

## **Embedding Business Continuity and Disaster Recovery within Risk Management**

Xinxin Zhang<sup>1</sup> and Adela McMurray<sup>2</sup>

*The purpose of this study was to uncover the relationship between the concepts of business continuity and disaster recovery. Utilizing documentary analysis of a comprehensive review of the risk management literature, the study uncovers the chronological evolution of the two concepts dating from 1970 to 2012. Supplementing the review, in-depth interviews were conducted with four risk managers in large organizations located in Melbourne Victoria Australia. Category theme analyses of the interviews generated findings complementing the review and inform the development of a new consolidated 'Holistic Risk Management' model. The innovative model establishes the way in which the two concepts are subsets of, and embedded within, the risk management literature. The findings also show their relationship to emergency management and crisis management.*

**Keywords:** Risk management; business continuity; disaster recovery

### **1. Introduction**

Over the past decade, Australia has experienced a diverse range of disruptive events such as droughts, storms and floods. Natural disasters between 1980 and 2010 have affected 16,051,010 people and economic damage reached \$926,451,000 per year (PreventionWeb, 2011). The readiness of a company in reacting to those events is of crucial importance and is dependent on how actively its management embraces a business continuity plan. The purpose of a business continuity plan (BCP) or disaster recovery plan (DRP) is to provide procedures that can sustain essential business operations when a company is suffering a significant business disruption. Many companies use BCP or DRP interchangeably, however, there is a distinct difference between these two concepts. The goals driving each concept are different yet both plans are essential to the effective management of disasters and other disruptive events (Eric et al., 2010). Before the US terrorist attack of 9/11 in New York, the planning was primarily focused on local disasters, which affected internal and external organizational threats such as fire and what the organization planned to implement in order to protect their employees. Today, the scope becomes much broader, especially after 9/11 and Hurricane Katrina. The purpose of this study was to uncover the relationships between the relevant concepts of business continuity and disaster recovery.

---

<sup>1</sup>Miss Xinxin Zhang, School of Management, RMIT University Australia, email: [xinxin.catherine@gmail.com](mailto:xinxin.catherine@gmail.com)

<sup>2</sup> Professor Adela McMurray, School of Management, RMIT University, Australia, email: [adela.mcmurray@rmit.edu.au](mailto:adela.mcmurray@rmit.edu.au)

## 2. Literature Review

What follows is a review and analysis of the key concepts comprising this study. These include business continuity, disaster recovery, emergency management, crisis management and risk management.

### 2.1 Risk Management

Hassan (2012, p 42) defined "risk management is the identification, assessment, and prioritization of risks followed by coordinated and economical application resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities". Alberto and Francesca (2011) adopted these phases into their study when developing a risk management model. Generally risk management is comprised of risk mitigation, risk assessment and risk identification (Bode and Wagner, 2009). Surapaitoolkorn (2012) employed this framework for analyzing Thailand's floods. The importance of continuous risk control and repeated risk management processes is to adjust to different environments in order to maintain an organization's sustainability and to inform academic developments (Kleindorfer and Saad, 2005). The risk management process weakens and cannot be identified without ongoing modifications even though it is a successful process because new risks will occur when the environment changes. Therefore, proper measures of the risks play an important role in the assessment, especially within a changing environment.

Nikolaos Vasileiadis Secure Ltd (2008) proposed that business continuity management (BCM) can supplement the risk management framework that is used to inform a general understanding of the business risks and the consequences resulted from those risks. Risk management is a tool to manage and control a variety of risks existing in organizations such as the risks in products delivered or services provided. It is difficult for organizations to forecast and analyze various risks although they know sometimes the products and services will be destroyed by potential incidents. However, BCM makes contributions to organizations by concentrating on the effects of business disruptions and identifying those products and services which can help organizations survive during disruptions and providing the required measures that organizations need for continuous development. An organization with formal BCM assessments enhances their recovery time when exposed to incidents and provides organizations with more confidence to continue their businesses after a disruption (Nikolaos Vasileiadis Secure Ltd, 2008).

### 2.2 Business Continuity Management and Crisis Management

BCM is a continuous management process which should be directed at the organization's critical business processes with an aim to ensure the continuity of the business. With the characteristics of prevention, BCM limits the damages resulted from disruptive business events (Smit, 2005). The BCM definitions from the period 1995 to 2005 share the same management process which is "holistic". And the aim is the same as well which is to prevent business disruptions and protect the organizations. However, the definitions are more detailed and include stakeholders, reputation, brand and value creating activities after 1995. From 2005, the definitions include the term "protective".

## Zhang & McMurray

In the field of BCM, crisis management is considered as one of the most easily misunderstood terms. Most plans related to crisis management are designed to be activated for accidents in spite of its impact. Some organizations define it as executive-level plan to address major events but in fact, the plans only cover the events related to physical security problems and address the issues of communications (Everest et al., 2008).

### 2.3 Business Continuity Planning

The definitions of business continuity planning from the period 1997 to 2011 were generated from various disciplines such as facilities management and risk management. During this period, BCP definitions show changes in focus from a “holistic” to “before” or “after” the disruption and most recently return to ‘holistic’ through Akram’s (2011) work. Common to all definitions is the term ‘business management’. Moreover, among these definitions, the definition (Pitt and Goyal, 2004) is different from others. Pitt and Goyal (2004) focused on the “before” phase, and proposed new areas such as information technology. In plain language, the intended effect of BCP is to establish the plans which can help business survive in the event of disaster and it is an ongoing methodology governing how business is conducted. Organizations should make sure that their BCP is simple to be taken advantage of when a crisis happens. Likewise, BCP as a component of an organization’s risk management framework will play a role as well as crisis management and disaster recovery planning (Hassan, 2012).

### 2.4 Disaster Recovery Planning

The term of Disaster Recovery Planning (DRP) is defined in many different forms in the literature from 1990 to 2011. The definitions of DRP illustrate that the concept has evolved from the narrow area of computer security to more broad areas such as the preparedness for business operations emergency. Business Continuity Planning (BCP) provides the organization with the long-term strategic business plan for the continuation after a business disruption. While Disaster Recovery Planning (DRP) is more tactical and provides a short-term plan to deal with the specific IT-oriented disruptions. The DRP concentrates on efficiently attempting to mitigate the influence of a disaster and respond and recovery IT systems immediately when facing a significant disruption. It is considered as tactical instead of strategic and focuses on providing a means for immediate response (Eric et al., 2010). Disaster recovery which is often used interchangeably with BCP is defined as the rebuilding and recovery after a disaster (Cannon et al., 2006). Disaster recovery is one of the potential solutions to effective BCP (Eric et al., 2010). Sometimes business continuity is confused with disaster recovery, but they are separate entities. Disaster recovery is a small subset of business continuity (Cannon et al., 2006).

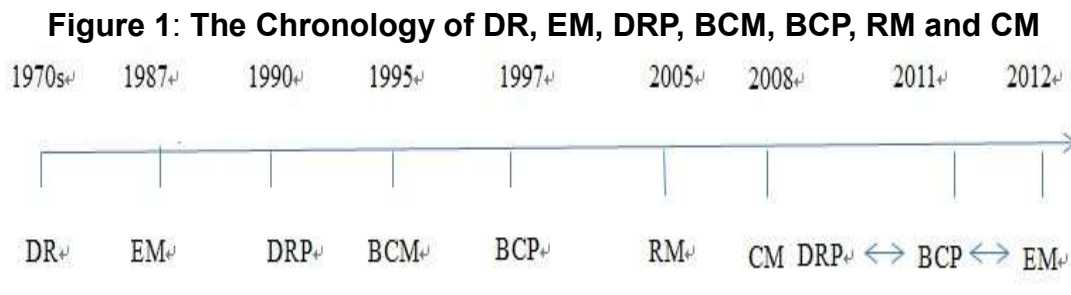
### 2.5 Emergency Management

McLoughl (1985) proposed that emergency management is a discipline that provides preparations for organizations to manage and control risks when a disaster happens which is an effective way that organizations can adopt to avoid unnecessary risks. Preparedness, mitigation, response and recovery are the primary elements of emergency management. Hoetmer (1991) pointed out that emergency management

## Zhang & McMurray

is the discipline that offers various means such as technology and science to deal with most disruptive events, which has been considered a good planning to meet emergencies. Donahu and Joyc (2001) defines that emergency management is a subset of complicated policy systems that organize diverse guiding principles to prepare, mitigate, respond and recover from the disasters and its efforts are omnifarious to realize the application of the policies. Emergency management is an ongoing process for organizations and societies to control risks for improving and avoiding the effects that the disruptive events cause and sometimes it is regarded as business continuity planning in the private sector (Hassan, 2012).

The following chronology (Figure 1) consolidates the literature to illustrate the development of these concepts.



**Source: Authors**

As can be seen in Figure 1, from 1970 to 2012, a variety of terms were used to describe business continuity and disaster recovery such as emergency management, crisis management and risk management, which made the concepts more complicated for the relationships between each other. The evolution of these concepts indicates their popularity and the growing of this literature. However, to date, even the current literature, is confusing as there is no relevant concept discussing disaster recovery management, which can be regarded as a gap in the current research.

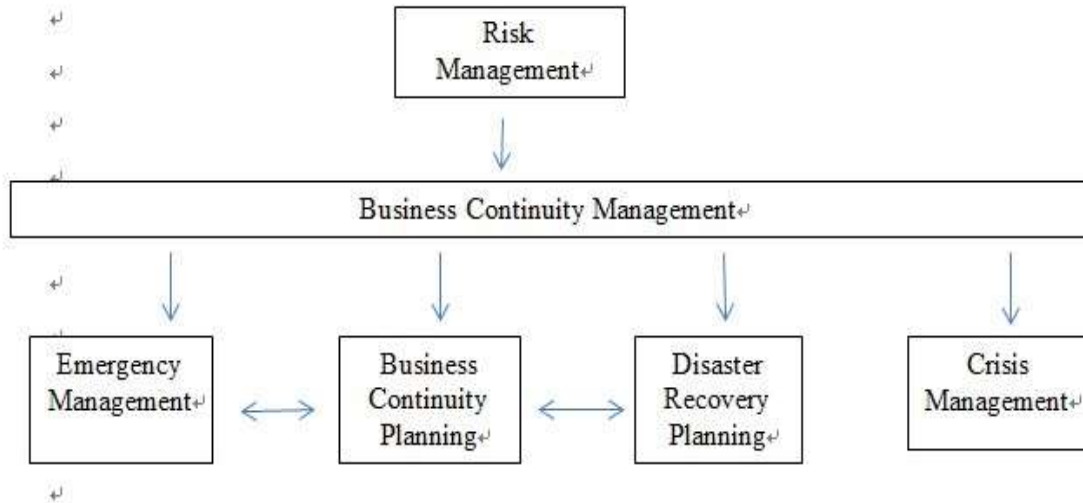
### 2.6 BCP/DRP & Industries

The information extracted from three different industries regarding business continuity and disaster recovery includes the non-profit organization, education organization and manufacturing organization. These kinds of industries have implemented the risk management plan that establishes a systematic process of identifying, managing and monitoring risk, which is in accordance with the process of business continuity. All these three industries review regularly for their risk management plan. Non-profit organizations use not only risk management plans but also implement several other planning mechanisms such as a business continuity plan. Education organization institutions primarily employ crisis management planning based on a risk management approach. The risk management plan of the manufacturing organization in this study was comprehensive and identified the management of their risks.

## 2.7 Summary

The holistic risk management model (Figure 2) is developed based on the existing relevant literature addressing business continuity and disaster recovery and shows the links between these concepts.

**Figure 2 A Holistic Risk Management Model**



**Source: Authors**

Figure 2 above shows the way in which the key concepts are related within a holistic risk management model. This new model consolidates the literature and shows the relationship between these concepts and contributes to the discipline and literature.

## 3. The Methodology

Lussier (2011) identifies four key areas of research design which are comprised of participants (sample), variables, data collection and data analysis. This study follows Lussier's (2011) suggested structure to conduct the research. Ethics approval was gained from the University prior to collecting the data. Utilizing the relevant information identified in the literature, the sampling criteria was identified in order to find suitable participants and then to undertake the interviews to collect the qualitative primary data. The interview data were transcribed which included data coding, followed by category theme analysis and interpretation. The interview findings were then merged with the literature review analysis to generate the study's concluding findings. The study was conducted in Australia's second –most populous city Melbourne in Victoria. The population of Greater Melbourne is estimated at 4,170,000 (Evi, 2012). As home to many large organizations, this made it relatively easy to locate those organizations which have business continuity and disaster recovery programs.

### 3.1 Sample

Theoretical sampling provided a way of selecting participants to partake in this study (Eisenhardt, 1989). Theoretical sampling is an ongoing process of selecting participants according to the relevance to the research question and the capability of making contributions to the development of the emerging theory (Bryman and Bell,

## Zhang & McMurray

2011). In theoretical sampling, “data gathering driven by concepts derived from the evolving theory and based on the concept of “making comparisons”, whose purpose is to go to places, people, or events that will maximize opportunities to discover variations among concepts and to densify categories in terms of their properties and dimensions” (Corbin and Strauss 1998, p201).

The criteria for selecting suitable participants in this study were firstly that the participant must be employed in a large organization and be responsible for that organization’s risk management policy/documentation and secondly that each participant was drawn from a different organization. Participants were selected following the criteria above and their likely knowledge of relevant information regarding business continuity and disaster recovery. It is important to note that the criteria for selecting the participants were deliberately narrow even though they do impose limitations for this study. The reason why the selection criteria were so targeted in selecting the study participants was that the newly developed holistic risk management model required confirming in the first instance. There were four participants partaking in this study .All four participants were male and worked in organizations located in urban Melbourne. Their work roles encompassed being in charge of their organization’s risk management but belonging to different departments within their organizations. Three organizations were not for profit and one for profit.

### 3.2 Data Collection

This research study primarily utilized secondary data supplemented by primary data. The annual reports of public organizations are one of sources often used in secondary data collection (Blumberg et al., 2011). For this study, several organizations in different industries were selected and the relevant information such as sustainability performance was extracted from their annual report and sustainability report. Moreover, the interview approach is an appropriate data collection tool and is different from questionnaires in that it enables the participants to reply to the questions unrestrainedly and comprehensively (Bryman and Bell, 2011). Semi-structured interviews were conducted for the study because they are designed with a set of open-ended questions that are posed verbally to participants in an open framework (Mason, 1996). Researchers should make sure that participants are asked and answered the same questions to ensure a common framework, whereas, sometimes it is difficult to gain the understandings because different people have different interpretations (Minichiello et al., 1995).

Four participants were interviewed over a period of one month. An interview schedule was designed to guide this study. Seven open ended questions comprised the interview schedule. Each interview was audio recorded with the participant’s informed consent. Interviews were conducted in participant’s offices or a meeting room in their organization. The duration of the interviews was approximately 30 minutes.

### 3.3 Data Analysis

Qualitative research is “the process of systematically and rigorously conducting flexible and contextual research that allows self-scrutiny by the researcher and

## Zhang & McMurray

produces explanations to intellectual puzzles” (Mason 1996, p5). The researchers collected and analyzed the data guided by grounded theory and made no assumptions so that new ideas could be developed on the topic. The manual thematic analysis implemented in this study was part of the grounded theory and was utilized as a process of generating understanding through analysis of the qualitative data, which is appropriate for this exploratory study (Glasser and Strauss, 1999).

Thematic analysis data coding is one of the most important aspects in grounded theory (Lussier, 2011) and is one of the central processes in breaking down transcribed interviews into specific components that generate themes (Bryman and Bell, 2011). The related themes drawn from the participants’ ideas were compiled to understand the research question and shed further insights into the comprehensive literature review. Initially, the data was read to generate an overall understanding and key phrases with color coded using highlighters in the transcribed interview script were analyzed to develop the themes.

For example, in this study, when discussing the important factors of BC/DR, different organizations held different opinions. Informant #1 stated *“give it back to normal operations quickly as soon as possible.”* Informant #2 asserted IT is a factor that cannot be ignored and Informant 3 indicated *“I suppose, it is able to reduce the gaps between what the plans are, consequently delete them.”* Informant #4 detailed the relationship is the important factor-*“Having good relationship with internal and external people.”*

Regarding the common pitfalls existing in their BCP, analysis showed a lacking in recovery thinking, impractical, un-communicated and incomplete are the main problems for all organizations, especially the BCP process is not complete and the business continuity team has not communicated the plan to all right people and staff remains unaware of business continuity issues. The typical quote illustrating this is *“At the moment, incomplete... somewhere is impractical...some of the plans are untested (Informant #4).”*

Theoretical saturation was adopted to review new data emerging and identify the relationships among categories as well established and validated (Corbin and Strauss, 1998). New understandings were drawn out from those interpreted themes that explained the research question sufficiently. These findings were reviewed against the existing literature to explore the possible relationships.

### 4. Findings

Linking back to the references, the interview findings support the literatures review and analysis. Firstly, the literature identifies three kinds of industries, the-non-profit organization, the education organization and the manufacturing organization as having implemented a risk management plan. These plans establish a systematic process of identifying, managing and monitoring risk, which is in accordance with the process of business continuity. The study’s participants were drawn from non-profit organizations and an education organization and all confirmed they have the relevant plans to maintain their normal operations when disruptions occur. This

## Zhang & McMurray

finding supports the literature that those types of large organizations generally have BCP and DRP processes embedded in their cultures.

Secondly, of importance is that those organizations sampled in this study, maintain risk management currency by updating their plans on a regular basis. All these four organizations update their BC/DR plans at least annually with some organizations updating their documentation quarterly. Regarding the importance of BC/DR, all the organizations view it as being very important. This finding is supported with the following typical quote “*BC is an increasing important part in the business* (Informant #3). “

After an extensive literature review, a holistic risk management model was developed and presented. The model shows the relationships between the concepts of business continuity and disaster recovery with risk management. The model identifies there is a direct relationship between RM and BCM and BCM have relationships with EM, BCP, DRP and CM. Moreover, BCP overlaps with EM and DRP. The interview findings uncovered that when the participants were discussing BC, some organizations mentioned the EM or RM, it can explain indirectly there is a relationship between BC and EM, whereas, it cannot identify which kind of relationship it is. Additionally, in the interview findings, they had differing viewpoints. “*We see BC as vitally important but probably separate from DR slightly...* (Informant #1)” Informant #4 stated “*My job is emergency management, so we see BC and DR as the extension of the role. How we manage the process, we have a number of emergency procedures, attach to those procedures are BC...DR, resolving problem, getting it right, BC would be around where we continue the core business, DR would be how long we are going to rebuild it.*” These illustrated that there was a relationship between BC and DR, which supported the newly developed holistic risk management model.

So as to remain within the scope of this study, the interviews mainly focused on business continuity planning and disaster recovery planning. However, the interview data also generated information on EM and RM. Although these are not new concepts, they support the literature analysis findings. In the interview findings, the participants think BC/DR extend the role of EM, while in the literatures, EM is sometimes referred to as business continuity planning (Hassan, 2012). This illustrates the inconsistency surrounding the concepts in the literature. The lack of information in the interview questions poses limitations in identifying the relationship between BCM and CM and thereby impacts on the new developed model.

## 5. Conclusion

This study contributes to knowledge of the evolution of the study’s main concepts regarding business continuity and disaster recovery from 1970s to 2012. A new risk management model was developed to show the relationships between each of the key concepts. This model provides theoretical and practical contributions to academe and industry. The chronological timeline and the Holistic Risk Management model provide significant theoretical contributions to the advancement of the academic literature, which to date has not identified the chronology nor the consolidation of these key concepts. The practical implications of the study’s findings are twofold. The first being that the chronology and holistic model may be utilized by teaching



## Zhang & McMurray

institutions in the development of risk management curriculum and the training of future candidates entering the risk management industry. They can use the model to set up more specific departments in charge of different roles and if business disruptions occur, they may take actions more effectively so that the organization may recover more quickly. In addition, organizations may utilize the chronology and new model to provide insights and understanding between the key concepts comprising risk management. For those organizations which are not familiar with BC/DR and risk management, they may use the chronology to enhance their general understanding about the development and evolution of these relevant areas which impact on an organization's sustainability.

Further research could include a more diverse sample of industries such as research institutes or mining industries. A deeper analysis of disaster recovery management as a key concept for disaster recovery would help to develop the model in this study. Future research could study more different industries across Australia to clarify if differences exist between the site studied in the present research and other regions. Future studies should consider gathering data from a larger and more diverse population sample of participants in order to test aspects of the holistic risk management model developed in this research.

## References

- Akram, JK 2011, 'Business Disaster Preparedness: An Empirical Study for measuring the Factors of Business Continuity to face Business Disaster', *International Journal of Business and Social Science*, vol. 2, no. 18.
- Alberto, P & Francesca, F 2011, 'Preventing Counterfeiting: A Risk Management Model', *World Journal of Social Sciences*, vol. 1, no. 5, pp. 197-209.
- Blumberg, B, Cooper, DR & Schindler, PS 2011, *Business Research Methods*, McGraw-Hill Education.
- Bode, C & Wagner, SM 2009, *Risk and security-a logistics service industry perspective*, Haupt, Bern.
- Bryman, A & Bell, E 2011, *Business Research Methods*, 3rd edn, Oxford University Press Inc., New York, United States.
- Cannon, DLB, Timothy, S & Pamplin, B 2006, *Certified Information Systems Auditor Study Guide*, Sybex.
- Corbin, J & Strauss, A 1998, *Basics of Qualitative Research*, Sage Publications, California.
- Donahu, AK, & Joyc, PG 2001, 'A Framework for Analyzing Emergency Management with an Application to Federal Budgetin', *Public Administration Review*, vol. 61, no. 6, p. 1.
- Eisenhardt, K 1989, 'Building Theories from Case Study Research', *The Academy of Management Review*, vol. 14, no. 4, pp. 532-50.
- Eric, C, Seth, M & Joshua, F 2010, *CISSP Study Guide*, 'Chapter 7-Domain 6: Business continuity and disaster recovery planning', Boston.
- Everest, D, Garber, RE, Keating, M & Peterson, B 2008. 'Business Continuity Management', USA.
- Evi 2012, *Population of Melbourne 2012*, viewed 31 August 2012, <[http://www.evi.com/q/population\\_of\\_melbourne\\_2012](http://www.evi.com/q/population_of_melbourne_2012)>.
- Glasser, B & Strauss, A 1999, *Discovery of Grounded Theory: Strategies for Qualitative Research*, Aldine Transaction, Chicago.

## Zhang & McMurray

- Hassan, J 2012, *Business Continuity and Disaster Recovery*, 1st edn, World Technologies.
- Hoetmer, GJ 1991, *Emergency Management: Principles and Practice for Local Government*, International City Management Association, Washington, DC.
- Kleindorfer, PR & Saad, GH 2005, 'Managing disruption risks in supply chains', *Production and Operations Management*, vol. 14, no. 1, pp. 53-68.
- Lussier, RN 2011, *Research Methods and Statistics for Business*, Waveland Press, Inc.
- Mason, J 1996, *Qualitative Researching*, Sage Publications, North Yorkshire.
- McLoughl, D 1985, 'A Framework for Integrated Emergency Management', Wiley..
- Minichiello, V, Aroni, R, Timewell, E & Alexander, L 1995, *In-Depth Interviewing*, Longman, Melbourne.
- Nikolaos Vasileiadis Secure Ltd 2008, *Business continuity management-part 1: Code of practice*, British.
- Pitt, M & Goyal, S 2004, 'Business continuity planning as a facilities management tool', *Facilities*, vol. 22, no. 3/4, pp. 87-99
- PreventionWeb 2011, *Australia - Disaster Statistics*, viewed 5 May 2012, <<http://www.preventionweb.net/english/countries/statistics/?cid=9>>.
- Smit, N 2005, 'Business Continuity Management: A Maturity Model'.
- Surapaitookorn, W. 2012, 'Risk Management of Flood: The Case of Thailand', *World Journal of Social Sciences*, vol. 2, no. 5, pp. 198-206