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Knowledge Portal for Addressing Corporate Sustainability Issues: a Conceptual Framework

S. Renukappa , C. Egbu and B. Kumar

School of the Built and Natural Environment, Glasgow Caledonian University, Glasgow G4 0BA, Scotland, UK; Suresh.Renukappa@gcal.ac.uk ;C.Egbu@gcal.ac.uk; B.Kumar@gcal.ac.uk

In the 21st century, organisations are faced with complex challenges stemming from increasing opportunities to create economic value by integrating corporate environmental and social responsibility change issues into business. Due to globalisation and the complexity of issues associated with working in a knowledge economy, the potential offered by emerging information and communication technologies along with commitment to the principle of sustainability pose profound strategic challenges for businesses. These complex challenges call for new and innovative solutions and approaches; and they demand new knowledge, resources, and perspectives often found outside current organisational processes and practices. A major challenge facing organisations is uncovering the most effective methods of capturing, mapping, sharing and applying stakeholders' knowledge en route to economic value creation by integrating corporate environmental and social sustainability issues into business. Hence, for organisations, a robust knowledge management (KM) approach or framework for continuously yet effectively, addressing the sustainability issues is desirable. Corporate knowledge portals present the potential for providing organisations with a rich and complex shared information and knowledge workspace for the generation, capturing, mapping, sharing and using of collaborative knowledge which addresses sustainability issues for decision making.

This paper primarily reports on the findings of an on-going research study, which is focused on managing change and knowledge associated with sustainability initiatives for organisational competitiveness. It involved semi-structured interviews with twenty six professionals from seventeen UK organisations in four sectors - construction, utility, transportation and non-governmental organisational sectors. It reviews the key concepts of sustainability and KM, and challenges associated with managing stakeholders' knowledge in addressing sustainability issues. It also presents a conceptual knowledge portal framework for organisations to manage stakeholders' knowledge in addressing sustainability issues. The paper concludes that taking the knowledge of stakeholders into account can be particularly useful in addressing sustainability issues. The key challenges impacting on the successful implementation of knowledge portals to address corporate sustainability issues effectively are lack of leadership, commitment from top management, organisational culture, people and technology.

Keywords: collaboration, corporate social responsibility, knowledge portal, stakeholders, sustainability.

INTRODUCTION

Reports in the academic, business and popular press make it clear that the world in which business operates today is different from the world of two to three decades ago. This is primarily due to globalisation, the knowledge economy, demographic shifts and migration, degradation of natural resources, and diminishing social and community structures (Connor and Mackenzie-Smith, 2003). The recent corporate scandals associated with Enron and WorldCom in the USA, and Parmalat and Vivendi in Europe, together with the collapse of Arthur Andersen have significantly reduced worldwide public trust in the corporate community. On 11 September 2001, the terrorist attack on the World Trade Center in New York and the Pentagon, and the recent 7 July 2005 terrorist attack in London, presented an unprecedented crisis not only for the businesses located there but for others as well. Other issues such as employee rights, sexual harassment, smoking in the workplace, product safety, occupational health and safety, bribery and corruption, deceptive advertising, and so on have not been characterised as being of crisis proportions. Nevertheless, to businesses these are formidable social and environmental issues that have evolved over time and that must be addressed (Carroll and Buchholtz, 2006). To address the above issues and challenges, sustainability offers business leaders a 21st century framework.

Many management scholars and consultants have argued that sustainability offers terrific opportunities for progressive organisations; and innovation is one of the primary means by which companies can achieve sustainable growth (Porter and Vander Linde, 1995; Hart, 1997). As Hart and Milstein (1999) noted, foresight is the key to survival. Managers that are able to perceive trends and weak signals where others see only noise or chaos can capitalise on the changing nature of the market to reposition their firms before new entrants become a serious threat. Today's corporations can seize the opportunity that sustainability offers (Hart and Milstein, 1999). For the purpose of this paper, sustainable urban environment is defined as "a complex integrated system (a mix of natural elements and the built environment) with an ability to absorb changes to key sustainability variables (environmental, economic and social), while answering the needs of the present and future users (community, business and citizens)". Businesses that integrate sustainability into their strategy and operations seek to ensure environmental, social and economic returns for both shareholders and stakeholders. In order to execute a successful sustainability strategy, organisations need to know what their competitive advantage is and what capabilities they need to grow in order to maintain this advantage.

Managers appear to have considerable difficulty in dealing with sustainability pressures. In particular, their innovation strategies are arguably inadequate to accommodate the highly complex and uncertain nature of sustainability demands. Sustainability-oriented business innovation is therefore usually more complex (because there is typically a wider range of stakeholders) and more ambiguous (as many of the parties have contradictory demands). As organisations try to meet these challenges, knowledge is increasingly being seen as important for innovation and for producing knowledge intensive services desired by society so as to maintain competitive advantage. The management of knowledge is therefore increasingly considered an important source of sustainable competitive advantage (Hamel and Prahalad, 1994; Nonaka and Takeuchi, 1995). Companies that actively manage knowledge and respond to a wide range of sustainability indicators (economic, social and environmental) are better able to create value for all these stakeholders over the long term (Funk, 2003).

Knowledge Management (KM) is the process of creating value from an organisation's intangible assets. It deals with how best to leverage knowledge within and between

organisations and with their stakeholders. According to Davenport and Prusak (1998), “knowledge derives from minds at work”. It is the fluid mix of framed experience, values, contextual and actionable information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. For the purpose of this paper, KM is defined as a systematic and integrative process by which a company creates, captures, maps, shares and learns collectively from employees, stakeholders and the outside world in pursuit of the major organisational sustainability goals.

This paper is part of an on-going PhD research study which is focused on the management of change and knowledge associated with sustainability initiatives for organisational competitiveness. A pilot study was conducted prior to a main study. The pilot study involved twenty six professionals from seventeen UK organisations in four sectors - construction, energy and utility, transportation and non-governmental organisational sectors. The pilot study, among other things, sought to investigate the main challenges that confront organisations in dealing with change and KM within the context of sustainability initiatives. The main research questions we sought to address here are: what are the key challenges for managing knowledge associated with sustainability initiatives and how do knowledge portals facilitate the diffusion of knowledge associated with sustainability initiatives among stakeholders? The following section elaborates on the research aim, objectives and methodology.

RESEARCH OBJECTIVES AND METHODOLOGY

This paper draws from an on-going doctoral study entitled “managing change and knowledge associated with sustainability initiatives for organisational competitiveness”. The aim of this research is to investigate how companies are managing change and knowledge associated with sustainability initiatives so as to improve their competitiveness. The objectives of the study are:

1. To investigate and document the key sustainability (environmental, social and economic) and key KM (capturing, mapping and sharing) initiatives needed to effect change that are currently being implemented in oraganisations of different sizes.

2. To critically appraise and document the main challenges associated with implementing key sustainability and key KM (capturing, mapping and sharing) initiatives needed to effect change in organisations.

3. To explore and document the different techniques and technologies for capturing, mapping and sharing sustainability knowledge needed to effect change in organisations.

4. To critically appraise and document the extent to which sustainability and key KM (capturing, mapping and sharing) initiatives needed to effect change contribute to organisational competitiveness in organisations.

5. To develop an integrated framework for managing change associated with key sustainability initiatives for the benefit of organisations.

6. To develop an appropriate training tool for improved awareness and understanding of the role which key sustainability and KM (capturing, mapping and sharing) initiatives, needed to effect change, play in improving organisational competitiveness in organisations.

In achieving the aim and objectives of this research, a robust methodology is essential. Broadly, the research process is identified into three key phases within its flexible boundaries. The three phases are the literature review, the pilot study and the main study. The development of the research work started with the literature review. The review of literature involved background study on challenges, critical success factors, benefits and gaps in change management, KM and sustainability areas. This resulted in the development of a theoretical framework.

Denzin *et al.* (1998) suggest that when there is a high degree of unpredictability, a pilot study is a good means to add value to the research. A pilot study allows the researcher to focus on particular areas that may have been unclear previously (Yin, 1994). The initial time frame of the pilot study allows the researcher to develop and solidify a rapport with the participant as well as to establish effective communication. In this PhD study, prior to the main study, a pilot study was undertaken which helped refine data collection plans with respect to both the contents of the data and the procedure to be followed.

The pilot study, which is reported in this paper, was interview-based and semi-structured in format. The pilot study involved twenty six interviews from seventeen UK organisations across four sectors - construction, energy and utility, transportation and not-for-profit organsiations. Those who participated included board members, directors, and managers responsible for corporate environmental, social and economic sustainability initiatives in organisations. Semi-structured interviews provide some flexibility and it is one of the ways to obtain a realistic picture of an individual's view (McCormack and Hill, 1997). The interviews in the pilot study lasted between thirty minutes and one hour. The format of these interviews was face-to-face. All face-to-face interviews were recorded with permission and later transcribed. As part of the analysis of the interviews, content analysis was employed.

The main study is planned to involve both qualitative and quantitative research approaches. The collected data will be analysed using the Statistical Package for the Social Sciences (SPSS) and the Non-numerical Unstructured Data Indexing Searching and Theorising (NUD*IST) software. The results derived from the data analyses will enable the development of an integrated management model for managing change and knowledge associated with sustainability initiatives for organisational competitiveness, an information technology based awareness-training tool, and a guidance document on process improvements through managing change and knowledge associated with sustainability initiatives. The following section highlights some of the key challenges of managing knowledge associated with sustainability initiatives as revealed from the pilot study.

THE KEY CHALLENGES OF MANAGING KNOWLEDGE ASSOCIATED WITH SUSTAINABILITY INITIATIVES

MANAGING TACIT KNOWLEDGE

The challenge of managing knowledge associated with sustainability initiatives is a daunting task for any organisation. An organisation's knowledge resources are complex and multifaceted, ranging from tacit to knowledge that is explicitly represented (Nonaka and Takeuchi, 1995). Explicit knowledge is codified knowledge. For example, the explicit knowledge of construction site safety exists in accident records, safety regulations and safety guidelines. Knowledge codification arguably reduces the cost of knowledge acquisition because the information content of codified knowledge becomes searchable, identifiable, accessible, transferable, reproducible and storable. However, knowledge can remain tacit and difficult to measure. Tacit knowledge makes a vital

contribution to knowledge generation and distribution. Tacit knowledge is more difficult to formalise, impart to others, exchange, or purchase because it resides in peoples' beliefs, experiences, values, organisational routines, and institutions (Huseman and Goodman, 1999). For example, in construction site safety, safety hazard recognisation is an important actualisation of tacit knowledge. Safety hazard knowledge is considered a tacit knowledge because it relies on safety experience. In this study, 18 out of the 26 (69%) of the interviewees agreed that managing tacit knowledge is a challenge. Lack of time, lack of techniques for knowledge capture and sharing, lack of an appropriate culture, and lack of rewards are highlighted as some of the main concerns associated with managing tacit knowledge related to sustainability initiatives.

TECHNOLOGICAL ISSUES

The implementation of appropriate technological tools to facilitate KM is an issue. Certain technologies can go a long way to make knowledge exchange far easier and more efficient. Appropriate technology is likely to be the single most important factor in leveraging knowledge in organisations. Brown (1998) argued, based on work in Xerox, that organisations should be seen as 'communities of communities', and that new technology such as intranets are well suited to provide support to the development of effective communication, both within and between communities. The technological potential to support collaboration may be available, but problematic socio-technical issues with respect to intra-community knowledge sharing have to be addressed. The idea of 'workplace portals' with an effective mix of structured and unstructured access to knowledge can help the process a great deal. The explanation also alludes to the fact that while KM technology is giving companies more sophisticated and easier ways to break down barriers, knowledge sharing still depends on people. Knowledge sharing across the organisation is increasingly used as a strategic tool to boost customer service, decrease product development times, and to share best practices. Computer systems that are networked across the organisation boundaries can improve the flow of knowledge to meet the business objectives. However, technology is merely the enabler (Mohrman *et al.*, 2002). In this study, 21 out of the 26 (81%) of the interviewees agreed that an information and communication technology infrastructure provides a broad platform for exchanging data, coordinating activities, sharing information and knowledge, and supporting e-commerce. However, many issues concerned with the human aspects of the use of computer-based systems remain problematic despite technological advances. An enhanced ability to collect and process data, or to communicate electronically across time and space, does not necessarily lead to improved human communication and action (Walsham, 2001).

SUPPLY CHAIN CHALLENGES

The challenge of capturing, organising and disseminating knowledge associated with sustainability initiatives throughout the aggregate supply chain is a huge undertaking. Complexity increases by several magnitudes when one considers a multi-tiered supplier chain in which numerous dynamic interactions happen between several suppliers and manufactures, distributors and clients. The flow of knowledge between these interfaces is critical to the success of the supply chain (Desouza *et al.*, 2003). The amount of knowledge transferred from a person within an organisation to the partners will be influenced by the level of trust between the two organisations (Davenport and Prusak, 1998). For the supply chain to be optimized, all elements of the supply chain must be connected to enable the flow of knowledge associated with sustainability. Connectivity is the first attribute to allow the flow of knowledge throughout the supply chain. The second attribute is the communication of sustainability knowledge in a fashion that allows all the users in the supply chain to make business decisions that maximise client value while reducing social and environmental impact. The third attribute of supply chain KM systems is the ability to

collaborate in a real-time fashion, encouraging knowledge sharing and allowing the supply chain to adjust to market changes in a more ethical way. There are many problems with finding key knowledge assets in the supply chain and being able to exploit the knowledge in an efficient and cost-effective manner. In this study, 16 out of 26 (61%) of the interviewees agreed that managing knowledge of supply chain is a huge challenge. The main concerns for an organisation in managing supply chain knowledge are: limited control over the behaviour of suppliers and customers; a lack of experience in managing external knowledge; and a lack of financial resources to exert control over external sources of knowledge.

MANAGING STAKEHOLDER KNOWLEDGE

A sustainable organisation is one whose characteristics and actions are designed to lead to a 'desirable future state' for all stakeholders. Sustainability requires the recognition of a wide range of stakeholders, including secondary ones (such as environmental groups) that are not directly involved in a market relationship but can still greatly affect a company's business. The additional interacting pressures from social and environmental concerns make sustainability innovation more complex than conventional market-driven innovation. Past research on innovation dynamics has implicitly recognised the importance of primary stakeholders (such as suppliers, complementary innovators and customers) but has not fully appreciated the role of secondary ones that are often highly influential in sustainable development innovation (Carroll and Buchholtz, 2006). Stakeholder ambiguities, because of the various stakeholders, often have disparate goals, demands and opinions. They can easily interpret the same situation differently, especially when the information and knowledge necessary to make informed decisions is limited.

Of the interviewees who participated in the pilot study, 23 out of 26 interviewees (88%) agreed that managing stakeholders' knowledge, in particular capturing and sharing stakeholders' knowledge, is a key challenge. This may be due to an organisation's limited control over the behaviours of stakeholders, and certain stakeholders could simply have irreconcilable differences with one another based on ethical, religious, cultural, social or other issues. However, when the unique knowledge of various stakeholders is pooled and used to solve corporate problems, it is suggested by the interviewees that new practices and strategies emerge that benefit all constituencies - just as entrepreneurship is recognised as the source of economic, environmental and social progress. Stakeholder collaboration can be viewed in this light as an extension of the entrepreneur's role to include stakeholders as active partners in value creation (Halal, 2000). The following section highlights the concepts of a knowledge portal and a conceptual framework for addressing corporate sustainability issues.

A KNOWLEDGE PORTAL FRAMEWORK FOR ADDRESSING SUSTAINABILITY ISSUES

In today's information economy, rapid access to knowledge is critical to the success of many organisations. The widespread adoption of networks and information technology has vastly increased our ability to store, transfer and generate knowledge; this has enabled and accelerated the emergence of an economic, organisational and technological landscape which is knowledge-based. Technology is a powerful enabler of KM objectives. KM tools can be defined as tools which support the performance of applications, activities or actions such as knowledge generation, knowledge codification or knowledge transfer (Ruggles, 1997). Information and Communication Technology enables KM activities for collaborative decision support, information sharing, organisational learning and organisational memory (Tiwana, 2002).

Most of the interviewees involved in the pilot study agreed that a major challenge facing organisations is uncovering the most effective methods of capturing, mapping,

sharing and applying stakeholders' knowledge en route to economic value creation by integrating corporate environmental and social sustainability issues into business. Hence, for organisations, a robust KM approach or framework for continuously yet effectively addressing the key sustainability issues is desirable. Corporate knowledge portals, a particular type of KM system, seem to present the potential for providing organisations with a rich and complex shared information and knowledge workspace for the generation, capturing, mapping, sharing and using of collaborative knowledge for addressing sustainability issues.

Corporate knowledge portals are a relatively new business concept. They offer a single point of access for the pooling, interaction, and distribution of organisational data, information and knowledge (Aneja *et al.*, 2000). While it is true that knowledge portals are useful because this technology can bring about cost reduction, organised and structured information and knowledge, and reduced access time, their competitive advantage is inherent in their abilities to filter, target and categorise information and knowledge so that users will get only what is needed (Eckel, 2000). Knowledge portals have fairly complex structures and features. However, their basic functions and elements are relatively easy to define. Firstly, from an operational perspective, the strength of corporate portals lies in their ability to provide web-based access to organisational information, applications and processes. Secondly, from a functional perspective, they leverage existing information systems, data stores, networks, workstations, servers and applications as well as other knowledge bases to give each employee in every corporate site immediate access to an invaluable set of corporate data, information and knowledge, anytime and anywhere (White, 2000).

A generic framework of a corporate knowledge portal showing some of the major applications, entities, capabilities, tools and their relationships is presented in Figure 1. The framework is adapted from the work of Aneja *et al.* (2000). It is especially relevant to this study because it is easy to understand, and yet it is comprehensive enough to show most of the corporate portal's complex functions and features.

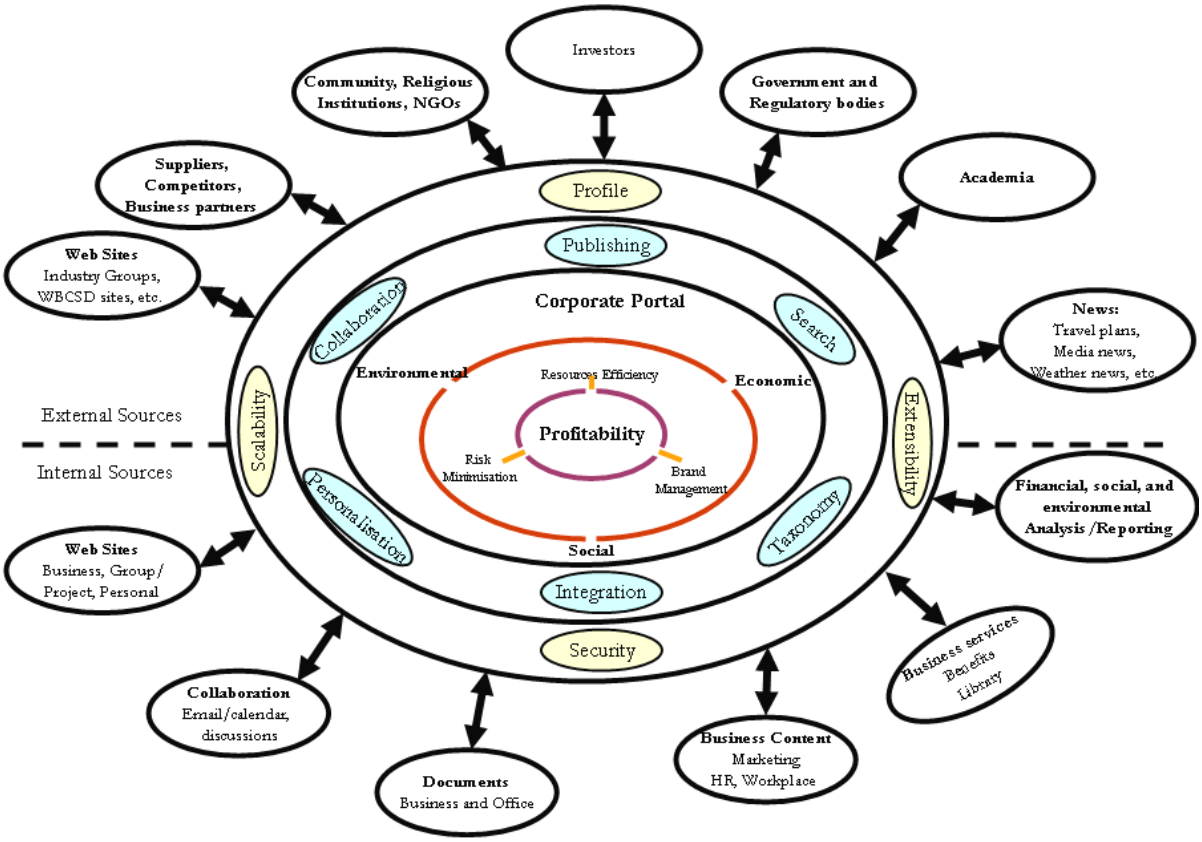

Fig. 1: A Conceptual Knowledge Portal Framework for Addressing Corporate Sustainability Issues.

As seen in Figure 1, the corporate knowledge portal framework essentially consists of two primary layers. At the core of any corporate knowledge portal framework are the applications it purports to support. These applications can be quite diverse. They can range from unit-specific to organisational-wide capabilities, staff to administrative support functions, and individual to system-wide inquiries. Both internal and external stakeholders can access all of these applications. These stakeholders or users are located outside the second layer which consists of various web-based drivers. These drivers provide easy access capabilities to the disparate database and reports generated. A corporate knowledge portal's feature can be classified into three categories: core capabilities, supportive capabilities and web services.

Core capabilities: These are the tools that support the knowledge development phases and consist of:

Taxonomy**:** Taxonomies are sometimes called 'classification schemes' or 'categorisation schemes'. Each refers to the grouping together of similar items into broad 'buckets' or 'topics', which themselves can be grouped together in ever-broader 'hierarchies'. The benefits of taxonomies include search, support, navigation, data control/mining, schema management, and personalisation / information delivery.

Publishing**:** This is a facility that supports content creation, authorisation and inclusion. It also includes the ability to render or publish documents in alternate formats including HTML, PDF, XML, etc. in portal content collections.

Search**:** The documents created by employees, suppliers, customers and competitors that remain isolated in various places are often the most important information and

knowledge available to an organisation. Therefore an integrated search capability across multiple information repositories is essential.

Personalisation**:** Based not only on the ability to enable users to modify their own interfaces and specify their preferences, but also the ability of the system to use such information to dynamically deliver specific content to users in order to propose to them the most relevant information to perform their job. Personalisation includes both push and pull technologies.

Integration**:** The ability to present a unified view of corporate information that integrates information from different organisational repositories, instead of having corporate information spread across many sources within the organisation.

Collaboration**:** Corporate portals can also give organisational participants the ability to create a shared community because they present a natural forum for online collaboration by assembling a set of content and services to which members of a group have special accesses. Collaboration can also entail offering native portal services such as threaded conversation, and project management tools such as task lists, calendars, document sharing or instant messaging.

Supportive capabilities: These are mainly tools necessary for the well-functioning of the corporate portal and consist of security, profiling, scalability and extensibility.

Security**:** The ability to secure access to a diverse range of resources with incompatible security controls is an enormous challenge for corporate portals.

Profiling**:** A technique aimed at sending personalised information to the user depending on his/her profile. Two techniques can be used: explicit profiling based on the expressed preferences of the user; or implicit profiling based on data obtained from the human resources.

Scalability**:** The ease with which the system can expand to support an increasing number of users or can be modified to fit the problem area.

Extensibility**:** 'Gadgets' are new application tools and services in the portal which are provided via modular components. 'Gadgets' provide the architectural construct to enable future extensibility without having to completely redevelop the portal. By using gadgets, new functionality could be easily added.

Web services: A wide range of services that the firm can provide to users, ranging from analyses and news to an e-marketplace where a company offers employees discounts on products and services that it has negotiated with vendors.

Many authors suggest that leadership commitment is a key challenge for the success of any KM initiatives (Nonaka and Takeuchi, 1995). If management spends a significant amount of resources on either purchasing or developing and implementing such technology, employees could interpret this as a sign of management's support for this ideal and act accordingly. However, as Martinsons (1991) acknowledges, if employees perceive that management is not very committed to implementing this new technology then the initiatives to promote a strong knowledge sharing culture are unlikely to be successful. Commitment also extends to providing appropriate training for staff to use such technologies.

CONCLUSIONS

Effectively managing knowledge associated with sustainability initiatives could lead to the creation of new ways of working, new products, services and processes, and new market space. Pursuing such an approach can offer organisations significant potential benefits, including the identification of new and untapped business opportunities, a greater focus on longer-term emerging customer needs, migration into business areas that, by definition, have greater longevity, and the ability to create a genuine 'win-win' situation for both business and society.

It is clear that managing sustainability knowledge is a complex process. Knowledge in organisations is dynamic in nature and is dependent on social relationships between individuals for its creation, sharing and use. Managers continue to strive for productivity, innovation, profitability and other competitive goals. They would, however, do so more effectively by harnessing the knowledge of their stakeholders. Conversely, stakeholders would continue to strive for social benefits, which they would achieve by sharing knowledge and forming pragmatic relationships with management. This paper has highlighted some of the complexities and challenges associated with managing sustainability knowledge for improved organisational competitiveness. A background to sustainability, KM and portals has been documented. The proposed research aim, objectives and research methodology have been discussed. In addition to this, a conceptual knowledge portal framework for managing knowledge associated with sustainability initiatives has been developed and discussed.

The paper concludes that taking the knowledge of stakeholders into account can be particularly useful in addressing sustainability issues for decision making. Since knowledge is now the strategic asset in modern economies, managing it increases the supply of this critical resource, which then leads to a clearer understanding of tensions and problems in stakeholder relations. It raises the general level of trust and initiates the search for creative solutions. Corporate portals seem to present the potential for providing organisations with a rich and complex shared information workspace for the generation, exchange and use of knowledge. They synchronise knowledge and applications, creating a single view into the organisation's intellectual capital. But developing corporate portals and building the critical mass of users required to make them successful is not an easy task. For the successful implementation of knowledge portals to address corporate sustainability issues, due consideration should be given to issues associated with effective leadership, commitment from top management, organisational culture, people and technology.

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