

See discussions, stats, and author profiles for this publication at:  
<https://www.researchgate.net/publication/46137301>

# Corporate Architectures for Sustainability

Article in *International Journal of Operations & Production Management* · December 2001

DOI: 10.1108/01443570110410919 · Source: OAI

---

CITATIONS

58

---

READS

57

## 2 authors:



**Andrew Griffiths**

University of Queensland

60 PUBLICATIONS 1,363 CITATIONS

SEE PROFILE



**Joseph A. Petrick**

Wright State University

87 PUBLICATIONS 616 CITATIONS

SEE PROFILE



The current issue and full text archive of this journal is available at  
<http://www.emerald-library.com/ft>

# Corporate architectures for sustainability

Corporate  
architectures for  
sustainability

Andrew Griffiths

*Department of Management, University of Wollongong,  
Wollongong, Australia, and*

Joseph A. Petrick

*Raj Soin College of Business, Wright State University,  
Dayton, Ohio, USA*

**1573**

**Keywords** *Sustainable development, Organizational design*

**Abstract** *While there exists a growing literature on corporate “green” strategies, there is a research gap about which corporate architectures and organizational change processes enable “green” strategies. This article addresses the research gap in an interdisciplinary manner by focusing on two questions: What conditions characterize ecological and humanly sustainable corporations? What alternative architectures can generate and institutionalize corporate sustainability? Three alternative architectures for sustainability are treated and three research propositions are identified to further future empirical research on specific architectures that link organization design and corporate sustainability.*

## **Need for examining corporate architectures for sustainability**

While there exists a growing literature on corporate “green” strategies, there is a research gap about which architectures and organizational change processes assist organizations to enact these strategies (Hoffman, 2000; Bhat, 1996). In a review of environmental research on organizational structures, Starik (1995) noted that the area of organizational design is under-researched, and he called for studies to examine the relationships between various corporate architectures and ecologically sustainable organizations (ESOs). This factor becomes all the more important as organizations begin to compete by design (Nadler and Tushman, 1997).

Additional recent studies have indicated three ways in which current corporate architectures impede sustainability (Sharma and Vredenburg, 1998; Hunt and Auster, 1990; Starik and Rands, 1995; Polonsky and Zeffane, 1992). First, current corporate architectures insulate organization systems and processes from a broad range of environmental information. This is because they have no structural elements, such as specialized departments that have the expert knowledge to recognise, act on and transfer to other parts of the organization information of an environmentally relevant nature. Such organizations typically have a reactive or minimal compliance stance to the adoption of environmental management strategies (Hunt and Auster, 1990; Roome, 1992).

Second, the established routines and organizational systems of many corporations seek to protect and promote the status quo. Schön (1971) refers to this as the dynamic conservatism of social systems. As a result new practices

International Journal of Operations &  
Production Management,  
Vol. 21 No. 12, 2001, pp. 1573-1585,  
© MCB University Press. 0144-3577

and theories are defined as threats to established ways of working. In particular, the corporate innovations which support sustainability are a threat to conventional command and control style management systems and often require new structures, strategies and organizational capabilities (Hutchinson, 1996; Maxwell *et al.*, 1997). Managers who have risen to power in command and control systems frequently resist the transition to alternative structures.

Finally, current architectures limit or deny access to a range of stakeholders whose participation is vital for the pursuit of sustainability agendas. Traditional organizations tend to be focused on a limited set of stakeholders, in particular, boards of directors and shareholders (Hart, 1995, 1997). Sharma and Vredenburg (1998) argue that such traditional or reactive companies have not developed capabilities for stakeholder integration. The initiatives of other stakeholders – particularly the workforce, unions and “greenies” – are seen as hostile, disruptive forces that may harm the basis of current corporate performance. In response to initiatives from these stakeholders, some corporations adopt aggressive and defensive practices which undermine the development of the broader stakeholder accountability and involvement needed to support moves to create more sustainable practices (Beder, 1997; Karliner, 1997).

These three limitations refer primarily to large traditional corporations that are hierarchical in design, have developed systems of managerial practice based on a strong centralized command and control style of management, and pursue reactive approaches to ecological and human sustainability issues (Collins and Porras, 1994; Hunt and Auster, 1990). Such corporate practices can also be supported by broader institutional systems. For example, economic systems can directly and indirectly encourage and reward the creation of pollution and waste (Mokhiber and Weissman, 1999; Korten, 1996). Vested financial interests and institutional investors can block the radical restructuring of corporations for the achievement of sustainable goals (Useem, 1996). Selected industries can neglect environmental stewardship and squander their reputational capital (Petrick *et al.*, 1999). Even nation states can abdicate their political responsibility for public stewardship of nonrenewable resources and protection of indigenous peoples (Karliner, 1997; Petrick and Quinn, 1994). However, the economic, industrial, and political contexts within which corporations operate are changing (Hoffman, 1997, 1999). New corporations are moving into prominence and old corporations are reorganizing to address sustainability issues (Hawken *et al.*, 1999). An active search for new organizational forms is taking place (Berry and Rondinelli, 1998).

In light of the limitations of existing corporate structures, this article focuses on two key questions:

- (1) What conditions characterize ecological and humanly sustainable corporations?
- (2) What alternative architectures can generate and institutionalize corporate sustainability?

---

While there exist many frameworks for understanding ecological and human sustainability issues, to date these literatures have often stood alone. For instance several phase models have emerged in the sustainability literature to demonstrate the strategic corporate and organizational responses to sustainability but these models ignore the internal human capital and design elements that align with these different corporate responses. Similarly, the human resources and change literature, the human sustainability tradition, has not engaged with the broader literature on sustainability. It is argued here that in order to develop sustainable organizational architectures linkages need to be made between ecological and human sustainability traditions (Dunphy and Griffiths, 2000). After addressing these issues, this article develops three research propositions that pose empirical linkage options between specific corporate architectures and corporate sustainability performance.

### **Conditions that characterize ecologically sustainable corporations**

Conditions that characterize ecologically sustainable organizations (ESOs) have been identified by a wide range of authors (Korten, 1996; Weizsacker *et al.*, 1998; Hunt and Auster, 1990; Starik, 1995; Shrivastava, 1995). These characteristics include:

- smaller corporate entities and structures will be more responsive to environmental concerns and will be less powerful and less inclined to dismiss government and societal attempts to regulate them (Korten, 1996);
- limited government regulation can be used to shape corporate environmental behavior to comply with ecological standards and adopt proactive environmental management practices, such as total quality environmental management (TQEM) to reduce waste and pollution (Hoffman, 1997);
- increased power should be devolved to individuals and local communities in order to create a citizen-inspired agenda for local ecological sustainability (Korten, 1996); and
- future ESOs will play an active role in creating self sufficient communities where production and use align with community needs.

However, some proponents of sustainability, such as Korten (1996), argue that firstly, it is beyond the capacity of large corporations to adopt ecologically-friendly practices and secondly, that the structures, strategies and decision making processes in large corporations are incompatible with some of the ideal characteristics of ESOs identified earlier.

Shrivastava (1995) and Weizsacker *et al.* (1998) adopt a different perspective than Korten. Both argue that corporations can play a key role in creating sustainable economies. Both authors argue that organizations can become much more efficient at modifying inputs, throughputs and outputs to reduce their negative impact on the ecology. In other words, these organizations can

gain competitive advantages via improvements to their operation and production management systems. Shrivastava (1995, p. 942) argues that there are several key components to ESOs that adopt this approach. These include; first, TQEM – a set of techniques used to solve organizational problems from a whole systems perspective. While uncritical adoption of quality initiatives have been rightly criticised, proper application of the quality techniques ensures that an organizations inputs, throughputs and outputs have a minimal environmental impact (Bhat, 1998; Wilkinson and Willmott, 1995). Like total quality management (TQM), TQEM requires structural and cultural changes, that enable an organization's employees to take on greater responsibilities in solving problems, if its full benefits are to be utilised.

Second, there exists a range of corporate strategies that organizations can pursue that have consequences on the structure, content and sophistication of corporate environmental programs. Corporate strategies, such as environmentally responsible supply chain management to address recovery issues and regional environmental issues, may require little change to an organization's structure and orientation. Other strategies such as industrial ecology may require significant changes to an organization's operating system, definitions of waste, and relations to its value adding chain (Senge, 2001; Cohen-Rosenthal, 2000). Lying at the heart of these studies on ESOs is the notion that ESOs will require internal structural changes to their operations systems, such as the implementation of TQEM programs, environmental management systems (EMS) and a broader understanding of what constitutes social and environmental "best practice".

### **Conditions that characterize humanly sustainable corporations**

There has been an increasing body of literature emerging in the management field over the past 30 years, compiling evidence of the importance of "people" or human factors in transforming and changing organizations (Dunphy and Griffiths, 1998; Bhat, 1996). The focus of this research in the management area was to generate organizational structures that contributed to human satisfaction, growth and development while also contributing to the profitability and productivity of the enterprise. Management research developed capabilities and knowledge relevant to the effective conduct of the micro and macro elements of organizational change (Mirvis, 1988). While early change agents focused on interventions at an individual and, or group level, the focus moved subsequently to the management of large-scale corporate restructuring and to forging links between change management practices and corporate strategy. So, over 30 years, the change movement generated a wealth of information on how to redesign and renew organizational architectures from the individual level to the total corporation (Beer *et al.*, 1990).

At the level of the individual, jobs were redesigned to enhance an individual's autonomy in decision making and to link individual employee's work to the organization's central purpose. Jobs redesigned in this way generate greater organizational commitment and employee satisfaction.

---

However, a focus on job redesign alone, which was typical of early humanistic interventions, while altering the responsibilities of individuals, was often not enough in itself to generate sustainable benefits for people in organizations. This initiative had to be supplemented by more encompassing organizational structures and systems for the fullest range of human potential to be released. Therefore, while job redesign, skills training, human development and culture change workshops frequently succeeded in enhancing individual skills, if such initiatives were not complemented with organizational systems and architectures that rewarded people for using these skills the initiatives would fail to generate sustainable positive outcomes for individuals and for the corporation (Lindsay and Petrick, 1997; Dunphy and Griffiths 1998).

At the level of the work group or business unit, the organizational renewal movement focused on designing architectures that would both benefit individuals and improve productivity and profitability for the organization. Such initiatives came mainly from the organization development (OD) and sociotechnical systems (STS) traditions and focused on the establishment of team based organizational architectures. These architectures were designed to address the stifling and oppressive structures in large bureaucratic organizations that impeded creativity and innovation in organizations and led to widespread employee alienation and industrial relations conflict (Lindsay and Petrick, 1997).

Team-based organizations were implemented, in which smaller business units were created and in turn broken down into semi-autonomous work teams. These were teams made up of skilled individuals who could take responsibility for planning, scheduling, quality and customer service in the production of goods and services. Such organizational architectures proved to be more effective than their mechanistic counterparts in producing high levels of performance and significantly raised employee work satisfaction. Other commentators have questioned the extent to which the human sustainability tradition achieved these outcomes (Kelly, 1992). Team based organizational architectures required supportive organizational systems such as particular approaches to recruitment and selection; the remuneration and the distribution of resources to value-adding activities. They also required significant modification of hierarchal management structures (Lawler, 1992).

More recently, the organizational renewal movement (ORM) has contributed to the creation of large scale organizational changes to corporate structures (Dunphy and Griffiths, 1998). So we know a great deal more about how to go about corporate change. Unfortunately some organizations, in their quest to become more competitive, have become stuck in a cycle of downsizing and cost cutting – losing important human and organizational capabilities in the process. While the human sustainability tradition advocates the use of large scale restructuring tools such as process re-engineering, downsizing and restructuring, in cases where organizational architectures are significantly out of alignment with their competitive environment, it appears that the reckless and unbalanced application of these techniques can also have devastating

consequences for organizations. However, despite radical changes in competitive environments, some organizations have proved quite adaptable to change.

### **Alternative architectures for sustainability**

Three alternative organizational architectures are identified and proposed – the network, the virtual organization and the community of practice. Each of these architectures is an ideal type. In reality they vary and appear in hybrid form. However, we identify their general characteristics and the prospects that they provide for enhancing human and ecological sustainability. It is important to keep in mind that these forms can be replicated at the level of groups, business units and whole organizations. Making it not only possible to create new organizations based on these ideal types, but to also retro-fit existing organizational architectures to capture the sustainability benefits of these new forms (Griffiths, 2000).

#### *Network organizations*

In recent years, the network organization has emerged as a powerful alternative to traditional vertically integrated organizational architectures (Nohria and Eccles, 1992). Network organizations may take a variety of forms but fundamentally they are organizations that give the advantages of larger size, whilst remaining small. In these organizations, the centre retains some key areas of decision making, for example major strategic moves, ceding considerable autonomy to smaller relatively independent units. For instance TCG, a company that operates in the technology and software support and services industry, is a small network of 24 independent firms that cluster together to provide the advantages of size while maintaining the flexibility and innovativeness of small firms (Mathews, 1992).

Quinn (1992) refers to network organizations as “spider web” organizations, noting that they typically have dispersed service nodes. He describes them as spider web organizations because of the lightness and multiple interconnectedness. Such organizations tend to have flatter hierarchies and minimise the use of formal rules. Individual units obtain more information by acting as a collectivity and can also attain economies of scale and scope as a result of their interconnectedness. Clusters of small firms, such as TCG, represent one form of network. But a network can also form around a large firm that seeks to outsource parts of its production or service value adding chain or that enters into strategic alliances. Joint ventures, partnerships and strategic alliances may also provide firms with the benefits associated with networks, if managed appropriately.

A major strength of network architecture lies in its ability to grow (by adding on new firms), whilst keeping the constituent units small, flexible, responsive and innovative. Networks are sustainable primarily because of their ability to respond quickly to changing market conditions, to be flexible in meeting customer requirements and to transform markets through the speedy

---

development of new products and services. However, networks have to be coordinated differently from traditional hierarchical organizations – they often appoint network “brokers” who coordinate the various elements of a network value-adding chain. Networks are strongly dependent on the skills, dexterity and knowledge base of their employees – whilst traditionally associated with craft work, new network forms have emerged in the new “craft industries” of biotechnology, software and information technology. Networks are relevant to sustainability in at least two primary ways. Firstly, networks are increasingly recognised as a major source of innovativeness in new product and service developments. In Germany and Denmark clusters of small firm networks have been leaders in green technology developments. Secondly, network structures are reliant upon free flowing information and communication – they are therefore appropriate structures for capturing and diffusing through the network information relevant to sustainability outcomes.

#### *Virtual organizations*

Another alternate organizational form that can support sustainability is the virtual organization. The concept of the virtual organization has received increasing attention in both popular press and academic journals (Rheingold, 1993; Hedberg, 1997). The virtual corporation can be seen to be designed on several levels. At one level the virtual corporation can be interpreted as an organization with a limited life. At first appearances, this does not appear to be a “sustainable practice”. In these cases, the issue is not about sustaining the organization in terms of longevity, but rather recognising that in the pursuit of sustainability there will be a need for limited term projects – organizations – that will come together to solve or address important issues and disband once they have been addressed.

Alternatively, a virtual organization can give the impression of size, yet be small in terms of numbers of employees. In other words, corporate sustainability is not just about large corporations but can and will also include smaller more nimble corporations that have a virtual facade. Such organizations, such as Amazon.com (an Internet book retailer) and Land’s End (textile and clothing manufacturer) can service via the Internet and electronic commerce and operate globally with a small number of employees. Such organizations require structures that are flexible and that compete on speed.

New information technologies are revolutionising industries – such as retail and publishing by operating with a small yet committed core of staff with high levels of technical and information systems expertise. Typically these organizations form strategic alliances for their distribution and warehousing activities. Such activities may be undertaken in-house but more often are out-sourced. These organizations will tend to leave a minimal environmental footprint, however they will need to be responsible for the environmental impacts of their suppliers and distributors rather than take the attitude that it is none of our responsibility how they operate.



Some organizations have adopted a virtual approach throughout the entire organization. In other cases, the virtual organization may be used only for organizing particular functions and or projects. Townsend *et al.* (1998) have discussed how virtual teams are best managed. As these commentators have pointed out, the creation of such teams raises new challenges in terms of the structure, technology and functioning of work.

---

*Communities of practice*

Unlike the previous two organizational forms, communities of practice are not clearly defined entities. Communities of practice have amorphous and in some cases fluid structures that form around areas of interest, expertise and or project orientation (Brown and Duguid, 1991). An example of a community of practice, maybe a community of professionals who gather information, pass on knowledge and contribute to the development of their field of expertise. Such communities generate the diffusion and acceptance of explicit and tacit knowledge that can be transferred into innovative solutions and actions within formal organizations.

Increasingly, communities of practice and knowledge groups rely upon and are assisted by cutting edge information technologies that provide the potential for innovation, rapid response and the ability to generate solutions quickly.

Brown and Duguid (1991) have stated that communities of practice have few hierarchies – member status is based on expertise and contribution to the development of leading ideas rather than on position or authority. They go on to state that:

The communities that we discern are . . . more fluid and interpretative than bounded, often crossing the restrictive boundaries of the organization to incorporate people from outside (Brown and Duguid, 1991, p. 49).

Such communities of learning may be difficult to design, but rather emerge organically and are continually being formed and reformed.

Whether they are located within formal organizations or arise independently, communities of practice are characterised by the following features. They are reliant upon architectures which enable them to take on new members, acquire new information and which bind people to each other through common interests, desire for learning and an enhanced ability to achieve collective and individual goals. Secondly, such organizations are characterised by a reliance upon both formal and informal processes for skills development and learning. Finally, communities of practice establish a core or nucleus of people who are responsible for creating and sustaining the community's collective memory. Their contribution to the attainment of sustainability outcomes for organizations lies in their ability to collect, process and diffuse knowledge of a technical and specialised nature and translate this knowledge into innovative and rapid solutions.

---

**Research propositions on corporate architectures and sustainability**

The previous sections of this article examined the conditions that lead to ecologically and humanly sustainable corporations and some alternative organizational architectures. Now it is time to develop three research propositions around a specific set of structural attributes to institutionalize ecologically and humanly sustainable practices that will lead to long lived corporations.

*Architectures that capture and use ecological information for strategic purposes*

An important element in the generation of sustainable corporations is the creation of organizational architectures and systems that are capable of capturing, processing and making sense of environmental information. King (1995) notes that organizations with limited access to environmental information are more likely to make ecological and environmental blunders. For an organization to avoid this and capture the benefits of environmental awareness, there must be multiple and diverse information entry points into the organization. If critical information about the environment is confined to specialist units it will fail to diffuse throughout the organization and is unlikely to be used in strategic decision making processes. Communities of practice can help assist with the diffusion and acceptance of such vital information. Creating a broad range of information entry points helps to reinforce the creation and generation of corporate wide environmental strategies (Maxwell *et al.*, 1997). The challenge therefore is to create corporate architectures that effectively internalise the environmental information needed to meet regulatory standards and corporate competitive strategies based on sustainable practices. For example, in Volvo, environmental programs were established by creating four corporate-wide “working groups” focused on addressing a broad environmental agenda. Specifically project teams examined: firstly, structures and systems that could capture the benefits of product recycling; secondly, structuring organizational systems for acquiring and diffusing environmental information; thirdly, reviewing production processes for environmental efficiencies and, finally, meeting European Union regulatory standards on environmental management (Maxwell *et al.*, 1997).

The first research proposition, therefore, is formulated as follows:

- P1.* Corporations that have specific architectural processes that capture and use ecological information that is integrated into strategic decision making will more likely demonstrate corporate sustainability performance than corporations without such architectures.

*Architectures that incorporate employee knowledge for strategic purposes*

Both the human and ecologically sustainable literatures emphasise the importance of employee knowledge in generating adaptive and responsive organizations. Hierarchies are killers of initiative and innovation and impede the effective utilization of employee knowledge. Other alternative

organizational forms are more conducive to fostering the generation of employee knowledge and to using it effectively. Team-based organizational architectures enable employees to have input, discretion over decision making and provide them with the information and resources to deliver organizational outcomes. Such strategies are long term, not a quick fix, for team-based organizational architectures require large investments in time and energy. As a consequence, managers need to make the shift from a short term orientation to the longer term strategies of developing these people centred, service orientated architectures (Quinn, 1992). Team-based organization architectures which include, project teams and virtual teams, based on new communication technologies, provide the basis for capturing and utilising the employees' knowledge needed to create effective sustainable corporate strategies.

The second research proposition, therefore, is formulated as follows:

- P2.* Corporations that have specific architectural processes that incorporate employee knowledge into strategic decision making will more likely demonstrate corporate sustainability performance than corporations without such architectures.

*Architectures for rapid response to sustainability opportunities and threats*

The structures for achieving rapid responses to sustainability opportunities and threats can give corporations the cycle time advantage of speed. This rapid response capability can be described as "ambidextrous". On the one hand, corporations need to maintain the day-to-day operation activities that create valuable products and services. On the other hand, they need to support the ongoing transformation of these activities to move them inexorably in the direction of human and ecological sustainability. Speedy change in corporate architectures is required – delay in this agenda means continuing damage to the quality of our community life and the ecology of the planet. It is in this area that the organizational renewal movement can make its greatest contribution to date – by providing the critical knowledge and skills needed for the transformation of traditional product and service organizations to the sustainable effective organizations of the future.

Some corporations have already created organizational architectures that position them to take advantage of these processes by creating supportive networks, virtual organizations and communities of practice. For example, Interface, which specialises in the production and provision of modular carpets and office refitting services and has a production presence in 27 countries. Interface has developed a corporate environmental management program that sits alongside its other corporate programs for growth, profitability and efficiency. Unlike many other firms, Interface has a commitment to ecological and human sustainability which moves beyond rhetorical platitudes into powerful programs of organizational reconstruction. QUEST was aimed at waste minimization through a variety of processes including the recycling of carpet. However, for QUEST to succeed as a program, the organizational

---

members needed to be strongly motivated to address the negative environmental impacts of key elements of the Interface value-adding chain.

The third research proposition, therefore, is formulated as follows:

- P3. Corporations that have specific architectural processes that rapidly respond to sustainability opportunities and threats will more likely demonstrate corporate sustainability performance than corporations without such architectures.

## Conclusion

While a significant amount of time and energy has been devoted to the creation and generation of environmental corporate strategies, there has been virtually no attention given to understanding the ways in which different corporate architectures impede or facilitate progress toward human and ecological sustainability. We have tried to fill this gap by bringing together knowledge from several traditions. Our basic approach has been that traditional architectures will not support the adoption of the changes in business practices necessary to achieve human and ecological sustainability. Corporations, large and small, will need to experiment with alternative organizational structures and systems. Such experimentation is already occurring. Many emerging organizations will never become large traditional bureaucracies. Existing bureaucratic organizations will need to adopt in part these new corporate forms or to modify the rigidity of their current structures. Furthermore, the operations and production management role will be impacted on and able to influence the design and structure of organizations in response to these sustainability challenges. Through engagement with technologies and processes such as industrial ecology; environmental management systems and total quality environmental management, operations management will play an integral role in shaping and re-designing an organization's response to sustainability issues. Alternative organizational architectures, networks, virtual and communities of practices, will require different operation and production systems configurations in order to deliver sustainability outcomes. Three research propositions have been identified to focus future empirical research on specific architectures that may link organization design and corporate sustainability.

## References

- Beder, S. (1997), *Global Spin: The Corporate Assault on Environmentalism*, Scribe Books, Carlton.
- Beer, M., Eisenstat, R. and Spector, B. (1990), *The Critical Path to Corporate Renewal*, Harvard Business School Press, Boston, MA.
- Berry, M. and Rondinelli, D. (1998), "Proactive corporate environmental management: a new industrial revolution", *Academy of Management Executive*, Vol. 12 No. 2, pp. 38-50.
- Bhat, V. (1996), *The Green Corporation: The Next Competitive Advantage*, Quorum Books, Westport, CT.
- Bhat, V. (1998), *Total Quality Environmental Management*, Quorum Books, Westport, CT.

- Brown, J. and Duguid, P. (1991), "Organizational learning and communities of practice: toward a unified view of working, learning and innovation", *Organization Science*, Vol. 2 No. 1, pp. 40-57.
- Cohen-Rosenthal, E. (2000), "A walk on the human side of industrial ecology", *American Behavioral Scientist*, Vol. 44 No. 2, pp. 245-64.
- Collins, J. and Porras, J. (1994), *Built to Last: Successful Habits of Visionary Companies*, Century, London.
- Dunphy, D. and Griffiths, A. (1998), *The Sustainable Corporation: Organizational Renewal in Australia*, Allen and Unwin, Sydney.
- Dunphy, D. and Griffiths, A. (2000), "Phases in the development of corporate sustainability", EGOS Conference Paper, Helsinki.
- Griffiths, A. (2000), "New organizational architectures: Creating and retrofitting for sustainability", in Dunphy, D., Benveniste, J., Griffiths, A. and Sutton, P. (Eds), *Sustainability: The Corporate Challenge of the 21st Century*, Allen and Unwin, Sydney.
- Hart, S. (1995), "A natural resource based view of the firm", *Academy of Management Review*, Vol. 20, pp. 986-1014.
- Hart, S. (1997), "Beyond greening: strategies for a sustainable world", *Harvard Business Review*, Vol. 25 No. 1, pp. 66-76.
- Hawken, P., Lovins, A. and Lovins, L. (1999), *Natural Capitalism: Creating the Next Industrial Revolution*, Little, Brown & Company, Boston, MA.
- Hedberg, B. (Ed.) (1997), *Virtual Organizations and Beyond: Discover Imaginary Systems*, Wiley, New York, NY.
- Hoffman, A. (1997), *From Heresy to Dogma: An Institutional History of Corporate Environmentalism*, New Lexington Press, San Francisco, CA.
- Hoffman, A. (1999), "Institutional evolution and change: environmentalism and the US chemical industry", *Academy of Management Journal*, Vol. 42 No. 4, pp. 351-71.
- Hoffman, A. (2000), *Competitive Environmental Strategy: A Guide to the Changing Business Landscape*, Island Press, Washington, DC.
- Hutchinson, C. (1996), "Integrating environmental policy with business strategy", *Long Range Planning*, Vol. 29 No. 1, pp. 11-23.
- Hunt, C. and Auster, E. (1990), "Proactive environmental management: avoiding the toxic trap", *Sloan Management Review*, Vol. 31 No. 2, pp. 7-18.
- Karliner, J. (1997), *The Corporate Planet: Ecology and Politics in the Age of Globalization*, Sierra Club Books, San Francisco, CA.
- Kelly, J. (1992), "Does job re-design theory explain job re-design outcomes?", *Human Relations*, Vol. 45 No. 8, pp. 753-74.
- King, A. (1995), "Avoiding ecological surprise: lessons from long standing communities", *Academy of Management Review*, Vol. 20 No. 4, pp. 961-85.
- Korten, D. (1996), *When Corporations Rule the World*, Kumarian Press, Bloomfield, CT.
- Lawler, E. (1992), *The Ultimate Advantage: Creating High Involvement Organizations*, Jossey Bass, San Francisco, CA.
- Lindsay, W. and Petrick, J. (1997), *Total Quality and Organization Development*, St. Lucie Press, Delray Beach, FL.
- Mathews, J. (1992), *TCG: Sustainable Economic Organization Through Networking*, UNSW Studies in Organizational Analysis and Innovation, Industrial Relations Research Centre, University of New South Wales, Sydney.

- Maxwell, J., Rothenberg, S., Briscoe, F. and Marcus, A. (1997), "Green schemes: corporate environmental strategies and their implementation", *California Management Review*, Vol. 39 No. 3, pp. 118-34.
- Mirvis, P. (1988), "Organization development part 1: an evolutionary perspective", *Research in Organizational Change and Development*, Vol. 2, pp. 1-57.
- Mokhiber, R. and Weissman, R. (1999), *Corporate Predators: The Hunt for Mega-Profits and Attack on Democracy*, Commom Courage Press, Monroe, MA.
- Nadler, D. and Tushman, M. (1997), *Competing By Design: The Power of Organizational Architecture*, Oxford University Press, New York, NY.
- Nohria, N. and Eccles, R. (1992), *Beyond the Hype: Rediscovering the Essence of Management*, Harvard Business School Press, Boston, MA.
- Patrick, J. and Quinn, J. (1994), "Indonesian deforestation: a policy framework for sustainable development", *Journal of Asian Business*, Vol. 10 No. 4, pp. 39-54.
- Patrick, J., Scherer, R., Brodzinski, J., Quinn, J. and Fall Ainina, M. (1999), "Global leadership skills and reputational capital: intangible resources for sustainable competitive advantage", *Academy of Management Executive*, Vol. 13 No. 1, pp. 58-69.
- Polonsky, M. and Zeffane, R. (1992), "Corporate environmental commitment in Australia: a sectorial comparison", *Business Strategy and the Environment*, Vol. 1 No. 2, pp. 25-39.
- Quinn, J. (1992), *Intelligent Enterprise*, Free Press, New York, NY.
- Rheingold, H. (1993), *The Virtual Community: Homesteading on the Electronic Frontier*, Addison-Wesley, Reading, MA.
- Roome, N. (1992), "Developing environmental management systems", *Business Strategy and the Environment*, Vol. 1, pp. 11-24.
- Schön, D. (1971), *Beyond the Stable State*, Norton, New York, NY.
- Senge, P. (2001), "Innovating our way to the next industrial revolution", *Sloan Management Review*, Winter, pp. 24-38.
- Sharma, S. and Vredenburg, H. (1998), "Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities", *Strategic Management Journal*, Vol. 19, pp. 729-53.
- Shrivastava, P. (1995), "The role of corporations in achieving ecological sustainability", *Academy of Management Review*, Vol. 20 No. 4, pp. 936-60.
- Starik, M. (1995), "Research on organizations and the natural environment", *Research in Corporate Social Performance and Policy*, pp. 1-41.
- Starik, M. and Rands, G. (1995), "Weaving an integrated web: multilevel and multisystem perspectives of ecologically sustainable organizations", *Academy of Management Review*, Vol. 20 No. 4, pp. 908-35.
- Townsend, A., DeMarie, S. and Hendrickson, A. (1998), "Virtual teams: echnology and the workplace of the future", *Academy of Management Executive*, Vol. 12 No. 3, pp. 17-29.
- Useem, M. (1996), *Investor Capitalism: How Money Managers Are Changing the Face of Corporate America*, Basic Books, New York, NY.
- Weizsacker, E., Lovins, A. and Lovins, L. (1998), *Factor Four: Doubling Wealth, Halving Resource Use*, Earthscan Publications, London.
- Wilkinson, A. and Willmott, H. (1995), *Making Quality Critical: New Perspectives on Organizational Change*, Routledge, London.