future activities at a strategic and operational level.

The **future sustainability of ISD** is currently being considered by the project partners. CMI understand that it is unlikely that there will be a project bid for funding of the same nature of the ISD project, although UWTSD aims to maintain a core ISD staff of two Senior Research Associates who will continue to undertake near to market post-doctoral research in support of innovative and sustainable businesses.

There are a number of areas where the ISD project has provided opportunities and options for further activity and development. In summary, these are:

1. **To rebalance the funding model** to embrace a mixed funding model – comprising a balance of charges for commercial services, research grants and University core funding - so that a sustainable funding position is developed over the long term (5 years +).
2. **To build on the legacy assets provided by the ISD project** including hardware and software; the skills and awareness to use these assets and the enhanced research capacities and confidence to engage and commercialise developed at the two Universities as a result of ISD activities.
3. **To capitalise on the SME engagements** that ISD activities have been able to foster, including networking and clustering activities and the iSustain events and awards.

4. **To meet specific niche sectoral needs and opportunities** by applying the design and innovation skills and technology and the wide engagement with businesses nurtured by ISD. These are likely to include the life sciences sector, ageing population technologies and applications and building components and architectural product design, in line with the current Smart Specialisation agenda for innovation and technology in Wales.

# Annex I: Detailed methodology

## Economic impact calculations

The economic impact method draws on good practice guidance provided by a range of EU, UK and Welsh organisations[15]. The method employed is listed below and is designed to calculate:

i. Actual benefits (benefits achieved at the end of the project)

ii. Cumulative benefits (actual benefits achieved at the end of the project, adjusted for their likely persistence)

These economic impact calculations are based on jobs created and GVA generated. GVA is a composite measure and is considered to be the primary indicator of sub-national economic performance in the UK. In order to calculate actual net GVA and cumulative net GVA, the following steps were employed:

**Actual benefit - net additional jobs created**

***Calculate gross job numbers for 2012 to 2015*****-** the number of gross FTE jobs created (67) is taken from ISD monitoring data (up to June 2015).

***Convert Gross jobs to net jobs created***- Use additionality weighted factors[16] described below, to calculate the net additional jobs created at the end of the project:

- *Deadweight* is a measure of how different employment would have been without the project. Based on beneficiary interviews, on average businesses reported 32% of the project impact would have occurred without ISD support. A deadweight factor of 32% is therefore assumed for the gross jobs created output.
- *Displacement (Dp)* is the proportion of economic impacts that are displaced outside of the target through support from the project. No evidence was found in the survey for the new jobs created displacing those elsewhere in the target area, thus a figure of 0% is chosen.
- *Leakage (L)* is the proportion of benefits achieved that have leaked outside of the target area. Again, no evidence of the jobs created leaking outside Wales was found in the survey. No leakage is therefore assumed (0%).

[15] BIS (2009) practical guide http://www.bis.gov.uk/assets/biscore/economics-and-statistics/docs/09-1560-rda-evaluation-practical-guidance-appendix1

Toolkit for the Evaluation of EMDA Strategic Programmes 2007/08-2009/10 http://irep.ntu.ac.uk/R/T88A44L4PXUNXK656Q6JAAY6X6SBR4V8DKH2SI9EXB22YYFIKL-00862?func=collections&collection_id=1301

[16] English Partnership (2008) 'Additionality Guide'. Third Edition. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191511/Additionality_Guide_0.pdf

- *Substitution (S)* refers to where an organisation substitutes one activity for a similar one (for example, where the recruitment of a new staff member, is at the expense of an existing staff member). No evidence of substitution was found in the survey, and it has been assumed to be 0%.
- Finally, *multipliers (M)* take into account the level of usage by each company of suppliers in Wales. On the basis of additionality guidance prepared by English Partnerships)[17] to calculate the level of multiplier and has applied a composite multiplier of 1.5 to the additionality calculation representing a medium level of local benefits anticipated to the wider supply chain.

A summary of the future potential net additional jobs calculation is set out in the table below.

***Table 9. Net additional jobs created***

| | | Jobs Created 2012 | Jobs Created 2013 | Jobs Created 2014 | Jobs Created 2015 |
|---|---|---|---|---|---|
| **Gross Impacts** | | **6.00** | **12.00** | 14.00 | 67.00 |
| | *less deadweight (32%)* | *4.08* | *8.15* | 9.51 | 45.53 |
| | *less displacement (0%)* | *4.08* | *8.15* | 9.51 | 45.53 |
| | *less substitution (0%)* | *4.08* | *8.15* | 9.51 | 45.53 |
| | *less leakage (0%)* | *4.08* | *8.15* | 9.51 | 45.53 |
| **Total Net Additional Impacts** | *plus multiplier (150%)* | **6.12** | **12.23** | **14.27** | **68.29** |

**Actual benefit - net additional GVA**

***Calculate GVA per job for Wales from 2012 to 2015*-** the Workplace based GVA for Wales divided by the number of total workers (seasonally adjusted) in Wales generates the GVA per job figure. The figure for total workers in Wales is on the ONS Labour Market Statistics, March 2012 to March 2015[18] and the workplace GVA figure is also from ONS data[19]. The latest data for total workers in Wales was in 2014 with 1,389,305 employed in the country according to ONS data. The latest data for workplace GVA in Wales was in 2013 with a figure of circa £52 billion recorded. In order to calculate the GVA per job for Wales in 2014 and 2015, the 2014 workforce jobs figure was used in 2015 and the 2013 workplace GVA figure

[17] English Partnership Additionality Guide 2008 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191511/Additionality_Guide_0.pdf

[18] ONS Labour Market Statistics, March 2012 to March 2015 http://www.ons.gov.uk/ons/rel/lms/labour-market-statistics/index.html

[19] ONS Workplace based GVA1,2 NUTS1 at current basic prices www.ons.gov.uk/ons/rel/regional-accounts/regional.../rft-nuts1.xls

was used and multiplied by the HM Treasury Greenbook discount/inflation rate of 3.5%[20] for both 2014 and 2015. This provided a GVA per jobs figure of £40,148.63 for Wales in 2015.

***Convert Jobs to Gross GVA*-** Multiply the number of net additional jobs created by the GVA per job in each year to calculate the net additional GVA.

A summary results of the net additional GVA impact calculation is set out in the table below. This shows that circa £4 million of actual net additional GVA has been created to date.

***Table 10. Net additional GVA created (Actual)***

| Year | GVA per job | Net additional GVA generated from jobs |
|---|---|---|
| **2012** | **£37,120.01** | **£227,003.12** |
| **2013** | **£37,467.93** | **£458,261.61** |
| **2014** | **£38,790.95** | **£553,516.95** |
| **2015** | **£40,148.63** | **£2,741,688.08** |
| **Total** | **-** | **£3,980,469.78** |

**Cumulative benefit - impacts based on the persistence of the actual impacts**

***Persistence of impacts*** – considers the length of time the impacts can be expected to last. Integrated guidance from the UK Department of Business, Innovation and Skills (BIS) provide a range of assumptions which are adopted by the analysis[21].

- *Persistence* - A persistence factor of 3 (years) has been selected based on 'individual enterprise level support' from the BIS guidance.

Persistence of impacts is calculated by taking the last net GVA impact achieved by the project in 2015 (£2,741,688) and multiplying it by the number of years of persistence (3). This gives a total persistence of impacts of £8,225,064 by 2018 and a total project net additional GVA of £12,205,534 (adding the 3 years persistence £8,225,064 to the actual net additional GVA of £3,980,469.78).

***The Present Value of GVA impacts*** is estimated using the discount rate of 3.5% and a base year of 2015, and adjusting the three years of persistence GVA impacts by progressively greater weights[22]. The total cumulative net additional GVA (the net present value GVA) when discounted to present value is £11,738,377.

[20] Cabinet Office Discount rates and net present value http://data.gov.uk/sib_knowledge_box/discount-rates-and-net-present-value

[21] BIS (2009) 'RDA Evaluation: Practical Guidance to Implementing the Impact Evaluation Framework'. Available from: http://www.mbsportal.bl.uk/secure/subjareas/mgmt/bis/1268961559RDAevaluation09.pdf

[22] EMDA (2010) 'Toolkit for the Evaluation of EMDA Strategic Programmes 2007/08-2009/10'. Available from: http://irep.ntu.ac.uk/R/T88A44L4PXUNXK656Q6JAAY6X6SBR4V8DKH2SI9EXB22YYFIKL-00862?func=collections&collection_id=1301

A summary of results of persistence of impacts and the cumulative net GVA calculations is set out in the table below.

***Table 11. Persistence of impacts and cumulative GVA***

| | Impact | Discount Rate | Net Present Value of Impacts |
|---|---|---|---|
| **2012 (Actual)** | £227,003.12 | 1.11 | £251,682.42 |
| **2013 (Actual)** | £458,261.61 | 1.07 | £490,901.30 |
| **2014 (Actual)** | £553,516.95 | 1.04 | £572,890.05 |
| **2015 (Actual)** | £2,741,688.08 | 1 | £2,741,688.08 |
| **2016 (Persistence)** | £2,741,688.08 | 0.97 | £2,648,973.99 |
| **2017 (Persistence)** | £2,741,688.08 | 0.93 | £2,559,395.16 |
| **2018 (Persistence)** | £2,741,688.08 | 0.9 | £2,472,845.57 |
| **Total Persistence of Impacts** | £8,225,064.25 | - | £7,681,214.73 |
| **Total Net Additional GVA (3 Years Persistence)** | £12,205,534.03 | - | £11,738,376.58 |

# Annex II: Case Studies

**Case study 1: Recliners**

Recliners design, develop, manufacture and supply bespoke electrical Rise and Recline and Manual Furniture to the trade. The company has been established for over 30 years and saw a substantial brand refresh in 2012. This consisted in the development of a more modern range of furniture. Since then the company has doubled its turnover in the first year and has seen steady growth in the two years following the rebrand.

Recliners has moved into the NHS and healthcare market developing bespoke specialist seating providing postural support. A large part of the business is gained through public procurement routes from the NHS and Local Authorities and is based on the joint development of furniture with occupational therapists.

The business operates from its location in Pentre, Rhondda Cynon Taff, has ca. 30 plus staff and a turnover of £2.3million.

*Support provided by ISD*

Recliners was looking to develop a new series of bespoke paediatric furniture in response to frequent enquiries about such products. Recliners was in particular looking for the CAD software that was required to translate the design that had already been developed in-house into a prototype, undertaking various tests on component parts and support with the necessary clinical trials for which the ISD team was to tap into initial links with Morriston Hospital. The design proposal itself already existed on paper and illustrated the considerable aspiration of the product.

The idea was to explore whether Recliners themselves could produce some of the components that would ordinarily be bought in. The company had developed a brand new solution to back support and postural management and were looking to test the required components from a functional perspective before going out to source the required materials on the basis of a detailed specification. Alongside this, the materials needed to be tested, specifically with regard to the wear of the material itself in terms of strength, fractional points etc.

Achievements

*Research and innovation*

A number of project meetings were held with the ISD project lead, however, the actual development and testing work did not proceed as anticipated. Recliners' impression was that the more technical staff charged with undertaking the actual testing and development work didn't get stuck into the project and weren't able to proactively address key steps (e.g.

purchasing the necessary materials etc.). As a result, the project never went ahead as planned and Recliners had to decide to draw a line under it at some point.

*Economic*

Recliners' perception is that the delays in the project meant that the company missed the window of opportunity regarding the launch of this particular type of paediatric furniture as similar products have now entered the UK market.

*Cross-cutting*

Other

n/a

*Ongoing innovation and design activity*

The company has since gone ahead with other related products in the Cozikids range outside of the ISD project. They have entered into partnerships with several local businesses that bring the range of skill sets and tooling that is required to undertake the necessary development work. The only thing that is not covered by these partnership arrangements is the material testing, which is therefore sourced from a third party provider.

Recliners has also since developed a strong network with occupational therapists, both individual therapists and working through the relevant Council departments, and have proceeded with clinical trials via this route. Most of these contacts existed prior to the ISD connection, but have now been developed further.

*Additionality*

n/a

*Areas for development*

Recliners' impression was that the ISD team might simply have had too high a work load with not enough staff to cover the range of projects that were ongoing.

Communication stands out as a key area that could be improved, both within the team and with the company clients.

The fact that ISD had a limited life span was seen as possibly have affected the commitment to the collaborative project.

**Case-study 2: HOS Hire Ltd**

HOS Hire Ltd is an independent hire firm offering a range of quality non-mechanical plant for hire and sale incl. formwork, scaffolding, shoring and groundwork equipment. The company also provides services sourcing reinforced concrete and creating concrete structures.

The company has been established for around 10 years, employs 70 people and has an annual turnover of about £4 million.

*Support provided by ISD*

HOS was originally merely looking for somebody to develop patterns and cut plastic for a particular construction contract that the company had been contracted to do. This involved finding appropriate materials and gaining access to the technology required to imprint a pattern on concrete once it is poured into the plywood shuttering. Patterned moulds are created by bonding vinyl sheets with low-relief texture onto the plywood shuttering moulds.
The HOS Director had been making enquiries for somebody to develop such patterns that could be delivered in the context of this particular customised concrete project and had contacted a number of universities looking for a pattern design student who might be able to work in partnership with the company.
In this context ISD was mentioned and the first conversation confirmed that the ISD team had a very good understanding of the specific requirements, had ideas of how they could help and were generally very interested in the project.
The specific client request to HOS Hire Ltd. to print letters in the concrete wall of a new school building, formed the backdrop to the initial joint development work. The ISD team was able to point HOS Hire Ltd. in the direction of a local company that was able to produce the necessary mould for this particular job. On the back of this conversation, however, the HOS Director and the ISD team realised that a larger market opportunity might exist here.
The plan that emerged was to develop the capability in Wales to develop and market form liners allowing to cast feature walls in situ. This was a new concept in concrete design that so far had depended on importing the necessary moulds from the Netherlands and Germany – at great cost.
The project was accelerated by a further specific contract that HOS Hire Ltd. was invited to quote for. The project had run into difficulty, because the costs for the sourcing of the form liners from Germany had been grossly underestimated and the opportunity was for HOS Hire Ltd. to come up with a solution. This triggered HOS Hire Ltd. and the ISD team into action who, on the basis of merely a photo of the required pattern, developed a solution and the corresponding prototype over the course of a week.

Achievements

*Research and innovation*
On the basis of the initial problem-solving approach for a specific construction project, the ISD team worked with HOS Hire Ltd. on the development of the underlying technique of creating the necessary form liners and patterns as well as a whole range of different materials and patterns for different uses (e.g. letters on school buildings, company logos) for both off the shelf and bespoke patterned concrete.
A key requirement that was addressed in the development process was to find a way of designing patterns that could cater for different dimensions, to tessellate, vertically or horizontally (like the pattern repeat for a curtain), which is necessary to cater for the diverse dimensions of different construction projects.

This ultimately led to the development of a new process (using existing technology to translate images into 3-D models) together with associated materials specifications. This process can now be used by HOS Hire Ltd. to offer an entirely new product line in the UK market avoiding the need to import expensive patterns from Europe that created a considerable cost burden for such projects.

*Economic*

The joint development work between HOS Hire Ltd. and the ISD team has led to the creation of Tesselform as a new HOS Hire Ltd. subsidiary. Tesselform will offer the new system and methodology including the ability to develop bespoke solutions to the UK market. The organisational separation was necessary so that HOS Hire Ltd. will be able to bid for contracts where Tesselform products form part of the specification.

Following completion of the ISD project, Tesselform will still require external equipment and expertise. This will be delivered by buying in the necessary services (e.g. CAD software) on a commercial basis. ISD is currently supporting the new company in developing the relevant business links.

The original job that HOS Hire Ltd. was able to secure only, because it was able to offer a solution for the issues arising around the imported patterns for the site in Barry has already generated more than £330,000 for the company. The expectation is that the close link to Tesselform will give the business a strong competitive edge in the market place on the basis of the customised concrete offer.

Over and above the direct turnover from Tesselform itself, the expectation is therefore that HOS Hire Ltd. itself will be able to secure considerable commercial benefit from the collaborative R&D project for years to come.

*Cross-cutting*

As a business in the construction sector, HOS Hire Ltd. would already be adopting stringent environmental policies, but no additional work on this was done as part of ISD support.

*Other*

The development of the broader customised concrete capability with HOS Hire Ltd. in itself can be seen as an unintended consequence from the support. The business's original need was purely problem-solving support for one particular contract. It was as a result of the highly relevant expertise and creative impetus that the ISD team could bring to this that a much larger innovation project with the potential to secure a whole new business avenue for HOS Hire Ltd. emerged from the collaboration.

Ongoing innovation and design activity

The ISD team still forms an essential part of the process of launching the new business and supporting the development of the necessary commercial networks on both the supply and demand side.

*Additionality*

HOS Hire Ltd. is quite clear that none of this would have happened without ISD support and the motivation and interest brought to the project by the ISD team.

*Areas for development*

One important bottleneck identified by the business relates to the resource required to actually launch Tesselform and develop this as a new business area. The HOS Hire Ltd. Director is the main internal driving force for the project and allocating sufficient time to the business development project is a challenge.

While work is ongoing to identify potential sources of funding to support a business development role in Tesselform, the issue is broader than that. Even an additional new member of staff would depend crucially on guidance and input from the HOS Hire Ltd. Director. It is therefore not so much the issue of funding a business development person – on the contrary, Tesselform's business proposition is strong enough to warrant own investment - but finding a way of supporting a new member of staff to take the project forward.

The crucial resource here would be a possibility for ISD to act as a launchpad for the new business that could then be fully spun out once the business development manager had developed the necessary understanding of the project and the capability to take Tesselform forward on its own steam.

**Case-study 3: Innovative Glass Products**

Innovative Glass Products was established in 2001, as a spinout company from the then Swansea Institute of Higher Education. The company was originally set up to manufacture six tons of KiloLux glass, a product developed by Director and Founder Rodney Bender for the Wales Millennium Centre in Cardiff. The company manufactures innovative and bespoke solutions for glass in architecture and interiors as well as providing prototype and consultancy advice for other companies. The company, located in Swansea, has three full time and one part time employees, Rodney is also a Research Fellow at University of Wales, Trinity Saint David (UWSTD).

*Support provided by ISD*

Rodney became aware of the Institute for Sustainable Design (ISD) through his ongoing involvement with the UWSTD as a research fellow of the Industrial Design Group. Rodney initially undertook a collaborative R&D project with ISD around using laser and water-jet cutting. Innovative Glass Products had been sub-contracted to manufacture glass tap handles for a company in Birmingham. Rodney had previously outsourced the water-jet cutting to another company but the majority of the batch of products had been rejected on quality grounds. It was identified that there were issues around the water-jet cutting

process, through discussions and testing with ISD's glass specialist Dr Shelley Doolan, Rodney managed to make adjustments to the speed of the cutter and the closeness of the nozzle to identify the appropriate speed to ensure a high quality product. Rodney has also working with the ISD on a number of other projects including: investigating the commercial viability of producing bowls using laser and water-jet cutting; producing some prototyped glass curtain tassles for an interior design company client; and exploring the relative costs of using laser and water jet processes.

Achievements

*Research and innovation*

While Rodney had previously used water-jet cutting in his production processes, as this had been outsourced he was unable experiment and make improvements to the process. The combination of using ISD equipment, drawing on their technical advice and the iterative testing facilitated by ISD staff, in Rodney's view enabled the company to:

> "Improve outcomes in a way I wouldn't have been able to if I had gone to a larger company to use their equipment"

Working with ISD has enabled Rodney to go one and undertake research around the feasibility of using water and laser jet cutting techniques for the production of other products. Rodney was also made aware of the potential of 3D printing but has had time to pursue this to date.

*Economic*

Rodney attributed the collaboration with ISD as an essential in Innovative Glass Products being able to improve the quality of their product and therefore securing an ongoing contract. Rodney suggests that as much of the prototype batch manufactured without ISD's intervention had been rejected for quality reasons it could be argued that their contribution was crucial to successfully fulfilling the contract. The value of this to the company depends on the ultimate demand for the final product, but it is estimated that the current value of sales to Innovative Glass Products, relating to the current order, is around £16,500. Furthermore accessing ISD facilities was a lot more cost effective than outsourcing with the additional value of being able to discuss the process.

Although further prototyping is needed, Rodney is looking to launch the glass bowl onto the market within the next year and also has a number of other product ideas in the pipeline:

> "the facilities at ISD have allowed us to demonstrate products to potential new clients"

In addition work with ISD may have also related in some more indirect financial benefits in terms of Rodney acquiring more knowledge about the costs of various processes and being able to make an informed decision on whether to buy water-jet cutting equipment for the company.

*Cross-cutting*

Rodney had a keen interest in sustainable practice prior to his collaboration with ISD and doesn't feel his work with them has added any further value in this area. Innovative Glass Products had achieved Green Dragon accreditation, some years before their involvement with ISD and in his role as Research Fellow at UWTSD, Rodney has been conducting research into recycling waste crushed glass into the design and production of consumer products.

*Other*

Rodney reports a number of unexpected benefits from working with ISD, including the aforementioned improved knowledge of the costs and benefits of using a variety of equipment which may inform his decision to buy a piece of machinery for the company. He also furthered his interest in the potential use of 3D modelling in the company's design process. In addition value of the technical advice provided by ISD surpassed his original expectation that collaborating with ISD would be mainly to use their equipment.

*Ongoing innovation and design activity*

Rodney intends to collaborate with ISD on the development of a number of products in the future, in particular he is interested in how he could use 3D printing. Rodney suggested that ISD has enabled him to undertake a lot of product prototyping and manufacturing himself instead of outsourcing it to other companies:

*"it has improved my confidence and broadened my horizons"*

*Additionality*

Rodney reports that while the equipment he accessed at ISD is available elsewhere, it is not underpinned by the research expertise found in ISD. In addition, the technical advice provided by ISD combined with the access to equipment enabled the company made the manufacture of his products more viable:

*"it was the fact that I was able to have a discussion which was useful….I wouldn't have got the same results"*

*Areas for development*

While Rodney was highly complementary of the support he received from ISD he suggests a number of areas for improvement. Rodney highlighted that there is a need for improved management of the commercial and research demands on equipment, reporting that he was unable to access some equipment (even though he had bought into the water-jet cutting machine) during busy times of the year because it was being used by research students as well as other businesses or was undergoing maintenance. In addition to this he was unable to get a clear response as to when the equipment would be available to use and the cost of this.

Rodney suggests that the facilities and expertise offered by ISD require more publicity as he believes there is limited awareness of ISD and the opportunities it may provide amongst the business community. However linked to this is the need to improve communication with new and potential business partners. Rodney suggested that ISD had tended to take a

patrician and slightly patronising attitude to companies, particularly related to the environmental management and health and safety aspects. He suggests that as the collaborative partnership is mutually beneficial to both businesses and the university and this equal relationship should be better reflected in communications. Furthermore while he values the conferences and events linked to ISD, it can be difficult for businesses to take time out to attend and the business benefit of such events needs to be better communicated.

**Case-study 4: Adam Harris**

Adam Harris used to run an architectural company, but after a bereavement he had to downscale the company considerably. Since then he has been working on a freelance basis delivering architectural supervision services throughout the UK.

*Support provided by ISD*

ISD was mentioned to Adam by a contact sometime in 2012. Having made contact with Swansea Metropolitan University, he was able to arrange a meeting with the Design Advisor for Enterprise & Innovation very quickly.

The advisor supported Adam in the process of questioning, re-evaluating and clarifying the existing business model, a process that he had embarked upon in response to his personal loss and that benefited greatly from the Advisor 'injecting knowledge and experience'. At the time his business was incurring considerable overheads and was losing money. Adam also had a need to redesign the business so that it would have a much lighter footprint in line with a different outlook on life.

The Collaborative R&D project emerged from these initial conversations. Adam had designed a prototype of a concrete desk which was the centre piece in his office and wanted to explore opportunities to prototype, further develop and market this as a product as well as the associated manufacturing process of using a Waterjet cutter to cut out a shape from a slab of concrete. The hope was that this would allow him to move away from the dependence on professional fees as an architect. The ISD Technical Officer for Sustainable Design was brought in, because she had undertaken a materials research PhD considering the use of recycled glass in product design using a technique that required lower kiln temperatures than conventionally used.

Adam brought a background in working with concrete through his father's business and the idea emerged to jointly develop a concrete desk as prototype for a new type of product that would allow the commercialisation of the research results from the PhD work and Adam's practical experience of construction settings and skills of working with concrete. This approach was in line with Adam's own strong interest from a postgraduate diploma from the Centre for Alternative Technology in Machynlleth.

The ultimate aim was to use the Waterjet cutter technique to design and create a hand-finished and cast and polished concrete desk incorporating fused recycled glass elements as a prototype that would allow the subsequent marketing of this as a production process.

Achievements

*Research and innovation*

The initial research stage involved the development of the design, the testing of different concrete mixes (which also involved a concrete company in Bridgend), templating and the development of the Waterjet cutter technique for the combination of recycled glass and concrete. The manufacturing method would allow the manufacturing of concrete furniture using custom-made digital designs.

The R&D project benefited considerably not only from the equipment available at the university (i.e. the kilns, glass crushing and mould making equipment and the Waterjet cutter), but also the additional technical expertise offered by various academics.

During the R&D project an opportunity was identified to tie the production of the actual prototype to the new build of the School of Art and Design. A reception desk incorporating this process was built into the budget for this project and the R&D project schedule amended to align with the appropriate construction project stages.

The production process and design element created some early interest, such as an invitation to take a stand at the 100% Design show at Earl's Court, which Adam couldn't take advantage of for financial reasons.

Ultimately, however, the R&D project was put on hold when the Technical Officer, who had been closely involved in the project and whose research results were vital in taking the project forward, went on maternity leave. Combined with changes in the time scales for the School of Art and Design construction project, changes in staff overseeing this overall project, the end result was that the scale model of the prototype did not form part of the construction project as envisaged. While the design of the desk was implemented, different materials were used.

Even though the development of the ultimate product has not been completed, Adam saw the project as a success, since jointly with the Technical Officer he holds the IP in the Waterjet cutter technique and the fusion of concrete and recycled glass. Negotiations are ongoing to buy out the university's part in the IP relating to the underlying manufacturing process (as this is not held by the Technical Officer personally, but by the university) in order to be able to take the product launch forward through other means following the closure of the ISD programme. The design of the desk itself is not patentable, but Adam and the Technical Officer created a design mark for the manufacturing process using the Waterjet cutter.

Alongside this main outcome in terms of the prototyping of the desk, the collaboration project also resulted in the development of new processes in the mixing of the concrete.

This has created positive results for the business of Adam's father, which had been involved in testing a great number of different concrete mixes.

*Economic*

As a result of the delays in the ISD supported R&D project itself and changes to the construction schedule of the new School of Art and Design, the Collaborative Research project didn't progress to the ultimate stage of test marketing and using a high profile prototype as part of a branding strategy as planned. As a result, no actual economic returns from the project have been secured yet.

However, it is also important to note that the underlying business model that had been redeveloped with support from ISD itself became more profitable again as a result of the support.

*Cross-cutting*

The new concrete mixing technique is now used in a commercial setting. The new process being incorporated into the current product range of the associated business has helped reduce its carbon footprint.

Beyond this, Adam didn't feel that the partnership working had led to any new environmental management practices being introduced in his business, but that was largely due to the fact that he had considerably pre-existing knowledge and was starting from a high base.

*Ongoing innovation and design activity*

Adam fully expects to take the R&D project further beyond the life time of the ISD project. As an architect, his way of working he already had strong design elements (e.g. he had designed furniture for clients of his previous architectural business).

Adam intends to continue using the university facilities on a commercial basis once the ISD project is closed, e.g. buy in the Waterjet cutter on an hourly basis.

*Additionality*

None of the activities delivered through the Collaborative R&D project would have happened without ISD support. It represented a big investment and without the partnership approach with the ISD team, this would not have been developed.

*Areas for development*

A key area for development for the ISD team is to embed strong leadership and strengthen team working. Adam's impression was that there was a lack of overall direction, which meant that it was difficult to tap into other specialisms and expertise outside of the direct R&D team allocated to the project. A stronger focus for the wider team to feed into the process, in particular the marketeers on the one hand and the engineers on the other, would have made a big difference to the project, specifically with regard to the marketing side of things.

**Case-study 5: Beate Gegenwart**

Beate Gegenwart has recently established herself (since August 2014) as a sole trader designing and producing bespoke and one off pieces of jewellery and decorative items. Prior to becoming a full time designer she was a lecturer at University of Wales Trinity St David (UWTSD). She also held a short residency with Design Wales at Cardiff Metropolitan University. As a lecturer at Swansea Metropolitan University she had already engaged in some collaborative activity around her design and production processes.

*Support provided by ISD*

Beate became aware of the Institute for Sustainable Design (ISD) through her residency at Design Wales. Prior to accessing support from ISD she had been mainly using laser jet cutting techniques for larger pieces She was introduced to technical advisors Shelley Doolan and Matthew Bellis at UWTSD who were able to advise on 3D printing which was a new concept to her and would enable her to produce smaller pieces. She was also introduced to water-jet cutting and went on a Rhino 3D (computer aided software) course. Fundamental to Beate was the fact that she was taught how to use the equipment herself, commenting. This was perceived to be important to her ongoing expertise.

She also received advice on business options from Jules Mallory Skinner, and was impressed by the perceived openness of ISD staff to collaboration and problem solving.

Achievements

*Research and innovation*

As result of her involvement in ISD, Beate has been able to develop new products (jewellery) and new processes (3D printing).Her involvement in ISD is ongoing and while the use of 3D printing has enable her to develop new products, as 3D printing only prints in in plastic, she has continued working with the technical advisors to introduce electro-plating so her products will have a silver or copper finish.

*Economic*

Beate anticipates she will be able to launch products to market by September 2015 once final product testing with the electro-plating is complete.

*Cross-cutting*

While Beate described the ISustain symposium as a good opportunity to discuss ideas, she has not introduced any new environmental/ equality and diversity practices as a result as she claims she was already aware and conscious of sustainable practices in the production process.

*Other*

Beate reports that she feels more knowledgeable since her involvement with ISD and as a sole trader she particularly values the collaborative aspect they offer. In addition the

confidence and knowledge she has gained as a result of her involvement may have contributed to her decision to become a sole trader and full time designer. Beate attended a number of ISD events and while she hasn't immediately benefitted from the networking opportunities to suggests that they may be of value in the future. Through her involvement with ISD, Beate also became aware of other equipment such as CNC machines that she may consider introducing into her production processes.

*Ongoing innovation and design activity*

Beate continues working with the ISD team on the electro plating processes. She notes that lots of research is being done on 3D printing and would like to continue to innovate in this area. She values the continued role of ISD highly, noting that industry does not have the time to work with smaller businesses, to solve problems and to undertake research with them. In addition the expense of accessing such support from commercial enterprises, may be prohibitive to start ups.

*Additionality*

Beate suggests that it is unlikely that she would have been able to access the advice and support she gained from ISD elsewhere, in addition 3D printing is expensive. While Beate has good links with the university she thinks staff would not have had the time to introduce her to new software and show her how to do the printing.

*Areas for development*

Beate is extremely satisfied with all aspects of the support she received from ISD and wouldn't suggest any major changes to their delivery approach. She did emphasise the importance of the 'hands on' technical support and while appreciated the business advice, it was possibly a little too generalised and didn't add to her existing knowledge. In reflecting on her experience of collaborating with ISD she noted that the support was vital for her new product development.

http://beategegenwart.co.uk/

**Case-study 6: Sylvie Vandenbeele**

Sylvie Vandenabeele is a formerly a Post-Doctoral researcher in biology (specifically studying the behaviour of animals) at the Swansea Laboratory for Animal Movement (SLAM), Swansea University. SLAM is a group of experts specialised in animal tracking using state-of-the-art technology. The SLAM team had existing links with the engineering department at Swansea University using a range of their facilities for design and research such as wind tunnel, 3D printers and imaging equipment to analyse detailed animal movements and behavioural data. They have also partnered with the Royal Society for the Prevention of

Cruelty to Animals, the Oiled Wildlife Care Network and the Max Planck Institute (a German institute with expertise in animal tracking).

*Support provided by ISD*

Sylvie was made aware of the Institute for Sustainable Design (ISD) through a presentation they made at an event. Sylvie and her team were involved in studying the behaviour of marine birds. Sylvie's role was to develop a novel 'back-pack' system to track rehabilitated oiled birds without compromising their well-being. Sylvie initially approached ISD as she was interested in how 3D scanning could be used to help the design of minimal impact harnesses to hold the tracking devices. She was shown how to use Computer Aided Design (CAD) software to 3D scan dead birds to enable the design of more streamlined harnesses. In addition Sylvie was made aware of the potential of using 3D printing to make the harnesses instead of silicone moulds as originally intended.

Sylvie was extremely satisfied by the level and quality of support provided by ISD and the outcomes of her collaborative project, however she states:

> "they always tried to help me the best they could, however it felt at times they had too much going on and couldn't always devote the time I needed on my project…. However I acknowledge that I was only one person and they were dealing with many companies"

Achievements

*Research and innovation*

Through iterative testing, using ISD's CAD and 3D printing facilities, Sylvie has been able to produce bespoke harnesses of various designs and sizes. With the range of harnesses now available, it enables most species to be fitted with a harness adapted to their morphology and lifestyle.

*Economic*

No economic impacts have been observed to date, Sylvie is considering some commercial application of the harnesses she has developed but the product needs further testing – while the harness has been successfully tested in captivity on a variety of species and is now ready to be used on wild birds as proof of concept.

*Cross-cutting*

Sylvie does not recall any environmental/ equality and diversity specific support but notes that she would try and ensure that any products produced were environmentally friendly and that waste would be reduced in her production process.

*Other*

Sylvie states that she has increased in confidence since her involvement in ISD and is now thinking about other areas that she could apply the design knowledge she has acquire:

"I'm definitely thinking of more design related opportunities"

*Ongoing innovation and design activity*

Sylvie has now completed her post-doctoral position at Swansea University and is no longer located in Wales. However, Sylvie would like to explore collaborating with ISD in the future as her product needs further testing and refinement before it can be made commercially available. In addition there are other design opportunities she would like to explore.

*Additionality*

Sylvie states that without ISD support she wouldn't have been able to afford to access similar services elsewhere.

*Areas for development*

In terms of future development, Sylvie was extremely happy with the support she received and would like to work with ISD again. She did, however, suggest that ISD could benefit from additional financial support to resource more staff and equipment as at times she had problem accessing staff.

**Case-study 7: My Smart Ideas Ltd**

Tim Joannides is Managing Director of My Smart Idea Ltd, a Swansea based company established in 2013 and employing two people. My Smart Idea is a product development company *"that creates fun, functional and engaging products, offering solutions to everyday problems"*[23]. The company has developed a range of products to date including menswear, pet, kitchen and bedding accessories.

*Support provided by ISD*

Tim was referred to the Institute for Sustainable Design (ISD) through his involvement with Swansea University's ASTUTE project whom he had been collaborating with on the development of a menswear accessory product ('Tie Genie').[24] Tim undertook a collaborative R&D project with ISD on a product for the pet accessory market – 'Easy Tie' – a dog safety accessory designed to dog owners to safely, securely and quickly attach their dogs to any object. Tim initially wanted help in designing the product but was made aware of how design can benefit the manufacturing process. He also continued working on the 'Tie Genie' product with ISD. Tim collaborated with ISD's Product Design Manager, Ian Williams who provided advice and facilitated training on Computer Aided Design (CAD) software and referred him to the University's engineering department for further product testing.

*Achievements*

*Research and innovation*

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[23] http://www.shell-livewire.org/home/alumni/grand-ideas-award-winners/2013-winners/2013-July/tim-joannides/

[24] http://www.astutewales.com/en/index.htm

The collaboration with ISD improved Tim's knowledge of the importance of design in ensuring good manufacturing outcomes. Through ISD he was able to access the university's engineering department which enabled him to improve the quality of his product through stress testing to assess product feasibility and material selection.

Tim describes the advice he has received from ISD as invaluable, both in terms of designing products so that they can be manufactured with minimal waste of resources and time, to enable him to deliver a commercially viable product at an acceptable price point to the consumer.

*Economic*

The 'Easy Tie' product was launched onto the market in March 2014 and is currently sold in more than 1600 stores in 16 countries across Europe and Eastern Asia. Tim notes that the pet accessory market is going from strength to strength and is such he is focussing on this area of his business but does plan to launch the 'Tie Genie' product onto the market within the next few years.

*Cross-cutting*

Through his collaboration with ISD, Tim has furthered his knowledge of recyclable materials in his products. While he recalls some reference to equal opportunities during his involvement with ISD, he states that he had already made a commitment to this in his business plan but as a company with only two employees in reality it is difficult to implement.

*Other*

Tim remarks that being nominated for an ISD iSustain Award for commercialisation for the work on 'Easy Tie' was an unexpected bonus and facilitated additional awareness and profile for both the product and the company. In addition Tim states that he didn't expect to learn so much from his collaboration project and will continue to apply the knowledge in future activities.

*Ongoing innovation and design activity*

Tim was extremely satisfied with the outcome of his first collaborative project and has continued to collaborate with the ISD team. With the support of ISD and additional funding, he is currently developing an 'advanced' dog ball with a view to launching it on the market within the next year. As a result of recognising the importance of design in the manufacturing process, Tim is also considering recruiting a CAD designer to the My Smart Idea team within the next 6 months.

*Additionality*

Tim suggests that as a result of his collaboration with ISD, the impacts and outcomes he has achieved would have occurred but probably at a later point. He points to the drive and determination required to be an entrepreneur and while he acknowledges that the support provided by ISD has certainly helped and furthered his knowledge of design practices – *"it*

*was definitely worthwhile and beneficial",* if he had not engaged with them he would have sought similar advice and support from a university industrial design department.

*Areas for development*

Tim suggests that ISD has been subject to some criticism from local companies who provide similar services who perceive a government funded project as taking business away from them. In order to address this criticism and to ensure ISD adds value, Tim suggests there should be a form of means testing in terms of who accesses ISD. By assessing whether businesses have a commercially viable idea (via a competitive tendering or expression of interest process) and genuinely cannot afford to access the services provided by ISD elsewhere, not only will the project support local start-ups but it won't displace existing services provided by local businesses. In the long-term this approach may benefit local businesses as start-ups receiving support from ISD grow and in turn access these services from the local business community. A further suggestion is that ISD consider providing support in the product design process as well as in manufacturing.

**Case-study 8: Cerebra**

Founded in 2001, Cerebra is a unique national charity that strives to improve the lives of children with neurological conditions, through research, information and direct, on-going support. Cerebra's innovation centre (CIC) is co-located with the Institute for Sustainable Design at University of Wales Trinity Saint David.

The Cerebra R&D manager, a member of staff at UWTSD, is contracted out to the charity. The CIC team overall is made up of three product designers whose job it is to design bespoke equipment to meet families' needs.

The CIC team design, develop and produce products to help in the daily lives of children with neurological conditions. CIC's starting point will always be to find out whether a particular product that parents need to support their child is already out there. Only if this is not the case will Cerebra undertake product development work, which will quite often be for a one off piece of equipment for the specific needs of one particular child. The development of such a product, however, will usually involve research to understand whether other children might also stand to benefit and, if so, whether it is possible and affordable to contract out larger production runs. Three commercial contracts for the production of walking and learning aids have been developed in this way.

*Support provided by ISD*

Cerebra regularly works closely with the ISD team. ISD has successfully processed a number of design assists with CIC through knowledge transfer.

This included vacuum casting techniques to produce the 'iPad Case' and product document drawings for the 'Sledge'. The 'iPad Case', designed to enable disabled children to use an

iPad, was Cerebra's most ambitious product to date due to its necessary design for mass production and after a season's trial run, the sledge is now commercially available.

Using the same workshop as ISD, the CIC have been able to work closely with ISD experts and to gain their advice and support. The CIC team are themselves product designers in their own right, but have benefited from the exchange of knowledge and expertise and access to particular items of equipment.

In this particular case, the development of a riding helmet, Cerebra's development work required use of a 3D scanner, a piece of equipment that CIC had no access to elsewhere.

Achievements

*Research and innovation*

The development of the helmet required a process of 3D scanning using a variety of scanning techniques to produce a 3D digital model. Over and above the CIC team's own expertise, a member of the ISD team was able to contribute computer modelling expertise to the development of the helmet.

The development work of the prototype is still ongoing with the helmet expected to go on the CNC machine before being fibre glassed soon. Once this is completed, the helmet will need to undergo extensive testing to ensure that all technical product requirements are met and any safety concerns can be eliminated.

The current stage of the development work must therefore be seen as proving the principle of the helmet.

*Economic*

Economic motives are not the driving force behind the development of the helmet. More often than not, Cerebra will develop one-off items to meet the needs of an individual child. There have been instances where such early development work has fed into a commercial product, such as for instance the sledge that has since been launched commercially. However, Cerebra will always contract out the commercial production of any products.

In the case of the helmet, this is unlikely to happen, because the final product would be too expensive for a larger production run to be commercially viable.

*Cross-cutting*

The ISD team did provide advice on different options of strengthening Cerebra's environmental policies and this was passed on to the charity's head office. However, in view of the fact that the activities delivered have no major environmental implications, this was not seen as a key priority.

In terms of equality and diversity, the very nature of Cerebra's activities itself, which is entirely aimed at helping disabled children being better integrated in family and community life is, of course, a major contribution to equality.

*Other*

There were not unexpected benefits from ISD support. However, through using the 3D scanner as part of the development of the helmet, the Cerebra team looked into the availability of this kind of equipment and has been able to identify a machine at the lower end of the market that has now been purchased and will be available for similar product development projects in the future.

*Ongoing innovation and design activity*

Seeing that ISD is due to close soon and there is uncertainty as to whether and how the equipment will be accessible after that, Cerebra does not currently anticipate continuing with the collaboration.

*Additionality*

The development of the helmet would not have been possible without the 3D scanner, so would not have happened without the collaborative arrangement with ISD.

*Areas for development*

There are no particular areas for improvement, as through the co-location with ISD Cerebra has been able to work very closely with the ISD team.