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Using bricolage to integrate business and information technology innovation in SMEs

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Abstract

Small and Medium Sized Enterprises (SMEs) can experience difficulties in adopting Information Systems (IS) and aligning them with their strategic development. Using the concept of bricolage, an improvisational approach that allows learning from concrete experience, we explore IS adoption and organisational change in two SME case studies. The case studies cover IS rationalisations and innovations and small- and large-scale change over a 4-year period, and highlight the roles of different actors, internal and external to the SMEs. We find that bricolage is a useful concept as it deals with the need for SMEs to learn about the possibilities of IS in situ, simultaneously exploiting the can-do approach that is usually found in SMEs. However, bricolage needs organisation space and the possibility for trust to grow between end users, developers and management as visions are explored and revised. The paper concludes with a set of guiding principles that can be adopted by SMEs to enable IS bricolage to contribute to an organisation's strategic direction.

Keywords: SMEs; Bricolage; Strategy; Information systems; Systems development

1. Introduction

Information Systems (IS) adoption in small and medium sized enterprises (SMEs[1]) has been understood by exploration of both the barriers to adoption and the common elements of successful IS implementations (Ballantine et al., 1998). Barriers identified include financial constraints (Foong, 1999), lack of strategic planning for IS adoption (Levy et al., 2001) and lack of in-house expertise in IS (Ballantine et al., 1998). Much of this work focuses on how Information Systems Development (ISD) approaches and strategies used within large corporations can be adapted for use in the SME context.

Two factors tend to call this assumption into question. Firstly, SMEs have specific strengths that can give them a competitive edge over larger organisations, SMEs are renowned for their ability to innovate, to respond rapidly to changing environments and to satisfy customers' emerging and evolving requirements yet these attributes are rarely exploited when SMEs implement IS. Secondly, SMEs engage with IS in a piecemeal way (Ballantine et al., 1998; Foong, 1999), stretch IS to support administrative functions that were outside of the application's intended remit (Foong, 1999), and allow internal non-IS specialist staff to develop bespoke applications (Taylor et al., 1998). An early exponent of such improvisation was Karl Weick who recommended emergent design for organisational change that focused more on reflective sense-making than on planning and prospective decision-making (Weick, 2001).

1.1. Bricolage defined

Using current resources to create new forms and order from tools and materials at hand has been defined by anthropologists as 'bricolage' (Levi-Strauss, 1966). Bricoleurs use resources that they intimately familiar with to address new tasks and challenges. By strict definition the bricoleurs 'universe of instruments' is closed and he will

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[1] The revised European Union definition, used for EU statistical comparisons, defines a small enterprise as one with fewer than 50 employees, and a medium enterprise as one with at least 50 but under 250 employees. Large enterprises have 250 or more employees. Junnarkar, S. 'Venture firms focus on business-to-business e-commerce,' CNET News.com, 1999.

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make use of whatever is to hand although Levi Straus does provide descriptions of bricolage scenarios where resource seeking occurs (Levi-Strauss, 1966). The concept of bricolage has been adopted by improvisational theorists (Innes and Booher, 1999; Weick, 1993) and information systems developers (Ciborra, 2002). When considering IS bricolage 'materials at hand' are usually considered to be information technology hardware and software artefacts. However, (Baker et al., 2003) recognises the contribution that professional and personal networks play in forming strategic direction, he refers to this use of 'networking' with pre-existing contacts as the 'materials at hand' for strategy improvisation as 'network bricolage' (Baker et al., 2003). In SMEs IS bricolage at operational level is common, however, the literature suggests that opportunistic bricolage and improvisation may also be experienced in strategic action (Baker et al., 2003; Mintzberg, 1994; Moorman and Miner, 1998). Indeed in the SME strategic improvisation is frequently the chosen business model, they adapt and change to suit market conditions with no long term direction or strategic plan.

1.2. Structure of the paper

In this paper, we begin by reviewing the literature on SME IS adoption, then introduce workable strategies for IS adoption that allow SMEs to gain the benefits of innovation whilst retaining a manageable IS infrastructure via the processes of bricolage and reflection Finally we present a model to support these twin processes that has emerged from a comparative analysis of two SME longitudinal case studies of IS development and integration in the period between 1999 and 2004.

2. SMEs Perspectives on IS

The archetypal image of an SME is of an organisation that it is often short of cash, operating within a focussed marketplace and reliant on a small number of customers. Factors that influence their adoption of IS may be internal-socially, politically or artefact dependent; or external factors e.g. the business climate, external perception of an organisation and necessary interfacing mechanisms with clients (e.g. adoption of Electronic Data Interchange). Such characteristics influence the decision making processes, strategies are often short term in nature and determined by funding, managerial perspective and skills available to the enterprise. We have synthesised the literature into a pragmatic schema of adoption factors that are recognisable to an SME IS practitioner and to which they can relate. The challenge is to turn characteristics that have traditionally been inhibitors into levers to gain competitive advantage. We examine the characteristics of personality of the creator, cost and strategic relevance.

2.1. Organisational characteristics

Most SMEs reflect the personality of their creator (Atkinson and Hurstfield, 2003), who typically employs a directive form of management within a shallow hierarchical structure, personally determining the ethics, recruitment, working practices and structure of the firm, as well as controlling financial resources and business decisions. Hence, the interest, knowledge and enthusiasm of the owner–manager tends to drive SME IS adoption (Peppard and Ward, 1999). IS may be seen as a burden rather than an opportunity, and, if no technology strategy or vision can be communicated to stakeholders (Luftman et al., 1999), then successful IS adoption is unlikely (Reich and Benbasat, 2000). Whereas larger organisations exploit the falling cost of IS, SMEs still tend to view IS purchases as a drain on resources, with only the more visionary owners looking to IS as an opportunity for business growth (Levy and Powell, 1997). SMEs' reluctance to employ tactical or strategic IS specialists, either in-house or on a consultancy basis (Chapman et al., 2000), may relate to their lack of knowledge of IS or result from a previous IS 'mis-sale' (Igbaria et al., 1998). Cost focus can result in the adoption or adaptation of affordable technology that gives a greater immediate financial return (Foong, 1999), yet may result in staff training on the use of purchased IS not being a priority (Lange et al., 2000).

The benefits of aligning IS strategy with the business strategy are well documented and are key to the conversion of IS from a cost to an investment with a reasonable Return On Investment ratio (Levy et al., 2001; Venkatraman, 1994). However, SMEs tend to react to immediate pressures, relying on instinct and intuition (Burns, 2001; Junnarkar, 1999) implementing IS in a fragmented, cost driven fashion, and applying them predominantly to operational and administrative tasks, rather than as a strategic competitive tool (Ballantine et al., 1998; Foong, 1999). For example, SMEs have been driven by perceived social pressure to join the Internet party (Riemenschneider et al., 2003) and are cautious about investing in integrated website and back office e-business solutions failing to see a significant business benefit to such an approach (Poon and Swatman, 1999). This failure to change their underlying business models to take advantage of potential new IS enabled revenue streams (Keindl, 2000), has reinforced SME caution towards Internet adoption, to the extent that SME Internet connections, number of web sites and acceptance of online orders have fallen significantly (DTI 2002).

2.2. Bricolage and systems development

The increased pace of the business environment has meant that even, for large scale ISD, the use of all stages of a software development methodology has become a luxury (Fitzgerald, 1997). For example, rapid application