EXPLORING DESIGN CAPABILITY IN TERMS OF ABSORPTIVE CAPACITY AND TIPPING POINTS

Kathryn BURNS[1]
[1]Birmingham Institute of Art and Design, Birmingham City University

ABSTRACT
Properly managed, design and innovation are seen as critical drivers to the competitiveness and survival of UK companies facing global pressure from low cost imports. They are a common strand in European Union, UK government and regional development agency policy (for example, Cox, 2005, DTI, 2005). Furthermore, considerable resources have been allocated to improving design and innovation, particularly in small and medium sized enterprises (SMEs) through various regional, national and European initiatives.
One such initiative is Design Knowledge Network (DKN), part-funded by the European Union and Advantage West Midlands. The project aims to increase design awareness and usage, improve the product development process and widen market knowledge, tools and techniques in SMEs. In providing 180 five-day assistances or interventions to over 60 companies, DKN has made a number of observations, which include differences in how companies implement and use the information provided by the project. As discussed by Burns and Ingram (2008), there are a number of possible explanations for this touching on design capability, capacity and maturity.
This paper explores one of those possibilities in more depth, ie, a framework, developed by Bessant et al (2005), combining aspects of the literature on absorptive capacity and tipping points. Additionally, the relevance of the concepts of absorptive capacity and tipping points to design capability are investigated. It is intended that further work will lead to a predictive model of organisational potential for applying design, thereby enabling assistance to the companies most likely to benefit from its implementation.

Keywords: design management, design capacity, design maturity, absorptive capacity, tipping points

1 INTRODUCTION

DKN's main aim is to increase innovation in SMEs in the West Midlands with funding from the European Regional Development Fund and regional development agency Advantage West Midlands. Here, innovation is defined as a company doing something new internally, eg, introducing a design policy, adopting a new process or developing a new product. This should improve the company's competitive position, most overtly demonstrated by new sales and jobs.
To assess a company and its innovative capacity before and after assistance (intervention), DKN created an innovation characteristics grid as shown in Table 1. As described by Burns and Ingram (2008), this helped to inform the services DKN supplied in order meet its objectives and the requirements of the companies. Assisted companies mainly create high value added consumer products and include furniture, jewellery, giftware, clothing and textiles. Typical DKN assistance included: initial research and SWOT; market research; market planning; competitor analysis; product analysis; prospect search; design audit; design process and management; and other services as required. The intervention, totalling five days, usually comprised business research and analysis, presented in the form of a report. These are described in more detail by Burns and Ingram (2008).

Over the last five years DKN has helped nearly 70 companies and provided 180 five-day assistances. The most popular services were those relating to marketing in various forms: research; strategy; planning; and communications. Additionally, while the majority of companies valued design only one had a formal design policy.

Table 1: innovator characteristics from Burns and Ingram (2008)

Zero innovators	Low innovators
• no marketing research; • no in-house design function or use of external design consultancies; • little understanding of design/marketing/ NPD; • no networking with other businesses or building of alliances and partnerships; • manufacture to the designs of customers.	• some market observation; • some knowledge of competitors; • some understanding of/interest in design; • no in-house design or use of external agencies; • beginning to recognise the need to develop new products/new markets or both; • little networking and strategic alliances; • no design policy/marketing strategy/ NPD management; • fear of or reluctant to change.
Medium innovators	**High innovators**
• product development incremental; • no coherent design policy/marketing strategy/NPD management; • some in-house design and/or experience of design consultancies; • infrequent monitoring of market trends and competitor products; • some networking and establishment of strategic partnerships and alliances; • recognise the need to develop new products/ new markets • ready to change but uncertain as to how to move forward.	• new products regularly introduced; • coherent design, NPD and marketing strategies and policies; • in-house design function and/or regular use of external agencies; • regular monitoring of market trends and competitor products; • established business-to business networks and/or strategic partnerships/ alliances with other businesses and/or academia

Once a company had a realistic period in which to apply recommendations and achieve improvements, DKN conducted a follow-up interview. This assessed what the company had implemented and achieved measured against DKN's expectations. Through these interviews it became apparent that some companies were more successful in implementing recommendations than others.

An investigation of the extant literature by Burns and Ingram (2008) to examine if this situation had been reported before revealed a dearth of sound investigations and explorations of the concepts of design capability and capacity. Although the terms are used frequently in the design research arena, they are rarely defined or applied to business environments. However, exploring the wider management literature did prove fruitful. In particular, the concept of absorptive capacity appeared to have much bearing on DKN's experience of companies' varying responses to intervention.

Cohen and Levinthal (1990) define absorptive capacity as the capability "of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends". Zahra and George (2002), taking account of the dynamic capabilities of companies, redefined absorptive capacity as "a set of organizational routines and strategic processes by which firms acquire, assimilate, transform, and exploit knowledge for the purpose of value creation."

DKN has observed, as reported by Burns and Ingram (2008), "that some companies could be offered knowledge to meet an identified need, but were unable or unwilling to use that information to create value. It now seems likely that they lacked the existing underlying experience needed to exploit the knowledge fully."

2 ABSORPTIVE CAPACITY – TIPPING POINTS FRAMEWORK

In their review of the literature relating to the role of external expertise to business growth and development, Bessant el al (2005) review over 30 articles regarding firm development. From a thorough analysis of this literature, they then identify six 'tipping points': operational improvement; people management; obtaining finance; formal systems; strategy; and market entry that are the key issues to be faced by growing businesses.

The authors then combine these tipping points with four levels of absorptive capacity:

- ignorance of key issues;
- awareness of key issues;
- knowledge and understanding of key issues and solutions; and
- implementation of actions to address key issues.

This combination results in a two-dimensional framework as illustrated in Figure 1.

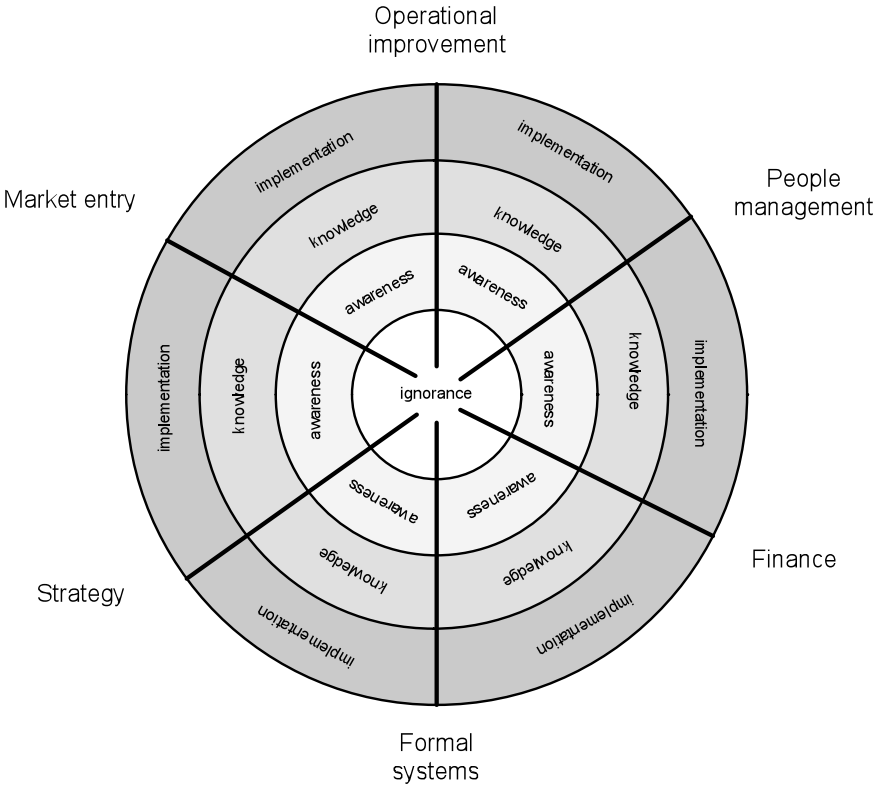

Figure 1 The absorptive capacity-tipping point framework for growth firm states
Adapted from Bessant et al (2005)

Bessant et al (2005) suggest that the status of a firm could be plotted on this framework resulting in a 'spidergram', from which the areas where a company needs assistance, the type of assistance and where it is likely to prove most beneficial can be identified. The framework is also used by Bessant at al (2005) in order to determine the likely efficacy of the various business support programmes supplied by the UK government.

2.1 Design tipping points

Throughout the Bessant et al (2005) review, there is no mention of design, or its contribution to growing businesses. Therefore, in considering the significance and implications of the framework to the observations made by the DKN project it seems logical that the somewhat general tipping points of the Bessant model need adaptation to incorporate specific design issues. A suggested adaptation is presented in Table 2.

Table 2 Suggested adaptation of key issues

Tipping point	General considerations	Design specific considerations
People management	Delegation of tasks, managing people, establishing functional or geographical teams	Employing designer(s), working with external consultancies
Strategy	Definition of types of work to accept or markets to target, development of brand and market position	Marketing strategy, product/service development strategy, branding and communications strategy
Formal systems	Developing systems to ensure consistency and reduce risks of things going wrong	Design process, product development process, customer feedback database
New market entry (new customers, new areas, new products)	Adapting business model to the new market, scaling-up of business, understanding new customer needs	Customer needs research, market research, competitor research, trends analysis, assessment of different market opportunities, adaptation of product offering
Finance	Obtaining funds to grow and meeting funder requirements	Obtaining funds to grow and meeting funder requirements
Operational improvement	Understanding process capabilities and best practice	Understanding and defining product development; design and marketing processes

2.2 Measuring absorptive capacity

In order to use the above framework fully, a company's absorptive capacity for a particular tipping point is required. However, this raises a fundamental question: how can a company's level of absorptive capacity be measured? A simple method may be to ask a company to rate itself on a scale of 1 – 4, ie, ignorance, awareness, knowledge, or implementation. This is obviously subjective, with some companies likely to exaggerate their capabilities, while others may prove to be modest. An alternative method would be to audit a company's capabilities and examine its processes, systems and adherence. This is likely to be prohibitively expensive and still may not supply a reliable measure unless it was applied rigorously and dispassionately. This problem with the framework is identified by Bessant et al (2005) who state: "But what we have not had explicated in the literature is what it is that organisations need to learn, when and from whom. Nor, indeed, have we found any metric that helps identify the maturity of their knowledge intake."

2.3 Improving performance

The above statement also highlights a further potential weakness in using the framework, ie, although it may help identify the immediate needs of a company, it does not specify the assistance that may be appropriate to help a company pass a particular tipping point. Bessant et al (2005) do discuss networks as a means of increasing awareness and Knowledge Transfer Partnerships (KTPs) as being appropriate at the implementation stage. Design aspects of these schemes are also discussed by Burns and Ingram (2004), Burns (2007) and Smith (2008). Additionally, as identified by Bessant at al (2005), "on its own, ability is not sufficient, motivation must also be present."

3 DISCUSSION

The above has presented a précis of Bessant et al's investigation into the literature addressing the role of external knowledge and expertise at key stages of business growth and development. This was investigated in order to provide a possible explanation for the observation of the DKN project that some companies were more likely to benefit from assistance than others. Consideration of the framework in relation to DKN's observations has highlighted three possible shortcomings:

- tipping points that relate directly to the design issues that growing companies may face;
- a reliable method of measuring absorptive capacity; and

- accurate determination what external knowledge is required and how it should be delivered to a particular company at a specific time.

Nevertheless, the notion of different knowledge states for key issues both within a single company and between different companies does chime with DKN's observations to date. Thus, an adaptation of Bessant et al's framework may be useful in exploring design capacity and in providing the most relevant assistance at any stage of a business's development. Further, this could provide a measure of design capacity.

For example, a future needs analysis could ask companies to rank their capacity in relation to key issues, from which a spidergram could be developed, as suggested above. A company that is low in design capacity would generally exhibit a small spider, reaching into the awareness area, but little further. Appropriate assistance, would be raising awareness of design, its benefits and contribution to company growth. A company with higher design capacity would reach into the knowledge states, where external information to build on existing capacity would most likely help the company move forward. A company with a high design capacity, ie, touching on implementation in some areas, would likely benefit most from assistance with implementation in weak areas, eg, through a KTP.

The assistance provided by DKN was generally external knowledge presented as a written report. An explanation of why some companies benefited from the advice, when others did not may be found in its stage of absorptive capacity. As discussed above, this aid would not be appropriate for low capacity or high capacity businesses. This reflection also parallels the original thinking of innovation characteristics.

However, it is less clear if the framework provides a structure to investigate a company's design capability or motivation. This will require further work comparing the findings in this paper with those of other workers and further reflection on DKN's activities to date. Indeed, Bessant et al (2005) identify a number of gaps in the literature investigating the value of support schemes as well as a lack of suitable assistance to growing businesses.

4 CONCLUSIONS

The observations of Burns and Ingram (2008) that different companies use information in different ways can in part be explained using a modified version of the Bessant et al (2005) framework. Consideration of a modified framework is likely to lead to the development of more targeted and staged business support services in the future, eg, implementation of a design process is unlikely to be successful before a company really understands the nature of design and its value to the business.

Further work to investigate design capability and business motivation is needed in order to realise a true model of organisational design capability.

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Corresponding Author Contact Information
[1]Kathryn BURNS
Birmingham Institute of Art and Design
Birmingham City University
Corporation Street
Birmingham
B4 7DX
United Kingdom
kathryn.burns@bcu.ac.uk
+44 (0)121 331 7808
www.designknowledgenetwork.co.uk