An institutional theory perspective of business continuity planning for purchasing and supply management

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Supply chains are increasingly susceptible to unplanned, unanticipated disruptions. With the implementation of the practices of lean systems, total quality management (TQM), time-based competition and other supply chain improvement initiatives, managers now realize that their supply chains are fragile, particularly to environmental disruptions outside their control. As a result of recent events including 11 September 2001, a system is now emerging in purchasing to manage supply risk characterised as having a very low probability of occurrence, difficult to predict, and with a potentially catastrophic impact on the organization. This paper presents case study research findings examining how and why firms create business continuity plans to manage this risk. Propositions are then presented from an institutional theory perspective to examine how various isomorphic pressures result in firms having similar risk management practices embedded in their supply management practices over time.

Keywords: Business continuity planning; Institutional theory; Risk management; Purchasing; Supply chain management

1. Introduction

Several recent events have emphasised the risk that exists in business and the increasingly fragile nature of the modern supply chain. On 14 August 2003 electrical power in the American Midwest and Ontario was disrupted, the resulting power outages lasting anywhere from minutes to days (www.macnn.com/news/20654). The effects of this disruption were felt as far away as California, where Apple Computer was preparing to launch its much-anticipated G5 computer. This launch was affected by the fact that IBM in New York manufactured all the microprocessor chips required by Apple. The power disruption resulted in large-scale losses of production. In another example, a fire in the main Philips radio-frequency chip plant in early 2000 stopped supply to Ericsson for their cellular phones. This supply disruption resulted in an estimated $400 million revenue loss for Ericsson and eventually led to their exiting the manufacture of cellular phones (Rice and Caniato 2003).

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In each case, the respective companies experienced significant financial losses. In part, these effects were amplified by the lack of buffers. In order to address supply risk, many managers are now adopting an approach for dealing with these specific types of disruptions—disruptions that are difficult to predict, have a small probability of occurring but that, when they occur, have an immediate and significant impact on the ability of the supply chain to meet customer demands. This approach is business continuity planning (BCP).

BCP is a system that has been developed primarily by practitioners to minimize the effects of unanticipated events on the firm’s ability to meet customer requirements. Planning and managing disruptions is now an expected part of managing supply chains. Responding to these potential disruptions can take many forms: actions aimed at reducing the probability of a disruption taking place; measures aimed at reducing the impact of the disruption once it occurs, and some combination of these two tactics.

As BCP and its study migrate from the practitioner to the research world, a change in how it is viewed and studied must occur. This is a change from a strictly empirically based perspective to a more theory-oriented perspective. This paper initially draws on open systems theory, and subsequently adopts institutional theory for understanding why and how organizations structure BCP processes for inbound supply. Ultimately, this paper has a dual purpose:

1. To examine how firms manage supply risk when its probability of occurrence is very low, it is difficult to predict, and its impact to the organization is potentially disastrous.
2. To explain why many of these risk management practices are similar.

Supply chain risk and business disruptions are real; they cannot always be avoided nor can they be ignored. To plan for business disruptions is necessary. The challenge facing both managers and researchers is to determine how best to structure BCP systems and their responses and options used. Addressing these concerns requires more research—research hopefully encouraged and shaped by this paper.

2. Risk management and business continuity planning

In order to understand how firms can create and implement business continuity plans and planning processes, the concepts of risk, uncertainty, and exposure need to be examined within the context of supply management. Limitations in using expected value analysis for risk management resource allocation are then discussed followed by an introduction to supply chain risk and business continuity planning.

2.1 Risk, uncertainty, exposure, and the supply chain

This study focuses on how firms and their management deal with risk and uncertainty within the supply chain. Before proceeding, it is important to consider the concepts of risk, uncertainty and exposure and why there is a need for additional research into these areas, especially in the supply chain context. Risk, uncertainty, and exposure (impact) have long been recognized as being critical elements in the management literature. The management of uncertainty and risk has been identified
as one of the primary tasks facing management (Thompson 1967, Weick 1969). The concepts of risk and uncertainty have been widely used in finance, economics, and strategic management. However, as pointed out by Miller (1992), risk and uncertainty have no generally accepted definitions.

In this study, we define risk as variability in outcomes or results. Risk is the product of two separate but interrelated elements: uncertainty and impact (also referred to as ‘exposure’, Miller 1992). There are two aspects of uncertainty that are relevant in the BCP environment. The first is lack of awareness of all the events that might occur and cause a supply disruption. The second is the probability of occurrence of those events.

Impact, or exposure, deals with the potential costs generated by the events whose uncertainty has been described in the preceding paragraph. Risk then, can be viewed as an expected value—the product of impact and probability. Assuming that managers are economically driven, resources are focused on events with the highest expected values.

2.1.1 The expected value paradox. In many cases, expected value analysis is both reasonable and acceptable. However, there are at least two limitations to this approach in the BCP environment. First, it assumes awareness of all the relevant events as well as confidence in the estimated probability of those events occurring and of their impact. As noted above, this is often not the case in a supply chain continuity planning setting. The second limitation of the expected value approach is that it assumes the firm has a linear utility function with respect to the impact of supply disruptions. For relatively minor disruptions, this may be reasonable, but when we include major disruptions that could threaten the very survival of the business, the linearity assumption is questionable. This setting, where there is significant uncertainty about the relevant events and there are events with potentially catastrophic impact, is the focal point for a system of enterprise risk management known as business continuity planning.

BCP treats risk from an integrative perspective. This perspective is important because it is consistent with the arguments made by researchers such as Oxelheim and Wihlborg (1987) and Shapiro and Titman (1986). These researchers have noted that, while the elements of risk are often treated independently of each other, these elements are often interrelated. Consequently, there are significant and distinct benefits to be gained by integrating the decisions pertaining to risk into a single unifying framework.

2.1.2 Supply chain risk—the new dimension to risk. One recent phenomenon affecting risk management is the increased pursuit of ‘integration’ in supply chain management. The integrated supply chain, the linkage of upstream suppliers and downstream customers with the firm, may enable the firm to enhance its flexibility, reduce costs, improve quality, reduce lead-time, and improve its overall competitiveness. Further, by investing in their core competencies and outsourcing those elements of the production or design process that are not core, the firm can potentially simultaneously reduce both fixed costs and variable costs—further improving its competitiveness.

Yet, these benefits come at a cost. As firms begin to outsource parts of their production process and subsequently rely on the chains of suppliers, they experience two phenomena—loss of control and loss of visibility. As Henry Ford (1926)
recognized long ago, when a firm subcontracts portions of its production process, it becomes dependent on the performance of its suppliers. However, the firm has less than complete control over the actions of the supplier. In addition, since supply chains consist of multiple echelons (first, second, third and higher tier suppliers), visibility into activities of the suppliers at the various stages in the chain decreases.

Further complicating this situation is the increased use of such approaches as lean/just-in-time systems, total quality management, six sigma, and time-based competition. These initiatives have been introduced as ways to reduce costs and improve competitiveness of the firm by focusing on reducing waste and variance. As waste and variance are reduced, the need for buffers in the form of capacity (safety capacity), lead time (safety lead time), and inventory (safety stock) is reduced. While these techniques have been effective, there is potential danger in their application—they can make the system too ‘lean’ and hence ‘fragile’. As long as there are no unplanned or unexpected negative variances, such systems can be expected to perform well. However, such systems may not cope well with unplanned variances because they lack resilience and/or robustness (Rice and Caniato 2003). Robustness is the ability of the system to resist a disruption. Resilience is the ability of the system to re-establish steady state and to correct the negative effects on the system after a disruption occurs.

When taken together, it can be seen that these various developments (the increased integration of the supply chain and the introduction of systems such as lean/JIT) create an environment in which the systems are highly sensitive to uncertainties emanating from the supply chain. It is in this environment that BCP has emerged as an integrated system for the identification, management, control, and reduction of risk.

2.2 Business continuity planning (BCP)

The concept of BCP has emerged relatively recently as an issue in the supply chain management literature. This literature has tried to address such questions as:

- What is BCP?
- What elements make a BCP system?
- Why do firms need BCP?

Barnes (2001) addresses all three of these issues, including a formal definition of BCP.

His viewpoint of business continuity planning is that firms can recover from a disaster that causes a disruption to business operations by the integration of formalized procedures and resource information. Elliott et al. (1999) view business continuity planning, from a finance market perspective, as ‘Planning which identifies the organization’s exposure to internal and external threats and synthesises hard and soft assets to provide effective prevention and recovery for the organization, whilst maintaining competitive advantage and value system integrity’ (p. 48). More recently, Shaw and Harrald (2004) recognize that BCP is an essential facet of business continuity management, which consists of business practices that provide focus and guidance for the decisions and actions required for a firm to prevent, mitigate, prepare for, respond to, resume, recover, restore, and transition from a crisis event. The need for organizations to create formal BCP systems is discussed by Ericson (2001), who points out that there has been a significant increase in perceived
importance by management for implementing BCP. For example, Digital Research Inc. (2002) reported that three in four companies with plans in place to deal with such disruptions have reviewed the adequacy of their plans in light of the events of 11 September 2001. Initially, the focus of BCP has been on information technology (Savage 2002). However, writers are increasingly recognizing that one of the most critical activities inherent in managing risk (Barnes 2002, Gilbert and Gips 2000) is ensuring the flow of inbound products and services as inputs to production (Burt et al. 2003).

Other authors have explored the question of what elements make up the formal BCP system. Gilbert and Gips (2000) saw a BCP system as consisting of four major elements:

1. risk identification;
2. risk assessment;
3. risk ranking; and
4. risk management.

These four categories were similar to the four discussed by Chapman et al. (2002), namely:

1. risk identification;
2. risk assessment;
3. supply chain continuity management and coordination; and
4. learning from experiences.

Morton (2002) presents a more detailed system consisting of nine activities:

1. provide top management guidelines;
2. identify serious risks;
3. prioritize the operations to be maintained and how to maintain them;
4. assign staff to disaster teams;
5. take a complete inventory;
6. know where to get help;
7. document the plan;
8. review the test plan with key employees and train all employees; and
9. maintain the plan.

This system, BCP, forms the focal point of this study.

3. Research structure

The primary purpose of this study is to understand how and why organizations structure BCP processes as a technique for managing supply risk. Grounded theory methodology (GTM) was utilized to discover theory and to extend existing theoretical structures from empirical data in a systematic and rigorous fashion (Glaser and Strauss 1967). This approach was applied to the generation, collection, and analysis of qualitative data.

The researchers applied an approach similar to that proposed by Turner (1983: pp. 334–335) for discovering and advancing theory:

This approach to qualitative data promotes the development of theoretical accounts which conform closely to the situations being observed, so that the
theory is likely to be intelligible to and usable by those in the situations observed, and is open to comment and correction by them. The approach also directs the researcher immediately to the creative core of the research process and facilitates the direct application of both the intellect and the imagination of the demanding process of interpreting qualitative research data. It is worth noting that the quality of the final product arising from this kind of work is more directly dependent upon the quality of the research worker’s understanding of the phenomena under observation than is the case with many other approaches to research.

GTM, as implemented in this study, begins with an initial theoretical perspective. This perspective is needed since no researcher can hope to enter the field and collect and analyse data without some sort of lens provided by an initial theory (Eisenhardt 1989). This lens identifies what factors and issues to focus on and what factors to overlook. Data is subsequently collected with the goal of identifying where the initial theory is adequate and, more importantly, where it is lacking. Data is generated using case studies; qualitative data analysis procedures are used for the subsequent analysis of this data.

The gaps flagged by this analysis form the basis for recasting the theoretical framework and for identifying issues in need of future research. Given the importance of the initial theoretical framework, discussion must be devoted to its selection and subsequent use.

3.1 Initial theoretical foundation

As recognized by several researchers (e.g. Miles and Hubermann 1984, Yin 1994), the establishment of an *a priori* theoretical framework is a necessary step in any qualitative data research project such as the one presented in this paper. While numerous organizational theories exist, the researchers initially selected the open systems theory framework first presented by Thompson (1967).

Open systems theory recognizes that all firms are essentially complex organizations. As such, they are open systems, ‘hence indeterminate and faced by uncertainty, but at the same time as subject to criteria of rationality and hence needing determinateness and certainty’ (Thompson 1967: p.10). Critical to this theory are the dual notions of openness and uncertainty. Openness recognizes organizational interdependence with the environment, including four major elements:

1. customers;
2. suppliers;
3. competition for both markets and resources; and
4. regulatory groups.

The firm recognizes that the environment constrains it and its actions; it also recognizes that it has imperfect and incomplete control over the environment. Under certain conditions, the firm can control elements of the environment through the use of power, which results from a set of relationships between the organization and elements of its environment. Yet, many elements of the environment are outside the firm’s control and it must buffer itself or attempt to coordinate activities between the elements. Ultimately, given the interdependency that exists between the firm and the environment and given the inability of the firm to control the actions or plans of
environmental elements, the environment must be seen as a major source of uncertainty. Actions taken within the environment can and will affect the firm and its performance. The challenge facing the firm is that of formulating strategies aimed at surviving and thriving within this setting. This framework was consequently used to develop the research protocol used in identifying candidate firms for detailed field study and for constructing the interview guide.

While there are many competing theoretical frameworks such as institutional theory (Grewal and Dharwadkar 2002, DiMaggio and Powell 1983), the resource-based view of the firm (Barney et al. 2001, Barney 1991, Wernerfelt 1984), contingency theory (Donaldson 2001), and transaction cost analysis (Chiles and McMackin 1996, Williamson 1981, 1996), open systems theory was initially selected for two reasons.

First, it recognizes the interdependencies (especially within the supply chain) that lie at the heart of BCP.

Second, it is the foundation of theoretical frameworks such as institutional theory, contingency theory, and the resource based view.

These subsequent theories were developed to explain specific issues not adequately addressed by open systems theory. By selecting open systems theory, we do not exclude the subsequent introduction of these other theories.

3.2 Data collection

The primary research method consisted of case studies with firms that have established BCP and risk management processes in supply management. An interview protocol was established before data collection and semi-structured interviews were conducted with key personnel from the candidate firms. The interviewees comprised individuals with titles such as commodity manager, quality management specialist, vice-president of procurement, risk management specialist, supplier development liaison, risk manager, and others. Evidence of BCP processes was also collected during the case studies in the form of documentation such as standard operating procedures, reports, and internal memorandums.

Candidate firms were identified before the interview protocol was administered by a number of different sources. These included: expert opinion, past experience and knowledge of the research team, and citations within the relevant literature. For a firm to be included in the study, it had to be acknowledged as being a leading practitioner of BCP principles and practices by more than one source. This identification process generated a short list of companies. These firms were then pre-screened through initial telephone and personal contacts for understanding the organization’s involvement with BCP in supply management.

This paper reports the case study findings from three firms. Prior to carrying out these studies, the research protocol and procedures were refined in a pilot study (as recommended by Yin 1994) with a company concerned with BCP. The first case study (J&L Aerospace) was conducted at a US plant of a large international aerospace supplier. The second case study was conducted with a large European telecommunications corporation (Blue Technologies). The third firm is in electronics manufacturing (A–Z Electronics). All three firms have detailed processes established for addressing risk with inbound supply and incorporate various tools and processes to ensure continuity of inbound supply. A summary of the candidate firms and their major attributes of interest is presented in table 1.
<table>
<thead>
<tr>
<th>Attributes</th>
<th>J&amp;L Aerospace</th>
<th>Blue Technologies</th>
<th>A–Z Electronics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit of Analysis</td>
<td>Division (part of a multinational company with headquarters located in Europe)</td>
<td>Corporate</td>
<td>Division (part of a multinational company with headquarters located in Europe)</td>
</tr>
<tr>
<td>Size (number of employees)</td>
<td>4500 (division)</td>
<td>61 000</td>
<td>1200 (division)</td>
</tr>
<tr>
<td>Location</td>
<td>Midwest USA</td>
<td>Europe</td>
<td>Southwest USA</td>
</tr>
<tr>
<td>Products provided</td>
<td>Components to the aerospace industry</td>
<td>Supplier of mobile systems, including:</td>
<td>Semiconductor, including:</td>
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<td></td>
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<td>multi-service networks</td>
<td>ASIC</td>
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<td>enterprise systems</td>
<td>discrete</td>
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<td>transmission and transport</td>
<td>memories</td>
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<td></td>
<td></td>
<td>technologies</td>
<td>microcontrollers</td>
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<tr>
<td>Nature of product/markets</td>
<td>Low volume</td>
<td>High volume</td>
<td>High volume</td>
</tr>
<tr>
<td></td>
<td>High value</td>
<td>Low-moderate value</td>
<td>Low-moderate value</td>
</tr>
<tr>
<td>Customers</td>
<td>Small number of large industrial customers; Department of Defence, civilian aircraft, energy/marine</td>
<td>Large number of customers, both industrial and consumer; operators, service providers, governments (especially in developing countries)</td>
<td>Moderate number of larger industrial customers; computer manufacturing, telecommunication, automotive, consumer, industrial applications</td>
</tr>
<tr>
<td>Technology</td>
<td>Moderate technological complexity, moderate pace of change</td>
<td>High technological complexity, rapid pace of change</td>
<td>High technological complexity, rapid pace of change</td>
</tr>
<tr>
<td>Rate of technological change</td>
<td>Relatively slow (slow clockspeed)</td>
<td>Very fast (very fast clockspeed)</td>
<td>Fast (fast clockspeed)</td>
</tr>
<tr>
<td>(clockspeed (Fine 1998))</td>
<td>High complexity</td>
<td>Moderate complexity</td>
<td>Low complexity</td>
</tr>
<tr>
<td>Bill of materials complexity</td>
<td>Mixture of commodity and specialized components provided by firms located internationally (some in politically sensitive areas)</td>
<td>Mixture of commodity and specialized components. Some components characterised by high setup and development costs.</td>
<td>Predominately commodity and capital equipment</td>
</tr>
<tr>
<td>Nature of products provided</td>
<td></td>
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<td>by upstream supply chain</td>
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</table>
3.3 Data analysis

Data generated in the case studies was subject to open, axial, and selective coding analysis, as per the guidelines set by Miles and Huberman (1984), Strauss and Corbin (1998), and Yin (1994). Open coding breaks down case study data in order to analyse, conceptualise, and develop categories for the data. Open coding begins with conceptualizing—a process by which a phenomenon observed is labelled. From the initial conceptualization, data that emerges from the case studies is classified into concepts, and refined by the creation of sub-categories.

Axial coding is a technique that makes connections among categories. Axial coding puts issues into groups during first level coding and summarizes the issues into themes. This process involves:

1. laying out the properties of a category and their dimensions, which begins with open coding,
2. identifying the variety of conditions, actions/interactions, and consequences of phenomenon,
3. relating a category to its subcategories through statements denoting how they are related to each other, and
4. looking for cues in the data that denote how major categories might relate to each other (Strauss and Corbin 1998).

Selective coding consists of integrating and refining categories and theory around a central explanatory concept (Strauss and Corbin 1998). This process shifts from describing the data from the case study analysis to conceptualizing the findings into a broader theoretical framework. Selective coding evolves into forming and refining theory (Flynn et al. 1990, Wacker 1998), and often leads to the creation of propositions for future research (Eisenhardt 1989). The results of open, axial and selective coding are presented next.

4. Gaps in the theoretical framework discussed

The case study data revealed that the BCP systems and the procedures that they embody exhibit a significant degree of convergence. That is, the three firms’ systems were more similar than they were different in terms of structure, approaches, and procedures (see table 2). Open systems theory, while providing an adequate framework for studying BCP and for identifying potential factors and constructs to be included in the research protocols, did not adequately explain these similarities. Consequently, it was decided to review those theoretical frameworks based on open systems theory with the goal of determining if any could adequately explain this ‘tendency’ to convergence.

After considering such frameworks as contingency theory and the resource based view, institutional theory was deemed to be the most appropriate. Institutional theory emphasizes homogeneity; it argues that forces exist both within the firm and the environment that encourage convergent business practices. This framework was found to generate insightful and compelling directions for future research. The remainder of this section will explore institutional theory. The next section will describe the research findings—first in terms of open and axial coding of the data, then its integration within the institutional theory framework.
4.1 Review of institutional theory

Institutional theory focuses on the pursuit of legitimacy in the eyes of important societal stakeholders and accentuates the significance of the institutional environment (Grewal and Dharwadkar 2002). This is different from many prior views based on economic fitness, which emphasize the competition for scarce resources and underscore the importance of the task environment. In a review of institutional theory, Scott (1987), synthesizing the work of Selznick (1949, 1957), refers to institutionalization as ‘a means of instilling value, supplying intrinsic worth to a structure or process that, before institutionalisation, had only instrumental utility’ (p. 494).

Early studies in institutional theory identified three mechanisms by which institutional changes occur that promote similarities in structures and processes. As introduced by DiMaggio and Powell (1983), these mechanisms for isomorphism are coercive, mimetic, and normative.

Coercive isomorphism results from both formal and informal pressures exerted on organizations by other organizations upon which they are dependent and by cultural expectations in the society within which organizations function. These pressures often stem from political influence and the problem of legitimacy. In a supply management context, these pressures can manifest from the requirements of regulatory agencies, customers, and other key constituents.

Mimetic isomorphism occurs due to uncertainty that encourages imitation. There is uncertainty associated with supply, and organizations may ‘transplant’ methods...
used successfully in other firms. Formal benchmarking, as well as descriptions of effective practices in the literature may contribute to this sort of imitation.

The third force is normative isomorphism, associated with the professionalization of fields and disciplines. Normative pressures refer to the collective struggle by members of an occupation to define the conditions and methods of their work, to control ‘the production of producers’, and to establish a cognitive basis and legitimisation for their occupational autonomy. Such pressures can be seen in supply management through the emergence and continued growth of organizations such as the Institute for Supply Management (ISM) in the US and the International Purchasing and Supply Education and Research Association (IPSERA) in Europe.

4.2 An updated view of institutional theory

The initial model and theoretical grounding of institutional pressures introduced by DiMaggio and Powell (1983) are limited to external mechanisms for instilling similarity in processes and structures. Scott (1987), synthesizing the work by Berger and Luckman (1967), Zucker (1977), and Meyer and Rowan (1977), notes that institutionalization is better viewed as the ‘social process by which individuals come to accept a shared definition of social reality’ (p. 496). Therefore, a missing element for understanding how institutional pressures promote similar processes is the internal organizational forces that explain how BCP in supply management becomes a core value within the firm.

Grewal and Dharwadkar (2002) provide an updated framework of the three initial institutional processes. The first is the process of regulating, which is the interaction with institutions that exist to ensure stability, order, and continuity of societies and social welfare. Regulatory agencies may control institutions, such as business organizations through a combination of imposition and inducement. The process of regulating is very similar to coercive isomorphism, as discussed by DiMaggio and Powell (1983).

The second institutional process is validating, which involves interactions between normative institutions such as trade associations, professions and professional associations, and mimicking behaviour. Validating encompasses both the mimetic and normative pressures originally introduced by DiMaggio and Powell (1983). The two mechanisms that bring out the process of validating in changing/influencing supply chains involve authorization and acquisition. Authorization occurs when supply chain firms voluntarily seek approval of authorizing agents with the primary objective of establishing legitimacy. Acquisition, on the other hand, involves firms mimicking structures and processes of particular benchmarked supply chains that are deemed legitimate.

The third institutional process consists of habitualising, which refers to the invisible, base-level institutional processes in which actions that are repeated become cast into a particular pattern that is then reproduced with minimal effort. Two sub-processes that facilitate habitualising include imprinting, which retains channel characteristics that originate at the time of channel inception, and bypassing, which involves cultural norms and shared beliefs developed collectively as a substitute for formal control and co-ordination mechanisms. Thus organizational structures and processes become ingrained in the firm, and become ‘taken for granted’ as the ‘way these things are done’ (Scott 1987).
Many of the similarities observed in the three case study firms in BCP can be understood from an institutional theory perspective. The next section will first provide the results from open and axial coding. Next, the data are interpreted from an institutional theory perspective. From these research findings, propositions are created for advancing theory in supply risk management, followed by managerial implications. Conclusions are then drawn from the overall study.

5. Research findings

The case studies indicate that a significant degree of homogeneity exists among the three firms in their business continuity plans and planning processes. These characteristics are first described in a four-stage process model for ensuring supply continuity that emerged from open and axial coding, and then within the context of institutional theory from the selective coding.

5.1 The four stages of business continuity planning in supply management

The three case study firms varied widely in terms of the nature of their operating environments, as shown in table 1. Although the firms operate in very different environments, there was surprising consistency in their approaches to continuity planning in their upstream supply chains. Specific tools and procedures were tailored to the firms’ particular environments, but the broad approach and the general processes and tasks were very similar (see table 2).

Our case studies reveal four major tasks in each of the subject firms involved with BCP in supply management: awareness, prevention, remediation, and knowledge management. These interrelated tasks form a framework for an effective supply chain continuity planning system (see figure 1).

5.1.1 Creating awareness. The first task in the framework is creating awareness. Awareness is developed when the firm recognizes that it is exposed to the risk of supply chain disruptions and realizes the potentially serious consequences of such disruptions. This awareness must develop internally, at multiple levels of management, so that resources can be allocated and appropriate processes and tools can be

![Supply Chain Business Continuity Planning Framework](image-url)

Figure 1. Business continuity planning framework.
developed and deployed to manage the risk. It is also important to drive this awareness out into the supply chain, to customers and suppliers, so that their help can be enlisted in the effort to manage risk. One example of creating awareness of risk involved the use of supplier financial appraisal reports at J&L Aerospace. These reports provide information about suppliers such as growth and profitability ratios, dependency ratios, liquidity and working capital management, and an overall financial rating of the supplier. The financial reports create internal awareness of financial risk that can arise at the supplier firms. Two additional risk awareness techniques, as discussed by Blue Technologies, consist of audit instruments and supply chain mapping. The supplier audits identify the potential risk that exists, the implications of that risk, the extent to which suppliers have secure processes, and the actions that suppliers intend to take for managing that risk. Supply chain mapping, on the other hand, allows Blue Technologies to identify critical or bottleneck suppliers. These tools provide incentives for both the purchasing (internal) and supplier (external) firms to recognize that risk exists in their supply chains.

5.1.2 Preventing supply discontinuity. The second important task in BCP for the inbound supply chain is prevention. The focus here is reducing the likelihood and/or the impact of supply chain disruptions. As synthesized by Blue Technologies, prevention comprises four key processes:

1. **Risk identification**—enumerating the causes/sources of potential supply chain disruptions.
2. **Risk assessment**—evaluating the likelihood of occurrence and the impact that event will have on the business for each cause or source of potential disruptions.
3. **Risk treatment**—prioritizing the causes/sources of potential disruptions and developing strategies for reducing their likelihood and/or mitigating their impact on the business.
4. **Risk monitoring**—monitoring developments in the supply chain that may increase or decrease risks on an on-going basis. These might include changes in the economic or political environment, changes in supply markets, or the status of individual suppliers.

One example of BCP practices for facilitating risk prevention is the purchasing risk register tool employed by J&L Aerospace. This instrument includes 14 categories for identifying, assessing, and managing supply risk. Each risk category is evaluated for its probability and impact in qualitative terms of high, medium, or low. Business processes that may be affected are listed, as well as the individual responsible for addressing the risk.

5.1.3 Remediating risk occurrence. The third task in the continuity planning framework is remediation. While the firm takes steps in the prevention stage to reduce its exposure, risk cannot be completely eliminated and disruptions to the supply chain cannot always be avoided. Thus, firms need a course of action to follow in order to recover from a disruption when it occurs. The firm should consider how it might shorten the duration of the disruption, minimize its impact on the business, and identify in advance the resources that will be needed to carry out this plan.

One example of remediation consists of the contingency plans created by A–Z Electronics. Their contingency plans address disaster recovery for important supplier
systems, including telecommunications, CAD, logistics (warehouse), computer rooms, factory automation, and applications for engineering data analysis. In addition to contingency plans, A–Z Electronics also subjects key suppliers to a material supplier quality assessment, which includes a section dealing with the supplier’s preparedness for disaster recovery.

Risk remediation is also addressed in an audit instrument created by Blue Technologies. This checklist includes 26 areas subject to audit for managing supply-side disruptions, such as management systems, risk management policies, critical equipment and tools, spare parts, fire prevention, and incident handling. Blue Technologies’ audit instrument is designed to reduce the two major dimensions of an interruption—duration and impact.

5.1.4 Fostering knowledge management. The final element in the framework is knowledge management. When supply chain disruptions occur, it is important that the firm learn from the experience. That requires a post-incident audit that identifies important lessons learned—things that went right, things that went wrong, and the results of the remediation effort—along with feedback to the earlier stages in the continuity planning process. The purpose here is to learn from supply disruptions, since they are an indication that the existing plans and contingencies in place may not be adequate.

The BCP process at A–Z Electronics addresses knowledge management by conducting an annual key performance indicator evaluation for important suppliers. This evaluation tool not only looks at the supplier’s contingency planning, but also evaluates the supplier’s response to actual events and the impact that such events had on A–Z Electronics operations. Blue Technologies also ensures knowledge management and transference in their BCP systems. For example, they categorize all incidents using a checklist containing documentation such as the actions taken by the supplier, what is needed during the next three months, and if there are available components from other supply sources.

5.2 An institutional theory perspective of business continuity planning

An examination of the case study data indicates that regulating, validating, and habitualising pressures have influenced the way in which the firms in this study have created processes and structures for ensuring business continuity in their upstream supply chains. Examples of each of these three mechanisms are discussed below.

Regulating mechanisms influencing isomorphic change in BCP can be found in all three of the case study firms. These pressures, in terms of imposition and inducement, originated externally from four sources: (1) government; (2) key customers; (3) insurance companies; and, (4) corporate directives. The US government was found to be one important regulating source. Specifically, US Customs has created a programme called Customs-Trade Partnership Against Terrorism (C-TPAT), which can be seen as both an imposition and as an inducement for business organizations to ensure their supply chains. As noted by several of the case study participants, C-TPAT is technically an optional program, but the lack of establishing and certifying inbound supply from overseas suppliers can result in delayed shipments through Customs.
Imposition and inducements also arise from other supply chain partners such as customers. Some of the study’s participants stated that risk assessments and business continuity plans are required by them to meet customer requirements. In addition, firms such as Blue Technologies are pushing such regulating mechanisms upstream in the supply chain by requiring their suppliers to have these plans in place.

A third regulatory body that influenced Blue Technologies to structure and manage BCP for their supply chains was the insurance industry. The ramifications from a prior risk event in Blue Technologies’ supply chain resulted in its insurance company requiring them to implement BCP in addressing the risks they face from supplier organizations.

Divisions and strategic business units (SBU) are also frequently subjected to standardized reporting mechanisms. For example, divisions and SBUs must often adopt accounting practices, performance evaluations, and budgetary plans that are compatible with the policies of the overall corporation. This applies to J&L Aerospace and A–Z Electronics from the SBU perspective to meet corporate mandates, and to Blue Technologies from the corporate level to the business units and functional areas. Many of the BCP processes and structures at J&L Aerospace and A–Z Electronics were required by corporate directive, while Blue Technologies formed an internal risk management group to drive overall corporate awareness and to create standardized BCP processes for dissemination throughout the divisions.

Validating mechanisms to facilitate isomorphism were discovered in this research from both normative and mimicking pressures in response to risk. The primary method by which this pressure was observed was through two of the firms adopting BCP processes and structures promulgated by external agencies, such as the Business Continuity Institute (BCI; www.thebci.org). The BCI was established in 1994 to help promote standards of professional competence and commercial ethics in the provision and maintenance of BCP and services. As the field of supply risk management matures, additional players are emerging to promote BCP processes in supply management.

Another normative pressure is the purchasing and supply management profession itself. Case study participants from all of the organizations believed that ensuring business continuity is one of the most important facets of their jobs. The driving force for this normative pressure emerges from the training and background many purchasing professionals have. For example, Leenders et al. (2002), state that ‘provid[ing] an uninterrupted flow of materials, supplies, and service required to operate the organization’ (p. 40) is one of the nine overall goals of purchasing. Additional leading textbooks in the supply management field support this observation (Burt et al. 2003, Monzcka et al. 2002).

Habitualisation may also influence how BCP is maintained. At Blue Technologies and A–Z Electronics, supply management professionals are encouraged always to think in terms of ‘what if’. All of the participating firms and respondents in this study recognize the criticality of ensuring the flow of inbound purchased goods and services for the smooth flow of operations and considered this one, if not the most important, part of their jobs.

The sources driving habitualisation among the three organizations studied, however, are different. For J&L Aerospace, the source of habitualisation in BCP comes from their overall drive to become a world-class supply organization. J&L Aerospace has many parallel business processes for reducing variance in their supply chains. For example, they have detailed early supplier involvement and
supplier development processes in place, which focus on continuous inter-organizational process improvements. Inherent within the overall framework of a world-class supply management function is the assurance of inbound supply, thereby promoting and ingraining the recognition for BCP in supply management.

Blue Technologies also has various process improvement initiatives in place throughout their organization. However, the factor that influences habitualisation in their firm was derived from an external risk incident that occurred several years prior. This event had such a detrimental impact on their market share in several markets and overall reported profits that BCP is becoming rooted within the organizational culture.

For A–Z Electronics, the habitualising mechanism is their corporate philosophy of total quality management (TQM). This philosophy is embedded as a core value and disseminated throughout their employee base, including the supply management function. Similar to the processes established by J&L Aerospace, BCP is driven by a focus on continually reducing variability in business processes, but is instilled through the philosophy of TQM.

The research findings presented have implications for understanding how firms manage one type of supply risk and provide insight for understanding how supply risk management may morph into many of our current purchasing practices. In order to address these issues, several propositions will be introduced.

6. Propositions

Institutional theory posits that similar business practices will develop across diverse organizations due to regulating, validating, and habitualising mechanisms. In this study, we found support for this type of similarity in one such set of business practices—business continuity planning in supply management. Using institutional theory as a starting point, in this section, we offer a set of propositions regarding BCP practices. These propositions represent a more formal, testable description of the applicability of institutional theory to BCP. We hope these propositions will serve as a starting point for further research on BCP practices in supply chain management.

The firms included in this study are applying BCP practices when risk is perceived as (1) having a low probability of occurrence, (2) being very difficult to detect and (3) potentially having a devastating impact on overall organizational performance. Awareness of this type of risk is growing and, as a result, we expect that interest in BCP for the supply chain will grow. On this basis, we introduce Proposition 1.

P1: Over time, more firms will adopt business continuity planning as a formal risk management technique when the probability of risk occurrence is very low, its potential impact is very high, and it is very difficult to predict.

The characteristics of BCP and planning processes discovered in this research first facilitate awareness creation and focus on prevention. In addition, if a significant risk incident did occur, organizations will create contingency plans (Morton 2002) for quickly reducing the effects of risk, and facilitating knowledge transference throughout the organization of the lessons learned from the risk, how it was
managed, and how it can be better managed if a similar circumstance did occur again. However, from an expected value perspective, it is very difficult to economically rationalize significant resource investments for striving to eliminate the risk, as previously discussed. Therefore, the adoption of BCP practices may emerge from non-economic sources.

From an institutional theory perspective, we expect that firms will go through stages to manage this type of risk. This process would first adopt practices and processes required from them by constituents, then as they further advance, they copy these practices from ‘leading edge organizations’ and established entities, and eventually these practices become part of the everyday way of doing business.

We believe that these sources initially begin from external sources such as the government and key constituents. As these stand-alone BCP practices become better accepted, validating (normative) institutions such as ISM, IPSERA, and college and university educational institutions that have supply chain curriculum will disseminate and advance the structures. Eventually, BCP as a supply risk management tool will no longer be a stand-alone practice for the purchasing function, and instead will become engrained within the everyday strategic business practices, such as supplier evaluation, supplier selection, allocation of business to supplier organizations, and categorization of suppliers such as being considered ‘certified’ of ‘preferred.’ These arguments lead to Propositions 2, 3, and 4.

P2: Purchasing organizations will adopt BCP in their upstream supply chains in the manner in which regulating bodies, such as the government and influential supply chain partners, direct them to do so.

P3: As purchasing organizations garner greater experience in BCP and supply risk management, these firms will look to normative institutions in adopting risk management processes.

P4: BCP and supply risk management will evolve toward being embedded in the everyday strategic practices of purchasing organizations.

7. Managerial implications

Most businesses are interested in a leaner supply chain. The potential benefits offered by such approaches are too great to be ignored. Yet, as managers continue to lean out their supply chains in search of better responsiveness and lower cost, they must recognize that these systems are increasingly becoming fragile—more sensitive to the effects of potential changes and unanticipated disruptions.

In the past, the commonly accepted prescription for dealing with such disruptions was to rely upon buffers in the forms of safety stock, safety lead-time, and safety capacity. Such buffers are no longer as attractive as they were in the past. What is needed is a broader approach. The findings from this research indicate that BCP in supply management can provide purchasing professionals an approach for addressing supply risk a priori while at the same time enjoying the benefits of engaging in modern supply chain management practices. We believe that this trend toward creating planning processes to assure inbound supply will only increase.

From a strategic perspective, we believe that, much like TQM and lean systems thinking has pervaded many standard business processes, continuity planning for
supply management must, and will, become embedded in many standard supply management processes. For example, we can envision that BCP will become a standard element of processes such as sourcing strategy development, supplier selection, supplier evaluation, and new product development. Moreover, these processes will be habitual, where supply managers in leading-edge firms will always consider the ramifications of supply continuity in their interactions with suppliers, similar to that observed with leading firms today in considering the total cost of ownership in their supply management processes.

From a more tactical perspective, at least two issues deserve managers’ attention. The first is the development of tools to support the first two tasks in the BCP framework—creating awareness and prevention. A fundamental requirement for effective BCP for the supply chain is a good set of tools for assessing the firm’s exposure to supply chain risk and its preparedness for dealing with that risk. Such tools help create awareness of supply chain risk and also provide the starting point for managing that risk. One type of tool is a supply chain risk/BCP audit. Development and refinement of such audit instruments will help managers identify their strengths and weaknesses, and also to prioritize actions.

A second issue worthy of management attention is metrics for BCP. Metrics play a critical role within every organization, as the means by which managers and organizations communicate, educate and focus attention (Magretta and Stone 2002). The development of metrics that capture, communicate and monitor the extent of supply chain risk, the dollar impact of such risk and the relative costs/benefits gained through the use of appropriate BCP practices and procedures should be an important focus for supply chain managers.

8. Conclusions

Risk exists in supply chains. The way in which this risk is managed depends on a wide range of factors, such as the competitiveness of supply markets (Kraljic 1983), power in the supply chain (Cox et al. 2002), how risk is perceived (Wayne-Mitchell 1995), and its dimensions in terms of probability, ability to detect, and impact (exposure). At times, purchasing professionals are able to implement managerial practices such as nurturing supplier alliances (Ellram 1991) and developing suppliers (Krause 1999) to reduce the likelihood of supply risk events from occurring. There are other times that purchasing organizations do not have the ability to cost-effectively reduce the chance of risk occurrence.

The underlying BCP practices discovered in the research provide evidence that a high degree of homogeneity exists in these firms in the core stages of awareness, prevention, remediation, and knowledge management. From an institutional theory perspective, the pressures toward isomorphic BCP practices stem from regulatory, validating, and habitualizing forces. We envision that the future of BCP in supply management will evolve toward habitualisation, where purchasing professionals in leading organizations will subconsciously consider supply continuity as a standard, rote practice, similar to other business processes and philosophies such as TQM and TCO, and eventually become embedded in the everyday practices of supply management professionals. It is only through this constant awareness and vigilance to create robust supply chains via BCP can firms survive unanticipated supply disruptions.
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