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eClusters and the Role of Intermediaries in Enabling Digital Enterprise Communities of SMEs

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Abstract

The potential for the emergence of digital enterprise communities enabled by one or more intermediaries, termed eClusters, has been predicted from empirical research in business communities of SMEs in the UK. The role of intermediaries, which will be pivotal to the formation of eClusters, is examined in this paper and forms part of a wider research project into the nature of digital enterprise communities. One conceptualisation of the role of intermediaries is the provision of a *Trust Platform*. As with IT outsourcing generally it is large companies that have been early adopter of application service providers (ASPs) services with little penetration in the SME sector. It is the notion of community and emergent properties of an eCluster that could provide the 'key' to this market and lead to the formation of community-centric ASPs.

Introduction

Within the context of e-commerce generally this research addresses some issues relevant to the involvement of small and medium enterprises (SMEs). Hither to such organisations, which in the UK total 97 percent of businesses (DTI, 1999), have been largely by-passed in the recent reinvention of electronic business-to-business and business-to-consumer transactions. In particular the research pursues three strands of thinking: Firstly, what is the potential for electronically mediated collaboration and business support for SMEs. Secondly, within such an arrangement, what are the roles of intermediaries and trust that would enable these groupings to function. And finally, what are the business and pricing models that could underpin this kind of development. Significant progress has been made in the first area of interest and work continues on the others.

eClusters are digital enterprise communities enabled by one or more intermediaries and are based on a new type of electronically enabled inter-organisational system (IOS) (Lockett and Brown, 2000). These eClustered IOS are especially significant precisely because they can lead to the formation of new forms of inter-organisational networks (ION), rather than supporting existing configurations. These new forms are themselves manifestations of new business models for electronic markets based on increasing functionality, innovation, integration and value. Timmers has proposed a broad classification based by functional integration and degree of innovation from E-Shop to Value Chain Integrator (Timmers, 1998) and Tapscott differentiates by control and value giving five distinct types of Business Webs (BWeb) (Tapscott et al., 1999). Tapscott's classification is usefully broad and a number of well-known examples fit within it, Table 1.

Table 1. Classification of Business Webs (Tapscott et al., 1999).

Type	Economic Control	Value Integration	Example
Agora	Hierarchical	Low	EBay, Priceline
Aggregation	Hierarchical	Low	Amazon, Chemdex
Alliance	Self-organising	High	Linux, AOL
Value Chain	Hierarchical	High	Cisco, Dell
Distributive Network	Both	Both	Wall Street Journal

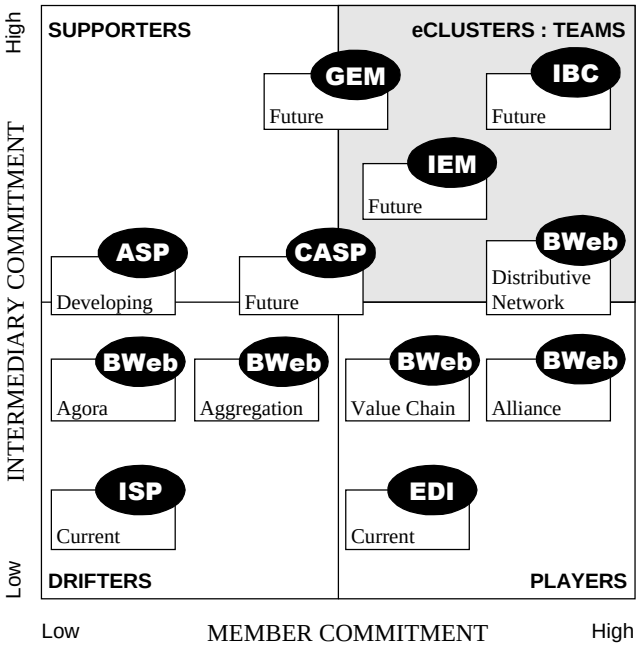
Within these Business Webs existing and proposed business models proliferate and currently include: Interconnected eMarketplaces (IEM) (Lief et al., 1999), Intelligent eBusiness (i2, 1999), Guaranteed Electronic Market (GEM) (Rowan, 1999), Digital Marketplace (Jones, 1999) and Internet Business Community (IBC) (Hewlett Packard, 1999). Together these (and others) constitute a class of IONs generally referred to as digital enterprise communities. Of these the IBC concept, originally proposed by Hewlett-Packard Laboratories, is of particular interest since the early research findings suggest that this concept resonates strongly with potential SME communities.

Community based internet business models can be differentiated by two primary dimensions, namely commitment of the intermediaries (low to high) and commitment of the members (low to high). Commitment is a relative measure of the level of obligation to participate in either role, which may be in the form of relative resources, contractual agreements, importance in maintaining reputation or focus of business activity. In order to place the existing and potential IBCs in a relative context with other digital enterprise communities the research has proposed taxonomy. This is shown in Figure

1 and depicts four basic types of digital enterprise community:

- *Drifters* are characterised by existing ISPs who provide a base level of intermediary commitment with low member commitment where switching costs are low and mobility is high.
- *Supporters* increase the commitment of intermediaries beyond that of an ISP by specialisation and community obligation, like ASPs and Portals.
- *Players* are dominated by value chain communities and strategic alliances, like Cisco and LINUX respectively, were member commitment is high.
- *Teams* are represented by proposed future communities namely Interconnected eMarketplace (IEM), Guaranteed Electronic Market (GEM), Internet Business Community (IBC), Business Web: Distributive Network (BWeb) and Community-centric Application Service Provider (CASP) with all requiring increased commitment from both intermediaries and members. All five types fall within the general class of eClusters and are shaded in figure 1. Teams are representative of eClusters.

Figure 1. Taxonomy of Digital Enterprise Communities (source: authors)



Precursor digital enterprise communities are already well established with increasing levels of commitment for both *players* and *supporters* evident. Many examples of these business models will converge as both intermediary and member commitment increase to form *teams* around the eCluster business model. Central to this model is the notion of community and the concept of communities of practice, both of which can help drive strategy, innovation and transfer best practice (Wenger and Snyder, 2000).

Such eClusters will have both elements of process and transaction e-commerce. Although currently there are many 'natural' constituencies within industry sectors, which are potential communities, these are typically loosely linked and are not electronically mediated. This is especially the case for the SMEs.

Characteristics of Potential Communities and Business Models

It was demonstrated in the early empirical research that it is the businesses that have the most to gain from the increased interactions resultant from community membership that expressed the strongest interest in the Internet Business Community concept (Lockett and Brown 2000). This was frequently linked to the perception of an external threat or simply the need to improve business performance. However, all the SMEs emphasised technology and security as the major barriers to the adoption of the IBC concept.

The digital nature of eClusters will give them characteristics similar to virtual organisations (VO), although they are based on existing communities. The characteristics of a VO can be divided into primary and secondary, Table 2.

Table 2. Characteristics of Virtual Organisations (Bultje and van Wijk, 1998)

Type	Characteristic
Primary	*Partial mission overlap* with partners also operating outside the VO.
	Geographically dispersed.
	Semi-stables relations enable partners to survive outside of the VO.
	Customer based & mass-customisation with the virtually of the relationships providing flexibility to meet customer needs.
	Based on core competencies that lead to synergy and any resulting excellence.
	Dependent on innovation either technical or cultural in matter with innovative products or services necessary.
Secondary	One identity distinct from that of the individual partners.
	Based on trust for information is shared between partners.
	Based on IT, which has lead to the spread of VOs.
	Distinction between strategic & operational levels at managerial level.

Drawing on the characteristics of VOs together with the research into the IBC concept, suggests the key attributes of a potential eCluster, namely:

- a strong sense of community
- a perception of external threat
- a requirement for intermediaries
- an opportunity for increased business performance
- a requirement for both e-process and e-transaction
- a demonstrated basis for trust relationships

Finally, it is possible to categorise eCluster business models into three different types, namely governmental, institutional and commercial depending on the community owner, Table 3.

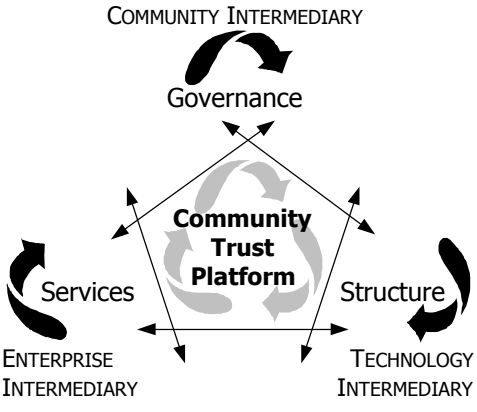
Table 3. eCluster Business Model Types (source: authors)

Model Type	Community Examples	Owner
Governmental	GEM	Parliament
Institutional	Professional Trade Association. Industry Initiatives. Local Area Initiatives.	Institutions
Commercial	Motorsport Engineering. Specialist Software Services. Construction Consortium.	Companies or Individuals

Conceptualisation of Intermediary Roles

The roles of intermediaries are pivotal to the eCluster business model and can be summarised as the provision of the necessary structure, services and governance that will enable the communities to function. Underpinning the whole eCluster concept is the *Trust Platform* on which the digital enterprise communities operate and comprises structure, services and governance. Each of these in turn is provided by three kinds of intermediary, namely technology, enterprise and community, Figure 2.

Figure 2. The Community Trust Platform (source: authors)



The role of the technology intermediary is to provide the ICT platform on which services can be provided and could include hardware, security and communications. The role of the enterprise intermediary is to provide the services including applications software, hosting and consultancy. The technology and enterprise intermediaries can be considered as generic and are trusted third parties. In reality these functions could be provided by one or more organisations. The community intermediary, being specific to a particular eCluster, has a critical role in gaining the commitment of potential participants to enter the digital enterprise community. It is the community intermediary, providing a broad governance function, which is a distinguishing characteristic of an eCluster. Although unlikely it would be theoretically possible for a community intermediary to also provide structure and services. More elaborate platform conceptualisations or models have been proposed including; Media Reference Model with four layers and four phases (Lechner and Schmid 2000), VEGA[1] Reference Model with four layers of Business, Process, Service and Infrastructure (Suter 1999) and a Framework of eServices divided into three layers of basic services and five layers of business services (Kluber et al. 1999). The *Trust Platform* provides a simple conceptualisation that highlights the collaboration required by intermediaries in order to achieve the appropriate levels of trust necessary for member participation and commitment.

Community-centric Application Service Providers

The emergence of the application service provider (ASP) sector has attracted much interest and speculation, with IDC forecasting a market opportunity of $4.5 billion by 2003 (Gillian et al., 1999) and Durlacher estimating the European ASP market at $100 million by the end of 2000 and $1.5 billion by end 2004 (Wendland, 1999). Wendland notes that although ASP solutions are targeted at the SME market it will not be a profitable segment for top-tier ASPs. Furthermore Weller states that 'it has been large companies that have been the primary drivers for ASP solutions rather than SME companies' and that this 'sweet spot requires further education' (Weller, 1999). Micro, small and medium sized enterprises, especially in the UK, have been slow to grasp the opportunities for business change. Currently the UK's micro and small companies are at the bottom of the league table of major European economies and compared with the US micro businesses in the UK are three times less likely to have a web site (DTI, 1999). There is an obvious and interesting parallel here with IT outsourcing, which is one of the highest growth rate industries of the last decade. Overwhelmingly, however, this industry is centred on large companies, with little penetration in the SME sector.

[1] Virtual Enterprise Generic Applications (http://vega.vptt.ch)

Clearly, this is a matter of economics – large accounts can be profitable for the outsourcing companies. The challenge for potential intermediaries is to derive the funding model that allows small individual accounts to be serviced profitably. This suggests large numbers. Already experience on the web indicates that this is possible, (Carr, 2000).

This paper predicts the emergence of community-centric ASPs (CASP) to serve these digital enterprise communities, resulting from the ASP industry's desire to penetrate the SME sector, and that the notion of community and emergent properties of eClusters could provide them the 'key' to significant uptake and profitable delivery. For the future of this research an important issue will be to articulate, both theoretically and practically, the concept of trust and the way in which trust can be engendered within the eClusters. A research forum is maintained at www.ecluster.org.

References:

Bultje, R. and van Wijk, J. "Taxonomy of Virtual Organisations, Based on Definitions, Characteristics and Typology," *Electronic Journal of Organizational Virtualness* (2:3), 1998, pp.7-20.

Carr, N.G. "The Future of Commerce - Hypermediation: Commerce as Clickstream," *Harvard Business Review*, Jan-Feb 2000, pp. 10-11.

DTI. "Benchmarking Study - Moving into the Information Age 1999," Department of Trade and Industry, UK, 1999.

Gillian, C., Graham, S., Levitt, M., McArthur, J., Murray, S., Turner, V., Villars, R., McCathy Whalen, M. "The ASPs' Impact on the IT Industry" *IDC Corporation*, September 1999.

Hewlett Packard. www.ecluster.org/ibc-concept.pdf, (Mar. 15, 2000).

i2. 1999. "Intelligent eBusiness Customer-Centric eBusiness for Sustainable Growth and Profitably," www.i2.com/rhythm/ieb_wp_0699.pdf, (Nov. 23, 1999).

Jones, K. "Digital Marketplaces Enabling the Internet Economy," www.tradex.com/whitepaper/, (Jan. 7, 2000).

Kluber, R., Alt, R., Osterle, H. "Emerging Electronic Services for Virtual Organizations – Concepts and Framework," *Electronic Journal of Organizational Virtualness* (1:1), 1999, pp.190-212.

Lechner, U., and Schmid, B.F. "Communities and Media – Towards a Reconstruction of Communities on Media" in *Hawaiian International Conference on Systems Sciences (HICSS 2000)* Sprague, E. (ed), IEEE Press, to appear January 2000.

Lief, V., Temkin, B.D., McCathy, K., Sharrard, J., Brown, T.O. "Net Marketplaces Grow Up" *The Forrester Report,* December 1999.

Lockett, N.J., and Brown, D.H. "eClusters: The Potential for the Emergence of Digital Enterprise Communities enabled by one or more Intermediaries in SMEs," *Journal of Knowledge and Process Management*, The Business Process Phenomenon: Into the Era of E-Business, forthcoming July 2000.

Rowan, W. *Net Benefit Guaranteed Electronic Markets*, Macmillan Press Ltd, London, 1999.

Suter, B. "The VEGA Cooperation Platform: Providing Real Support for Virtual Enterprises," *Electronic Journal of Organizational Virtualness* (1:1), 1999, pp.171-189.

Tapscott, D., Ticoll D., Lowy A., "The Rise of the Business Web," *Business 2.0*, Nov 1999, pp. 198-208.

Timmers, P. "Business Models for Electronic Markets" *Electronic Markets* (8:1), 1998, pp. 3-8.

Weller, T. "Application Hosting Market: Industry Update," *Legg Mason Equity Research*, Dec 1999.

Wenger, E., Snyder, W. "Communities of Practice: The Organizational Frontier," *Harvard Business Review*, Jan-Feb 2000, pp139-145.

Wetland, R. "Application Service Providers," *Durlacher Research*, July 1999.