

University of Southern California

From the Selected Works of Win Shih

October, 2007

Signs of the times: business continuity, disaster recovery, and IT audit

Win Shih

John Cashaw, *University of Colorado at Boulder*



Available at: https://works.bepress.com/win_shih/16/

Signs of the Times

Business Continuity, Disaster Recovery, and IT Audit

John Culshaw
University of Colorado at Boulder Libraries
Win Shih
University at Albany, SUNY

Our Disaster Recovery Plan Goes Something Like This...



Introduction

- Growing interdependence of technology
- 50% institutions experiencing IT disruption in last 5 years (ECAR)
- #6 of Top 10 projects in '07 (*Baseline*)
- Top 5 critical issues facing Higher Ed CIO (EDUCAUSE)
- Business continuity, disaster recovery, risk assessment, business impact, and IT audit

Business Impact Analysis

- Identify unit's functions and critical processes
- Examine likely threats to those processes
- Create mapping between functions and IT resources (campus + library)
- Determine impact and recovery time
- Identify the dependencies on IT resources
- Integrate with IT recovery plan

Library IT Services Work Areas					
Service Code	Service	Critical	Vital	Sensitive	Non-Critical
LIT1	Library Web server	*			
LIT2	Google Mini	*			
	Library Intranet Server (hosting password journal accessing information)		*		
LIT3	Development Server (Website application)		*		
LIT4	Impulse Server (Library catalog, Circulation, Millennium, Authentication)	*			*
LIT5	File server (G/H/S drive)	*			
LIT6	Application Server (LRC educational software)	*			
LIT7	Streaming Video Server	*	*		
LIT8	Print servers (GoPrints/Staff printer)	*			
LIT9	Backup Operation (all servers)	*			
LIT10	Online Access Support	*			
LIT11	IT Help Desk (Web, phone, cell, email)	*			
LIT12	Workstation support (monthly patching, software installation)		*		
LIT13	Week Night and Weekend IT Coverage	*			
LIT14	Asset Management (Hardware / Software)			*	
LIT15	Training (Hardware / Software)			*	
LIT16				*	

Workgroup	Service Description	Critical	Vital	Sensitive	Non-critical	IT Requirement	
						Library	Campus
Access Services	Circulate collection materials in all formats	*				LIT5, LIT9, LIT10, LIT14	TC1, TC2, TC3, TC4, NS2, AAS5, O24
	Interlibrary loan (lending and borrowing)		*			LIT9, LIT14	TC1, TC2, TC3, TC4, O24
	Manage course reserve in print and digital format	*				LIT5, LIT10, LIT14	TC1, TC2, TC3, TC4, NS2, AAS5
	Manage collaborative remote storage facility			*		LIT5, LIT9, LIT10, LIT14	TC1, TC2, TC3, TC4, AAS5
	Manage access to library public workstations	*				LIT14	TC1, TC2, AAS5
Reference Services	Answer patron questions at service desk, by phone, via email, and chat	*				LIT14	TC1, TC2, TC3, TC4
	Provide in-depth research support			*			TC1, TC2, TC3, TC4
	Provide one-on-one consultation			*			TC1, TC2, TC3, TC4
	Provide comprehensive instructional services	*				LIT8	TC1, TC2, TC3, TC4, O22
Technical Services	Catalog materials in all formats		*			LIT5, LIT10, LIT14	TC1, TC2, TC3, TC4
	Inventory library resources in all formats		*			LIT5, LIT10, LIT14	TC4
	Maintain library's ejournal holding information		*				TC1, TC2, TC3, TC4

Recover Time Objective:
 Critical: 0-12 hours; Vital: 13-24 hours
 Sensitive: 1-3 days; Non-critical: 3+ days

Risk Assessment

Overall Risk = Probability * Severity (Magnitude – Mitigation)

Threat	Probability 1-5 (high-low)	Magnitude 1-3 (high-low)	Overall Risk
Earthquake	9	3	9
Fire	2	3	6
Flood / Flash Flooding	2	2.5	5
Hurricane	1	2	2
Ice Storm	5	3	15
Landslides	1	3	3
Power Failure	2	3	6
Computer Crime	3	3	9

Literature Review

Boss, R.W. (2002). Disaster planning for computers and networks. <<http://www.ala.org/ala/pla/plapubs/technotes/disasterplanning.cfm>> (Accessed August 7, 2007).

Dewey, B.L., DeBlois, P.B., & the EDUCAUSE Current Issues Committee. (2006). *Current IT Issues Survey Report, 2006*. *EDUCAUSE Quarterly*, 29(2), 12-30.

Cervone, H.F. (2006). Disaster recovery continuity planning for digital library systems. *OCLC Systems & Services: International Digital Library Perspectives*, 22(3), 173-178.

Gulachek, B. (2005). Business continuity planning: process, impact, and implications. *EDUCAUSE Center for Applied Research Bulletin*, 2005(13).

Hertzberg, R. (2007). Top 10 projects in '07. *Innovations: a Supplement to Baseline, CIO Insight, and eWeek*, 2007(4), 18-22.

Jarnel, J. (2005). Lemons to lemonade: disaster preparation and recovery. *EDUCAUSE Center for Applied Research Bulletin*, 2005(5).

Kahn, M.B. (2004). *Protecting your library's digital resources: the essential guide to planning and preservation*. Chicago, IL: American Library Association.

Pirani, J.A., & Yansky, R. (2007). Shelter from the storm: IT and business continuity in higher education. *Roundup: Tools for Navigating Complex Decisions*. <<http://www.educause.edu/ir/library/pdf/ECM0702.pdf>> (Accessed August 7, 2007).

Question and Answers

University of Colorado at Boulder

University Libraries

Signs of the Times

Business Continuity, Disaster Recovery, and IT Audit

John Culshaw
University of Colorado at Boulder

Win Shih
University of Albany, SUNY


Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder

University Libraries

University of Colorado at Boulder

- Flagship campus of CU System
- Nearly 29,000 students
- Main library plus 5 branch facilities
- Mid-size ARL library



Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder


University Libraries

Experiences

- THEN: Major, non-university events
- NOW: Local disruptive events

Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder




Define a Disaster

- “any unplanned disruption of service beyond an acceptable period of time”

Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder




Planning History

- 2002 – Risk Assessment
- 2003 – First Recovery Plan complete
- 2005 – IT Audit
- 2007 – Risk Assessment
- 2007 – COOP Planning

Enter here the timeless fellowship of the human spirit

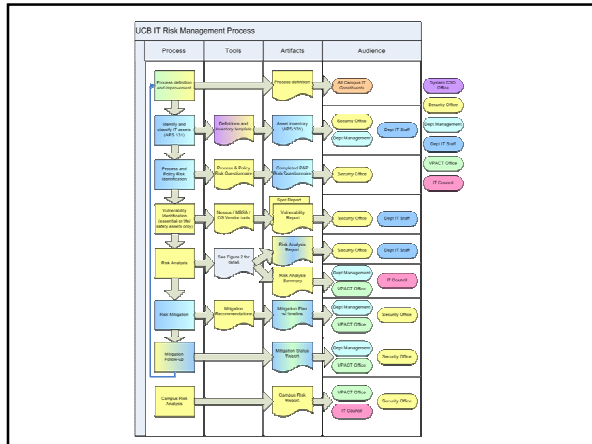
University of Colorado at Boulder



Risk Assessment (2007)

- Developed by campus IT Security Office
- Based on frameworks from outside organizations such as NIST and CERT
- 1: Inventory and classification
- 2: IT Security Policy and Process
- 3: General Background Questionnaire

Enter here the timeless fellowship of the human spirit



University of Colorado at Boulder
 University Libraries

Process and Documents

- IT Security Office Risk Assessment site
<http://www.colorado.edu/its/security/itriskmanagement/>
- CU Boulder Risk Management Framework
<http://www.colorado.edu/its/security/itriskmanagement/UCB%20Risk%20Management%20Framework%20-%20no%20links.doc>

Enter here the timeless fellowship of the human spirit!


University of Colorado at Boulder
 University Libraries

End Result?

- Risk Assessment Report
 - Evaluation of IT Related Risk
 - NOT an in-depth technical review of security controls
 - Example finding

Enter here the timeless fellowship of the human spirit!

University of Colorado at Boulder




IT Audit

- Uh-oh, an audit!
- Review goals, objectives, opportunities, and barriers...in order to better align work with the institutions priorities

Enter here the timeless fellowship of the human spirit!

University of Colorado at Boulder




Audit Timeline (all 2005)

- Entrance conference – April
- Information gathering – April through July
- Preliminary report – August
- Review report, develop action plan – Fall
- Exit conference – November
- Final report – November

Enter here the timeless fellowship of the human spirit!

University of Colorado at Boulder




Audit Reporting

- Quarterly reports to campus until all items complete
- Campus reports on audit status to President and Regents
- Took 12-18 months to complete all items

Enter here the timeless fellowship of the human spirit!

University of Colorado at Boulder




Sample Audit items

- Some easy items
- Some items required collaboration with others in Libraries, campus, or vendors
- Some really hard

Enter here the timeless fellowship of the human spirit!

University of Colorado at Boulder




Tabletop Exercise

- Recommended in audit as a way to test in-place disaster plans
- New experience
- Completed Summer 2006

Enter here the timeless fellowship of the human spirit!

University of Colorado at Boulder




Tabletop Exercise

- Create scenario
- Raise initial questions to fuel discussion
- Don't discuss with participants in advance
- Have copies of current disaster plans for review during exercise

Enter here the timeless fellowship of the human spirit!

University of Colorado at Boulder


 University Libraries

SNOW EMERGENCY

- *On Tuesday, November 16, Boulder is hit with a major snowstorm. The campus was closed as of noon that day. The next day, the campus remains closed. The Boulder Turnpike is closed and most roads leading into Boulder are still impassable.*

Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder


 University Libraries

SNOW EMERGENCY

- *At 10:00 am, John receives a phone call that the roof over the main reading room in Norlin Library has caved in. This broke a pipe and caused a flood in the building and there is likely water standing in on the west side first floor. Although no one has been in the machine room, Chinook and the Libraries web server are not responding over the Internet. It is unlikely that anyone can enter the library until sometime November 18.*

Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder


 University Libraries

SNOW EMERGENCY

- *The Dean has requested that Systems restore critical IT services no later than Friday, November 19. The campus plans to reopen that day. Some staff will be expected to return to assess damage to the physical library collection.*

Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder




Discussion Questions

- 1) *What are the first steps?*
- 2) *How will the department establish communication?*
- 3) *What is needed to reestablish IT services?*
- 4) *Think about priorities – this is a week before Thanksgiving – one of the busiest times of the semester.*

Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder




Tabletop Results

- Slow to start conversation (will depend on your group)
- Became like a game
- Excellent team building opportunity
- Sample outcomes

Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder




ILS Vendor Backup Testing

- Service offered by Innovative
- Audit point called for testing of our ability to backup
- This is for ILS – you could perform similar testing for any server on your own hardware

Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder




Why Bother?

- ensure backups have meaningful data
- test system restore capability
- peace of mind

Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder




How Innovative's Service Works

- Library sends FULL backup tape to Innovative
- Innovative restores your system on a server at their headquarters

Enter here the timeless fellowship of the human spirit

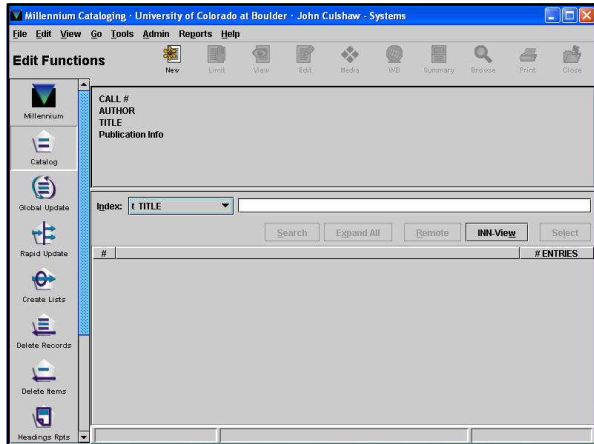
University of Colorado at Boulder

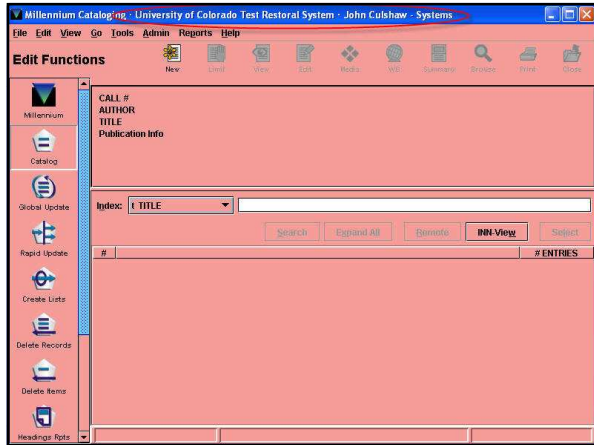


What Innovative Does

- System checks on data and indexes
- Provides your library with the server IP address so that YOU can connect via telnet and Millennium to test the system

Enter here the timeless fellowship of the human spirit






University of Colorado at Boulder

What To Look For?

- Chinook Oversight Group developed a list of the functionality we wanted to test
- Systems Department either performed or coordinated the test
- **Has all of your data been restored properly?**
- In the case of emergency, what would you need a restored system to do immediately?

Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder




Things to Remember

- You're working on your restored server – use your regular logins
- Don't mix up PRODUCTION server and RESTORED server
- You can't hurt your database – you're not on your production server
- Some things will not work

Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder




Advice

- Invest in a service like this (for vendor-provided ILS) or test on your own (other servers)
- Develop your own list of what functionality needs to be tested on the restored server – and store the list with your disaster plans

Enter here the timeless fellowship of the human spirit

University of Colorado at Boulder




Advice

- Understand and follow your backup plan
- Plan this when you have time to test
- Maintain a backup log


Enter here the timeless fellowship of the human spirit

1	A	B	C	D	E	F	G	H
Task/Function	Module	Notes	Working?	Checked by	Date			
2	create and attach order records	Acquisitions	YES	CK	5-Oct			
3	encumber funds	Acquisitions	YES	NO				
4	pay invoices	Acquisitions	YES	NO				
5	post to fund accounts	Acquisitions	YES	NO				
6	fund account display	Acquisitions	fund display and appear to be correct for this point	YES	CK	5-Oct		
7	create bib records	Cataloging	yes - see k39287348	YES	JPC	5-Oct		
8	create item records	Cataloging	yes - see k39287348	YES	JPC	5-Oct		
9	create authority records	Cataloging		YES	NO			
10	create resource records	Cataloging		YES	NO			
11	update bib records	Cataloging		YES	JPC	5-Oct		
12	update item records	Cataloging		YES	NO			
13	update resource records	Cataloging		YES	NO			
14	check out materials	Circulation		YES	BA	5-Oct		
15	check in materials	Circulation		YES	BA	5-Oct		
16	e-reserves	Circulation	unable to authenticate	NO	BA	5-Oct		
17	check patron records	Circulation		YES	BA	5-Oct		
18	update patron record	Circulation		YES	BA	5-Oct		
19	search OPAC	OPAC	not tested	in/a	JPC	25-Sep		
20	search WebOPAC	OPAC		YES	JPC	25-Sep		
21	patron use of WAM service	OPAC	LDAP authentication failed	NO	JPC	28-Sep		
22	my chinook	OPAC	LDAP authentication failed	NO	JPC	28-Sep		
23	links to e-resources (856 links)	OPAC	internet resources scope colorado water	YES	JPC	5-Oct		
24	scopes work	OPAC	tested internet resources scope	YES	JPC	5-Oct		
25	authentication with PIN	OPAC	failing	NO	BA	5-Oct		
26	connections to prospector	Prospector	searched 'denver photography' went to Prospector	YES	JPC	5-Oct		
27	links to prospector (record updates, etc.)	Prospector	did not test - didn't want to change central db	in/a				
28	create checkin records	Serials		YES	NO			
29	perform global update	System	changed eng to noabas for 100 items	YES	JPC	5-Oct		
30	create lists	System		YES	JPC	5-Oct		
31	reserve/tun backup	System	checked log - didn't run backup	YES	JPC	5-Oct		

University of Colorado at Boulder

Advice

- Clean tape drives according to manufacturer specs
- Replace tapes regularly
- Store backups in a secure, off-site location
- Do NOT provide broad access to test server

Enter here the timeless fellowship of the human spirit!

University of Colorado at Boulder

Audit vs. Risk Assessment vs. Business Continuity Planning

- Yikes!
- Audit = formal process, action expected/required
- Risk Assessment = formal process, action recommended
- BCP = planning for future

Enter here the timeless fellowship of the human spirit!
