

0114

Design Support and the Transfer of Knowledge to SMEs

G C Raulik¹, P Larsen², G Cawood¹

¹University of Wales Institute Cardiff - Design Wales, Cardiff, Wales, United Kingdom, ²University of Wales Institute Cardiff - PDR, Cardiff, Wales, United Kingdom graulik@designwales.org.uk

Design support programmes have became more and more popular, with countries recognising the importance of investing in programmes that will help their companies to develop products and services with design input. In parallel the emphasis placed on the development of small and medium enterprises (SMEs) grows as fast as market competition makes the survival of these companies more and more difficult. Their importance for national economies is recognised as well as their limited skills and resources. At this point there is a need for addressing these weaknesses and providing SMEs with the information they lack in order to improve product and process innovation.

Schemes for design support and promotion offer an important role in providing the information needed. However, as well as providing information, such schemes have the opportunity to create a learning environment where companies can learn how to access design sources and can also be trained in creative thinking. In such ways, with a short-term input of advice, such companies will be able to innovate and develop their own ideas, thereby sustaining their own competitiveness.

This cycle can only be developed through the transfer of knowledge from design support initiatives to companies. In this way, design support mechanisms become crucial agents in the development of the small business sector, not merely design advice suppliers.

The need for focusing knowledge transfer in design support schemes

In December 2005 the need for a design programme that supports industry was publicly recognised in the UK in the publication of the "Cox Review". This report was commissioned by the UK Chancellor Gordon Brown to address relevant issues for the UK's long-term economic success with important emphasis on the development of the SME sector. In response, the Design Council's Chairman Sir George Cox presented a document where he outlined the obstacles and opportunities of helping SMEs in the use of design. He reported that; "smaller companies do not respond well to generalised 'awareness' programmes. (...) SMEs



need to be reached on a local basis, with active support and a practical demonstration of the benefits on offer". (Cox, 2005, p. 16)

This statement raises the discussion about the efficiency of the means of communication to small companies and the importance of investing in programmes that will actually transfer knowledge to these businesses.

In an interview Professor Ranjan from India commented:

"design promotion is something that governments will have to do and continue to do to make sure that awareness is built both in the public as well as in the industrial sector, but I think design support is perhaps a far more effective way to get direct involvement with industry, to ensure that they move up the value change very rapidly and competently". (SEEdesign Bulletin, 2006, p. 8)

This paper argues that although there is no tradition in linking knowledge management and design support, principles of knowledge management could be used in order to strengthen the efficiency of design support and promotion mechanisms.

Knowledge transfer is a broad discipline and a complex process, which involves many stakeholders (for example universities, businesses, industry, government). There are several ways to define knowledge transfer but for this paper Grady & Locke's definition is used: "the transfer of knowledge, expertise, invention, or equipment from the point where they have arisen or been found to the point where they are applied or used for competitive advantage" (Grady, 2004, p. 2).

In the subject of knowledge transfer the first issue is to understand that data, information and knowledge are not interchangeable concepts. Data is a set of discrete, objective facts about events. Information can be described as a message, usually in the form of a document or an audible or visible communication, involving a sender and a receiver. And knowledge is "a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information" (Davenport & Prusak, 1998, p. 5). It is then possible to differentiate between explicit and tacit knowledge.

Explicit knowledge is already codified and can be easily communicated (for example patents - a representation in text of a process or product developed through the expertise of scientists or inventors). Tacit knowledge is gained by practical experience and accumulated over time by a person.

These concepts can be transferred to design activity and show that design promotion activities tend to concentrate on the dissemination of explicit knowledge, while design support mechanisms might be dedicated to the transfer of tacit knowledge, from the design advisor to companies.

Many authors argue about the crucial role of the knowledge manager in the transfer activity. In a similar way, the design advisor is the key element for the delivery of design support, which relies most on the advisor's knowledge and experience more than on design tools (for example templates, management tools).



According to Davenport & Prusak (1998) and Bergeron (2003) there is a close relationship between the roles and skills needed by design advisors and knowledge managers, namely, both share the following:

- Developing project objectives;
- Assembling and managing teams;
- Determining and managing customer expectations;
- Monitoring project budgets and schedules;
- Identifying and resolving project problems
- Facilitate in project management, change management and technology management
- Have a background that emphasises the creation, distribution or use of knowledge
- Speak the same languages and understand the same value systems
- •

Why knowledge transfer in design support activity?

Design support mechanisms tend to target small companies, in particular those first-time users of design. If companies learn from the experience of having design advisors conducting them through the design process for the first time, they should feel confident in making a second attempt on their own. Therefore they would not need to seek advice for future projects.

Overall design advisory services are developed by design organisations, which are non-profit and public funded and therefore must aim to assist as many companies as possible. Once the resources are limited, the choice is to ensure that the advice process is a learning process. After one, two or at the most three projects, the company must be able to cope with the design process by itself as well as to find the necessary external resources for such activities.

In the great majority of cases, design advisory services are funded by local governments and often provided for free. This is the scenario in Wales (UK), where the Welsh Assembly Government funds Design Wales for the delivery of free design advisory services for Welsh industry. In such cases knowledge transfer should be strongly emphasised. Because of the nature of the funding, the programme should aim to provide advice to the largest number of companies as possible. This could be exploited through the correct use of knowledge transfer.

So, how should the transfer of knowledge be happening in design support schemes? How clear can this transfer of knowledge be?

As described by Davenport & Prusak (1998) knowledge has to be absorbed otherwise it has not been transferred. Moreover, it is important to highlight that transmission and absorption together have no useful value if the new knowledge does not lead to some change in behaviour or the development of some new idea that leads to new behaviour. This is a fundamental issue for design advisory services. Cultural change is always aimed at companies as it is expected that these advice recipients will incorporate design in their process after



the delivery of support. It is highlighted by O'Dell & Grayson (1998, p. 7), who says that "the process must explicitly address sharing and understanding of those practices (...)". And they add: "the process involves helping the recipients adapt and apply those practices to new situations, to create new 'knowledge' and put in action."

The transfer of knowledge should be clear in a way that will provide companies with the confidence to undertake future design projects by themselves.

The Objectives

The objectives of this paper are to:

- Report on a desk-based analysis of data held by Design Wales (a UK design support agency) to identify if the transfer of tacit knowledge to businesses seeking design advice was successful and, if so, to what degree
- Analyse other data held by Design Wales in order to determine the impact design advice has had on the performance of each of the businesses assisted
- Through a literature review identify methods that have been advocated by other researchers as appropriate methods to improve transfer of tacit knowledge between business advisors and a business's management
- Conclude with a discussion of the findings

Methodology

Design Wales is a free and independent design advisory service for Welsh industry. Since 1994, when it was established in Wales/UK, it has advised more than 2000 companies. Advice is provided on an individual basis. Advisors visit Welsh companies addressing their issues in one-to-one meetings. The bottom line is to help them with the identification of their design needs and facilitate them in achieving their objectives. Advice given to companies usually falls into the categories of support for design management (such as project planning and creativity facilitation) and help in resolving specific technical issues (such as material selection). Specialist advice is provided by 6 design advisors who are experienced designers in the areas of product development, materials selection, fashion and textiles, graphics and branding, ecodesign and website development. Having always been entirely funded by the Welsh Assembly Government, Design Wales is able to provide advice for free, which ensures that every company based in Wales has access to design guidance.

Design Wales has recently engaged in exercises to evaluate the impact of its service within Welsh companies. This paper discusses one of the aspects analysed in this evaluation: how much companies have learned from the advice provided at what level, and whether in the future they would be able to undertake design projects (where they had previously been assisted by Design Wales) without support from external advisors. In other words: has knowledge transfer happened?

For this case study analysis 75 individual companies assisted by Design Wales were investigated based on information contained in two main sources of information:



- **Design Wales's evaluation forms.** A survey answered by the owners of companies who have benefited from Design Wales support service. The form contains questions about satisfaction, assessment of services, expectations and impact on businesses.
- **Design Wales client log**. A database that contains details from the 1275 companies that Design Wales has worked with, the projects undertaken and results.

The selection of 75 companies was based on the group that replied to the Design Wales evaluation form. This form is sent to companies when the advisory service for this client is registered as 'closed' on the database. Therefore, these companies are the ones who we consider have received full advice in response to their original enquiry.

The first stage of the research looked at the level of satisfaction of the design advice provided to the 75 businesses studied, the type of advice provided and whether the businesses would consider using Design Wales at some time in the future?

The second stage of the research sought to identify how many, if any, of the businesses assisted by Design Wales in the past returned and contacted Design Wales again at some time afterwards. To further understand why businesses might return for additional design advice Design Wales's advisors were contacted and interviewed. The return of businesses for additional design advice is seen as important for two reasons:

- 1. If businesses are returning for the same design advice then they are not learning from the design advice provided by Design Wales tacit knowledge is not being transferred.
- 2. If businesses are returning but for different design advice then they may be learning tacit knowledge may well be being transferred

The third stage of the research looked at the impact the design advice had on a business's performance based on eleven key metrics.

The fourth stage of the research revolved around the analysis of other research into mechanisms for assisting with the transfer of knowledge from advisors to business managers.

Findings

The findings from the first stage of the research are shown in Graphic 1 and 2. Graphic 1 shows that the vast majority of the sample analysed for this paper found the advice provided by Design Wales to be excellent (46) and good (17). Seven considered the service satisfactory and only 3 found the service poor and 2 unacceptable.





Analysing the data from Graphic 1 with the type of projects (Graphic 2) that Design Wales had assisted each individual business with revealed that there were no patterns, that is, responses regarding level of satisfaction was not linked to specific areas of advice, such as, fashion, graphics, product design, packaging design, etc. The responses for poor and unacceptable levels of satisfaction related to advice centred on web and graphic design. However, the analysis of the individual cases shows that this dissatisfaction is related to the individual experiences and cannot be considered as a characteristic of this area of design advice. In most of the cases, disappointment is related to the availability of government co-funding for individual projects.

The figures in Graphic 2 sum to more than the number of businesses surveyed because most businesses sought advice on a number of interrelated issues rather than one single design problem. However, Graphic 2 does highlight that the main area of concern for businesses, by a substantial margin, is 'graphic design/branding', a vital factor in ensuring successful sales. Also, the increase in recent years in web awareness and use of the Internet by consumers is reflected by 'web design' being placed as the second most common area for design advice, by a large margin. Product development continues to be a problematical area closely followed by packaging design.



Analysing the data from Design Wales's evaluation forms to identify if Design Wales's clients would request advice again on future projects revealed that 68 out of the 75 would.



Is this high response directly related to the results presented in Graphic 1, which showed that the great majority of clients declared to be satisfied with Design Wales's services? Or is it suggesting that the majority of businesses have not learnt from the advice provided, tacit knowledge has not been transferred?

The findings from the second stage of the research, which analyses Design Wales client log, looks at those businesses that have actually returned for additional advice. This suggests that the high level of responses above to "would you contact Design Wales again?" is directly related to the level of satisfaction, as only 16 businesses actually returned for more advice.

But, had knowledge transfer not occurred in the 16 businesses that had returned? Analysing the reasons for design advice amongst the 16 businesses proved that the divide between knowledge transfer occurring and not occurring was not as clear-cut as expected. Design support, as previously described, is a unique kind of service, as it does not aim to keep clients for the long term. This is the importance of knowledge transfer for this activity, as external assistance is only expected to be given to businesses to assist with specific design projects. This is the opposite principle of other services, which aim to maintain a clients' loyalty.

While 11 of the 16 businesses had returned to Design Wales for advice on other design problems, suggesting that knowledge transfer had occurred for a specific design problem, but the businesses needed further advice on additional design problems; the remaining businesses had sought to develop long-term relationships with Design Wales. As some advisors interviewed stated, in some cases the relationship with a certain businesse evolves and instead of the original one-way advice, it becomes collaboration for mutual interests. Dr Frank O'Connor, design advisor specialising in ecodesign projects, confirmed that this was the case for two of his current projects, where the knowledge transfer process had evolved to a higher stage that could be better defined as a 'knowledge exchange'.

The third stage of the research sought to identify the key metrics that could be used to measure the value of design advice provided for the businesses. Not all of the 75 businesses studied for this research provided data on the key metrics. 14 companies did not provide an analysis of the impact of the advice on their businesses. Graphic 3 shows the responses for 61 businesses that pointed the most important impact of the service provided.

Most of businesses (21) were not able to quantify the impact the design advice had had, even though they declared that it was a positive influence on their business. This could be described as the 'feel-good factor' – the specific design problem has been addressed, the business can use the knowledge they have gained for other similar problems and now move on. The second most common key metric was 'image/profile boosting' (13 businesses), which reflects the fact that most projects were on the areas of branding, website and graphic design. The third most common selected key metric was 'financial impact' (11 companies), which is encouraging as previous research has suggested that not being able to clearly identify the financial benefits of design is a major reason why businesses neglect design (Trueman & Jobber, 1998). Job creation, e-business improvement, company culture change, sales increase, confidence and encouragement, and company survival



all show some support. Only one business selected negative impact and none of them declared that there was no impact at all.



The fourth stage of the research looked at the findings of previous research by other authors on knowledge transfer mechanisms. This paper argues that knowledge transfer should be intensified and made clearer in order to make the best delivery of design support schemes. Therefore, an important question to be addressed is how to provide businesses with advice that ensures the transfer of knowledge and is an effective learning process?

The challenge is to "teach" companies how to proceed with the difficulties of the design activity. For the small company, where each new product is vitally important and equally rushed, finding time to go through this learning experience is perhaps the biggest problem. Therefore, training must be objective and useful, targeted on their demands. In a very practical view it should, for example, demonstrate how to hire a designer, from writing a brief to consulting databases, contacting and selecting proposals. This is the kind of knowledge that, although it may seem very obvious, is a barrier for many businesses to engage into the design activity. There are also several other stages during the entire process where businesses demand awareness.

Various authors (Kettley & Hirsch, 2000; Eppinger & Kressy, 2000; Creigh-Tyte, 1996; Topalian, 2002; Leonard 2005; Davenport & Prusak, 1998) recommend routes that can lead to effective learning, highlighting useful training materials, pedagogical tools, techniques and strategies. Some of these routes can be exploited by design organisations when providing design advice.

- **Demonstration:** case studies (publications) and lectures can be used to show evidence of the value of design and how other companies handle their problems, demonstrating that design issues can be a rich source of inspiration and instructive tales. The emphasis ought to be on analysis for action,



not merely a description of the context in which design activities take place. This tool is important and highly used by design organisations. However, this should not be used as the main tool considering that companies, in particular SMEs, do not often dedicate time to read case studies or academic publications.

- **Observation:** participants can transcend the experience of others, and develop their own potential within their particular working circumstances. Observation is a strong tool, with great results in educational training. However, it is important to note that companies are competitors by nature and therefore finding appropriate examples for observation activity can be problematic.
- Practice (projects, workshops, hands-on exercises...): exercises need to be realistic and targeted to
 show participants the value of experimental learning. This activity usually results in quality learning.
 However, there is a well-known difficulty in attracting companies to take part in such exercises. The
 cost of this kind of activity is also considerably high in comparison to the number of participants.
- Implementation/experience: the actual implementation is the only way to test ideas and discover their outcomes. In this way, some design programmes prefer to include a final stage of prototyping or market positioning for products that received design advice.
- Networking and interdisciplinary approach: this involves connecting participants with external
 resources and other disciplines in teams in order to experiment with collective problem-solving.
 Networking is also particularly important for connecting small companies that can work with each
 other on projects, besides its capacity of providing reassurance for companies who intend to invest
 in design.
- Joint problem-solving: a direct transfer of knowledge and skills from experts to trainees on a single and objective task/problem. Young designers, internal designers or employees can benefit from the intervention of an expert designer and this kind of arrangement can only be facilitated by a neutral element – the design advisor. This knowledge transfer tool can provide quality results, in particular in the transferring of tacit knowledge and scenarios where instructions for the development of certain processes cannot be transferred step-by-step.
- Visual communication: the language used in design projects is definitely an obstacle for companies wishing to engage in this process. Visual representation can be exploited in all stages of the process in order to ensure perfect exchange of information.
- Sharing of information on similar issues: topics of discussion, subjects for case studies or workshops should always be selected from familiar problems for companies. This approach is recommended by Topalian (2002), who suggests that participants can learn more and will be more interested in subjects with which they can establish tangible links between their own activities and



design. Familiar problems and project circumstances can provide more powerful lessons than addressing problems imported from elsewhere.

Language is an important issue in the knowledge transfer and for this reason it is addressed by some of the transfer tools. Communication is an important topic for design and should be stressed by design advisors. Without a shared language, individuals will neither understand nor trust one another (Davenport & Prusak, 1998). This is a challenge once efforts are made to bring a multidisciplinary team together in the design process. It is known that each discipline uses a different vocabulary (Eppinger & Kressy, 2002). In this context, design organisations must bear in mind that their language will be a temporary link between business and design. The task will be to train both sides to understand each other without the need for this link.

Technology can also be used to aid the transfer of knowledge to companies using tools such as the Internet, communication by e-mail, video-conferencing. However, tacit knowledge transfer generally requires extensive personal contact (Davenport & Prusak, 1998). The "transfer relationship" may be characterised as partnership, mentoring or apprenticeship, with close and personal contact. For this reason design organisations nominate a design advisor for each company and this person will deal with this client's demands.

Another important issue in models for design advisory services is to **multiply efforts** and get the most from each process. Basically, the idea is that each company advised in design will learn about this practice and will be able to transfer this knowledge to another company. It is not necessarily about taking part in the training process but rather encouraging another small business to invest in design or to seek specialised advice in design. Creigh-Tyte (1996) is one of the authors who believe that if business professionals can experience at first-hand what design can do for them, for their practices and for their companies, they will be persuaded of its importance. An interview published in the British design magazine "New Design" presents a testimonial that reinforces this idea. After collecting the outcomes of their investments in design to any company we went to." (Boult, 2002, p. 63). This SME has succeeded in incorporating design in the development process and is a perfect example of the essence of 'transferring the knowledge transferred'.

Conclusion

This paper has reported on the findings of a research project that sought, through 75 case studies and a literature review, to evaluate the transfer of knowledge regarding design advice to businesses.

The first stage of the research looked at the level of satisfaction of the design advice provided to the 75 businesses studied, the type of advice provided and whether the businesses would consider using design support agency again. The findings showed that the majority of businesses assisted found the design advice excellent or good (63 out of 75) and most would return for more advice in the future. Comparing the level of satisfaction with the types of advice provided showed no relationship.



The most often-sought design advice, by a substantial margin, was geared towards graphic design and branding, although web design was also a major area of concern. Product development continues to be an area where businesses seek design advice, as was 'packaging design'.

The second stage of the research sought to identify how many of the businesses assisted by Design Wales in the past actually returned. This was seen as important for two reasons:

- If businesses are returning for the same design advice then they are not learning from the design advice provided by Design Wales tacit knowledge is not being transferred.
- If businesses are returning but for different design advice then they may be learning tacit knowledge may well be being transferred.

The findings from this research suggests that of the 16 businesses that returned for more advice 11 did so for different design advice – the transfer of tacit knowledge had been successful to a degree. That is, the 11 businesses were confident they could manage design problems relating to the original advice but were not confident that they could make the transition to new areas. However, in the 5 other cases the knowledge transfer process had evolved to a higher stage that could be better defined as a 'knowledge exchange', where these businesses were seeking to build long-term relationships with their individual advisors.

The third stage of the research looked at the impact the design advice had on a business's performance based on eleven key metrics. Most of businesses (21) were not able to quantify the impact the design advice had had, even though they declared that it was a positive influence on their business. The second most common key metric was 'image/profile boosting' (13 businesses and the third most common selected key metric was 'financial impact' (11 companies). Job creation, e-business improvement, company culture change, sales increase, confidence and encouragement, and company survival all show some support. Only one business selected negative impact and none of them declared that there was no impact at all.

The fourth stage of the research revolved around the analysis of other research into mechanisms for assisting with the transfer of knowledge from advisors to business managers. From the previous research a number of methods for improving knowledge transfer were identified; demonstration, observation, practical applications, experience and implementation, networking, joint problem solving, visual communication, sharing similar situations, use of a shared language, use of technology, and multiplying efforts by businesses themselves transferring the knowledge transferred.

It would appear that design advice agencies need to look to a portfolio of mechanisms to assist in the transfer of knowledge to businesses; what works for one business might not necessarily work for another.



References

Bergeron, B. (2003) Essentials of Knowledge Management. New Jersey: John Wiley & Sons.
Boult, J. (2002, March/April). Service Stations. New Design, 62-65.
Creigh-Tyte, A. (1996) Design Training in the Professions: A Policy Proposal for the United Kingdom. Design Management Journal, 7(3), 61-66.
Davenport, T., & Prusak, L. (1998) Working Knowledge. Massachusetts, USA: Harvard Business School Press.
Eppinger, S. & Kressy, M. (2002). Interdisciplinary Product Development Education at MIT and RISD. Design Management Journal, 13(3), 58-61.
Kettley, P., & Hirsch, W. (2000). Learning from Cross-functional Teamwork. UK: The Institute of Employment Studies.
Grady, R. (2004, May). Knowledge & Technology Transfer. International Workshop on Design Support, Cardiff, UK. (unpublished paper)
Leonard, D. (2005). How To Salvage Your Company's Deep Smarts. Retrieved March 28, 2006 from
http://www.cio.com/archive/050105/keynote.html.
HM Treasury. (2005). Cox Review of Creativity in Business: Building on the UK's Strengths. London, UK: HM Treasury.
Ranjan, M. P. (2006, March). Interview. SEEdesign Bulletin, 2, 7-8.
O'Dell, C., & Grayson, J. (1998) If only we knew what we know. New York: The Free Press.
Topalian, A. (2002) Promoting Design Leadership through Skills Development Programs, Design Management Journal, 13(3), 10-18.
Trueman, M., & Jobber, D. (1998). Competing Through Design, Journal of Long Range Planning, 31(4), 594-605.