BCP Testing
A case study of UTHCPC ,S BCP plan testing

Asif Ali Yasir Ali
Email: {asial221, yasal731}@student.liu.se
Supervisor: Juha Takkinen, juhta@ida.liu.se
Project Report for Information Security Course
Linköpings universitet, Sweden

Abstract

Business continuity planning is the continuity of critical business processes after disasters. Testing the plan is good practice because it ensures the correctness and viability of the plan. Testing of BCP can be performed on the full integrated plan, at the component and the module level. Different methods are used to carry out BCP testing. The choice of a method is based on the testing plan and the type of testing that one wants of the BCP. This report presents various BCP testing techniques. A comparison of BCP testing methods with respect to the quality factors is also presented. The report includes a case study and implementation of a BCP testing method.

1 Introduction

Business Continuity Planning (BCP) is the advanced planning and preparation necessary to identify the impact of potential loss, formulate and implement viable recovery plans that ensure continuity of services and administer a comprehensive training, testing and maintenance program [3]. Susan Snedkelt has defined as the BCP as,

Business continuity planning (BCP) is a methodology used to create and validate a plan for maintaining continuous business operations before, during, and after disasters and disruptive events [1].

Business continuity planning got the focus of corporate and organizations after the Y2K threat and the 9/11 terror attacks [4]. It has now become necessary and is implemented with high priority basis in companies.

BCP requires a considerable amount of work for business continuity management because nearly every aspect of technology, information and people in the organization needs to be reviewed, planned and developed [4]. The BCP plan can have flaws inside it, and there exists an uncertainty about the preliminary plan. Many questions need to be answered before it is recognized as a final plan, like, is this viable in emergency circumstances? Does this really demonstrate the business activities and operations? Is this free of bugs? And, is this also effective in the dynamic business environment?

To get the answers to the above questions and for the surety of the plan it should be tested and updated regularly. The testing of the plan is equally important as its preparation which requires comprehensive knowledge and resources. Different methods have been developed and used to test the BCP. This report covers and illustrates various adopted BCP testing methods and provides a comparison between them according to their easiness of implementation and common quality factors.

1.1 AIM

The aim of the project is to explain different testing methods on a BCP. To demonstrate the procedure and the effect of testing on a BCP, the report provides a case study by applying the feasible testing method. It also includes a comparison of testing method with respect to the common quality factors

2 Method

We used different literature books, journals and articles about BCP and disaster recovery. A number of testing methods are taken from the literature studied. A case study of a UTHCPC (University Texas-Houston Harris County Psychiatric Center) BCP plan is performed. We applied the most feasible testing method with regard to the BCP Plan chosen and the practical conditions in order to try to refine the BCP plan and show the effectiveness and procedure of BCP testing.

3 BCP Testing Methods

Based on the type of BCP testing it can be categorized into four classes.[9]

1. Hypothetical Test

2. Component Test
3. Module Test
4. Full test

Hypothetical test is used to verify the content of the plan, procedures and possible actions theoretically. It is simplest and easiest form of BCP testing and can be performed with limited resources [9].

Component testing is carried out to validate the correctness of individual procedures and actions within the plan [9].

Module testing is carried out to validate the functionality of the procedures after integrating components [9].

Full test verifies that each and every function of the plan working properly [9].

3.1 Popular BCP Testing Methods

The more classes of testing method that one uses, the more sure one will be about the quality of the BCP plan. To get maximum accuracy and precision of the plan, all the classes of testing method need to be performed. To perform the testing in these classes, a systematic approach is necessary. A number of approaches are available which are used according to the testing plan. The selection of the approach totally depends on the type and condition of testing plan. Below we present the most popular and most adopted techniques for BCP testing

3.2 Paper Tests

"A *paper test* is a review of BCP procedures and other response documentation, such as contact lists. In a paper test, individual staff members review these documents on their own"[6].

Procedure

Select the testing team and assign them the tasks. All the members individually start evaluating BCP procedures and actions in the plan and keep writing notes if anything is missing or needs to be changed. Combine the results from all the members and handle it to the team leader to the project manager [6].

3.3 Walkthrough Tests

In the walkthrough test a group of people review the BCP procedures and actions in the plan. [6]

Procedure:

The walkthrough is more formal than the paper test. But the procedure is almost same to the paper test just testing is performed at group rather than with individuals. Roles and responsibilities are assigned in the group to perform testing and the end result is produced and provided to the project manager [6].

3.4 Simulation Testing

"A simulation is basically an on-location walkthrough test with props. A simulation is more than a walkthrough but it shares many characteristics with a walkthrough" [6].

Procedure:

The simulation testing procedure is similar to walkthrough testing. The difference is that simulation test is performed by special (expert) recovery team, the result then handled to the procedure owner (Manager) [6].

3.5 Parallel Testing

"With parallel testing, disaster response personnel actually perform the steps in their response procedures. When the procedures say build a server, the personnel build a server. When the procedures say start the applications, the personnel start the applications" [6].

Procedure:

Parallel testing procedure is quite different from other procedures, First company need to create a new network, systems and database, then company hires the additional employees and test the image of each transaction side by side [6].

3.6 Cutover Testing

"In a *cutover test*, the recovery team builds and readies recovery systems that can support critical business functions. A cutover test is the real thing. If the recovery systems don't work, the business processes they support will really be interrupted. That could be a real disaster!" [6].

Procedure:

Cutover testing procedure starts with shutting down production systems and has to move operations to recovery systems.[6] After that the notification is sent to the team members to get ready for full production workload and then they need to identify either recovery systems are actually performing all the functions. Then test the script or plan which has been prepared. After

testing script on recovery system all production loads reverts back to primary systems and all duties has to resume, In this case primary system would have full knowledge of the transactions performed by recovery system and examine all the functions that has been performed correctly. Test team and test organizers need to document all the issues and results gained from this test [6].

4 Conclusion

BCP Testing can be performed at various levels. The deeper and internal we go the more surety will be achieved. So the need is to test it for each level. It cannot be say that the full test gives the surety and viability of each component until and unless each component is tested individually. The best approach of BCP testing is to start from its component level and go to its full plan test. It is also important to remember that the surety of the plan can be achieved only when we test the each component of the plan by adopting and exercising the provided solution in a hypothetical disaster atmosphere.

5 Case Study

Our case study provides the practical example of BCP testing. We have selected the UTHCPC (University Texas-Houston Harris County Psychiatric Center) BCP plan for testing. And we hope to draw some conclusion about the viability and accuracy of UTHCPC BCP plan.

5.1 Method

We performed a case study and tested the BCP Plan by analyzing the UTHCPC (University Texas-Houston Harris County Psychiatric Center) BCP plan we compared the components of the plan with the UTHCPC organization, both of which are available from their website. The reason to choose the UTHCPC BCP plan is its free availability and also that UTHCPC has a well informative website which is helpful to perform the testing.

Since we do not have physical access to the hospital and to any representative of it, we will be using the hypothetical test on the hospital's BCP Plan which is available from the UTHCPC'S website. We will also use paper test approach as it is the most feasible one with regard to the BCP Plan chosen and the practical condition for our case study

5.2 Company Description

The University of Texas Harris County Psychiatric Center (UTHCPC), is a teaching hospital, providing psychiatric and psychosocial services to more than 6,100 inpatient admissions and 14,000 outpatient annually [7]. The mission of UTHCPC is to provide excellence and leadership in the care of patients [7].

The UTHCPC has created a Business Continuity Plan, in order to maintain and continuation of the business process and clinical operation, during any disaster or interruption. The picture below which is taken from the UTHCPC, S BCP Plan provides information about UTHCPC departments, critical needs, failure modes and planning in four columns. The following picture is only a small part of UTHCPC'S BCP plan [13].

Figure 1 UTHCPC BCP Plan [13]

Business Continuity

DEPARTMENTS	CRITICAL NEEDS	FAILURE MODES	PLAN
Attending and Nursing	Information needed: (1.) Allergy's (2.) Medications (3.) Abnormal or positive labs as follow: (a) CBC with differential (b.) Thyroid test (c.) Pregnancy (d.) BUN Creatinine (e.) LFT (Liver Function Test) (f.) Physical exam diagnosis Axis III (g.) Blood Glucose (h.) Emergency Contact (i.) Demographic Sheet (j.) Prescription Pads	Computer System down due to the following: Natural Disaster, Unscheduled emergency (ie.cut cable, software problems) and Scheduled	(1.) Eleven to seven shift will print medication summary sheets on a daily basis. (2.) This sheet gives a history of the active medications for the past 24 hours. (3.) The summary sheet will be placed in the front of every chart. (4.) A PRN report will be printed daily. (5.) A shift report will be maintained from the previous 24 hours. (6.) Physicians will write an order on physician's order form. (7.) Glucometer maintains a history of each patient's results; therefore, the results can be reprinted. (8.) Information is entered when system is functional again.
Admissions	Bed count		(1.) Manual bed count is done. Count is entered when computer system is functional again.

.

5.2.1 Participants

Normally it is necessary that the test team should include representatives from the organization who are familiar with the company objectives and operations. Since we could not get any representative from the organization, we were forced to perform the test by ourselves with the knowledge that we learned about the hospital from its website and from the corresponding BCP.

5.2.2 Testing Checklist:

To perform our testing we prepared a checklist. The idea of the checklist is taken from the BCP Checklist by Barry A Cardoza and from the Business Continuity Planning Checklist for Universities [10][11]. The checklist includes the basic questions to test the content of a BCP. We went through each element individually and tested its existence and correctness in the UTHCPC BCP Plan against the hospital information on their site. we also have summarized and presented our findings and the results in the next section of the report.

Table 1: UTHCPC'S BCP Testing Checklist [10][11]

Elements	**Result**
Does the BCP include all the Departments & Functions?	YES
Does it identify the critical Functions within each Department?	NO
Does it identify where the critical Functions in one Department interact with critical Functions in other Departments**?**	NO
Does it identify functions and technology systems dependencies?	NO
Does it identify and included critical personnel and consider how operations would continue if they were unavailable?	YES
Does it determine when direct Financial impact is likely to occur?	NO
Does it rate the threats from high to low probability of occurrence?	NO
Does it mention the quick response to unanticipated threats?	YES
Does it describe the most likely reasons for problems to occur?	NO
Does it describe the responsibilities (who takes what actions)?	YES
Does it describe the Impact of disaster and what will be their probability like high, medium or low?	NO
Does it describes the resources required to recover the business operation and function?	NO

5.2.3 Results

We conclude from case study that the UTHCPC BCP Plan includes all the important departments and functions and describes the responsibilities in case of disaster. But neither does it have good structure nor does it include all the important and compulsory information. The plan lacks in prioritizing the critical functions and operations. The plan is also missing a list of possible risks and their probability of occurrence. It also does not describe the impact of risks in an appropriate manner or describe the cost and resources to recover the critical business functions. In short the UTHCPC BCP Plan is poorly structured and requires lot of improvements to really help in the continuity of critical business operations in a disaster.

5.2.4 Suggestion

Based on results gained from BCP testing of the BCP Plan of UTHCPC and the problem found in it, a new BCP plan structure is suggested below. The suggested plan is easy to understand and test. It accurately provides information about the potential risk, their impact and what resources are required to recover the affected functions. The plan also provides information about the probability of risks which is helpful in prioritizing the plan according to the risk factors and their probability of occurrence. The idea of this suggested plan is taken from the *De Montfort* University BCP plan.[12]

Table 2 Proposed BCP Plan [12]

Risk	Information Loss
Probability	High
Impact	Severe
Likely Scenario	Network problem
Functions Affected	All computer and information systems
Action	Contact network administrator XXXX
Responsibilities	Network Administrator will sort out the problem
Resources	Computers, Cables, CD and softwares
Mitigation	Backup

6 Methods Comparison With Regard To Quality

The motivation for BCP testing is to attain high quality and the surety of the BCP plan. We described earlier that the selection of a testing method depends on the type of testing that one wants of the BCP, which is directly related to the available resources, conditions and the constraints for the testing of BCP. It is possible that one technique may be more cost effective but cannot fabricate high effectiveness. Similarly, one testing team may be more concerned to achieve high correctness and preciseness of the BCP and they can spend extra money and resources to do it. The table below provides a comparison for the BCP testing methods with respect to the quality factors. which is derived hypothetically from the literature analysis and from the experience of BCP testing in our case study.[14]

Table 3 BCP Methods Comparison [14]

General Quality Factors	**Paper Test**	**Walkthrough Test**	**Simulation Test**	**Parallel Testing**	***Cutover Test***
Correctness and conciseness	L	M	M	H	VH
Completeness	L	M	M	H	VH
Efficiency and effectiveness	M	H	H	H	VH
Usability and understandability	H	H	H	VH	VH
Structuredness	M	M	M	H	VH
Cost Effective	Y	Y	Y	M	M
Easy to conduct	H	H	H	M	L
Consistency and Hierarchy in the plan	M	M	M	M	H
Testing Time	M	M	M	H	H

Legend
Low: **L,** Medium: **M,** High: **H**, Very High: **VH,** Yes: **Y,** No: **N**

The comparison table among different testing methodologies is based on different quality factors. The common quality factors which every method need to test is, correctness, completeness, effectiveness, structuredness, usability and consistency in the plan. The quality factors, time and cost effectiveness is more related to techniques procedures and the resources they required. The paper test is the initial step for BCP testing and it is seen most cost effective, easy to conduct and requires less resources but it provides average level of accuracy and correctness. The walkthrough and simulation test is slighter batter than to paper test which provides medium level of accuracy and correctness. Where as the parallel test and cutover test are found the best one in all BCP testing method which gives high viability and quality of the plan. But they consume more time, cost and resources and are difficult to perform.

7 Conclusion

Testing confirms the viability of a BCP plan. Different methods can be applied for BCP testing. The most common and famous BCp testing methods are, paper test, walkthrough test, simulation test, parallel test and cutover test. The method selection depends on the type of testing plan and the conditions for the testing. From the above testing of UTHCPC BCP plan we concluded that the hospital needs to follow a standard BCP structure. The selection of the BCP testing team is also important and it is necessary to get all the employees from each department involved. Responsible recovery persons need to work closely with the testing team to exactly recognize their job. Paper test, walkthrough and simulation test can be best used to map the plan with the company operations and functions. But they lacks in practically practicing the recovery solution. Parallel and cutover tests are more credible and realistic methods which also guide to practice the recovery procedures and actions, but they consume more resources and time. It can be concluded that the methods which take more resources and time provides high quality and guarantee of the plan.

8 References

[1] Susan Snedaker, “Business Continuity and Disaster Recovery Planning for IT Professionals”, 2007

[2] Altman, Wilf, “When it all comes raining down [business continuity planning]”, 2006

[3] Brian Turley, Presedent Strohl Systems Group, Inc, “What is BCP ?”, http://www.strohlsystems.com/Software/PLANet4CreditUnions/WhatisBCP.asp , [Accessed 2009, April 15]

[4] Wing Lam, "Ensuring business continuity", vol. 04, no. 3, 2002, pp. 19-25.

[5] Michael Wallace and Lawrence Webber, “The Disaster Recovery Handbook”, 2004

[6] Peter Gregory, CISA, “IT Disaster Recovery Planning For Dummies”, 2008

[7] “The University of Texas Harris County Psychiatric Center”, http://hcpc.uth.tmc.edu/ , [Accessed 2009, April 04]

[8] Yusufali F. Musaji, “Auditing and Security: AS/400, NT, UNIX, Networks, and Disaster Recovery Plans", 2001

[9] Philip Jan Rothstein “Disaster Recovery Testing exercising your contingency plan ”, 1993

[10] Barry A. Cardoza, “BCP Checklist”, January 2006, http://www.cpaccarolinas.org/Symposium08/Presentations/BCP%20Checklist.pdf , [Accessed 2009, April 15]

[11] “Business Continuity planning checklist for universities”, http://www.ncsu.edu/ehs/BCP/documents/Checklist.pdf , [Accessed 2009, April 15]

[12] “DMU Business continuity Plan”, http://www.rmaa.com.au/docs/library/items/BusinessContinuityPlan.pdf , [Accessed 2009, April 20]

[13] UTHCPC Business Continuity / Disaster Recovery / contingency / Emergency Plan

[14] Alain Abran, Luigi, “A quality factor for software”