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Enterprise Portals: Addressing the Organizational and Individual Perspectives of Information Systems

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ENTERPRISE PORTALS:
ADRESSING THE ORGANISATIONAL AND INDIVIDUAL PERSPECTIVES OF INFORMATION SYSTEMS

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Abstract

Enterprise portals are being viewed as the next generation application platform of choice, offering benefits over both client/server and thin client arrangements. By providing a mediating layer between the information applications and resources of the organisation and the individuals using them, enterprise portals appear to provide a unique context to allow both the organisational and individual perspectives of information systems to be addressed. This study seeks to examine these often competing perspectives of information systems by using an exploratory empirical survey to investigate the actual deployment of enterprise portals within a range of different organisations. It is found that both the individual and organisational benefits that enterprise portals can offer appear to have been recognised, and coherent sets of services addressing each of these perspectives are being developed. Consistent with diffusion and acceptance of technology models, organisations appear to be commencing their portal developments with services that will ensure utilisation by individuals, and are subsequently seeking to realise organisational level benefits.

Keywords: Enterprise portal, new technology adoption, individual perspective, organisational perspective

1   INTRODUCTION

Enterprise portals have been cited as *'the most important business information project of the next decade'* (Collins, 1999). The attractions they offer organisations are significant. By integrating disparate information sources and allowing easier access to existing corporate applications, portals allow staff to find the information and knowledge that they need to do their job (Collins, 2002: Detlor, 2004; Terra and Gordon, 2003). In addition to helping with the search for information, portals can also improve the provision of information to staff, often termed *'information push'*. Unlike other systems, enterprise portals allow the information provided to be tailored to the role or location of each individual staff member, ensuring that they are fully informed on issues relevant to their role or their interests whilst mitigating the effects of *'information overload'* (Ben-Arieh and Pollatscheck, 2002). Portals can further enhance effectiveness by supporting communication between individuals and work groups, allowing increased collaboration (Benbya *et al*, 2004; Detlor, 2000; Dias, 2001). In addition to these improvements in internal operations portals can also improve collaboration with external business partners, such as customers and suppliers (Dias, 2001; Detlor, 2000). Organisations as diverse as Airbus (Counsell, 2004), the BBC (Milne, 2002), Shell (Roberts, 2002), Barclays (Breu and Hemingway, 2001), West Sussex County Council (Daniel and Ward, 2003) and the US Army (Smith, 2002) are using enterprise portals to deliver information and applications to their employees.

Studies of successful information systems investment and development, particularly those from the socio-technical domain, stress the need to recognise not only the organisational perspectives, that is the expected benefits or payoffs that will accrue to the organisation from the use of the system, but also the perspectives of individuals or groups that must use the systems in question (see for example: Orlikowski, 1992). Whilst these different perspectives may in many cases be symbiotic, it has been recognised that this is not always the case (Jurison, 1996). Robey and Boudreau (1999) talk about the *'contradictory consequences of IT'*: with IT adoption improving the roles of individuals in some cases, but diminishing them in others. Griffith *et al*, 2003 describe certain information systems as acting as a *'destabilising force'* within organisations, providing benefits to the organisation whilst impoverishing individuals. Enterprise portals appear to provide a unique context to allow these dual perspectives of information systems to be addressed. Such portals provide a mediating layer between the information harnessing and processing needs of the organisation and the information retrieval and use needs of the individual. The inclusion of collaboration tools in this layer can also improve the range and quality of the interactions that staff have with other staff, both inside and outside organisations (Benbya *et al*, 2004; Kim *et al*, 2002). Enabling such interaction between individuals has been shown to be important in causing individual use and satisfaction (Joinson, 2003).

This study seeks to investigate the role enterprise portals can play in addressing both the organisational and individual perspectives of information systems within organisations. This investigation is undertaken by means of a study of the intentions that are driving the portal deployments within a range of organisations. The study, which was carried out by means of an empirical survey, should be considered exploratory in nature. Whilst there is a rapidly growing body of academic literature relating to enterprise portals, underlining the interest in this area, little of this is based upon the actual or planned deployments by organisations. Our study, although exploratory, is based upon an empirical quantitative study of such deployments.

The paper commences with a concise discussion of the literature published to date concerning enterprise portals and literature addressing the organisational and individual perspectives of information systems. The research propositions, by which the study has been operationalised, are presented and discussed. The methodology adopted for the study is then described and the findings are presented. The paper concludes with a discussion of the study findings, including noting the limitations of the current study and outlining areas for future research.

2   ENTERPRISE PORTALS: EXTANT LITERATURE

Enterprise portals, also termed corporate portals, have their antecedents in internet-based consumer portals (Detlor, 2000; Kehoe, 2002). The launch in 1996 of MyYahoo!, which allowed users to customise their own web pages and to select the information that was of interest to themselves (Rindova and Kotha, 2001; Milne, 2002), led vendors to consider how such developments could be applied to the information within organisations.

Due to the relatively recent emergence of enterprise portals, and their continued evolution, there is not as yet a widely accepted definition. Early definitions, such as those proposed by Dias (2001) and Chan and Chung (2002), do not capture more recent developments, such as application integration capabilities. We therefore propose the following definition of enterprise portals:

Enterprise portals are secure web locations, that can be customised or personalised, that allow staff and business partners access to, and interaction with, a range of internal and external applications and information sources. Uses of the portal may include: improved access to information, increased collaboration, greater use of existing applications and effective integration between applications.

Such a definition is useful in differentiating enterprise portals from intranets. Although intranets are frequently used within organisations to provide corporate information to employees (Phelps and Mok, 1999; Horton *et al*, 2001), there is rarely an ability to tailor the information received or to interact with existing business applications, two of the most powerful features of enterprise portals. Furthermore, Detlor (2000, p.92) notes *'corporate portals differ from intranets in that a portal's primary function is to provide a transparent directory to information already available elsewhere, not act as a separate source of information itself'*. This difference is currently being amplified as portals are being used in many organisations to provide a simplified and unified access to intranet sites, the number of which has often grown out of control (Milne, 2002).

Benbya *et al* (2004 p.205) note that a number of terms, such as enterprise portals, employee portals, enterprise intranet portals, corporate portals and business-to-employee portals are *'often used interchangeably as synonyms'*. Kim *et al* (2002) add the terms; data portal, enterprise information portal and collaborative portal to this list. We include all of these terms and the systems they refer to within our broad definition of enterprise portals. Our definition also distinguishes enterprise portals from other uses of the term portal. For example, Kotorov and Hsu (2001) use the term in their study, but appear to refer to a public web sites that allow access to a range of services and information available on the World Wide Web, a facility that might be better termed a consumer portal.

In a similar way to the observations made regarding other new IT developments, such as e-commerce (White *et al*, 1998; Prescott and Conger, 1995), enterprise portals have been described, not as a single innovation, but a cluster of separate but related services or functions. The previous theoretical studies of this domain have identified a number of key services or functions that are frequently incorporated in an enterprise portal. Table 1 presents a list of such services or functionality commonly derived from these extant studies.

Portal Services or Functionality	Previous Studies
Single web front end to information and key applications	Detlor, 2000; Dias, 2001; Kotorov and Hsu, 2001; Raol *et al*, 2002; Chan and Chung, 2002
Integration with key IT applications	Detlor, 2000; Dias, 2001; Mack *et al*, 2001
Content management	Dias, 2001; Raol *et al*, 2002; Benbya *et al*, 2004
On-line search	Detlor, 2000; Dias, 2001; Raol *et al*, 2002; Kotorov and Hsu, 2001; Mack *et al*, 2001
Find an expert	Dias, 2001; Kim *et al*, 2002
Personalisation	Dias, 2001; Kotorov and Hsu, 2001; Raol *et al*, 2002
Role/function based services	Dias, 2001; Breu and Hemingway, 2001

Collaboration tools	Raol *et al*, 2002; Mack *et al*, 2001
HR information	Gable, 2004
Training (on-line training and information for off-line training)	Detlor, 2000; Dias, 2001
Time and/or expense reporting	Detlor, 2000; Dias, 2001
Procurement	Breu and Hemingway, 2001
Remote or mobile access	Breu and Hemingway, 2001; Mack *et al*, 2001
Access by customers	Chan and Chung, 2002; Benbya *et al*, 2004
Access by suppliers or other trading partners	Chan and Chung, 2002; Benbya *et al*, 2004

Table 1: Enterprise Portal Services or Functionality

Due to the nascent state of portal deployments, our study concentrates on the intent of organisations in developing and deploying portals, rather than benefits that have been realised. However, such intents are driven by the expectation of benefits. Dias (2001), consolidating the views of earlier authors, recognises a number of benefits of the adoption and use of enterprise portals. She notes that the portal provides staff within the organisation and permitted business partners to share a common, but personalised view of enterprise information. This consistent view, she argues, will provide a common understanding of the operations of the business and therefore enable improved and consistent decision-making. She also notes that the enterprise portal will allow improved access to information to geographically dispersed employees. Breu and Hemingway (2001) found that the personalisation capability also allows organisations to establish information access based on roles or locations within the organisation, helping with the orientation of new staff and the ability to orchestrate change within the organisation. These authors also link the ability a portal provides to more easily deploy new information systems within organisations to increased workforce and organisational agility.

The studies by both Firestone (2003) considers the application of enterprise portals to knowledge management, showing how their knowledge sharing features can improve collaboration between individuals within an organisation, hence improving team and group effectiveness. Such collaboration can also be undertaken with partners outside the organisation. As Davis (2004) notes, much collaboration, such as that in the construction and engineering fields happens quickly and is for a finite period. Enterprise portals allow multiple partners to be provided with easy access to shared documents and plans and to exchange information. Portals have even been linked to the improved effectiveness of mergers and acquisitions, acting as a bridge that can quickly bring together applications in the different organisations and allow them to act as a single unified entity, something that traditionally has often taken many years to achieve (Davis, 2004).

3 ORGANISATIONAL AND INDIVIDUAL PERSPECTIVES OF IS

The predominant intention of organisations when deploying information systems is to improve performance at an organisational level (Jurison, 1996). However, the socio-technical view of systems development espouses the importance of recognising and addressing the social aspects of deployment, both at an individual and group level (see for example; Hirschheim, 1985; Orlikowski, 1992; DeSanctis and Poole, 1994; Doherty *et al,* 2003). Such studies suggest that addressing such social perspectives is often critical to staff making use, and particularly effective use, of the system in question. Such increased utilisation is often a key prerequisite for realisation of the organisational performance improvement sought.

Much of the recent consideration of the individual and organisational perspectives of information systems derives from studies of knowledge management initiatives (Garud and Kumaraswamy, 2005; Griffith *et al*, 2003; Bock *et al*, 2005). Given a number of the services and functionality included in enterprise portals pertain to this domain, such studies are highly pertinent.

Garud and Kumaraswamy (2005) observe that in the knowledge management domain there is a tension or '*opposing forces*' between individuals and their organisations, which '*need to be balanced dynamically to generate a virtuous circle*' (p.28). Without such balance, these authors note that vicious circles of behaviours and consequences will result. Griffith *et al* (2003) describe knowledge management systems as acting as a '*jealous mistress*' between an organisation and its employees. They suggest such systems encourage individuals to codify their personal knowledge, to the benefit of the organisation, but particularly in the case of virtual teams, reduce the ability of those individuals to gain new personal knowledge. Bock *et al* (2005) also observe distinctions between individual and organisational levels of benefit, suggesting that these will lead to different '*motivational forces*' (p.89). One particular manifestation of the need to balance the different perspectives of knowledge systems and other forms of information systems is the tension between centralised and decentralised structures and governance (Ward and Peppard, 2002). Whilst centralisation increases synergies across the organisation, providing organisational benefit, decentralisation allows individuals and groups to do things in ways that best meet their needs.

Various means have been proposed and implemented to address the imbalances information systems can cause between individuals and their organisation. A federal structure and governance has been suggested as a middle way between centralisation and decentralisation, allowing both individuals and the organisation to better meet their needs from systems (Hodgkinson, 1996). Incentive mechanisms have been developed to ensure that it is not only the organisation that benefits when individuals contribute their knowledge to information stores (Gold *et al,* 2001; Huber, 2001). Whilst some have been based on financial incentives, effectively establishing a market-for-knowledge (Garud and Kumaraswamy, 2005), others have found such incentives exert a negative effect (Bock *et al*, 2005). Instead individuals may seek other benefits such as recognition, reciprocity and the enjoyment of helping others (Kankanhalli *et al*, 2005) and organisations should ensure they can provide suitable means for achieving these individual level benefits.

Griffith *et al* (2003) observe how the provision of information systems that can support improved quality and a richer set of interactions may also be a means for providing benefit to those individuals who use them, particularly in replenishing their personal knowledge stores. However, neither their study nor other studies identify or exemplify particular information systems that can fulfil this role. This study seeks to address this gap in extant literature by seek to explore the role enterprise portals can play in addressing both the organisational and individual perspectives of information systems.

4 RESEARCH AIMS AND PROPOSITIONS

The paper is based upon the exploration of a set of research propositions that are derived from the extant literature on enterprise portals and the organisational and individual perspectives of information systems. The propositions are explored by means of a quantitative survey.

Our first proposition recognises that enterprise portals are not a single innovation, but are comprised of a range of distinct services and functionality as shown in Table 1. It is proposed that by combining these services into coherent sets, an organisation can address either the individual or organisational perspectives.

P_1: *The plurality of services inherent within enterprise portals provide an opportunity to address either individual or organisational perspectives of their use and the under-lying information sources and applications.*

Our second proposition suggests that, in accordance with diffusion and adoption of innovation models including the Technology Acceptance Model and its derivatives (Rogers, 1995; Venkatesh *et al*, 2003), the perceived usefulness of systems by individuals is important in determining adoption, and hence;

P₂: *Deployment of enterprise portals will commence with services that facilitate the tasks of individuals, that is those services that enable the individual perspective.*

Jurison (1996) suggests that the payoffs from information systems investments should be viewed as a portfolio of benefits across many stakeholders. He notes that employees are an important group to realise benefits, *'but the firm must eventually recover some of the value in order to earn sufficient return on the investment'*. Deployment of services focussed on individuals and services focussed at the organisation suggests that organisations are seeking to find an equitable and effective balance between these two perspectives. This provides our third proposition;

P₃: *Additional service and functionality deployment will allow organisations to balance their early focus on individual use with improved organisational performance.*

5 METHODOLOGY

The research was intended to be exploratory in nature. An appropriate methodology was therefore adopted in which data on a large number of variables suggested by the literature were collected by means of a structured questionnaire. Exploratory data analysis, in the form of cluster analysis and cross-tabulations was then carried out in order to inductively determine relationships between variables. Such an exploratory methodology has been widely tested in the social sciences in general and in the IS field in particular, where such broadly based surveys have been used to study similar emerging or rapidly changing empirical phenomena (Brancheau and Wetherbe, 1987; Gottschalk, 2000; Breu *et al*, 2001).

The survey instrument is included as Appendix 1 to this paper. Respondents were first asked if their organisation was developing an enterprise portal and its status. If respondents indicated that their organisation had no plans for an enterprise portal, then they were asked to specify reasons for this. For organisations that had implemented a portal or had plans to do so, the survey instrument then explored the services and functionality they had deployed, were developing or had planned. The service and functionality items on the survey were derived from Table 1, which is derived from extant portal literature. Whilst the individual items were not taken from existing survey instruments, the methodology of previous studies (Breu *et al*, 2001; Daniel *et al*, 2002) was replicated.

Background information on the company, such as its market sector, company turnover and employee numbers were also requested. A pilot of the survey instrument was undertaken with three representative organisations.

A database of organisations held within the researchers' institution was used to provide a sample of the population of interest. This database contains the contact names and company details of individuals that have attended an executive programme or research workshop in the area of business information systems. The database contains the details of 657 distinct organisations. The companies covered a wide range of industry sectors and were distributed throughout the UK. The total number of responses received was 67 giving an effective response rate of 10.2%, which is consistent with other studies of emerging information systems (see for example; Daniel and Grimshaw, 2002, Doherty *et al*, 2003). The majority of respondents (75%) were information systems managers or directors, suggesting that they were sufficiently knowledgeable about their own deployments in this area and the domain for the purposes of our study.

A lack of non-response bias is an important feature of any survey-based research. The method of determining non-response bias adopted in studies such as Goode and Stevens (2000) was adopted for this study. In this method the earliest responses to be received are compared with the responses received later. Thus the responses were split into two equal sets of according to the dates on which they were received. No significant differences were found between the responses of these two groups. It is therefore concluded that the responses received are unlikely to contain a non-response bias.

However, it should be recognised that there may be less obvious criteria that make the sample distinct from the population at large, and that may have an influence on their approach to enterprise portals. For example, organisations sending delegates to university based programmes or workshops may be more innovative than organisations in general, and hence more likely to foresee benefits from such developments. This concern, taken with the small sample size, causes us to label this study as exploratory in nature.

Whilst the statistical techniques employed in this study are objective, consistent with other studies that have adopted a clustering technique the titles ascribed to each cluster are somewhat subjective (Bensaou and Venkatraman, 1995; Malhotra *et al*, 2005). Clusters are likely to include some elements that it can be argued could be incorporated into other clusters. However, Malhotra *et al* (2005 p.160) caution against '*over-interpreting the membership of clusters and... focus on the description of the clusters themselves*'. They also suggest that the analysis should seek to represent the true '*in-the-field*' situation, rather than be purely data driven. They accomplished this by presenting their work to practising managers for validation. We too have adopted this approach to increase the validity of our work. The findings of our study have been presented at a number of workshops of IS and business staff responsible for both developing and operating enterprise portals across a range of businesses.

6   STUDY FINDINGS

Table 2 presents a summary of the deployment status of enterprise portals within the sample. The majority of the sample (46.3%) are currently implementing or planning an enterprise portal whilst the minority of the sample (22.4%) have implemented a portal.

Deployment Status	Coding Variable	Frequency	Percent	Cumulative Percent
Have implemented	1	15	22.4	22.4
Current or planned implementation	2	31	46.3	68.7
No plans	3	21	31.3	100.0
Total		67	100.0	

Table 2: Enterprise Portal Deployment Status

Proposition 1 was tested by determining how organisations are deploying enterprise portals, in particular, if they appear to be deploying clusters of services or functionality that addressing either the individual or organisational perspectives of the portal or both of these perspectives.

Respondents were asked to indicate for each of the services or functionality shown in Table 1 their level of development, that is: whether they had developed such a service, were currently developing such a service, had such a service planned or had no such plans (an effective four point Likert scale). A hierarchical cluster analysis method was adopted (Field, 2000). This method was chosen, since unlike K-means clustering it can cluster either variables or cases, and is most suitable when the number of cases or variables is small. The clustering steps are shown in the dendogram in Appendix 2 to the paper. There is a significant increase in the average linkage distance between clusters for a five-cluster solution. However, two of the clusters are small, with only two members each. The dendogram shows that these two clusters are similar and are joined. Hence for the remainder of the analysis, these clusters are combined and a four-cluster solution is adopted.

Four clusters of portal services or functionality were identified from the cluster analysis as shown in Table 3. At this stage the numbers given to the clusters are those that arose from the clustering order of the statistical technique used and do not denote a sequence or relationship between the clusters. A

descriptor or title has been given to each of the clusters based upon the services in that cluster and is discussed below.

Cluster 1	Cluster 2	Cluster 3	Cluster 4
Personal Effectiveness	*Organisational Effectiveness via process change*	*Personal Efficiency*	*Inter-organisational Collaboration*
Collaboration tools	Role/function based services	HR info	Access by customers
On-line search	Content management	Training	Access by suppliers
Personalisation	Single web front end	Time or expense reporting	
Find an expert	Integration with key applications	Procurement	
	Remote or mobile services		

Table 3: Clusters of Portal Services Identified

Cluster 1: Personal Effectiveness. This cluster includes the functional attributes associated with improving individual access to information and facilitation of its collective use, enabling individuals to obtain or be provided with personally pertinent information and work more effectively with colleagues in information and knowledge based activities. It has been described as individual rather than collective effectiveness, because improving the latter is dependent on more than technology and information availability, for example, the prevailing culture with regard to sharing knowledge (Brown and Duguid, 1991). Given the complexity of finding and accessing the wide range of existing information systems and resources that already exist in most large organisations, the uniformity of the presentation layer and the search and navigation tools provided by the portal reduce the skills and knowledge required to find existing information, increasing both employee productivity and task effectiveness. Such functionality enables a degree of reconciliation between the disparate types of legacy information resources and the idiosyncrasies of personal working styles, hence facilitating and therefore improving the effectiveness of individuals.

Cluster 2: Organisational Effectiveness via process change. This cluster comprises a range of functionality mainly associated with organisational processes rather than individual activities. Even the provision of mobile access is primarily aimed at enabling process activities to be carried at from wherever the employee is located, either temporarily or permanently. Gaining performance improvements from these elements of portal functionality requires the rationalisation and consolidation of information sources and the redefinition and change to processes (e.g. for content management). It requires standardisation in the way information is defined and used across the organisation and usually new processes or procedures to control the provisioning of information or its use. Without these additional disciplines overall organisational effectiveness improvements are difficult to achieve, hence the characterisation of the functionality in this cluster as 'organisational effectiveness, via process change'.

Cluster 3: Personal Efficiency. This cluster includes a set of functionality often associated with '*employee self-service*' (Breu and Hemingway, 2001) which in part enables each employee to integrate administrative tasks into his or her daily routine. It can also allow a reduction the number of specialist administrative staff needed in functions such as Human Resources or Purchasing, and free such staff from routine tasks, allowing them to undertake more strategic activities. The main organisational purpose for carrying out activities in this way is to decrease overall costs via efficient use of employee time, and hence its characterisation as 'personal efficiency'.

Cluster 4: Inter-organisational Collaboration. This cluster includes the external dimensions of portal functionality, enabling outside parties – customers, suppliers and trading partners as well as others such as regulatory bodies – access via the portal to information and applications appropriate to and often customised to the particulars of the inter-organisational relationship. This requires changes to both internal and external processes and should provide benefits to all parties if such changes are to be effective.

The identification of four clusters of services and the characterisation of these as either focussed on the individual or the organisation provides for proposition 1.

Propositions 2 and 3 were explored by means of a cross-tabulation of cluster number or membership versus development status. This was undertaken separately for the two active groups identified in Table 2; those that have implemented a portal (deployment status = 1) and those that are currently implementing a portal or have one planned (deployment status = 2).

Such analysis showed that those organisations that are currently implementing or planning an enterprise portal have focused their initial development on the functionality described in cluster 3 in order to improve personal efficiency and achieve the related cost savings (cluster with highest currently available services of 42.1%). Attention has also been given, but to a slightly lesser degree, to the services in cluster 1, related to personal effectiveness (31.6% of currently available services). Examination of the services that are under development suggests that although attention on clusters 3 and 1 continue, the focus for development is the services of cluster 2 that are aimed at improving organisational effectiveness (cluster with highest under development services of 39.3%). Consideration of the services that are not yet under development but are intended for the future, suggest that organisations will continue their concentration on cluster 2 services (cluster 2 has highest planned services of 39.7%).

Very little completed or current development work is directed at the services that comprise cluster 4, that is those services that extend beyond the boundary of the organisation (5.3% and 11.3% of services currently available and under development respectively). This can be understood since, until the portal is fully effective internally, external use is potentially risky. It would appear that organisations wish to establish both the technical and organisational operation of their portals within the relative safety of their own organisation, before opening them up to trading partners. Taken together with the low level of such services planned by the respondents (11.5% of planned services), then it can be seen that this is currently the area of least emphasis, underlining the distinctions between consumer or supplier portals or extratnets and enterprise portals discussed earlier. The former are built with the distinct intention of providing services and access to parties outside the organisation, whilst the latter is primarily internally focused, but may in the future be opened up to outside partners.

The sequence of deployment of the identified clusters across the organisations surveyed provides support for propositions 2 and 3.

7   DISCUSSION OF FINDINGS

The identified clusters have been shown in Figure 2. The sequence from left to right is that found in the study and discussed above, that is the participating organisations have started their developments with cluster 3, followed by clusters 1, 2 and then 4. A set of axes suggested by the identified sequence of adoption is also shown. These have been proposed by the authors having considered the degree of organisational change and hence risk that may be expected to be associated with each cluster and the degree of benefit that the extant portal literature suggests may arise from each cluster of services.

Our findings suggest, that in contrast to most information technology and systems investments, when achieving measurable, often financial improvements at an organisational level is paramount even if this is to the detriment of individuals, the initial emphasis of enterprise portal implementation is the

individual. Performance improvement by individuals is seen as a pre-requisite to achieving organisational improvement. A difficulty caused by this initial focus on the individual, is the requirement in most organisations to produce a financially justified and robust business case for each stage of development of large information systems. Financial justification of the early stages may be difficult, or may appear less attractive than other investments being considered by the organisation. The sequence of deployment identified in this study, showing that the realisation of organisational improvement can follow an initial realisation of individual level benefits, will therefore provide guidance in the specific area of developing the justification or business cases for such systems and other systems.
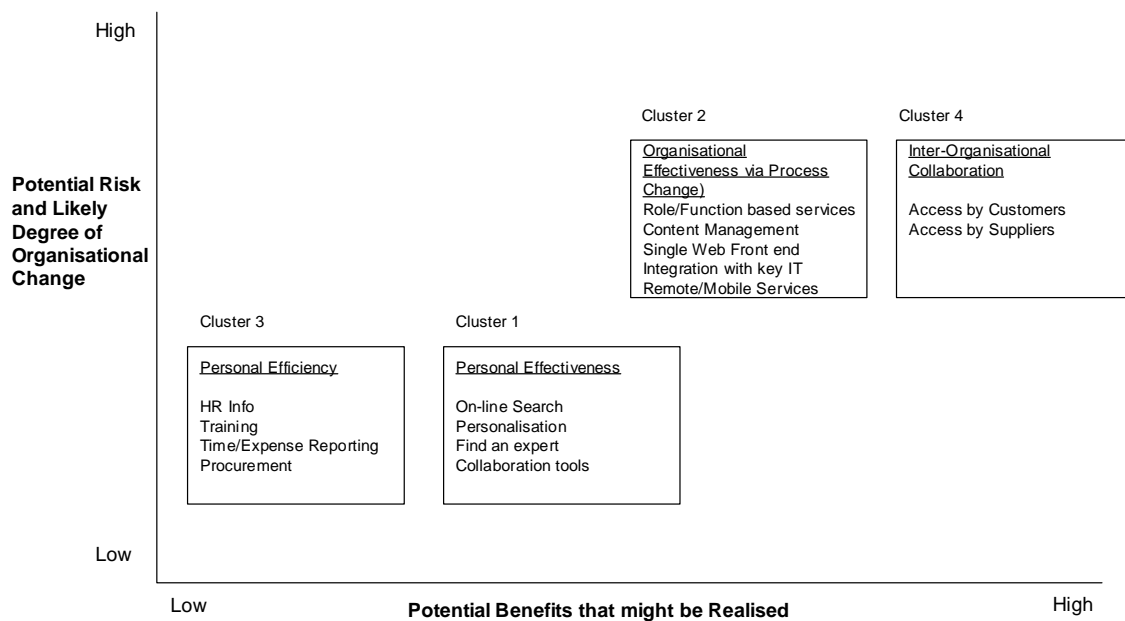

Figure 2: Service Clusters Sequence of Adoption

Achieving organisational improvement from an enterprise portal depends on the level and rate of adoption by individuals. This in turn, is dependent on the advantages individuals personally perceive from using the portal compared with existing ways of accessing information and applications, termed 'utility'. The cluster 3 functionality (self–service) appears to be an enabler of ensuring initial portal use from individuals, particularly if this becomes the only means within the organisation that individuals can use to complete such tasks. It would appear that utility benefits, which are often related to improved personal efficiency, should encourage regular usage of the portal, by the majority of staff. However, enterprise portals appear to offer an additional means of increasing utilisation. The collaborative features offered by many portals can increase the interaction or 'connectivity' of individuals to others, both within and outside the organisation. Effective interaction with colleagues is often essential for individuals to be able to carry out their roles and therefore presents a more compelling reason for frequent usage (Joinson, 2003). As with other networks, externality effects result in the perceived value of such connectivity increasing as more individuals make use of the system. Whilst other collaborative systems offer such connectivity, the unique combination of both utility and connectivity provided by enterprise portals has led to them being dubbed *'user-centric'* (Reynolds and Koulopoulos, 1999).

Having generated appropriate levels of usage amongst individuals the clusters identified suggest the realisation of organisational performance improvements requires more significant process and role changes. This is consistent with the findings from research studies of other forms of enterprise-wide information systems; successful implementation of the technology, of itself, gives rise to few organisational improvements. Rather, it is the associated changes to processes and working practices that yield the most significant organisational benefits (Davenport, 1998). A significant argument for many enterprise portal developments is improved access to information within the organisation. A study by Daniel and Ward (2003) of enterprise portal adoption within local government found that the project had been recognised as one of organisational change, rather than technology implementation, and change managers within the lines of service had been tasked with developing and implementing new roles and working practices alongside deployment of the technical aspects of the portal.

Whilst it was not the intention of this study to develop a stage model of enterprise portal deployment, Figure 2 shows some similarity to such models. Stage models for adoption of IS were first popularised by Nolan (1973) and despite criticisms of their general applicability, have had a significant influence on the management of information systems over the last thirty years. These models are premised upon the notion that, at each stage of development or adoption, the organisation gains experience and dissipates uncertainty and risk. While we have found evidence that the stages are broadly sequential in the sample as a whole, this does not preclude the possibility that individual firms may stop, retrench or indeed skip a stage.

8   CONCLUSIONS

This study sought to explore the role enterprise portals can play in addressing both the organisational and individual perspectives of information systems. Considerable interest has been shown in the practitioner community with such portals being described as the next organisational application platform of choice, and considered to offer benefits over both client/server and thin client arrangements (Butler, 2003; Davis, 2004).

This study makes contributions to both academics and practising managers. Academics interested in improving the use of information systems within organisations have for some time called for the need to balance the individual and organisational perspectives of those systems (Orlikowski, 1992; Jurison, 1996). The findings of this study, within the limitations discussed below, suggest that the rich set of services and functionality that can be incorporated in enterprise portals can allow such systems to address both of these perspectives. Our findings also suggest that from the consistent pattern of adoption observed in the study, that organisations themselves have recognised this ability. The sequence of their adoption suggests that they consider the route to addressing both of these perspectives is to commence with delivering utility and connectivity benefits for individuals. These, in combination, encourage regular and frequent use of the portal, facilitating the implementation of further functionality and process change across large numbers of users to improve organisational performance.

For practitioners the study offers a suggested approach to enterprise portal deployment. The study has identified a common pattern of adoption across the participating organisations. Whilst this has not been explicitly linked to the success of such deployments, this commonality suggests a route other organisations might wish to consider emulating. The study will also help organisations with the difficult issue of the justification of the portal deployments. Our findings suggest that if portal functionality is implemented in the sequence identified, then early benefits will accrue to individuals, but the organisational value will be difficult to measure. However, providing such benefits will create extensive use of the portal. Then, a more traditional approach to investment justification can be used to identifying, quantifying and realising organisational benefits, based on the additional application functionality available and changes to organisational processes and associated working practices.

9   LIMITATIONS TO CURRENT STUDY & FUTURE RESEARCH

The current study has a number of limitations. The sample upon which the study was based was small in size and the findings have therefore been presented as exploratory rather than confirmatory in nature. Future studies should aim to test the findings of this study on a larger sample and include organisations from a wider range of geographic locations. Vendors continue to develop the functionality available within enterprise portals. Inclusion of new services and functionality identified in more recent literature (Detlor, 2004) may lead to the identification of additional clusters to those found in this study.

In addition to the quantitative approach adopted in this study, qualitative studies should be undertaken to explore enterprise portal adoption and use within different types of organisations. Such studies, although not generalisable, can reveal the rich inter-relationships between individual effectiveness and organisational performance improvements, much of which may be expected to be highly context specific. They can also determine in greater detail the nature of changes to processes and roles that are required to ensure organisational benefits are realised from enterprise portal adoption in such contexts. Enterprise portals are currently being deployed by a large number of organisations. Further studies will help ensure that, rather becoming a costly additional layer of software that *'inherits the inertia of the installed base of systems that have come before'* (Bowker and Star, 2000, p.33), they become an effective means of unlocking the information sources and applications within an organisation in a way that meets the requirements both of individuals and the organisation as a whole.

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Appendix: Survey Instrument

**Enterprise Portals:
Unlocking Organisational Performance**

In this questionnaire the term **enterprise portal** is used to describe a secure web-location that can be personalised and that allows staff and external partners access to and interaction with a range of applications and information sources.

1. Status of your Enterprise Portal deployment or plans

1.1 Which of the following statements most clearly describes your organisation?

We have implemented an enterprise portal that is now operational ☐1
We are currently implementing or planning an enterprise portal ☐2
We have no plans to implement an enterprise portal ☐3
If you have no plans, please explain why
not………………………….….…………………………………………...…
………………………………………………………………………………….....................................

2. Services and Functions Offered

2.1 Please indicate which of the following services or functionality you currently offer or plan to offer via your enterprise portal.

	Currently available	Under development	Intended	No plans
A single web-front end to existing intranets and other internal information sources	☐	☐	☐	☐
Integration with key enterprise applications	☐	☐	☐	☐
HR policies and procedures	☐	☐	☐	☐
Training (on-line training or info on traditional training)	☐	☐	☐	☐
Time or expense reporting	☐	☐	☐	☐
Procurement (indirect goods)	☐	☐	☐	☐
On-line search across all information sources	☐	☐	☐	☐
Personalisation	☐	☐	☐	☐
Find an expert – search for internal expertise	☐	☐	☐	☐
Collaboration tools (group calendars, shared documents, web based discussions)	☐	☐	☐	☐
Role/location or function based services	☐	☐	☐	☐
Access by customers	☐	☐	☐	☐
Access by suppliers or other business partners	☐	☐	☐	☐
Remote or mobile access	☐	☐	☐	☐
Content/publishing management	☐	☐	☐	☐
Other, please specify				
………………………………………………………….	☐	☐	☐	☐
…………………………………………………………..	☐	☐	☐	☐

Appendix 2: Cluster Analysis Dendogram

```
Dendrogram using Average Linkage (Between Groups)

            Rescaled Distance Cluster Combine

           0         5        10        15        20        25
  Label    +---------+---------+---------+---------+---------+

  HRINFO                                                        Cluster 3
  TRAINING
  TIME/EXPENS
  PROCURE
  SEARCH
  EXPERT                                            Cluster 1
  COLLABTIVE
  PERSONAL
  ROLE/FUNCT
  CONTENT
  ITINTEG                                           Cluster 2
  REMOTE
  WEBFRONT
  CUSTACC                                           Cluster 4
  SUPPACC
```