Sustainable manufacturing strategy: an evidence based study from Indian metal industry.

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Abstract
This research aims to provide an institutional theory perspective of organizational adoption of sustainable manufacturing practices. The institutional theory is based on the premise that not all organizational decisions have economic rationale behind them and many decisions are based on organizational desire to gain legitimacy and conform to social norms and standrads. The analysis presented explains that organizational adoption of environmentally sustainable manufacturing practices is more likely if institutional forces of coercive, normative and mimetic isomorphism are in play.

Keywords: Sustainable manufacturing, institutional theory, green manufacturing

INTRODUCTION

The issue of environmental sustainability has over the years evolved as a core issue and area of concern for business units. This idea has gained centre stage due to wide variety of factors viz; legal practices, organisation development, cost-benefit analysis, social responsibility, highly informed citizenry and best practices code of the industry. Businesses around the world are increasingly facing pressure from different stakeholders to become environmentally conscious and make their processes environmentally sustainable. Sustainable development is the new challenge for business and is the central theme in the debate for economic and business policies (Klassen and McLaughlin, 1996). Sustainable development refers to the "*Development that meets the needs of the present without compromising the ability of the future generations to meet their own needs"*

During the last decade, social science researchers have increased their focus on analyzing the impact of industrial activities on the natural environment. This response from the businesses around the world is the result of the increased regulatory and stakeholder pressure. Last few decades have seen increased environmental awareness among government and regulatory agencies. Governments and regulatory agencies are formulating policies to save nature earth. These regulations are in form of directives for companies to observe their operations and keep its environmental impact within permissible limits. These policies are designed to make corporations responsible for their environmental impact. The basic rational behind these environmental legislations, is making organizations responsible for the resources they consume which is not unlimited. This change in regulatory environment has changed the way corporations used to view their operations and its impact on the natural environment. Apart from the pressure from regulators, the increased environmental proactivity has mobilized different stakeholders towards pressurizing organizations for becoming environmentally sustainable. Stakeholders demand organizations to be more responsible and transparent in the way they treat natural environment. The different stakeholders involve environmental groups, NGO's, suppliers, customers, industry associations, trade bodies among others. Business and natural environment literature found pressure from regulators and customers to be the main source contributing to organizational sustainability (Henriques and Sadorsky, 1999).

Organizations worldwide have responded to these pressures by either implementing Environmental Management Systems (EMSs) or process changes to bring about a culture of environmental sustainability. Environmental ecologists suggest harmful effect of organizational processes can only be reduced through the adoption of cleaner production technologies. Cleaner technologies reduce environmental impact by improving process efficiency and reducing waste generation. Much research in sustainability literature is dedicated to the determinants of implementing EMSs in organizations (Bansal and Hunter, 2003). However the success of these systems depends on how organizations manage their pollution problems, be it waste effluents, air emissions, noise or other aesthetic issues. To address these issues organizations need to improve their business processes by adopting some type of environmental technologies. Present research is in this direction of determining the antecedents of adoption/diffusion of sustainable manufacturing practices in organizations. Presented research will help policy makers in understanding the different drivers of technical environmental diffusion in organizations. This understanding will help in designing policies which will help in bringing down the harmful environmental impact. Sustainable manufacturing strategy requires firms to make changes in their products and processes. These changes can be in form of modifications in production processes or the material of production, waste minimization techniques, reuse of byproducts, or new organizational policies like introduction of new work practices, environmental audits, or environmental certification like ISO 14001 etc.

In summary, the current literature has explained organizational adoption of sustainable practices for two importance reasons. Firms have been observed to voluntarily adopting these practices in order to gain competitive advantage through primitive environmental actions. The other important reason being the desire to appear legitimate and conform to institutional norms and values. Apart from the early adopters, there are organizations that are late and adopt because of many different motivations. The primary objective of this paper is to develop new propositions to explain the adoption of environmentally sustainable practices among manufacturing organizations that are among the late adopters. Late adoption usually happened

among organizations either with the aim of reducing transaction cost or to maintain legitimacy in institutional relationship (Tate et al., 2011). In this paper we will use the institutional theory to explain the late adoption of sustainable practices from an institutional theory perspective. The analysis will cover the coercive, normative and mimetic isomorphic pressure on organizations to conform to institutional norms and standards.

The next section will provide an introduction on institutional theory and its link to the study of natural environment. Section 3 will present the proposition explaining the organizational adoption of sustainable manufacturing practice and following which implication for theory and managerial practice s is presented. Finally an assessment of future research direction and conclusion is presented.

LITERATURE REVIEW

Institutional Theory

Institutional theory is relevant to the central theme of this study i.e. the adoption of sustainable manufacturing practices because institutional theory is based on the premise that not all decisions have economic rational. Organizations operate in a manner that meets the social and regulatory acceptances. Organizations environmental isomorphism happen in response to pressure from governments, regulatory agencies, industry associations, NGO's, and other stakeholders, who dictate the environmentally responsible behaviour by organizations.

Applying institutional theory to explain the emerging conception of environmental management, this research tries to explain the cultural and institutional systems which influence these organizational responses. This research will answer questions about the fundamental sources of organizational environmental management response. The objective is to analyse the mediating role of institutional processes between organization and the natural environment. Different field effects occur at the institutional and organizational levels, directed by both the institutional channels through which field level influences affect organizational behaviours and routines through which those influences are received, interpreted and acted upon (Hoffman, 2001). Institutional and organizational analysis tries to answer questions related to social choices. Institutional analysis answers related to how social choices are shaped, mediated, and channelled.

Before we onset on describing the different components of Institutional theory it is necessary to recall the conception of Institutions:

"*Institutions comprise of regulative, normative, and mimetic elements that, together with associated activities and resources, provide stability and meaning to social life."*

The idea of regulative, normative, and mimetic will be described in the following section. In this definition Scott describe institutions as multifaceted, durable social structures, made of symbolic elements, social activities, and material resources. Institutions are relatively resistant to change and have distinctive properties (Jepperson, 1991). Institutions are characterised by their

meaning making properties because of the processes set in by regulative, normative, and mimetic elements. Hoffman (1991) described these three elements forming a continuum moving from the conscious to the unconscious, from the legally enforced to taken for granted. All these elements form an interdependent and mutually reinforcing ways, to form a powerful social reality, which encapsulates and exhibits the strength and resilience of social structures (Scott, 2005). Though these elements are inclusive to the institutional theory model but there exists an adequate distinction among the elements. Institutional theory binds together these three distinctive elements that need to be differentiated. Before moving forward to develop a more integrated concept it is necessary it distinguish among the component elements and identify their underlying assumptions, and mechanisms. In addition to these three elements different researchers have included other elements like cultural-cognitive, habitual disposition, but the regulative, normative and mimetic elements remains the central building block of institutional theory. The institutions manifest themselves in the form of rules, norms and cultural-cognitive beliefs.

Institutional Theory and Environmental Management

Institutional theory is based on the assumption that not all business decisions are result of normative rational economic choices (DiMaggio and Powell, 1983, 1991; Scott, 1991). External norms, values, and traditions have a significant influence on the decision making process. Research evidence suggests that firms that conform to societal and business norms have better legitimacy and access to resources. Organizations experience pressure both internal and external to the organization. External pressure from governments, industry alliance while internal functions like marketing, corporate communications can exert internal pressure. Because of organizational conformance to pressures, organizational actions become institutionalized (Oliver, 1997). Institutional theory is relevant to the organizational adoption of sustainable environmental practices in form of coercive, normative, and mimetic isomorphism. Organizations conformance to this isomorphism is the result of their desire to operate in a way that meets social and legal expectations. As mentioned earlier government regulators, industry alliance, environmental groups, press and media, local communities and other stakeholders exert pressure which is dictates environmentally responsible behaviour among corporate. Institutional theory lens will help in improving our understanding of organizational processes through which sustainable values become embedded in organizations, which contributes to sustainability. Scott (1991) emphasised that as the focus is on analysing the process through which values become institutionalized, this theory can help in policy makers and managers to consider the actions which might be done to encourage the sustainable corporate behaviour. Institutional theory also covers issues of "deinstitutionalization" which suggest how current organizational structures and policies breakdown and are replaced by new ones. Thus institutional theories focus as: (i) institutionalization as a process of instilling value, (ii) institutionalization as a process of creating reality, (iii) institutions as classes of distinct elements within systems, and (iv) institutions as social systems. While the former two are used to understand the process of development of new rules and practices; the latter two focuses on the creation and diffusion of institutions.

THEORITICAL PROPOSITIONS

Sustainable manufacturing practice adoption and coercive institutionalism

States are the most prominent actors in the regulative aspect of institutional mechanism. States develop their own interests and operate autonomously from the social actors. It becomes an important task to analyze states role as rule maker, and enforcer. Against most of the laws and regulations which are unambiguous and authoritative, many are sufficiently ambiguous or controversial. These regulations do not provide a clear picture of the accepted behaviour of conduct. In such cases institutional theorists calls for an occasion for sense making and interpretation and in such cases actors rely more on normative and mimetic forces than coercive elements.

Coercive pressure can force organization to adopt and comply with environmental regulations through threats, regulatory sanctions. Delmas, (2002) observe coercive pressure to be so strong that any new government regulations are significant enough to motivate organizations to observe and participate in voluntary sustainable manufacturing initiatives. It is also important to note that this pressure is significantly more on organizations that operate in environmentally sensitive industries like chemical, primary metal or paper. When adopting sustainable manufacturing practices based on purely institutional perspective, organizations will focus on compliance based metrics (Tate et al., 2011). Manufacturing firms worldwide are beginning to incorporate environmental tracking systems (GHG emissions, effluent discharge, etc.) into not only their processes but also into their associated manufacturing bases.

Based on the coercive isomorphism it can be argued that higher the regulatory proactivity and awareness among organizations on environmental sustainability, higher will be organizations adoption of sustainable manufacturing practices. Sustainable manufacturing isomorphism can be better observed among firms operating in environmentally sensitive industries. Also the resource dependence of organizations on public resources can be viewed as a source of coercive isomorphism as the host organizations are dependent upon the approval of governments and regulators for critical resources. Thus we can hypothesize,

Proposition 1: As higher the existence and awareness of coercive environmental mechanism, a manufacturing firm is more likely to adopt sustainable manufacturing practices.

Sustainable manufacturing practice adoption and normative institutionalism

Normative forces are characterised by both values and norms. Values are conceptualised as the preferred or the desirable actions with the construction of standards to which the existing structures or behaviour can be compared (Scott, 2013). On the other hand norms have a prescriptive nature specifying how things should be done. The normative systems are not just anticipations or predictions but rather prescriptions and normative expectations, expectations as to how specified actors are supposed to behave or operate. Normative systems give rise to 'roles' and become internalised by the social actors. Example: in market setting organizations are expected to comply with certain value system and their behaviour should reflect that, similarly in

organizational settings particular positions are defined to carry specific rights and responsibilities.

The normative institutionalism can be used to explain the industrial and even organizational differences regarding their response to different issues facing them. Organizations use the established formal and informal norms and values to strategies their responses. Organizations who are part of any association or group with proactive environmentalism, confront a strong normative pressure to observe high levels of environmental performance. For example the Chemical industries "responsible care codes of practice" require the firms in the industry to observe critical attention towards environmental sustainability. As practice firms in the industry cooperate to develop and promote practice which reduces the impact of effluents on environment.

Thus norms and standards associated with a manufacturing organizations association in professional network and industry may influence the organization to adopt sustainable manufacturing practices. This will also promote the host organization to pressurize its associated manufacturers and suppliers to adopt sustainable manufacturing practices. Industry bodies generally have a accepted set of routines and advisories to certain managerial and professional problems and in this direction industry association have come up with advisory for members regarding environmental sustainability. Based on the above discussion we propose:

Proposition 2: A manufacturing organization is more likely to adopt environmentally sustainable practices if it conforms to practices encouraged by industry associations to which its suppliers and customers belong.

Sustainable manufacturing practice adoption and mimetic institutionalism

Organizations face uncertainty regarding the efficiency and effectiveness of sustainable manufacturing practices. This uncertainty promotes what is known in institutional theory as mimetic isomorphism. An organization tends to mimic the successful and respected organizations in the industry, and this behaviour is driven by their concern to appear legitimate (DiMaggio and Powell, 1983). Also organizations desire to claim prestige and positive coverage in public leads them to imitate those they perceive as leaders and are respected. Literary evidence suggest mimetic pressure for the initial adoption of ERP, lean manufacturing, Toyota production system etc., among manufacturing firms in early 1980's. Organizations try to mimic those organizations that have similar characteristics in terms of size, age, industry or membership of same association, geography. Organizations and associated organizations of the manufacturing network share similar characteristics and become aware of sustainable environmental practices and adopt them to compete with each other. Thus

Proposition 3: A manufacturing organization is more likely to adopt an environmentally sustainable practice if competing organizations also have also adopted similar environmentally sustainable manufacturing practices.

Theoretical Implication

This paper makes a critical view on the adoption of environmentally sustainable manufacturing practices form an institutional theory perspective. Based on the past evidence from literature an organization in more likely to adopt sustainable manufacturing practices if the phenomena is supported by coercive, normative and mimetic institutionalism. Host organizations by their adoption of sustainable practice scan motivate and encourage their associated manufacturers and suppliers to adopt similar practices.

Managerial Implication

Institutional theory provides insight into the organizational adoption of sustainable manufacturing practices. Institutional theory indicates that governments/ regulators through coercive mechanism can motivate organizations to conform to sustainable practices. Similarly industry bodies/ trade organizations can encourage the members to observe high level of environmentally responsible behaviour.

FUTURE RESEARCH DIRECTION AND CONCLUSION

This research work is in the direction of explaining the organizational adoption of sustainable manufacturing practices through the theoretical lens of institutional theory. The analysis in this paper suggests that adoption of sustainable manufacturing practice scan be viewed from different perspectives. From past research the role of governments/regulators and industry/trade bodies become increasingly evident in influencing the organizational adoption of sustainable practices. The proposition presented lends them to empirical testing. The propositions can be empirically tested by operationalizing the variables into survey items. This can be done either developing new scales or modifying the existing scales. The scale developed by Delmas and Toffel (2004) to examine adoption of sustainable practices reflects institutional pressure. These and other scales can be adapted to examine an organizations adoption of sustainable manufacturing practices. These scales can be tested through research sample in different industries with varied degree of environmentalism.

Thus institutional theory provides deep insights into the influence of governments/regulators, industry association/trade bodies on organizational adoption of sustainable manufacturing practices. It also focuses on the mimetic behaviour of firms to mimic successful firms. The presented arguments tries to illustrate that not all organizational decision have economic rationale behind them and that many actions are driven by organizational desire to gain legitimacy.

Bibliography

Bansal, P., & Hunter, T. (2003). Strategic explanations for the early adoption of ISO 14001. Journal of Business Ethics, 46(3), 289-299.
Berger, P. L., & Luckmann, T. (1967). The Construction of Reality: A treatise in the Sociology of Knowledge.
Delmas, M. A. (2002). The diffusion of environmental management standards in Europe and in the United States: An institutional perspective. Policy Sciences, 35(1), 91-119.
Delmas, M. A., & Toffel, M. W. (2008). Organizational responses to environmental demands: Opening the black box. Strategic Management Journal, 29(10), 1027-1055.
DiMaggio, P., & Powell, W. W. (1983). The iron cage revisited: Collective rationality and institutional isomorphism in organizational fields. American Sociological Review, 48(2), 147-60.
Dowling, J., & Pfeffer, J. (1975). Organizational legitimacy: Social values and organizational behavior. Pacific sociological review, 122-136.
Hart, S. L. (1995). A natural-resource-based view of the firm. Academy of management review, 20(4), 986-1014.
Henriques, I., & Sadorsky, P. (1999). The relationship between environmental commitment and managerial perceptions of stakeholder importance. Academy of management Journal, 42(1), 87-99.
Hoffman, A. J. (2001). From heresy to dogma: An institutional history of corporate environmentalism. Stanford University Press.
Jepperson, R. L. (1991). Institutions, institutional effects, and institutionalism. The new institutionalism in organizational analysis, 6, 143-163.
Klassen, R. D., & McLaughlin, C. P. (1996). The impact of environmental management on firm performance. Management science, 42(8), 1199-1214.
Oliver, C. (1991). Strategic responses to institutional processes. Academy of management review, 16(1), 145-179.
Porter, M. E., & Van der Linde, C. (1995). Toward a new conception of the environment-competitiveness relationship. The journal of economic perspectives, 97-118.
Scott, W. R. (1987). The adolescence of institutional theory. *Administrative science quarterly*, 493-511.
Scott, W. R. (2005). Institutional theory: Contributing to a theoretical research program. *Great minds in management: The process of theory development*, 460-485.
Scott, W. R. (2013). *Institutions and organizations: Ideas, interests, and identities*. Sage Publications.
Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. Academy of management review, 20(3), 571-610.
Tate, W. L., Dooley, K. J., & Ellram, L. M. (2011). Transaction cost and institutional drivers of supplier adoption of environmental practices. *Journal of Business Logistics*, *32*(1), 6-16.