The Diffusion of Sustainability Ideas, Products and Processes within Business Networks

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ABSTRACT

Sustainability, defined in terms of "development that meets the needs of the present without compromising the ability of future generations to meet their needs" (BrundtlandComission WCED Report, 1987; P43) is becoming a very important issue within organisations. To date there are no appropriate theories to describe how sustainability can be effectively planned and managed within organisations and poor management of sustainability can severely impact upon corporate image and reputation which in turn can adversely affect a firm's shareholder value and market capitalisation. The purpose of this study is to develop a theoretical framework to evaluate how sustainability ideas, products and processes are created and diffuse within a relational network of interacting organisations and stakeholders (actors).

Network theoretical approaches derived from the Industrial Marketing Purchasing (IMP) Group and Actor Network Theory (ANT) perspectives combined with Service Dominant Logic are believed to provide a better understanding of how sustainability is co-created and established amongst the different actors as well as providing suitable of explanations of the success and failures for different sustainability initiatives within organisations from the presence or lack of presence of suitable networks or network characteristics.

Key Words: IMP, Sustainability, Business Networks, Diffusion of Innovations

INTRODUCTION

Sustainability[i], defined in terms of "development that meets the needs of the present without compromising the ability of future generations to meet their needs" (BrundtlandComission WCED Report, 1987; P43)[ii] and interpreted as effectively managing the Planet's scarce resources in order to minimise their depletion (Brown et al, 1987) is increasingly becoming an important issue (Cronin et al, 2010; Hunt, 2010; Sheth et al, 2010; Starik&Rands, 1995). Although concerns over the environment have been predominant since the middle of the eighteenth century and peaked during Victorian times[iii] (Lumley & Armstrong, 2003) it has significantly increased in importance since the 1980s [iv](Hart, 1997; Hawken, 2010; Tueth, 2010). Ever increasingly,privatised,for-profit organisations are being made even more

accountable than before for their environmental and social impact and are being pressurised to take responsibility in solving the problems[v] (Collins et al, 2006). The reasons for their greater involvement[vi] could be due to them being the major culprits contributing to the problem. Alternatively the major corporations,due to their diverse, global presence, are currently being perceived as modern daymajor social institutions of power, like governments and the Church before them, controlling economic and social power (Bakan, 2004). The focus on sustainability solutions to date has been based primarily on technology; involving the development of cleaner products and processes but it should also include managerial and social processes as the problems are usually complex, interactive, mixed ecological-economic issues involving the natural and social sciences (Norberg,2008).The purpose of this paper is to develop a theoretical framework to understand how sustainability ideas, products and processes are developed and become established within organisations. The intention is to design and undertake an empirical study involving case study research order to explore and develop a theoretical understanding of sustainability within organisations.

The pathways involved in the creation and diffusion of sustainable products and processes are important from a managerial perspective as it provides a framework for future sustainable production. Therefore understanding the network of stakeholders involved as well as the critical factors involved in gaining their support for sustainable projects in needed to provide a solid grounding for understanding the risk profile of sustainable projects. Therefore a better understanding of the processes of the diffusion of sustainable innovation within a network should provide a basis for more efficient strategy formulation for future innovative, sustainable projects.

THEORETICAL LIMITATIONS TO UNDERSTANDING SUSTAINABILITY

Many sustainability initiativeshave been successfullydeveloped but they have also beenrelatively slow in terms of adoption and diffusion throughout the World. However, there are also an equal number of organisations who are struggling and even within single organisations there are examples of mixed stories of successes and failures regarding sustainability projects (Abbett et al, 2010).This is supported by PatermanninVanDijken et al (1999) who claim that considerable progress and advancement had been made in the knowledge of the environmental problems with solutions being developed and targeted at cleaner production techniques and processes supported by European Union (EU) Research and Technological Programmes. Unfortunately, the diffusion and adoption of innovative, cleaner technologies in the 1990s had been slow, particularly in Small and Medium Enterprises (Patemann in Van Dijken et al, 1999). Therefore a research proposal was recommended by *the EU Environment and Climate RTD Programme* under the section *of the Human Dimension of Environmental Change* to study the dimensions and actions needed to be taken that would result in a faster adoption and wider use of cleaner technologies (Patemann, ibid)

As environmental threats and resource issues are increasingly becoming severe it is important that organisations have appropriate strategies in place to handle them. Therefore one should have a good theoretical understanding of how sustainability operates within organisations and society but to date, there has been little empirical research undertaken to understanding how sustainability ideas, products and processes are created and diffuse within organisations and finally becoming established as the status quo. The creation of sustainability ideas, products and processes within organisations can be considered as an innovation process therefore requiring theinvolvement of new product/process development strategies. It is envisaged that

the adoption of sustainability as a concept as well as adopting ideas, products and processes are complex issues (Norberg et al, 2008) requiring major change strategies involving shifting attitudes, beliefs and possibly values within organisations, consumers and society.

To date the focus of extant sustainability research has been on single organisations and this is believed to be inappropriate by this research group. Modern day organisations are less likely to be single hierarchical, institutional structures with clearly definable boundaries demarking the division between the firm's external and internal environment (Powell, 1990). Organisations are increasingly outsourcing their processes (Kytle&Ruggie, 2005) therefore creating networked organisational forms consisting of focal firms embedded in a network of interacting relationships and co-creating value with third party organisations. Even internally organisations can be considered as a network of different functions interacting with each other as well as with functions in other organisations defined as intra and inter organisational networks respectively (Ritter et al; 2004; Wilkinson, 2008). This is evident with the increasing use of internal supplier agreements between departments and the fact that internal departments can also compete with external suppliers for quotes and provision of services to serve their internal audience. Production departments are often encouraged to contract out their services if they have redundant capacity. Therefore sustainability ideas are believed to be generated within one or more of the firms embedded in the network and eventually diffuses throughout the network over time to finally becoming established throughout the network. Ideas, activities, resources and riskare shared and ideas, products, processes and value are co-created by the different actors in the network. It is envisaged that a network theory of sustainability may provide a better theory of sustainability within organisations and society as well as provide possible explanations for the success or failures of sustainability initiatives.

DEVELOPING A THEORETICAL FRAMEWORK TO EVALUATE THE CREATION AND DIFFUSION OF SUSTAINABLE PRODUCTS AND PROCESSES

Actor-Network Theory (ANT) (Law and Hassard, 1999) suggests that the success of a project, network or industry is reliant on the all actors, materials and semiotics acting together as a coherent whole (Newton, 2002). Therefore the success of sustainable products and processes are not created within single organisations but are influenced at the very least by governments and other stakeholders including consumers, legislators, regulators and business networks as well as the materials and semiotics used in process (Milne et al., 2006). Organisations that are effected by the development of sustainable products and processes are not passive participants but are believed to be interactive participants embedded in a relational network of interacting external and internal stakeholders suggesting that creators of innovative ideas and powerful managers are equally likely to drive sustainability as well as end consumers. To date research in this area has focused on innovative companies as closed systems, creating and defusing sustainable innovation in isolation of the societal and business networks. Therefore traditional, closed system, transactional research is not believed to be appropriate to research the creation and diffusion of sustainability as the adoption process will be influenced by complex interacting networks of stakeholders influenced by historical relationships (Nohria, 1992; Wood, 2010). Therefore Industrial and Marketing Purchasing Group (IMP) (http://www.impgroup.org/about.php), Service Dominant Logic (SDL) (Vargo and Lusch, 2004, 2008) and ANT (Mclean and Hassard, 2004) approaches to viewing supplier organisations as embedded within a network where value is created within the network rather than in the originating organisation are better theoretical perspectives with

which to explain and expatiate the creation and diffusion of sustainability products and processes into society.

The IMP approach suggests that the adoption of new products and ideas (sustainable products & processes) within organisations from third party suppliers is influenced by all historical relationships (Hakansson, 1982) between the buyer and supplier organisations and brings into consideration all previous transactions as well as the interactions (Turnbull & Valla, 1986) between actors or stakeholders between both organisations. In addition later IMP studies showed that additional relationships with other parties, termed network influences (Hakansson&Johanson, 1992; Hakansson&Snehota, 1995) also affected current and future transactions between supplier and buyer firms. Prior to the IMP approach business ideas regarding the adoption of new products and ideas focussed solely on the latest transaction between buyers and suppliers and not any previous relationships or network interactions. Buyers and suppliers were assumed not to be influenced by third parties, being described as atomistic and opportunistic and driven primarily by price (buyers) and opportunity costs (suppliers). Buyers (customers) in the older business framework are perceived as powerless, passive consumers relative to the suppliers. The IMP approach should provide greater insights into how sustainable ideas and products are likely to be adopted by organisations influenced by their intra and inter-organisational networks.

The SDL approach further suggests that it is indeed impossible for a single originating company to develop any mark value *per se* (Vargo and Lusch, 2004). This philosophical shift in marketing theory suggests that all any individual organisation can do is create a value proposition for the market (Payne et al., 2008; Vargo and Lusch, 2008), it then falls on the other network participants to realise that value in the use of the value proposition (embodied through a product or service). Therefore any attempt to envisage how sustainable innovation can proliferate the market without a thorough exploration of all participants in that market would be mute.

ANT further suggests that actors (people or organisations) are inter-related and often indistinguishable to the ‘materials’ or ‘semiotics’ of their networks. ANT therefore suggests an alternative approach to data collection involving the use of Actor-Network biographies (Mclean and Hassard, 2004). ANT argues that influence and power in a network is affected through the production and reproduction of ‘actants’ (Mclean and Hassard, 2004) where humans and non-humans can be included in the analysis as influencers. The researcher searches for ‘generalized symmetry’ (Newton, 2002) where social and technical aspects of the network interlink, meaning that any *a priori* separation of the social and the physical world is prohibited (Callon, 1986). Thus, the actor network is realised through the common ‘enrolling’ of human and non-human participants into a network through processes of negotiation and translation.

Understanding of the means through which sustainable innovation can proliferate the market is therefore highly unlikely to be researchable without extensive in-depth exploration of the entire network landscape of stakeholders, actors, influencers, materials and semiotics. Case study methodology utilising Actor-Network Biographies is seen as the most appropriate method to capture the richness and complexity of the issues surrounding actors embedded in a network (Eisenhardt, 1989; Yin, 2003; Halinen&Tornroos, 2003) and therefore is the most appropriate method for investigating the development and adoption of sustainability products and processes.

The above mentioned network and SDL theories need be combined with diffusion of innovation theories (Rogers, 2003) in order to derive a suitable theoretical framework which will be able to track the pathway of adoption and diffusion within the network. Diffusion of innovation theories and studies has been developed in many fields including medicine, most of the social sciences, geography and education. Mahajan and Peterson (1985) have reviewed the innovation/diffusion research in different fields and attempted to develop generalised mathematical models of diffusion. In addition Valente (2005) reviewed a number of the original diffusion studies and re-interpreted them in terms of network theory. Using Valente's research one can think of innovation/diffusion and networks as being intricately linked. It is well known that the adoption of new ideas, products and processes never diffuse and get immediately adopted by the majority of the population; instead the speed of adoption/diffusion is determined by the network structure and the speed at which certain influential actors adopt and influence others within the network. Network structures can ease or impede the adoption and diffusion of innovations; it is a case of how do new innovations access a network in the first place. For example networks with 'strong ties' amongst actors are likely to share common sources of information and are unlikely to access or be open to ideas from external sources. Some actors within a 'strong tie' networkalso having 'weak ties' to external networks are likely to access new ideas. Therefore in a recent discussion with a general manager of a large restaurant chain one identified that the restaurant disposes its oil from frying food to farmers as a source of energy in farm machinery, identified as a sustainable innovative source of energy facilitated by the relationship and interaction that the restaurant owner has with the farmer. The restaurant also disposes large quantities of cork from the high volume of wine consumed in the restaurants. The cork is disposed by being transported to France. The manager has an idea of turning the cork into filler used for building materials in the construction business but cannot find any business interested in the prospect. Is this because he is not 'weakly tied' in a relationship linking the restaurant business with construction?

Therefore sustainability modelled as a diffusion of innovation issue with networks could provide useful insight, however caution is recommended as most of the empirical diffusion studies have involved simple ideas and products and not the adoption of complex integrated scientific- technical-social –economic – moral issues potentially involving significant change of attitudes, values and beliefs amongst individuals, groups, organisations and society. So can the diffusion framework cope with such complexity; can we rely on the hope that we have managed to work together to ban the use of CFC sprays that were destroying the Ozone layer and reach agreement amongst the US and former USSR Superpowers to reduce the stockpile of long range nuclear weapons?

CONCLUSION

The aim of the paper was to develop a suitable theoretical framework which could be used to empirically explore the creation and establishment of sustainability within business networks. Therefore the following propositions are forwarded as a conclusion to this section:

Propositions

- Sustainability ideas are not initiated and established within a single organisation but tends to be generated and diffuses across different organisations (actors) interacting in an embedded relational network

- Sustainability ideas, products and processes are classified as innovation and form part of the new product/process development strategies of marketing

- All organisations can be considered as intra-organisational networks of different functional actors interacting with one another

- Actors embedded within intra-organisational networks can also interact with inter-organisational ones.

- Networks provide suitable actor bonds, resource ties and activity links shared across the network to facilitate the adoption and diffusion of sustainability initiatives

- Failure of adoption or diffusion of a sustainability initiative can be explained by the lack of presence or a defect within a network or network characteristic.

- Sustainability adoption and diffusion is reliant on actors within networks having a good understanding or appreciation of complex technological - scientific – economic and social issues.

- Different actors are likely to be the main drivers of sustainability in different environmental contexts: regulators or government bodies in highly controversial or high environmental impact industries, highly motivated leaders (individuals) acting as change agents & championing initiatives and end stage stakeholders including consumer and ethical investor groups, activists.

- Sustainability initiatives are also reliant on the fact that objects and materials such as valuable resources of the Earth are also actors within Actor – Network theory

- Diffusion of innovation models linked to networks should provide an appropriate theoretical framework for sustainability although they have not been utilised to model such complex issues.

Research questions

- Where the idea of the sustainable product or process was originally conceived?
- What the primary motivating factors, materials and semiotics in developing the sustainable opportunity?
- What role do regulatory pressures play, how it affects the development process?
- Who are the primary stakeholders involved in ensuring success of the project, and how they influence the process?
- Are there likely to be other secondary stakeholders influencing the project, if so who are these actors and how will they affect the process?
- How was the idea conceived?
- What are the barriers to diffusion and how can theybe overcome?

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[i]Although one definition for sustainable development with term being popularised by the Brundtland Commission report the concept had been mentioned in earlier reports relating to the ‘limits to growth’ and ‘Green’ discourses of the early 1970s (Meadows et al.: 1974, The Limits to Growth: A Report for the Club of Rome, Potomac Associates and Pan Books, London and Sydney – (Lumley & Armstrong, 2003).

[ii] Sustainability has several definitions but the Brundtland Commission definition serves the purposes of our study and has survive the time.

[iii] According to Lumley & Armstrong,(2003) there has been little acknowledgement to the 19th century intellectuals who came from a wide range of disciplines and discussed sustainability issues concerning the social, economic and environment and used them in their search for justice and conservation of nature. They included Darwin, Malthus, Martineau and Mill.

[iv]Although environmental and resource issues have always been important, such as acid rain causing deforestation in Scandinavia, Chenobyl disaster and Three mile island nuclear disasters, Exxon Valdez oil spillage disaster, Depletion of the Ozone layer by CFCs and a heavy dominance on oil for hydrocarbons the concerns have magnified exponentially since 1980s due to increasing population and increased industrialisation of emerging BRIC (Brazil, Russia, India and China) countries placing incredible resource demands as well as increasing levels of pollutants. “We are now using between 1.2 and 1.5 planets worth of resources that can be sustainably supported. Before mid-century we will need the capacity of two Earths to keep up with our level of demand” (Overpopulation – World Population Awareness,http://www.overpopulation.org/solutions.html - Accessed Jan 15, 2012) A radical re-organisation of the production and consumption patterns are required to ensure that the future of the earth’s resources are sustainable (Collins et al, opcit)

[v]A growing number of critics argue against the ability of organisations in contributing to sustainable goals as they are seen as the cause and not the solution to environmental issues because their primary growth and profit objectives. (Collins et al, opcit)

[vi]Sustainability goals will not be achieved unless business using its resources and global presence are actively involved in the process (Collins et al, opcit)