

University-Based Units providing Design and Innovation Support for Businesses and Public Sector Organisations

Dr Terence Love, PhD, AMIMechE, FDRS, PMACM

School of Design and Art, Curtin University, Western Australia

IADE/UNIDCOM, Portugal

Dept of Entrepreneurship and Enterprise Development, Lancaster University, UK

Citation: Love, T. (2009). University-Based Units providing Design and Innovation Support for Businesses and Public Sector Organisations. In E. Corte-Real, A. Couto & C. Duarte (Eds.), Proceedings of the 5th International Conference of UNIDCOM/IADE "40IADE40" (pp. 402-409). Lisbon: IADE - Creative University.

Abstract

This paper reports preliminary findings of research investigating the characteristics of university-based units that provide design and innovation support to small to medium businesses and public sector organisations. These outward-facing university-based design and innovation support units are potentially one of the most significant levers for improving national, social and economic development outcomes and economic competitiveness by facilitating the transfer of expertise and knowledge from universities in to the private and public sectors. The research was initiated as a result of anecdotal evidence that organization of these kinds of design and innovation units presented unusual problems that limited the benefits available from them.

The findings of this preliminary research show both benefits and problems. At a local level, they indicate that external-facing design support units for businesses are a marker of successful university schools proving education and research in the Design and innovation realms. The national value of the units was not tested directly by the research. The research findings indicate, however, that there are many challenges in successfully creating and managing outward-facing design and innovation support units that function successfully. In the main, it appears the problems and impediments to success originate within the universities rather than externally. The detail of the problems suggests organisational design solutions and changes necessary to enable successful function of these units when operating in university environments.

Keywords:

Design and innovation support, organisational design, socio-economic development, SMEs and micro-business innovation.

Introduction

Small to medium enterprises (SMEs) and micro businesses are the lifeblood of national economies (see, for example, Australian Bureau of Statistics, 2001; BIS, 2009; Davenport & Bibby, 1999; Estime, Madeuf, & Scheel, 2004; Nachira, 2002; Venesaar & Loomets, 2006). Innovation is proving to be a crucial element for gaining competitive advantage economically at a national scale and the basis for fulfilling national socio-economic development agendas (Bruce & Bessant, 2002; CBI 3M and Design Council, 2002; Clark

& Guy, 1997; Commonwealth of Australia, 2001; Hippel, 2005; OECD, 2001; Venesaar & Loomets, 2006). To become actualized, innovations require substantial design commitment and expertise (Anderson Wright Associates, 1999; Andreasen & al., 1989; Davenport & Bibby, 1999; Freeman, 1995; Jevnaker, 2000; Jolly, 2003; Kim, 1997; Korvenmaa, 2000; Langrish, 1987; Mohrman, 2001; OECD, 2001; Owen, 1990; Roy & Field, 1986; Utterback et al., 2006). Design activity is also essential for products and services to be attractive to consumers thus increasing national and local GDPs.

Universities through their research provide knowledge that can support cutting edge innovation. Transfer of this innovation knowledge from universities to businesses and the public sector has to date typically been undertaken on a project basis. This has been done through a range of approaches, by undertaking research for external organizations and through the creation of spin –out and spin-in companies to develop particular elements of intellectual property. These project-based approaches are limited however in that the university resources are focused on a very small number of businesses and (relatively) risky innovation-based ventures.

An alternative approach is to more broadly support the development of business and public sector capability in design and innovation at all levels of their functioning. This contrasts with the project-based approach to innovation in that many more organizations benefits from opening up their potential for design and innovation-based improvement. There is increasing awareness of the potential for this more generic approach by which skills in innovation and design are provided to industry and the public sector more generally through outward-facing university organizations located at a university's periphery. Typically, these outward-facing university-based design and innovation support units are found attached to departments of Design and departments of Business and Management specializing in entrepreneurship and business development practices.

The paper outlines some of the preliminary findings from investigation via a pilot survey and in-depth semi-structured interviews with six outward-facing design and innovation support organizations. The paper has five sections. This introduction is followed by a section describing the functional differences between these outward-facing university-based units that provide design and innovation support for business and the public sector. The third section outlines the benefits these organizations offer that differentiate them from conventional research institutes. Section four outlines findings from the preliminary data collection about the problems associated with the establishment and management of these outward-facing university-based design and innovation support units. It identifies an approach to resolving many of these problems. The concluding section summarises the research outcomes

Differences between Design and Innovation Support Units and Research Centres

Innovation is proving to be a crucial element for gaining competitive advantage economically at a national scale and the basis for fulfilling national socio-economic development agendas (Bruce & Bessant, 2002; CBI 3M and Design Council, 2002; Clark & Guy, 1997; Commonwealth of Australia, 2001; Hippel, 2005; OECD, 2001; Venesaar & Loomets, 2006). To become actualized, innovations require substantial design commitment and expertise (Anderson Wright Associates, 1999; Andreasen & al., 1989; Davenport & Bibby, 1999; Freeman, 1995; Jevnaker, 2000; Jolly, 2003; Kim, 1997; Korvenmaa,

2000; Langrish, 1987; Mohrman, 2001; OECD, 2001; Owen, 1990; Roy & Field, 1986; Utterback et al., 2006). As described above, the primary role of the outward-facing university-based design and innovation units that are the focus of this study is to improve the functioning and competitiveness of businesses and public organisations in part through providing expertise and education and business improvement in the areas of design and business development in innovation. On the design side, this involves providing an improved understanding of the benefits that design activity can bring, and where it might apply; it may involve identifying opportunities within an organization where improved design activity would offer best leverage for improving competitiveness and financial business outcomes; it may involve brokering connections between organisations and design services providers; it may involve designing and providing design-related prototyping services; and it may involve helping the organization improve its own in-house design services.

On the innovation support side, the design and innovation support units may work with businesses and public sector organizations through identifying opportunities for innovation that will improve business and organisational outcomes; developing an innovation focused culture, educating the organization in best practices in innovation-based entrepreneurship, exploring reorganization of business structures and intellectual property management to maximise the organization's value proposition through innovation; it may involve brokering connections between the organization and professional services providers that are able and necessary for an organization to rearrange its processes to become more innovation focused in its offerings and its external and internal services.

In providing design and innovation support to businesses in the public sector, the work of these university-based outward-facing units is focused on capability improvement rather than on a specific design project or product, although a specific design may be the catalyst or provide the framework for the support. The work targets the organization, knowledge, finances and human resources as an infrastructure. The emphasis is on improving capability and performance. This provision of capacity-building support for design and innovation contrasts strongly with research-based approaches and service-supply approaches dedicated to individual projects and products and to specific business functions such as accounting.

The differences between the primary foci of activity university-based outward-facing design and innovation support units and research centres and institutes are listed in the following Table 1.

Table 1: Some core differences between university-based outward-facing design and innovation support units and research centres

Design and innovation support units	Research centres and institutes
Target capability improvement in design and innovation	Focused on research outcomes
Building improved design and innovation infrastructure	Gathering and analysing information
Education in design and innovation processes and benefits	Educating in theories to benefit specific design
Providing design support services	Providing technical research services
Supporting organisations in the development of their	Selling Intellectual Property

intellectual property	
Focus on bilateral transfer of expertise and understanding	Focus on information gathering, new theory, published papers and research funding.

Benefits of Design and Innovation units

As raised in the introduction, innovation is a crucial element for improving outcomes for businesses and public sector organizations as well as national improvement (Bruce & Bessant, 2002; CBI 3M and Design Council, 2002; Clark & Guy, 1997; Commonwealth of Australia, 2001; Hippel, 2005; OECD, 2001; Venesaar & Loomets, 2006), and innovation design activity (Anderson Wright Associates, 1999; Andreasen & al., 1989; Davenport & Bibby, 1999; Freeman, 1995; Jevnaker, 2000; Jolly, 2003; Kim, 1997; Korvenmaa, 2000; Langrish, 1987; Mohrman, 2001; OECD, 2001; Owen, 1990; Roy & Field, 1986; Utterback et al., 2006).

Thus improving innovation-based outcomes requires improvement in organizations' capability to design and implement beneficial innovations in products and services that they provide to customers and in their internal processes, structures and organization. This capability improvement in design and innovation holds the potential for benefits for all stakeholders and constituencies.

Increasingly, innovation and design offer the best opportunity to leverage investment. The benefits of doing this through universities have been relatively weak. Although universities act as a node of knowledge management and knowledge generation, the most common means of dissemination of knowledge to organizations outside the universities has been limited to educating future members of business and public service organizations and dissemination through papers, books, conferences and project focused research interactions. In the latter, either universities can provide research services for other organisations, or universities try to commercialize the research findings and knowledge generation outcomes of employees. All of these approaches are relatively weak in assisting and public service organisations to maximise the potential infrastructural benefits available from the design and innovation expertise and knowledge available within universities. The delays are significant. In particular, the education of new graduates and researchers either have long delays with a knowledge improvement cycle in the order of 10-12 years, or are so specifically targeted that their increase in organizations' capability is a secondary accidental and incidental benefit.

In contrast with these limited and relatively weak pathways for universities' to contribute to society's innovation development through teaching and research, university-based design and innovation units offer increased potential for improving the innovation capability of organisations in a variety of ways. For example:

- Introducing improvements in development of various practices of design, innovation and entrepreneurship
- Providing innovation capability improving courses for employees and managers of business and public services organisations that provide input to organizations in raising levels in design, innovation and entrepreneurship.

- Working with organisations on improving their internal processes' design and innovation capabilities
- Acting as a source of knowledge about current best practices that organisations can draw on
- Assisting businesses and public services organizations to develop by providing design services.

Providing design and innovations support services for businesses and public services organisations requires expertise that is very different from university teaching and undertaking academic research. In addition, the supply of these design and innovation support services and requires its own appropriate management, internal organisation and financial structures. Best practices in the management, organisational and financial structures for these university-based outward facing design and innovations support units are very different from the management, organisational and financial structures found in traditional university units (departments, schools and centres) focusing on teaching and research.

Many of these outward-facing units providing design and innovation support for businesses and public services organisations to originate in Art and Design Schools. This can be problematic where participating academic staff have an overwhelming desire to 'design something' and thus recast the relation with the external organisation as 'client for a design project'. This can be problematic in a number of ways. It can badly compromise any design and innovation capacity building program. It has ethical implications as the staff are in effect attempting to take work off professional designers and design organisations that are more dedicated and skilled at the task in hand. It can result in less than adequate design outcomes for the project because university academic staff are typically not fully dedicated as designers and their practice standards are likely to be lower than those working full time in design organizations. The drive to re-envisaging design and innovation support as providing design services is understandable as university staff in design schools like to do design and there is some status as an academic in 'being a real designer'. The most significant gains of design and innovation support units, however, are reserved for society, business and the public sector, rather than providing benefits for individual staff members in design schools. The main gains are in providing assistance and advice to businesses and public sector organizations to improve their own design and innovation capacities. These external organisations can buy in design services easily from commercial design businesses. Managing the situation in this way avoids introducing and unnecessary complexity and costs in terms of funding ongoing training of design educators in design practice and resolving the complexities of the complex political ethics of a situation in which academic employees are advising companies to purchase design services and offering those themselves.

To recap, the main benefits of university-based outward facing design and innovation support units are:

1. To provide capacity building support in design and innovation for businesses and public services organizations
2. To provide design and innovation support services that are not typically available via the education and research arms of universities.

3. To act as an appropriate intermediary to transfer expertise relating to design and innovation-based organisational development between universities and external organizations.

Preliminary Findings

The following preliminary findings are from an initial survey and semi-structured interviews with six carefully chosen representative design and innovation units. They give some insights into the spread of activities that these units undertake and the specific problems that they have found. In all cases, the problems emerged as primarily due to problems of poor fit between the university organisational and financial systems and the organisational and financial systems necessary for optimal functioning of outward-facing university-based design and innovation support units.

Activities

The main practical engagement activities undertaken by the chosen study sample of outward-facing university-based design and innovation support units included the following:

- Consultancy to identify opportunities for improvement
- Providing business support skills in the area of innovation (market segmentation, innovation accounting, value redefinition, organisation restructuring)
- Providing collaborative project-based support to in-house staff working on a specific design or innovation project
- Educating SME's and public sector organizations about benefits of design and innovation
- Providing design services
- Providing education services
- Representing SMEs and public sector organizations to government innovation policy units
- Acting as a marketing agency of universities to try to obtain research funding from SMEs and public sector organizations
- Acting as a marketing agency of universities to try to obtain funding for education programs from SMEs and public sector organizations
- Acting as information gathers to collect publishable data to improve universities research metrics and hence research funding
- Building more extensive and longer term liaisons between the university and business and public sectors.

Problems

The research indicated that regardless of the extensive benefits gained, the location of outward-facing university-based design and innovation support units as deeply embedded in the university context gives rise to many difficult problems in initiating, creating and managing units.

The problems clearly stem from an assumption by university management (and in some cases the managers of the units) that these outward-facing design and innovation units should use the same management and financial structures as the university.

University management and financial structures, however, are primarily highly optimized for managing teaching. This is not surprising. For most universities, around 90% of their income and expenditure relates to teaching. Researchers and research organisations in universities themselves often have significant problems arranging their affairs because the management and financial arrangements needed for undertaking research is significantly different from universities' teaching-based management, human resources and financial systems. In the case of outward-facing university-based design and innovation support units, the tension with university systems is both different again and more difficult.

In effect, outward-facing university-based design and innovation support units act as almost completely autonomous business units. Their style of operation is necessarily entrepreneurial. This means their management and financial arrangements need to have the rapid response, flexible and short cycle time of entrepreneurial start-up companies. They need to be able to pull in money quickly and store it, often for some time, to be used on later activities. They need to be able to speculate on risky projects. This necessarily and naturally means they will lose money on some ventures. Taken together, these factors require that these outward-facing design and innovation units operate at their best almost completely autonomously from established university systems.

A small tension, however, is these outward-facing university-based design and innovation support units are staffed by academics who are managed at least in part under the existing university human resources systems. Often, the workload of design and innovation unit personnel comprises a mixture of working for the design and innovation unit and performing conventional university teaching and research roles. This is as would be expected because it helps provide the learning loops both ways between the university knowledge-base and business and public sector organisations. Typically, the salaries of staff involved in design and innovation support units are traditionally managed within the university financial systems.

The tensions and problems that emerged in this preliminary survey were most evident in relation to financial management systems and responsibilities. There seem to be five main issues:

- When universities 'invest' funding in outward-facing university-based design and innovation support units, they expect to apply close financial control over it to ensure that it is used for the purposes to which it was intended. Typically this presents problems because the management of design and innovation support units needs much more flexibility in how they use financial resources. In addition, they necessarily need to risk these resources speculatively in order to function. This results in conflict between the needs of the two management groups.
- Outward-facing university-based design and innovation support units are essentially a profit-making entrepreneurial business. Such businesses typically need their management to build resources to risk on new ventures to increase and expand the unit's activities. This is in contradiction with universities style of management which is to avoid storage of financial resources locally to ensure that it is primarily held in a central pot that upper university management can manage. This tends to result in universities stripping out any temporary surplus value from outward-facing university-based design and innovation support units. This is

in direct contradiction of the needs of the outward-facing university-based design and innovation support units.

- Universities always have fewer funds than their management and staff would wish to have. Outward-facing university-based design and innovation support units act as business entities and in the course of their activity bring in income. This income is typically irregular and a primary management task from the point of view of the design and innovation support units is to ensure that the shortfalls in projects are at least matched by excessive income on the more successful activities. These can involve financial cycles of the order of weeks or years. From the university financial management point of view, the accounts of outward-facing university-based design and innovation support units are occasionally in surplus. This tends to result in universities stripping out any temporary surplus finances. In effect, the university is trying to use them as short-term cash generators.
- The varied operational contexts of these outward-facing university-based design and innovation support units frequently results in the need to quickly create new and often temporary legal entities. Sometimes these are entities that undertake work on behalf of the outward-facing university-based design and innovation support units. Sometimes they are temporary legal entities that are the means of contracting the work of outward-facing university-based design and innovation support units, university staff, and university services.
- Occasionally, to enable design and innovation support units to achieve their aims within the university management context has required managers and staff of design and innovation support units to undertake activities at the boundaries of the law and occasionally to expose their own finances (and in some cases their own business entities) to financial and legal risk on behalf of the universities.

Potential solution

The above problems for design and innovation units appeared to be almost totally caused by the university environments in which they operated. The problems appear to be due to conflict in the differing needs of the management and financial systems of universities and design and innovation units. The situation offers an opportunity to design alternative ways for these design and innovation units to be established and managed in relation to existing university management and financial systems to address and resolve these problems.

The most obvious potential change is for the universities to regard outward-facing university-based design and innovation support units as autonomous from existing university systems. In organisational terms, the best option would seem to be for design and innovation support units to be incorporated as limited companies with the university providing initial funding as the major investing shareholder. As in any other company of this form, the company management would have sole responsibility for the company direction, for day to day management, for business choices whilst fulfilling the company's mission, vision, goals and strategy, and making choices of whether to retain profits and when to redistribute profits as dividends back to shareholders (the university).

The above arrangement would remove many of the problems associated with the typical integration with university management and financial systems that occurs in these units at present. Establishing design and innovation support units as limited companies resolves three problems seen by current design and innovation units whose management and financial systems are integrated with university systems. It enables design and innovation support units to be able to establish other business entities as and when needed. It enables management of design and innovation support units to be able to more flexibly use financial, technological and human resources to be able to respond competitively to opportunities. Third, and perhaps most important it reduces the need for managers and employees associated with design and innovation support units to operate at or across the bounds of legality and use their own finances and business structures to address failings and issues that cannot be resolved because of tight interlinking between the activities of the design and innovation support units and the management, human resources and financial systems of the universities of which they are a part.

The above leaves unresolved the problems associated with staff members being partially employed in roles within the universities with teaching and research responsibilities and partly employed in design and innovation support units thus having overlapping yet different responsibility and focus. There is limited anecdotal evidence that some academic staff can personally manage these differences in roles and responsibilities. It is clear however that some other staff have difficulty and assume that because the design and innovation support units are related to the university that the same purposes and responsibilities apply. This latter is of concern because it is this conflation of the different roles of the university in education and teaching and the roles of outward-facing university-based design and innovation support units that clearly underpins the problems that the university contexts causes for these design and innovation support units that have been identified in this research. The solution of this employment problem is left to another time

Conclusion

This paper has reviewed preliminary findings of research into the characteristics of outward-facing university-based design and innovation support units. It has identified their benefits and has drawn attention to the differences between these design and innovation units and conventional research centres and institutes. The paper has described the main activities of these design and innovation units and the most significant problems that emerged relating to setup and management in the university context.

This preliminary research on outward-facing university-based design and innovation support units identified that these units seemed to offer substantial benefits nationally and locally in contributing to fulfilling socio-economic agendas and improving their trajectories. They offer benefits to businesses and public sector organizations, to the universities themselves, and to the Design and Business Schools within universities in which they originate. The extensive range of problems appear to occur as a result of significant systemic misfits between the needs of the management, human resources and financial systems of the design and innovation support units and the universities in which they originate. A potential solution to these problems was identified. The solution appears to be provided by functionally, organizationally and legally separating these design and innovation units from the universities. The most

obvious approach is to incorporate the design and innovation support units as a private limited company managed independently of the university with the university as main investing shareholder.

References

- Anderson Wright Associates. (1999). *Report on Finland for the Industrial Innovation Working Group of the National Innovation Summit*. Melbourne: Anderson Wright Associates/Industrial Innovation Working Group of the National Innovation Summit.
- Andreasen, M. M., & al., e. (1989). *The Product Development Organisation as a Basis for Innovation*. Kobenhavn: Jernet.
- Australian Bureau of Statistics. (2001). *Small Business in Australia Update 1999-2000 (released 30/4/2001)* (pdf file No. Product No. 1321.0.55.001). Canberra: Australian Bureau of Statistics.
- BIS (2009). Enterprise Directorate: Small and Medium Enterprise Statistics for the UK and Regions, Available from <http://stats.berr.gov.uk/ed/sme/>
- Bruce, M., & Bessant, J. R. (2002). *Design in Business: Strategic Innovation Through Design*. London: Financial Times/Prentice Hall.
- CBI 3M and Design Council. (2002). *Innovation Potential: Results and Analysis of the 2002 Innovation Survey*. London: CBI.
- Clark, J., & Guy, K. (1997). *Innovation and Competitiveness*. Brighton, UK: Technopolis Innovation Policy Research Associates,.
- Commonwealth of Australia. (2001). *Backing Australia's Ability - An Innovation Action Plan for the Future*. Canberra: Commonwealth of Australia.
- Davenport, S., & Bibby, D. (1999). Rethinking a national innovation system: The small country as 'SME'. *Technology Analysis & Strategic Management*, 11(3), 431.
- Estime, M.-F., Madeuf, B., & Scheel, R. (Eds.). (2004). *The Compendium II on SME and Entrepreneurship Related Activities*: OECD.
- Freeman, D. (1995). *Competing by Design: The National Design Review Report*. Australian Academy of Design. Sydney: National Design Review Steering Committee.
- Hippel, E. v. (2005). *Democratising Innovation*. Cambridge, Mass.: MIT Press.
- Jevnaker, B. H. (2000). Championing Design: Perspectives on Design Capabilities. *DMI Academic Review*, 1(1).
- Jolly, A. (Ed.). (2003). *Innovation Harnessing Creativity for Business Growth*. London: Kogan Page.
- Kim, L. (1997). *Imitation to Innovation: The Dynamics of Korea's Technological Learning*. Boston, MA: Harvard Business School Press.
- Korvenmaa, P. (2000). Design Research and the Wealth of Nations. Reflections on the interaction of design research and national policies of research, innovation and industry. In D. Durling & K. Friedman (Eds.), *Doctoral Education in Design: Foundations for the Future* (pp. 447-452). Stoke-on-Trent: Staffordshire University Press.
- Langrish, J. (1987). *The Importance of Design in Technology Transfer*. Manchester: Inst of Advanced Studies, Manchester Metropolitan University.
- Mohrman, S. A. (2001). Designing Organizations to Add Value Through Knowledge. from www.marshall.usc.edu/emplibrary/knowledgeworld01.pdf
- Nachira, F. (2002). *Towards a Network of Digital Business Ecosystems Fostering the Local Development*. Brussels: European Union.
- OECD (2001). The New Economy: Beyond the Hype. Final Report of the OECD Growth Project, Available from <http://www.oecd.org/dataoecd/2/43/2380415.pdf>

- Owen, I. (1990). Building Your Business on Design. In K. Barnfather (Ed.), *Directory of Designers*. London: The Design Council.
- Roy, R., & Field, D. (1986). *Product Design and Technological Innovation*. Milton Keynes: Open University Press.
- Utterback, J., Vedin, B.-A., Alvarez, E., Ekman, S., Sanderson, S. W., Tether, B., et al. (2006). *Design-inspired Innovation*. New Jersey: World Scientific Books.
- Venesaar, U., & Loomets, P. (2006). *The Role of Entrepreneurship in Economic Development and Implications for SME Policy in Estonia*. Paper presented at the 14th Nordic Conference on Small Business Research.