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Introduction

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ABSTRACT

This introductory chapter highlights the key complexities of the modern business environment and how they impact on strategic supply management. Major determinants of change discussed include globalization, information and communication technologies, the changing nature of value, increased awareness of the scarcity of resources, and instability of capital markets. The phases and stages of development of supply management are mapped out, from its rise in the nineteenth century, most notable milestones of which are outsourcing in the 1970s and cooperative supply relations from the 1980s. The new supply management role is characterized as a complex adaptive system, in contrast with traditional purchasing and supply functions.

KEYWORDS

Strategic supply management, globalization, outsourcing, cooperative supply relations, complex adaptive system

A CHANGING BUSINESS WORLD

If we compare the current business environment with that of a few decades ago, we observe a radically different and more complex business world. A first decisive determinant of change is what is generally called 'globalization'; the integration

of markets and the consequent international mobility of goods, services, knowledge, and capital. While the global gross domestic product has almost doubled in the last 20 years, international trade has nearly quintupled. Subcontinents such as China and India have entered the international circuit, drastically enhancing world production capacity and opening huge sales markets. A belt of other countries has followed the two Asian giants, from Vietnam to Eastern Europe, effectively redrawing the geopolitical map of continents. The first world is no longer first in economic terms and the technological and military leadership is now less concentrated than in the past. Globalization is not a new phenomenon, but what is remarkable is the speed with which these changes occurred, in particular the speed at which the economic barycentre of the globe has migrated from the traditional western world to the Asian shore of the Pacific Ocean.

A second powerful determinant of change is related to technological development, primarily of information and communication technologies (ICT) and, profoundly, the internet. Their impact on supply management has been disruptive and not yet fully deployed: interactivity, virtual reduction of distances, disintermediation between parts of the value chain, emergence of new businesses, especially where digital products are concerned, are all features of these new technological developments. In the ICT field it is worth highlighting the so-called remote monitoring technologies and collaboration platforms that professional communities use for joint product development, design, and schedule changes. The development of these platforms, along with the increasing convergence between different technologies (microelectronics, telecommunications, micromechanics, robotics, etc.), blur the traditional boundaries between industries and put forward dynamic forms of cooperation and collective processes of knowledge sharing. New waves are constantly being announced in molecular biology and nanotechnologies, cognitive science and genetic engineering, green chemistry and industrial ecology, holding the promise for more efficient energy and food production processes, new therapeutic interventions, improved environmental monitoring, and expanded communicative capacities. The pace and the origin of these cross-industry technological advancements suggest that the leverage of suppliers' innovation capacity is likely to increase.

The technological development has emphasized a third decisive factor for change: the nature of the value that circulates in the global space. While in the past this value was mostly connected to tangible capital (machinery, equipment, and materials), now arguably the most important capital assets are the less tangible information, knowledge, and relationships. Supply nets are at least partly dematerialized: the value that flows inside is composed by design, engineering, advertising, communication, and customer service. This more fluid value cannot be measured in percentage of defects and is much more difficult to control, maintain, and store. The individual and organizational capability to access, develop, and share this intangible value has become a critical success factor.

Other forces of change refer to consumption patterns inspired by a culture more sensitive to the scarcity of natural resources and to environmental protection.

These aspects reflect in the choice of materials, in their packaging and transport, and in the need to control product and services throughout their entire life. Enhanced disparities between income classes, both in the emerging markets and in the western world, are likely to increase influence on the offer, including the political position.

While the aforementioned factors have gradually dismantled the previous business landscape, the new scenario has yet to be deciphered. Winds of crisis are blowing over the international terrain with religious, physical resources, and wealth profile disparities leading to quite unstable comparative advantages. The free movement of factors of production is both cause of integration and homogenization across countries, not only in terms of cultural values and social demands, but also of disintegration of pre-existing balances. The political movements that are questioning the institutions of some nations (notably in the Islamic world) are at least partly justified by the increasingly free flow of information in the global web. The development of ICT, and in general the cross-industry development and hybridization of technologies, tends to destabilize the rules of the competitive game and erode positions that were previously consolidated. Similarly, the free movement of capital is no stranger to the violent financial imbalances recorded in recent times. The economic and financial activities rush along global highways where signals, when present, are not uniform and where no control institution has jurisdiction over the entire route. The instability that exists in the capital market, as well as in other contexts, is also justified by the difficulty of governing processes that overcome the sovereignty of individual countries, while forms of supranational government are weak. In the context of global recession and crisis in financial markets, protectionist temptations are resurfacing not only in the western context, to the point that – as history shows – the aforementioned process of globalization cannot be considered irreversible.

Therefore, uncertainty and instability appear as the main characteristics of the ‘new world’. In this scenario, companies are solicited to constantly re-evaluate their core, i.e. the parts of value upon which to build their competitive advantage. Higher flexibility is required in the do vs. buy and domestic vs. international sourcing choices, taking into account the opportunities of international markets, the interdependencies between the various internationalization forms, the characteristics of the product, the current configuration, and therefore the investments already made (path-dependency). In some sectors a true relocation within the value stream has taken place, for example, in order to become designers, marketers and system integrators, and leaving behind traditional low-value-added parts. Greater flexibility is also required in order to compose and harmonize supply networks that differ in terms of objectives (efficient, responsive, agile, focused on risk coverage (Lee, 2002)), geographic scope (synchronizing short (local supply base) and long (international supply base) chains), and patterns of consumer demand. Since current organizational networks are geographically more spread than in the past, involve more actors, and move a variety of tangible and

intangible contents, they are also more vulnerable to potential disruptions. It follows therefore that there is a need for tools and operations architectures that limit liability, intellectual property and reputational risks and ensure supply continuity.

In addition, global competition calls for the revision of organizational structure and profile. A trend towards greater size and scope seems to affirm the need to consolidate and leverage corporate-wide volumes to achieve any possible efficiency gains. Together with the geographical expansion of businesses, the skills needed in the global arena broaden, i.e. skills in the management of decentralized units, cross-cultural coordination, and adaptation to the tangible and intangible infrastructure of the various countries.

Ultimately, the new scenarios call for a composite and reconfigurable organizational design, for multilateral collaborations in the joint value creation and network monitoring, for great flexibility to adapt to the complex interplay of social, economical, and political forces.

METAPHORS AND META-FORMS

To understand better the current evolutionary directions it may be useful to look at the past in order to identify the phases and stages when the supply environment has significantly changed.

The rise of the supply function – seen as a set of specialized skills permanently deputed to acquisition and management of production inputs – dates back to the nineteenth century. However, only in recent times has it been perceived as a strategic activity that requires planning. Two major milestones mark this evolution:

- Production decentralization and outsourcing from the 1970s has seen large and vertically integrated companies – characterized by centralized control, strict separation of cognitive and executive work, Taylorist specialization of production tasks – reveal their inertia when coping with the instability of output and input markets that have arisen in this phase. Companies then discover that outsourcing can be a source of flexibility, transforming fixed costs into variable costs and allowing the focus on core activities. However, the resort to external resources still remains inspired by a short-term logic, while the relationship with suppliers does not lose its adversarial, zero-sum perspective.
- The second phase, which emerged in the late 1980s, is marked by the 'consecration' of cooperative (supply) relations. The Japanese model became the paradigm of this phase. Companies realized that competitiveness was not an individual play, but rather an attribute of the network of organizations they belonged to. If it is true that competition is a joint effort, and if the value that reaches the consumer is the sum of the contribution of all the members of the net, then the challenge is to develop a joint project in which each node brings specific capabilities. Therefore relationships are not necessarily antagonistic: between market and hierarchy a variety of hybrid solutions are discovered and experimented. This way cooperation (partnerships, and alliances) emerges.

The management literature often uses metaphors to describe the meta-organizational forms that best characterize specific historical periods. Indeed, the archetypal

image can evoke concepts and meanings in a more effective way.¹ It is then interesting to recall the metaphors that the literature has pointed out to describe the organizational forms that distinguish the phases that precede and follow the two milestones previously introduced:

- The 'growth through accumulation' stage (Fordist mass production), associated to metaphors such as the 'pyramid', the 'castle', the 'machine'. These meta-forms recall the verticality, the rigorous specialization of labour, and the hierarchical coordination and control of the organizations that characterize this phase. These metaphors remember the engineering concepts and the optimization logic ('best way') used to configure the organizational *machine* and its articulated synchronisms. Inside this organization, the buyer has a role not much more sophisticated than that of providing to the production line the (perfectly replaceable) pieces produced externally.
- The 'growth through propagation' stage (alliances/partnerships), associated to metaphors such as the 'chain' or the 'network'. Here the company was considered part of a system and it became evident that there were types of growth not closely related to size or the quantitative and vertical dimensions of business. What appeared to matter was rather the dimension of the relational environment where companies could share resources and complementary skills. Put simply, we can say that while in the previous stage the buyers' task was to look for products, at this stage their task was to identify organizations and to manage the complex interdependencies (in product development, in logistics, etc.) that develop between them.

Currently, however, the competitive landscape has become even more unstable: the world economic geography has suddenly changed with recession impacting on most territories; the technological change has opened up new horizons. Uncertainty has called for structural and organizational developments where the growth has had to be rethought in even more dynamic terms. What metaphor distinguishes this current phase? References to 'holograms', 'fractals', and 'multi-cellular organism' can be found in the literature. However, the 'complex adaptive system' is probably the more appropriate metaphor, mentioned not by chance in various sections and in a chapter of this book. It can be described as a community of interacting agents (customers, suppliers, complementary businesses, etc.), whose behavior is inspired by common rules (values, ethics, economic principles, and organizational arrangements), aimed at the continuous exchange (of goods, services, ideas, and resources) through mutual influence' (Dooley and Van de Ven, 1999; Miller and Scott, 2007). The design of such a system is based on the criteria of: (a) self-organization, i.e. the ability of the constituent parts to decide (at least partially) independently: 'New emergent structures, patterns, and properties arise without being externally imposed on the system' (in Choi et al., 2001); (b) the team and network relationships: 'In a complex and uncertain world is better not to play alone' (Ohmae, 1989); (c) the strategic flexibility; (d) the learning organization; and (e) the creative disorganization.

These principles characterize a complex adaptive system that needs a wide circulation of information, distributed intelligence, involvement at all levels, and extensive entrepreneurship in order to tackle the uncertainty and instability of a world that does not behave in a linear manner. A system able to develop, implement, maintain, and store knowledge, culture, behavior, and able to leave

adequate space for innovation, which ‘frequently arises from the thin path that runs along the edge of chaos’ (De Toni and Comello, 2010).

Building on the contributions of co-evolution theory, it is reasonable to think that the high-performing organization of the future will be able not only to adapt itself to the external environment, but also to mould that environment. Another metaphor that recurs in current literature is ‘ecosystem’. On a biological level, an ecosystem is a community of different species in a given space, or habitat, which in turn works as an active support for the community itself. In this space, companies co-evolve through a dense network of cooperative and competitive relationships, different technologies converge, and the product and service development is to some extent the shared effort of a population of professionals, users, and service providers. ‘In a business ecosystem, companies co-evolve capabilities around a new innovation: they work cooperatively and competitively to support new products, satisfy customer needs, and eventually incorporate the next round of innovations’ (Moore, 1996). The most direct example is probably that of the computing ecosystem, which includes the software and significant segments of the hardware industries, but extends into many other industries (Iansiti and Levien, 2004). Companies like Microsoft and Apple employ tens of thousands of direct workers, but their system is populated by millions of software and hardware developers and by several companies that offer computer and internet-based services. The Windows or Apple platforms support applications connected to an invaluable number of businesses, from tourism to finance, from entertainment to publishing. Even the authors and the readers of this book are to some extent included.

It isn’t perhaps a coincidence that the current metaphors come from the biological field, in sharp contrast to the manufactured engineering artefacts of past images (the pyramid, the machine). Nature offers extraordinary examples in the shaping of individuals and populations functionally suited to the eco-environment in which they live. Business cycles, like biological eras, have sometimes generated dinosaurs and sometimes small organisms. This seems to be the time of complex and adaptive species able to evolve dynamically with their environment.

How do the principles of adaptive complexity translate into current and future supply environments? The ‘new’ purchasing function – more precisely, the organizational subsystem responsible for managing the interfaces between internal and external units – should be configured as an entity with distributed intelligence and responsibility, able to self-organize quickly in a rapidly changing context; a subsystem that is capable of:

- Building inter-organizational architecture characterized by variable geometry, acting as a link between internal and external resources;
- Governing these relationships looking for a dynamic equilibrium between multiple instances (cost vs. differentiation, internalization and externalization, domestic vs. international, centralization vs. local responsiveness, cooperation and competition, material vs. immaterial);



- Managing the increasingly sophisticated technological infrastructure, both for the communication between the network of stakeholders and for the control and monitoring of their distributed assets.

The function, therefore, requires a cultural perspective far broader than the past. Also, we can expect a higher sophistication of the conceptual and operational tools of supply network managers: worldwide data, common category codes and the ability to elaborate different but harmonized categories strategies, performance measurement/management instruments, cost and risk management tools over the product lifecycle, location decision models, value stream mapping tools, scenario analyzes, and technological foresight.

RATIONALE FOR THIS TEXT

The main motivation for this text was always to gather together the viewpoints of a diverse set of well-established academics who, in the editors' views, were informing the development of the field of strategic supply management, though the term/title in itself was the cause of much debate. The team of editors and editorial review board involved in this project reflected the diversity and the origins of the subject. Broadly speaking, a number of scholars had been observing and commenting on the boundaries and content of what we might term supply chain management, supply strategy, and the strategic management of supply, as well as conducting empirical research within the practice space. The academic reflection and interest in defining and illuminating the development of the field was evident in the special issue of the *International Journal of Operations and Production Management* in 2006 questioning whether an academic discipline was emerging. At that time the general consensus was that there was insufficient clarity of definitions and boundaries and, rather than a focusing in, there was more of a broadening out of viewpoints. But, given the changing business context discussed previously, it is not surprising. The rapid and profound changes impacting on the practice space were necessarily being debated, analyzed and conceptualized in the academic arena. It might have been concluded that a number of academic camps were evident and that in the future a number of disciplines might emerge. But that wasn't how the story panned out. Rather, the discussion developed more in tune with practice – that there was a need to integrate different perspectives, that all were useful in their own right as 'lenses' through which to view the changing terrain. What was emerging was rather a more configurationist approach – knowing which lens to pick up at which time and look through to inform each decision. As Guinipero et al. (2006) concluded, the changes in practice required greater coordination and integration, leading to the requirement for more strategic practitioners. We can extend this thinking into the need for greater understanding of configuration, or the metaphor of 'conductor' of an orchestra, with each section of the orchestra governed by their own specialisms, but being



brought into play in appropriate combinations to deliver particular works. This echoes Cousins et al.'s (2006) conclusions 'Perhaps [supply chain management] SCM will become simply an overarching field for differing theories applied to study the variety of phenomena and situations that arise.' So, as more musical pieces are composed, more and new configurations of the use of the sections of the orchestra develop.

This text therefore brings together the contributions of various authors who each observe the strategic management of supply through their own particular theoretical lenses, and who configure and shape their explanations and understandings of the dynamically changing phenomena in the business world that their thinking is devoted to. The theoretical framework developed through this text is supply in a dynamic environment (Chapters 1 and 2) leading to configurationist approaches (Chapter 3) at different systems levels – organization, relationship (Chapters 4 and 5), chain (Chapter 6), network (Chapter 7), and sector/system (Chapters 8 and 9). The text then broadens to examine strategic supply management through different theoretical lenses (Chapters 10–13). Chapters 14–19 deal with particular issues relevant to the strategic management of supply. Chapter 20 is a review chapter, reflecting on the story of the strategic management of supply so far and the future direction of this multi-disciplinary field of study. We wish to thank all of our authors and reviewers who have contributed to this text.

NOTE

1. 'Metaphor' originates from the Greek : 'the transfer of the sense of one word to a different word'. Through the metaphorical image (precisely the meta-form) it becomes possible to express meanings and translate intuitions into comprehensible concepts. When the image then undergoes a process of repetition in verbal and written communication, it acquires a symbolic significance.

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