

Business Disaster Preparedness: An Empirical Study for measuring the Factors of Business Continuity to face Business Disaster

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Abstract

At present, the expansion in using data management technologies, globalization, and rapid communication offer organizations an unprecedented set of possibilities for evolution. On the other hand there are several vulnerabilities to threats and disasters. In this context, a realistic business goal is to guarantee the continuity of the processes in the case of disasters or crises. Business preparedness, through implementing Business Continuity Planning (BCP), decreases or eliminates the disruption to employees and profitability and allows businesses to perform balanced tasks in community. This research presents a conceptual design for measuring the factors of BCP on business disaster preparedness through the use of statistical indicators. Such research is required to develop systematic knowledge on how importance it is for businesses to persist with BCP to recover from disasters. The paper concludes that there is a significant effect of Strategic Management, Business Risk Analysis, Training and Awareness, and Information Life Cycle Managements when making BCP a cornerstone for the successful preparedness to any disaster.

Keywords: Business continuity, disaster recovery, disaster preparedness, risk management.

1. Introduction

During the last twenty years, organizations of all sizes have been sustained by their information systems and their expenditures were heavily based on their intensifying Information Technology infrastructures. This assisted them to computerize, manipulate, and analyze their business operations and long/short term strategies in a highly professional way. It is difficult to envision contemporary businesses devoid of advanced information systems covering their daily operations such as online trading, airline reservations, financial databases, etc. Business managers identify that a disaster can occur as a result of various causes, depending on a range of challenges such as environmental, economical and political, such as power outages, virus eruptions, disruptions, data fraud, terrorist attacks and the like. All of these may put off organizations from exercising their right to use the data and systems they need for managing their businesses. A business impact analysis (BIA) can expose the accurate detriments of disaster and the consequence disruptions in a specific business. However, these kinds of analysis are costly, and many senior managers are disinclined to financially support based on a BIA analysis without an accurate evaluation to the exact value or to the return on investment (ROI).

Disaster Recovery Planning (DRP) is a description of how a business reacts to any internal or external event to assure that critical business operations should carry on without any barriers. The aim of DRP is to reduce the consequences of a disaster and perform the proper actions to defend valuable resources. On the other hand, Business Continuity Planning (BCP) illustrates the methods and procedures that have been used by business to guarantee that important functions should carry on in and after a disaster. It is the facility of sustaining the continuous availability of significant systems, applications, and information of the business. BCP corresponds to the reaction of the required business understanding to the undesirable events. This process should be accomplished for the enterprise wide functions to reduce financial loss, enhance customer's service and alleviate the destructive events that may affect on name, processes, liquidity and market reputation.

As a result, disaster recovery, which focuses on IT activities, is possibly more common, however it is in fact a subset of the wider theme of business continuity. Although disaster recovery is a reaction to unusual events which removes all the mess subsequently so the business can continue as formal, business continuity is highly proactive plan, it carry on actions to guarantee that regardless of what occurs, business operations continue as stable as possible.

The majority of business professionals suggest undertaking business continuity planning initially; subsequently disaster recovery will carry the most critical elements of the business. Although a BCP concentrating on bring back the organization's power to do business, despite of the type of the disaster, various kinds of distraction may need a different kind of reaction for recommencing business. Different kinds of disasters may even affect the community environment surrounding the organizations; thus, human element (e.g. employees) may deeply influenced by a disaster events. It is indispensable to organize businesses to be able to react and improve from any types of disaster that may cause deficit in business operations and may inhibit business continuation. It is insufficient to believe that business is just typical day-to-day operations arguing that there are no threats that might stop our business to continue or we are sharp enough to a level that we will not be influenced same as others. Furthermore, with the ideas of globalization, business managers turn out to be more responsible for deficiency if they did not adopt right actions on right time to avoid this type of losses. Consequently, this research may end up directing the following questions to any business: Are you ready to protect your business from future threats? Do you prepared, have an efficient and applicable business continuity plans?

The aim of this research is to introduce a conceptual research model to assist businesses to answer such questions. From a pragmatic viewpoint, a disaster is anything that can cause a disruption in the normal operation of a business (Wallace & Webber, 2004). Business preparedness, often intended as business continuity, which covers a variety of factors such Strategic management, Business risk analysis, BCP resources, BCP documentation and Information Life Cycle Management. This research explores and evaluates the need for any business to be ready for any future threats by attracting the attention to business continuity planning to rescue lives and assets and to present a clear strategy for effective business continuity plans. This research measures the quantitative indicators of Business Continuity Planning (BCP) to gain a high knowledge base, test hypotheses, and confirm the introduced conceptual research model. It will develop realistic expectations for Continuity Planning and recovery and measures the organizational readiness in a present or future disaster. The remainder of this paper is organized as follows. Section 2 present literature review and 3 discusses the research model and hypothesis. In Section 4 we discuss the research methodology which will be used for this research. In section 5 result analysis and discussion will be presented. Finally, the conclusion will be presented in sections 6.

2. Literature review

Following brief preliminary search through some of the literature connected to Disaster Recovery (DR) and preparedness for recovery using Business Continuity Planning (BCP), it has been found that the number of pioneer articles is not commensurate with the importance of the subject and the size of the problem that need to be solved (Botha and Gaadingwe, 2006). The reviewed literature introduces different definitions of disaster recovery. The title is frequently utilized in the significance of "bringing the post disaster situation to some level of acceptability which may or may not be the same as the pre-impact level" (Quarantelli, 1999, p. 2). The Federal Emergency Management Agency of the United States (FEMA, 2000) introduce a definition of recovery as "referring to those non-emergency measures following disaster whose purpose is to return all systems, both formal and informal, to as normal a state as possible". Bajgoric (2006) defines the Business Continuity Planning in terms of its related to an Information Technology as "the ability of a business to continue with its operations even if some sort of failure or disaster occurs".

Other definitions which may be much comparable to the above definition can be obtained from other areas such as physical facilities management (Pitt & Goyal, 2004), international business (Hofstede, Van Deusen, Mueller, Charles and the Business Goals Network, 2002), international terrorism prevention (Then & Loosemore, 2006), human resources (Perry & Mankin, 2005), and banking and finance (Hanna, 2005). Regardless of this obviously implicit definition, firms still introduces some challenges for developing BCP. The two most familiar argues refer to for the lack of planning are the high costs and extra time (MCC, 2005). Initially, Business Continuity Planning was a notion that was carried out by IT departments and was restricted to backing up, protecting, and providing redundancy of data (Gill, 2006), however, currently, risk management is a comprehensive of human and technical involves and have an effect on all sides of a business. Thus, business professionals believe that there is a need for more collaboration to create the most effect on Business Continuity Planning (Edmonson, 2006; MCC, 2005).

Mitroff et al. (1992) propose that disaster management of all organization's departments should consider a strategic role, as resources and priorities must be considered to save lives and property by top management. Furthermore, Herban et al. (2004) studied the probability of introducing the business continuity planning on a strategic management.

They reveal normal matching between strategic management and continuity management in terms of: Planning processes, capability development and socio technical approaches, speed, configuration, resilience, and obligation. Although there are a move forward been made in evaluating and contrasting disaster susceptibility, an ordinary, robust framework has up till now been deficient in accurately assessing recovery (Birkmann, 2006; Cutter et al., 2003). Croy and Geis (2005) indicated that together Disaster Recovery and Business Continuity Planning are subjects of risk-management. Disaster Recovery is the reaction to any disruption of an ordinary business operation that is planned to worsen the business and take it towards the state of turmoil and instability. They define BCP as "...the proactive discipline of identifying vulnerabilities and risks, and planning in advance how to mitigate, accept, or assign them in the event of a business disruption". Their idea reveals that the essential element of the business continuity is the security of business critical information. When disasters or even small risks occur in small or large business organizations, it generates major difficulties for employers, such as significant losses in profits, time, and other resources (Jackson, 2006; Maher & Zimmerman, 2005).

In some cases when it is obvious that something wrong will occur, it is hard to understand why several organizations reject to give in enough money and time to be prepared and be fully ready for any challenge when it comes. Consequently, isolating a business from the disturbing forces of a disaster could be a subject that should be a main concern for business managers. Most organizations revealed that some disasters are inevitable, however, too many businesses are not prepared to face them (Jackson, 2006; Pitt & Goyal, 2004). There are only 20% of businesses have a plan which they believe it will be effective in the event of an emergency (Swartz, 2003). By having a brief reading of the 9/11 Commission Report (2004), we can conclude that the United States should have been prepared and get ready for a terrorist attack. Furthermore, everyone knows about the possibility of Katrina to make harm before it made landfall, but, yet countless number of businesses and communities botched prepare and be ready when the storm hit. Consistent with their research, number of researchers introduces two incorrect suppositions. First, they believed that the management and businesses had the millennium bug restrained as they spoke about it before and, therefore, implicitly they could manage other threats.

The second supposition is that the preparation is not required as the threats were not going to attack them personally. Authors illustrate such lack of concern as illogical confidence (Aucote & Gold, 2005; Covey & Davies, 2004; Hermand et al., 2003; Park, Scherer, & Glynn, 2001). Therefore, it is wise to say that even though the threats are clearly predictable, businesses and government's organizations still need to prepare for when, not if, a disaster will occur. Information Life Cycle Management has become known as an essential element of the Business Continuity Plan due to great significance of consistent and safe data storage for institutional continuity. Farajun (2005, p.3) describes Information Life Cycle Management as "a data archiving process which moves data automatically to the most cost-effective storage media available and is based on prescribed policies of accessibility, security, and long-term storage". He shows that data usually lose criticality eventually, and may be shifted to secondary storage point.

Arminio and Truax (2005) revealed the importance of Information Life Cycle Management on the principles of Vital Records Management "Vital records management and contingency planning for their preservation are inexorably linked to successful emergency preparedness". This is a clear indicator shows that data are possibly essential for a short time where it can be used to as major support for decision making process, and then it may turned to be entirely worthless. This fact has been described by Croy (2004) "An effective information life cycle management strategy keeps pace with those shifts and, in doing so, ensures unfettered access to crucial data while optimizing an organization's storage investment". Business and professional journals have published a spate of recent articles describing an impact of human side on BCP. Braverman (2006) says that every crisis is a human crisis. Disasters have absolute influence on the health and job performance of people. They have a direct and often indirect impact on confidence, personalization, family life and people reliability. Thus, certainly, there is no business continuity without people.

Kirschenbaum (2006) disparage alleviation, risk management and estimation approaches that have accentuated the physical plant and information systems while disregarding the people who are the "most crucial, underlying basis for all organizations". He emphasized that the business continuity plan should comprise the security and accessibility of staff members, however, it should not criticize the significance of ensuring the availability of employees who have the capability for applying these systems during threat period. Consequently and further to the above overview of the Business Continuity Planning (BCP), literatures reveals that most significant factors of BCP that affects organizational successful preparedness for any potential threats are:

Strategic management, Business risk analysis, BCP resources, Training and awareness, BCP documentation and Information Life Cycle Management. The following table (table 1), shows the identified significant variables, brief description and the authors who are directly or indirectly pointed to them.

Insert table (1) about here

However, business continuity planning is an essential process to various types of organizations and political stability. Thus, different firms start supports business continuity planning policies in particular for financial organizations such as banks and investments organizations. In this research, we are evaluating six significant factors to measure their impacts on comprehensive business continuity plan, consequently, measuring the preparedness of the global selected organizations.

3. Conceptual research model and Hypothesis

Figure 1 illustrates the conceptual research model, which assumes that by having a solid strategic management; good Business risk analysis, clear identified BCP resources, Training and awareness, BCP documentation, and by having the most relevant information through using Information Life Cycle Management, will have a positive impact on the improved business continuity planning and then we may have a successful preparedness to any potential threats.

Insert figure (1) about here

3.1 Research question and Hypothesis

To achieve the purpose of the current study, the research questions are presented to be consistent with the objectives of this research, in which we are revealing the apparent needs for awareness concerning BCP, the following research questions have been formulated:

1. To what extent the organizations are identifying and adopting the essential elements of Business Continuity Management?
2. To what extent the organizations are prepared and ready for any potential disaster?

To respond to the above questions, this research carries out seven hypotheses that were developed from our conceptual research model which is actually based on previous literatures and studies.

The following hypothesis assumes that there is no statistically significant impact on the carrying out business continuity planning to produce the organizational successful preparedness for any potential threats:

H₀1: There is no statistically significant impact of Strategic management on improving business continuity planning.

H₀2: There is no statistically significant impact of Business risk analysis on improving business continuity planning.

H₀3: There is no statistically significant impact of BCP resources on improving business continuity planning.

H₀4: There is no statistically significant impact of Training and awareness on improving business continuity planning.

H₀5: There is no statistically significant impact of BCP documentation on improving business continuity planning.

H₀6: There is no statistically significant impact of Information Life Cycle Management on improving business continuity planning.

H₀7: There is no statistically significant impact of business continuity planning on improving organizational successful preparedness for any potential threats.

4. Research Methodology

This research was conducted by analyzing results of distributed questionnaires about business continuity planning in different financial sector, distributed to different countries around the world. A questionnaire was published on the web and sent to risk management and internal audit departments of those organizations.

4.1 Survey Instrument

The questionnaire we prepared for this exercise was divided into 2 sections. The first section concentrates on the general profile of the respondent including his/her age group, education level and profession, and income group. In the second section we were interested in finding the factors affecting organizational successful preparedness for any potential threats.

The respondents were provided with a list of 14 questions; 2 questions on the perceived Strategic management, 2 questions on the perceived Business risk analysis, 2 questions on the perceived BCP resources, 2 questions on Training and awareness, 2 questions on BCP documentation, 2 questions on Information Life Cycle Management and finally 2 questions for the impact of business continuity planning on improving organizational successful preparedness for any potential threats. The participants were asked to indicate their perception on a likert scales (1-5) with response ranging from “strongly disagree” to “strongly agree”. The collected data were analyzed based on correlation and regression analyses using the statistical package for social sciences (SPSS) version 17 computer program.

4.2 Sample and Data Collection

The survey was conducted using primary data collection method through which was designed and distributed to different people of different age group and of different educational level working at different organization around the world. However, the common denominator of these is the desire of improving organizational successful preparedness for any potential threats. The all chosen respondents should have worked and practiced on Business continuity planning. A total of 182 questionnaires were distributed but we had only 87 usable answers. The greater part of the respondents were female (56.4%), the age was (77.1%) for those who are between 20 and 45 years old.

4.3 Pilot Study

With the purpose of confirming that the survey is valid and reliable, a pilot study will be conducted before the final distribution process. To find out whether the questionnaire is reliable or not we will measure the internal consistency, which is the most popular methods of estimating reliability. Cronbach's alpha test will be used for this purpose (Nunnally and Bernstein, 1994). She suggested that a minimum alpha of 0.6 is sufficed for early stage of research. As showed in table 2, the Cronbach's alpha in this study were all higher than 0.6, the constructs were therefore deemed to have adequate reliability.

Insert table (2) about here

5. Analytical results and discussion

5.1 Correlation Test

The Pearson correlation coefficient is to evaluate the strength and direction of relationship that may exist between two variables measured on at least an interval scale. It illustrates the strength and direction of the linear relationship between seven variables. Studies stressed that prior to the regression testing; the correlations between variables (Coakes and Steed, 2007) should be achieved. The result of this research, as illustrated in table 3, showed that five independent variables found to be strongly correlated to business continuity planning, except strategic management, which surprisingly sowed weak relationship with BCP.

Insert table (3) about here

The results are presented in a matrix (table 3) such that, the Pearson correlation coefficient, the significance value and the sample size that the calculation is based on. The data showed no violation of normality, linearity or homoscedasticity. There was a strong correlation results which showed that Business risk analysis ($r=.258$, $n=87$, $p < 0.05$), BCP resources ($r=.220$, $n=87$, $p < 0.05$), Training and awareness ($r=.189$, $n=87$, $p < 0.05$), Information Life Cycle Management ($r=0.414$, $n=87$, $p < 0.001$), and BCP documentation ($r=0.361$, $p < 0.05$) are clearly correlated to business continuity planning. It also showed that business continuity planning is statistically significant and strongly correlated ($r = .925$, $n = 27$, $n=87$, $P < .0005$) to successful preparedness for ant threats.

5.2 Regression Test

For further analysis, Linear Regression was carried out to study the extent to which the independent variables influence the dependent variable. The independent variables were regressed across organizational outcomes. Tables 4 summarized the results of the Linear Regression analysis.

Insert table (4) about here

The results of the regression in the coefficients table (table 4) exposed that Strategic Management ($t=-1.698$, $sig =0.041$), Business Risk Analysis ($t=2.425$, $sig = 0.018$), Training and Awareness ($t=-2.191$, $sig =0.31$), and Information Life Cycle Management ($t=3.050$, $sig =.003$), found to be significantly affects business continuity planning and it also indicates that, overall, the model applied is significantly good enough in predicting the outcome variable.

The results also exposed that Business Continuity Planning ($t=22.397$, $sig = 0.000$) found to be significantly affects successful preparedness, and also indicates that, overall, the model applied is significantly good enough in predicting the outcome variable. This result corresponds with the view of Mitroff et al. (1992), Herban et al. (2004), Croy and Geis (2005), Jackson (2006), Maher & Zimmerman (2005), Farajun (2005), Arminio and Truax (2005), and Maher & Zimmerman (2005). The analytical results of the regression, astonishingly, shows that BCP Resources ($t=1.296$, $sig = .199$) and BCP Documentation ($t=1.644$, $sig = .104$) are surprisingly unaffected the dependant variable (business continuity planning). Based on the above discussion, it seems that there is a highly significant relationship and affects between Strategic Management, Business Risk Analysis, Training and Awareness, and Information Life Cycle Managements with performing business continuity planning. It also indicates that, overall, the model applied is significantly good enough in predicting the successful preparedness for any potential threats.

6. Conclusion

The disaster management planning should not only involve the conventional disaster response planning, however, it must include disaster preparedness using Strategic management, Business risk management analysis, awareness and Information Life cycle managements for the development of a business continuity plan. Integration of these five important factors should provide a concrete basis for an effectiveness to manage and handle potential threats. Business Continuity Planning focusing on the designing of plans to protect the continuity of business processes. Business continuity planning is significant effort that must be undertaken. It is clearly showed from the above discussion that any business needs to prepare for the extraordinary threats, whether they are predicted or not, in order to protect employees, products and profitability and to guarantee continuity of business processes. It is vital to indicate that no planning attempt will be successful without business obligations and leadership of senior management.

Threats always around us no matter how well you consolidate your facilities; there will always be causes out of your control. But plans are ineffective, unless there is a management commitment to develop strategic management, build business risk management analysis, create redundant systems, testing them frequently and prepare employees on what actions to follow in the event of disasters. It is also important to develop information life cycle managements for organizing the stream of an information system's data from creation to the time when it turns into outdated. The actuality shows that disasters and crises could cause businesses thrashing; thus we must be prepared to stop, avoid, or at least mitigate losses. This preparedness is translated by major firms through achieving business continuity planning.

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Figure 1: Conceptual research design

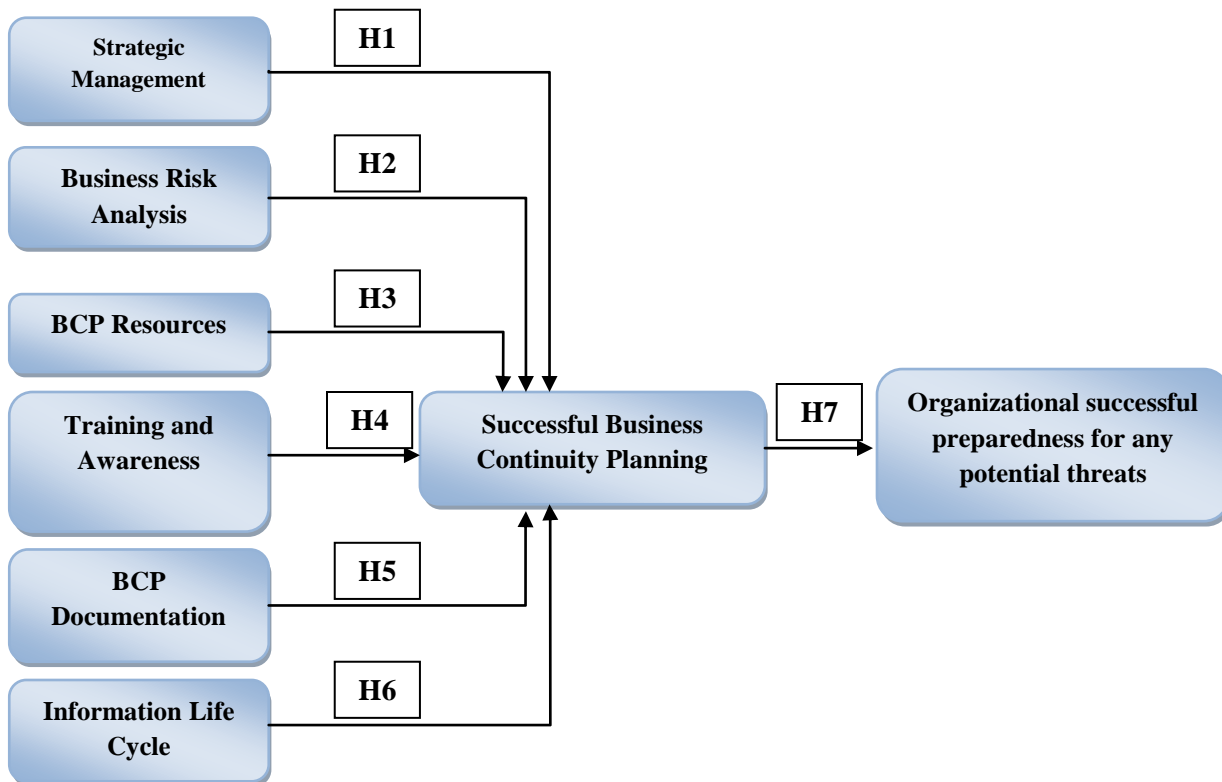


Table 1: Research Variables

Variables	Brief description	authors	Dependent (D) /Independent (I)
Strategic management	There is a general parallels between strategic management and continuity management.	Mitroff <i>et al.</i> (1992); Herban <i>et al.</i> (2004).	I
Business risk analysis	Risk analysis is a technique to recognize and evaluate factors that may risk the success of a project or attaining objectives.	Croy and Geis (2005).	I
BCP resources	Business continuity plan is to find out what resources do you need to carry on trading. These resources may include: <ul style="list-style-type: none"> ▪ Human side (people) ▪ Property ▪ Enterprise Systems (technology) such as hardware, software, communication, data managements. 	Braverman (2006); Kirschenbaum (2006); Edmonson (2006); MCC (2005); Mitroff <i>et al.</i> (1992); Herban <i>et al.</i> (2004).	I
Training and awareness	Training related to the actual lessons, providing for proficiency in carrying out business continuity activities.	Jackson (2006); Maher & Zimmerman (2005).	I
BCP documentation	After identifying probable threats, documenting the influence scenarios that shape the core of business continuity plan is required.	Gill (2006); Croy (2004).	I
Information Life Cycle Management	Essential records management and emergency planning for their protection are inevitably associated with the preparedness for business disasters.	Farajun (2005); Arminio and Truax (2005); Croy (2004) and Gill (2006).	I
Organizational successful preparedness for any potential threats.		Jackson, 2006; Maher & Zimmerman (2005).	D

Table 2: Cronbach alpha estimation

Reliability Statistics

Cronbach's Alpha	N of Items
.790	8

Table 3: Correlation test results

Correlations

		Strategic Management	Business Risk Analysis	BCP Resources	Training and Awareness	BCP Documentation	Information Life Cycle Managements	Business Continuity Planning	Successful Preparedness
Strategic Management	Pearson Correlation Sig. (2-tailed) N	1 87							
Business Risk Analysis	Pearson Correlation Sig. (2-tailed) N	.094 .385 87	1 87						
BCP Resources	Pearson Correlation Sig. (2-tailed) N	.171 .114 87	.188 .080 87	1 87					
Training and Awareness	Pearson Correlation Sig. (2-tailed) N	-.057 .602 87	.208 .053 87	.374** .000 87	1 87				
BCP Documentation	Pearson Correlation Sig. (2-tailed) N	-.080 .462 87	.057 .600 87	.362** .001 87	.545** .000 87	1 87			
Information Life Cycle Managements	Pearson Correlation Sig. (2-tailed) N	-.017 .879 87	.147 .175 87	.242* .024 87	.609** .000 87	.590** .000 87	1 87		
Business Continuity Planning	Pearson Correlation Sig. (2-tailed) N	-.124 .251 87	.258* .016 87	.220* .041 87	.189 .045 87	.361** .001 87	.414** .000 87	1 87	
Successful Preparedness	Pearson Correlation Sig. (2-tailed) N	-.206 .055 87	.238* .026 87	.200 .063 87	.170 .114 87	.342** .001 87	.391** .000 87	.925** .000 87	1 87

*. Correlation is significant at the 0.05 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4: Regression Results Analysis

Dependent Variable	Independent Variables	Beta value	T value	Sig	Hypothesis Testing
Business Continuity Planning	Strategic Management	-.163	-1.698	.041	Accepted
Business Continuity Planning	Business Risk Analysis	.236	2.425	.018	Accepted
Business Continuity Planning	BCP Resources	.139	1.296	.199	Rejected
Business Continuity Planning	Training and Awareness	-.282	-2.191	.031	Accepted
Business Continuity Planning	BCP Documentation	.207	1.644	.104	Rejected
Business Continuity Planning	Information Life Cycle Managements	.393	3.050	.003	Accepted
Successful preparedness	Business Continuity Planning	.925	22.397	.000	Accepted