



# Technology Disaster Response and Recovery Planning

A LITA Guide

EDITED BY  
Mary Mallery



An imprint of the American Library Association

CHICAGO 2015

[www.alastore.ala.org](http://www.alastore.ala.org)

**MARY MALLERY** is the associate dean for technical services at Montclair State University Library. She has published articles and presented on library technology-related topics extensively. She is the book review editor for the *Journal of Electronic Resources Librarianship* and a regular contributor to the Web Review column of *Technical Services Quarterly*. She teaches classes in database design and management as well as metadata sources for library professionals at the Rutgers University School of Communication and Information as a part-time lecturer.

---

© 2015 by the American Library Association

Extensive effort has gone into ensuring the reliability of the information in this book; however, the publisher makes no warranty, express or implied, with respect to the material contained herein.

ISBNs

978-0-8389-1315-4 (paper)

978-0-8389-1339-0 (PDF)

978-0-8389-1340-6 (ePub)

978-0-8389-1341-3 (Kindle)

### **Library of Congress Cataloging-in-Publication Data**

Technology disaster response and recovery planning : a LITA guide / edited by

Mary Mallery.

pages cm

Includes bibliographical references and index.

ISBN 978-0-8389-1315-4 (print : alk. paper) 1. Library buildings—Safety measures—Planning. 2. Libraries—Information technology—Security measures—Planning. 3. Electronic information resources--Management—Planning. 4. Library materials—Conservation and restoration—Planning. 5. Data protection. 6. Data recovery (Computer science)—Planning. 7. Emergency management—Planning. 8. Library buildings—United States—Safety measures—Case studies. I. Mallery, Mary, editor.

Z679.7T43 2015

025.8'2—dc23

2014048260

Cover image © foxie/Shutterstock, Inc. Text composition in the Berkeley and Avenir typefaces.

This paper meets the requirements of ANSI/NISO Z39.48–1992 (Permanence of Paper).

© Printed in the United States of America

19 18 17 16 15    5 4 3 2 1

# Contents

## ■ PART 1 ■

### **Creating the Technology Disaster Response and Recovery Plan**

- |   |           |
|---|-----------|
| <b>1 What Could Go Wrong? Libraries, Technology,<br/>and Murphy's Law</b> | <b>3</b>  |
| <i>By Mary Mallery</i>  |           |
| <b>2 Inventory and Risk Assessment for Digital Collections</b>            | <b>11</b> |
| <i>By Liz Bishoff and Thomas F. R. Clareson</i>                           |           |
| <b>3 Disaster Planning and Risk Management with dPlan</b>                 | <b>23</b> |
| <i>By Donia Conn</i>  |           |
| <b>4 Disaster Communication: Planning and Executing<br/>a Response</b>    | <b>33</b> |
| <i>By Denise O'Shea</i>   |           |
| <b>5 Future Trends: Cloud Computing and<br/>Disaster Mitigation</b>       | <b>45</b> |
| <i>By Marshall Breeding</i>   |           |

■ PART 2 ■

**Managing Techmageddon:  
Disaster Mitigation and Lessons Learned**

<b>6 The University of Iowa and the Flood of 2008: A Case Study</b>	<b>73</b>
<i>By Paul A. Soderdahl</i>	
<b>7 Digital Disaster Recovery and Resources in the Wake of Superstorm Sandy: A Case Study</b>	<b>89</b>
<i>By Thomas F. R. Clareson</i>	
<b>APPENDIXES</b>	
<b>A Disaster Communication Planning Template</b>	<b>99</b>
<b>B Example of a Basic Disaster Communication Plan for a Public Library</b>	<b>103</b>

# 1

■ PART 1 ■

## Creating the Technology Disaster Response and Recovery Plan

# What Could Go Wrong?

## Libraries, Technology, and Murphy's Law

*Mary Mallery*

Libraries depend more and more on technology to provide essential services. There are Internet and social media sites, electronic resources, and digital collections; our staff and public infrastructures of PCs, tablets, laptops, and peripherals; and of course the ubiquitous integrated library system (ILS). As technology becomes more essential to everyone's life, this variety of devices, data, and software will grow more complex, as will the many ways that disasters, both natural and manmade, can cause loss of services and resources. Yet most library disaster plans focus on response and recovery from collection and facilities disasters, such as fire and flood.

But how do you begin to draft a comprehensive plan? This LITA Guide will provide readers with a step-by-step, blow-by-blow process to create a Library Technology Disaster Response and Recovery Plan. It includes sample checklists and templates, tools and solutions for promoting collaborative services to enable digital library continuity, and case studies and lessons learned from successful efforts in recovering from library technology disasters.

This LITA Guide includes chapters from contributing authors who have experience and practical advice to share about various aspects of library technology disaster response and recovery planning. The topic will be of great interest to tech-savvy staff—systems librarians, electronic resources librarians, digital collections librarians, data management librarians, emerging technology librarians, and library administrators—as well to librarians who wish to transition into these new careers and to library students. The target audience is academic library staff,

with librarians and information professionals in other types of organizations as a secondary audience.

## DEFINITION OF TERMS

Librarians were the first to create systematic means of indexing and retrieving information, and as such they have always been in the forefront of the use and development of information science technologies. Technology disaster planning has been and continues to be essential to our field. But which technology do we focus on for our plan, and what constitutes a technology disaster? Let's start out by defining our terms.

### What Is Technology?

4

The word *technology* comes from the Greek *techne*, meaning *skill* or *art*, which includes a vast array of possibilities. For example, long ago, fire was a technology. All libraries use technology to do their work these days, and we depend on it. If we don't have a plan to respond and recover and continue our work in the event of technology failure, when the fire goes out, we will be left in the dark. When we talk about library technology, are we referring to the hardware, software, peripheral devices, or everything mechanical? What about the infrastructure, such as the electrical grid or the telecommunications network—the oxygen that makes the fire possible? Or what about the data—the fuel that makes the fire burn long or fizzle out? These days, when we talk about technology in the library, we talk about *systems*, because technology is not just one device or program but a complex integrated network of many technologies that depend on one another to work effectively.

### What Is a Disaster?

The word *disaster* comes from the Latin for “ill-starred.” In the old days, a disaster was considered to be the predetermined outcome of inevitable bad luck. These days, however, we believe in self-determination, and that planning will keep away bad luck. Or, as Cassius says to Brutus in Shakespeare's *Julius Caesar*, “The fault, dear Brutus, is not in our stars, but in ourselves.” Today, we can plan to moderate the effects of disasters and create networks of experts and services that will help

us to respond efficiently and recover effectively, even if the disaster that strikes is not the one we feared.

There are many kinds and causes of disaster, both natural and manmade. There are large-scale natural disasters, such as the 2011 tsunami in Japan that caused the Fukushima disaster, and small failures of technology design, such as the O-ring failure that caused the Challenger explosion in 1986. Large or small, natural or manmade—in complex systems, all the dominoes will fall in a cascade because of one tipping point failure.

Disasters are not just physical phenomena; they affect the whole system. Therefore, a holistic approach and an understanding of the dependencies of modern life are essential to a good disaster plan. Both the environmental and emotional effects of a disaster must be taken into account in planning.

## MURPHY'S LAW

When we talk about disasters, we usually think of fire, floods, or earthquakes, but technology disasters can have many more causes than these. The problem can be as simple as ants blocking up a circuit board or “bugs” in the system, but if it causes the system to fail, and we depend on that system, the results can be disastrous.

The story goes that what is known as Murphy's Law was first coined by an American aerospace engineer in 1949. The classic version of Murphy's Law is: “Whatever can go wrong will go wrong.” Anyone who works with or depends on technology should keep this adage in mind. It also helps to acknowledge that you cannot anticipate all technology failures. You may never know what may cause the next outage, but you can try to be prepared to mitigate the circumstances so that it does not turn into a disaster.

## KINDS OF TECHNOLOGY AND FAILURES

The Y2K bug was the first time that my library's systems department became aware of how much we depended on software and time-stamped databases to maintain our operations, from the integrated library system to the human resources payroll system to even the elevators in the building.

In the twenty-first century, library technology has expanded to include global networks, and as the scope of the technology becomes larger and more complex, the dependencies that our systems rely on for day-to-day operation become more at risk of single and multiple points of failure.

My library has a Collections Disaster Response Plan, which we update on a regular basis. Recently we had an unanticipated technology disaster when there was an air-conditioning outage in the university server room, which caused us to lose access to our digital collections. The consequences of this simple problem had a huge impact on user access to resources, which made us realize how much the library depends on technology to deliver services and host resources. These days, all libraries need a Technology Disaster Response and Recovery Plan in addition to a Collections Disaster Response Plan.

## BACKGROUND LITERATURE

6

The literature on disaster planning for library print collections is well-established and continues to grow. When I searched for model technology disaster response and recovery plans, I found that there was a great deal of literature that focuses on library collections (e.g., Miriam Kahn's classic *Disaster Response and Planning for Libraries*<sup>1</sup> which was updated in 2012 to include more information about library technology systems, electronic resources, digital communications, and social media). However, I found very little library literature technology disaster response and recovery planning.

There are many more technology-focused resources in business literature, such as the American Management Association's *Disaster Recovery Handbook*.<sup>2</sup> Librarians could learn a great deal from business managers, but the library universe's dependence on technology—especially on cloud-based databases—makes the literature of information management systems even more relevant.

National organizations, such as the Heritage Preservation Trust, the Conservation Center for Art and Historic Artifacts (CCAHA), and the Northeast Document Conservation Center (NEDCC), offer workshops and online tools to assist libraries and cultural heritage communities with risk assessment and response and recovery planning for print collection disasters. For example, NEDCC received an Institute of Museum and Library Services (IMLS) grant to create the online tool dPlan, which is profiled in chapter 3. Most recently, the National Network of Libraries of

Medicine has begun the NN/LM Emergency Preparedness and Response Initiative, which provides free online workshops and templates for disaster risk assessment and emergency planning.

## FIRST STEPS IN TECHNOLOGY DISASTER RESPONSE AND RECOVERY PLANNING

A one-step-at-a-time approach to disaster response and recovery is optimum. Miriam Kahn introduced the idea that disaster response entails four phases; these are good principles to keep in mind approaching any kind of disaster. They are:

- Phase 1: Respond to Notification
- Phase 2: Assess the Damage
- Phase 3: Begin Rescue and Recovery
- Phase 4: Recovery Process: Resumption of Services; Restoration of Cash Flow; Recovery of Materials<sup>3</sup>

In contrast, in technology and systems administration, Disaster Response and Recovery Plans are split into three parts: Mitigation, Continuity, and Recovery. The UCLA Social Science Data Archive Disaster Recovery Plan presents one of the best examples and offers this explanation of the three main sections:

The first section, Mitigation, outlines activities the Data Archive will undertake to ensure emergency preparedness and to protect its assets. These activities include risk assessment, an inventory of assets and equipment, backup policies and procedures, standards, training, and the maintenance of the plan.

The second section, Continuity, is concerned with the activities the Data Archive will undertake to ensure continued access to its products and services with minimal disruption in the event of an emergency. This section contains a list of important contacts, references, and relevant department, and campus documents that outline specific emergency procedures.

The final section, Recovery, details the steps the Data Archive will undertake to restore full functionality after an emergency. This section

includes guidance on restoring and using key applications and technologies.<sup>4</sup>

Chapters 2 through 4 in Part 1 of this LITA Guide will help you work through these steps one at a time to build and maintain a Library Technology Disaster Response and Recovery Plan based on this three-part structure. Part 1's concluding chapter provides an in-depth look into future trends in cloud computing in library technology and maps out its role in disaster mitigation, response, and recovery planning.

You don't need a different plan for every technology your library uses, but you do need a comprehensive Technology Disaster Plan that:

1. provides an inventory of technology (hardware, software, and data) with a risk assessment for each
2. describes simple incremental prevention and restoration procedures for each risk
3. identifies training and communication procedures for the plan
4. schedules the iterative process of reviewing and updating the plan on a regular basis

Part 2 of this LITA Guide focuses on practical uses of library technology disaster planning, or what I like to call “Managing Techmageddon.” Two experienced professionals provide detailed case studies of recent large-scale technology disasters and discuss how lessons learned have helped to improve technology disaster planning for libraries.

You never know when or how disaster might strike, but with a Technology Disaster Response and Recovery Plan that is integrated into your library's budget and strategic planning policies, your staff will know what procedures and accommodations are in place to weather the storm, and you can be confident that library services will be disrupted as little as possible as a result of any disaster that may come your way.

## NOTES

1. Miriam B. Kahn, *Disaster Response and Planning for Libraries*, 3rd ed. (Chicago: ALA Editions, 2012).

2. Michael Wallace and Lawrence Webber, *The Disaster Recovery Handbook: A Step-by-Step Plan to Ensure Business Continuity and Protect Vital Operations, Facilities, and Assets* (New York: American Management Association, 2004).
3. Kahn, *Disaster Response*.
4. UCLA Social Science Data Archive Disaster Recovery Plan (August 2010), p. 4–5, [www.sscnet.ucla.edu/issr/da/\\_images/Disaster.Recovery.Plan.docx](http://www.sscnet.ucla.edu/issr/da/_images/Disaster.Recovery.Plan.docx).

## RESOURCES

- IFLA Preservation Section Disaster. Preservation and Conservation. Useful Resources. [www.ifla.org/preservation-and-conservation/useful-resources](http://www.ifla.org/preservation-and-conservation/useful-resources).
- Kahn, Miriam B. *Disaster Response and Planning for Libraries*, 3rd ed. Chicago: ALA Editions, 2012.
- Library of Congress: Emergency Preparedness, Response, and Recovery website. [www.loc.gov/preserv/emergprep](http://www.loc.gov/preserv/emergprep).
- National Network of Libraries of Medicine (NN/LM) Library Disaster Readiness Test. <http://nnlm.gov/ep/2014/08/05/how-ready-is-your-library>.
- New Jersey State Library Disaster Planning Resources. [www.njstatelib.org/services\\_for\\_libraries/resources/disaster\\_planning](http://www.njstatelib.org/services_for_libraries/resources/disaster_planning).
- Northeast Document Conservation Center (NEDCC) Emergency Response Framework for the Cultural Community (COSTEP). [www.nedcc.org/free-resources/costep](http://www.nedcc.org/free-resources/costep). The COSTEP Framework is a planning tool designed to bring together cultural institutions with emergency management agencies and first responders. It provides a blueprint for preparing for area-wide disasters and building alliances with federal, state, and local emergency management agencies.
- Tanner, Simon. “Do You Understand Your Digital Ecosystem?” *When the Data Hits the Fan* (blog). September 26, 2014. <http://simon-tanner.blogspot.co.uk/2014/09/do-you-understand-your-digital-ecosystem.html>.
- UCLA Social Science Data Archive Disaster Recovery Plan. August 2010. [www.sscnet.ucla.edu/issr/da/\\_images/Disaster.Recovery.Plan.docx](http://www.sscnet.ucla.edu/issr/da/_images/Disaster.Recovery.Plan.docx).
- Wallace, Michael, and Lawrence Webber. *The Disaster Recovery Handbook: A Step-by-Step Plan to Ensure Business Continuity and Protect Vital Operations, Facilities, and Assets*. New York: American Management Association, 2004.

# Index

## A

- access
  - to collections, disaster planning and, 23
  - to digital archive, 94
  - failed physical communication channels and, 37
- active redundancy, 58–59
- Acts of God (*Force Majeure*) events, 12
- Alire, Camila C., 34
- Alliance for Response New York City, 91
- Amazon
  - data replication offering, 52
  - Elastic Compute Cloud, 51, 60
  - as infrastructure-as-a-service provider, 51
- American Institute for Conservation of Historic and Artistic Works (AIC), 91
- American Institute of Certified Accountants, 62
- American Management Association, 6
- applications, disaster response, 39–40
- Assessing Institutional Digital Assets (AIDA) Self-Assessment Toolkit, 20
- Audit and Certification of Trustworthy Repositories* (Magenta Book), 19

## B

- background literature, 6–7
- backup
  - cloud computing and, 45, 50, 64–65
  - by Cumberland County Library system, 92–93
  - data backup/facility backups, dPlan guidance on, 29–30
  - software-as-a-service and, 56
  - vendor-hosted instances and, 54–55
- backup-as-a-service, 57–58
- Bishoff, Liz, 11–20
- blog, 41
- Breeding, Marshall, 45–68
- budget, 17

## C

- Carbonite, 58
- case studies
  - digital disaster recovery in wake of Superstorm Sandy, 89–96
  - University of Iowa flooding, 89–96
- CCAHA (Conservation Center for Art and Historic Artifacts), 6
- cell phone networks, 37
- Center for Research Libraries, 19
- certifications, 61–62

- chat, 39
  - Clareson, Thomas F. R.
    - “Digital Disaster Recovery and Resources in the Wake of Superstorm Sandy: A Case Study,” 89–96
    - “Inventory and Risk Assessment for Digital Collections,” 11–20
  - cloud computing
    - adoption of by University of Iowa, 81
    - backup-as-a-service, 57–58
    - benefits/challenges of, 45
    - conclusion about, 67–68
    - connectivity for, 66–67
    - data chaos, 65–66
    - data ownership, 62–63
    - expectations, setting, 48–49
    - fault-tolerant systems, design of, 58–60
    - infrastructure-as-a-service, 50–51
    - institutional policies/practices, 65
    - in libraries, inevitability of, 46–48
    - for library backup/redundancy, 37
    - network security for, 67
    - personnel, impact on, 63–65
    - privacy/confidentiality and, 66
    - protection of data, 49–50
    - service-level agreements, 60–62
    - software-as-a-service, 55–57
    - storage-as-a-service, 51–53
    - vendor-hosted instances, 53–55
  - CloudHQ, 53
  - clustering, database, 59
  - “cold site,” 30
  - The Collaborative Assessment of Research Data Infrastructure and Objectives (CARDIO) tool, 20
  - collection disaster planning
    - See* disaster planning
  - collections
    - See* digital collections
  - Collections Disaster Response Plan, 6
  - commitment, to digital preservation, 14, 16–18
  - communication
    - See* disaster communication
  - communication plan
    - See* disaster communication plan
  - communication tree, social media, 41
  - computers
    - See* servers; systems
  - confidentiality, 66
  - Conn, Donia, 23–31
  - connectivity
    - See* Internet connectivity
  - Conservation Center for Art and Historic Artifacts (CCAHA), 6
  - contact information, 34–35
  - continuity, 7
  - contracts, for digital collection, 17–18
  - costs
    - of backup-as-a-service, 58
    - of cloud computing disaster strategy, 49
  - CrashPlan, 58
  - criticality levels, 76
  - cultural heritage, 12
  - Cumberland County Library system,
    - response to Superstorm Sandy, 92–93
- D**
- data
    - backup, dPlan guidance on, 29
    - chaos, cloud computing and, 65–66
    - management by multi-tenant systems, 56
    - ownership, cloud computing and, 62–63
    - protection of data with cloud computing, 49–50
    - storage-as-a-service and, 51–53
  - database clustering, 59
  - definition of terms, 4–5
  - designated community, 14
  - digital collections
    - digital disaster recovery in wake of Superstorm Sandy, 89–96
    - digital preservation policies, 14
    - impact of risk on, 13–14
    - inventory of, 15–16
    - organizational commitment to digital preservation, 16–18
    - risk assessment, need for, 11
    - risk assessment, tools for, 19–20
    - risks to, 12–13
    - technical infrastructure risk assessment, 18–19

- Digital Curation Centre, 19–20
- digital files
  - of collection, inventory of, 15
  - no digital asset is original, 86–87
- digital library infrastructure, 85–86
- Digital Repository Audit Method Based on Risk Assessment (DRAMBORA), 19–20
- Digital Preservation Europe, 19–20
- disaster
  - definition of, 4–5
  - prediction of outcome of, 82–83
- disaster communication
  - after recovery, 41–42
  - challenges/solutions, 36–37
  - communication plan, components of, 34–35
  - conclusion about, 42–43
  - dPlan supplies and services section for, 27
  - failed communication channels, 37
  - failed social communication channels, 38
  - lessons learned, 38
  - non-essential team member for, 83
  - plans for emergency communication, 86
  - pre-disaster communications with all parties, 24
  - preliminary planning, 33–34
  - preparation, 34
  - scripts, 35
  - situation awareness reporting, 36
  - social media for, 39–41
- disaster communication plan
  - basic disaster communication plan for public library, 103
  - components of, 34–35
  - on failed physical communication channels, 37
  - planning template, 99–102
  - questions to evaluate readiness of library, 42
- disaster planning
  - background literature, 6–7
  - cloud computing and, 48–49
  - dPlan, examples of use for, 27–30
  - dPlan, overview of, 24–27
  - dPlan, pros/cons of using, 30–31
  - example of basic disaster communication plan for public library, 103
  - software-as-a-service requirements for, 56–57
  - steps of, 23–24
- disaster recovery
  - communication after, 41–42
  - digital disaster recovery in wake of Superstorm Sandy, 89–96
  - disaster recovery plan, 7–8
  - of Eyebeam Art+ Technology Center after Superstorm Sandy, 93–94
  - of Frederick L. Ehrman Medical Library at NYU, 95–96
  - of University of Iowa, 80
  - for vendor-hosted instances, 54–55
- Disaster Recovery Handbook* (American Management Association), 6
- Disaster Response and Planning for Libraries* (Kahn), 6
- disaster response and recovery plan
  - of Cumberland County Library system, 93
  - three parts of, 7–8
  - of University of Iowa, lessons learned about, 82–84
  - of University of Iowa library, drafting, 74–76
  - of University of Iowa library, execution of, 76–80
  - of University of Iowa, observations from 2013, 84–87
  - See also Library Technology Disaster Response and Recovery Plan
- disaster response, four phases of, 7
- disaster team
  - communication, lessons learned about, 38
  - disaster communication, responsibility for, 33–34
  - evacuation of University of Iowa library, 77–79
  - lessons learned about, 83–84

- disaster team (cont.)  
 phone tree in communication plan, 34–35  
 responsibilities of, 26–27  
 situation awareness reporting, 36  
 social communication channels for, 38  
*See also* library staff
- discovery services  
 with cloud computing, 47  
 disaster planning for, 48–49
- documentation, 31
- dPlan: The Online Disaster-Planning Tool  
 advantages/disadvantages of using, 30–31  
 description of, 24–25  
 for digital disaster planning, examples of use of, 27–30  
 function of, 23  
 grant to create, 6  
 prevention section, 25–26  
 response and recovery section, 26–27  
 supplies/services, 27
- DRAMBORA (Digital Repository Audit Method Based on Risk Assessment), 19–20
- Dropbox, 39
- duplicate copies, of data, 52–53
- E**
- Eisenhower, Dwight D., 82
- Elastic Compute Cloud, Amazon, 51, 60
- email  
 cloud computing for, 47–48  
 failed physical communication channels and, 37  
 in social media communication tree, 41
- emergency communication directory, 35
- emergency contact information, 28
- emergency service information, 27
- Emanuel, Rahm, 80
- encryption, 67
- enterprise storage, 65
- evacuation, of University of Iowa library, 77–79
- Evernote, 39
- exit strategy, 16
- Eyeball Art+ Technology Center, 93–94
- F**
- Facebook  
 for disaster communication, 39, 40  
 in social media communication tree, 41
- facility backups, 29–30
- fault-tolerant systems, 51, 58–60
- FEMA, 85
- file formats, 15, 16
- financial issues, 13
- flood, University of Iowa case study, 73–87
- Frederick L. Ehrman Medical Library at New York University, 94–96
- funding, 17
- G**
- Gmail, 39
- Google Drive, 39
- Google Hangout, 39
- grants, 17
- H**
- hardware inventory, 28–30
- Heritage Preservation, 6, 91
- Holden, Maria, 90
- “hot site,” 30
- Hurricane Irene, 90
- I**
- information technology (IT)  
 library IT disaster response plan, 74–80  
 section of dPlan, 28–30  
*See also* technology
- infrastructure-as-a-service, 49, 50–51
- Instagram, 41
- instances  
 reserved instances, 60  
 vendor-hosted instances, 53–55
- instant messaging, 39
- Institute of Museum and Library Services, 24
- institutional policies/practices, 65
- insurance information, 27
- integrated library systems (ILSs)  
 with cloud computing, 47  
 vendor-hosted instances, 53–55
- Internet connectivity  
 for cloud computing, 66–67

failed physical communication channels, 37  
 vendor-hosted instances and, 55  
 Internet Service Providers (ISPs), 37  
 inventory  
   of digital collections, 15–16  
   hardware/software inventories with dPlan, 28–30  
   item-level/printed form inventory, 94  
   of legal documents for digital collection, 17–18  
   of staff skills for digital preservation work, 16–17  
 Iowa River, 73–74, 84  
 ISO/IEC 27001:2005: Information technology certification, 62  
 ISO/IEC 27001:2013: Information technology certification, 62  
 IT  
   See information technology

## J

Joint Information Systems Committee (JISC), 20  
*Julius Caesar* (Shakespeare), 4

## K

Kahn, Miriam B.  
   on communication methods during disaster, 37  
*Disaster Response and Planning for Libraries*, 6  
   on four phases of disaster response, 7

## L

legal agreements, 17–18  
 legislative mandate, 12, 13  
 lessons learned, 38, 82–84  
 library  
   cloud technologies in, 45–48  
   data ownership with cloud computing, 62–63  
   service-level agreements, 60–62  
   technology, dependence on, 3  
 Library Dean, 33  
 Library Director, 33  
 library services platforms, 47

library staff  
   cloud computing's impact on, 63–65  
   disaster team, responsibilities of, 26–27  
   emergency contact list in communication plan, 35  
   essential personnel, identification of, 83–84  
   inventory of staff skills, 16–17  
   loss of key staff, impact of, 18  
   social communication channels for, 38  
   social media applications, familiarity with, 40  
   social media communication tree, 41  
   See also disaster team

## Library Technology Disaster Response and Recovery Plan

background literature, 6–7  
 definition of terms, 4–5  
 drafting, 74–76  
 execution of, 76–80  
 first steps in, 7–8  
 lessons learned, 82–84  
 LITA Guide for help with, 3–4  
 Murphy's Law, 5  
 technology/failures, kinds of, 5–6  
 See also disaster response and recovery plan

Library Technology Guides, 46  
 library website, 37, 41  
 Lilley, Barbara, 90  
 literature, on library disaster planning, 6–7  
 logging, transaction, 59  
 LYRASIS (library and cultural heritage network), 90

## M

MailChimp, 39  
 Mallery, Mary, 3–8  
 mandates, 12, 13–14  
 Massachusetts Board of Library Commissioners (MBLC), 24  
 media outlets, in communication plan, 35  
 Metropolitan New York Library Council (METRO), 90  
 Microsoft, Office 360 service, 47–48

mitigation

See risk mitigation

Mozy, 58

multi-tenant platforms

data ownership with, 62–63

overview of, 55–57

service-level agreements, 61

See also software-as-a-service

Murphy's Law, 5

## N

National Center for Preservation Technology and Training, 24

National Network of Libraries of Medicine, 6–7, 42

natural disaster

failed communication channels in, 37

Superstorm Sandy, 89–96

University of Iowa flooding, 73–87

network security, 67

network traffic, 66–67

New Jersey State Library, 36, 90

New York Community Trust, 91

New York State Archive, 90

New York State Library (NYSL), 90

NN/LM Emergency Preparedness and Response Initiative (National Network of Libraries of Medicine), 6–7

Northeast Document Conservation Center (NEDCC), 6, 24

## O

OCLC/Research Libraries Group (RLG), 19

Office 360 service, Microsoft, 47–48

off-site backup, 92–93

Open Archival Information System (OAIS) Reference Model, 14

organization

change, as risk to digital collection, 12

cloud computing and policies of, 65

commitment to digital preservation, 16–18

mandates for digital collections access, 12, 13–14

O'Shea, Denise, 33–43

ownership, data, 62–63

## P

personnel

See library staff

Pinterest, 41

planning

disaster communication planning template, 99–102

disaster response plan of University of Iowa, 82

organizational commitment to digital preservation, 16

preliminary, for disaster communication, 33–34

See also disaster planning; disaster response and recovery plan

policies, 14, 18

portable devices, 53

Pradarelli, Stephen, 73–87

preparedness, 85

press release, 35

prevention section, of dPlan, 25–26

privacy, 66

public information officer (PIO), 33–34

public library, basic disaster communication plan for, 103

## R

RAID (redundant arrays of inexpensive disks), 51–52, 92

readiness, 85

reciprocal arrangement, 29

recovery

See disaster recovery

redundancy

active redundancy, 58–59

cloud computing and, 49

of Internet connections, 67

reserved instances, 60

with storage-as-a-service, 51, 52

relocation, temporary, 79–80

remote hosting services, 37

replication, 52

reserved instances, 60

resources

basic disaster communication plan for public library, 103

on digital collection protection, 89–91

- disaster communication planning
    - template, 99–102
  - response and recovery section, of dPlan, 26–27
  - responsibility, 76
  - risk assessment
    - in disaster planning process, 23–24
    - in dPlan's prevention section, 25–26
    - impact of risk on digital collections, 13–14
    - inventory of digital collections, 15–16
    - need for, 11
    - organizational commitment to digital preservation, 16–18
    - policies, questions for, 14
    - risks to digital collections, 12–13
    - summary of, 19
    - technical infrastructure risk assessment, 18–19
    - tools for, 19–20
  - risk mitigation
    - in disaster recovery plan, 7
    - in University of Iowa case study, 80–81
  - risks
    - to digital collections, 12–13
    - identification of materials at high risk of loss, 15–16
- S**
- Salesforce.com, 55
  - salvage priorities, 27
  - SAS 70 (Statement on Auditing Standards No. 70) certification, 62
  - Schmidt, Gregory, 36
  - security, network, 67
  - servers
    - Cumberland County Library system's preparation before Sandy, 92–93
    - evacuation of University of Iowa library and, 78–79
    - of Frederick L. Ehrman Medical Library at NYU, 95
    - standby systems, 60
      - of University of Iowa, relocation of, 80–81
      - vendor-hosted instances, 53–55
  - service continuity plan, 35
  - service interruption, 48–49, 61
  - service-level agreements, 60–62
  - Shakespeare, William, 4
  - Simple Storage Services (S3), Amazon, 51
  - situation awareness reporting, 36
  - Skype, 39
  - social communication channels, failed, 38
  - social media
    - communication tree, 41
    - for disaster communication, 39–41
    - free social media/web-based applications
      - for disaster response, 39–40
      - tips for using, 40
  - Soderdahl, Paul A., 73–87
  - software inventory, 28–30
  - software-as-a-service
    - data ownership with, 62–63
    - disaster planning for, 48–49
    - impact on personnel, 64
    - overview of, 55–57
    - reliance on, 45
    - service-level agreements for, 61–62
    - vendor-hosted instances marketed as, 53, 54
  - spokesperson
    - communication with traditional media, 41
    - non-essential team member for, 83
    - selection of, 33–34
  - Spore, Stuart, 95–96
  - staff
    - See library staff
  - standby systems, 60
  - statutory breach of duty, 13
  - storage services, cloud computing for, 46
  - storage-as-a-service, 51–53
  - subject guides, 47
  - succession plan, 16
  - Superstorm Sandy, digital disaster recovery
    - in wake of, 89–96
  - supplies/services section, of dPlan, 27
  - synchronization, 53
  - systems
    - Cumberland County Library system's preparedness/response, 92–93
    - disasters affect whole system, 5
    - fault-tolerant systems, design of, 58–60

systems (cont.)

- of Frederick L. Ehrman Medical Library at New York University, 94–96
- technology in the library as, 4
- University of Iowa disaster mitigation, 80–81
- University of Iowa library evacuation/relocation, 77–80

## T

- technical infrastructure risk assessment, 18–19
- technical review, 64
- technology
  - cloud computing, transformation of technology use, 45
  - definition of, 4
  - kinds of technology/failures, 5–6
  - libraries' dependence on, 3
  - risks to digital collections, 12
  - training of staff, ongoing, 17
  - See also* information technology
- technology disaster
  - definition of “technology” and “disaster,” 4–5
  - first steps in response to, 7–8
  - Murphy's Law and, 5
  - Technology Disaster Response and Recovery Planning* (Mallery), 3–4
- telecommunications, 30
- telephone lines, 37
- telephone numbers, 34–35
- template
  - disaster communication planning, 99–102
  - of dPlan, 24–25
- temporary relocation, 79–80
- tools, for risk assessment, 19–20
- training, 17
- transaction logging, 59

transparency, 18

- Trustworthy Repositories Audit and Certification: Criteria and Checklist* (tool), 19
- Tumblr, 41
- Twitter, 39, 41
- 2009 Horizon Report* (New Media Consortium/Educause), 81

## U

- UCLA Social Science Data Archive Disaster Recovery Plan, 7–8
- Uninterruptible Power Supply (UPS), 92, 93
- University of Iowa
  - floods of 1993, 2008, and 2012, 73–74
  - lessons learned in 2008, 82–84
  - library IT disaster response plan, drafting, 74–76
  - library IT disaster response plan, execution of, 76–80
  - mitigation of risk, 80–81
  - observations from 2013, 84–87
- University of Notre Dame, 102
- updates, from library after recovery, 41–42

## V

- Van Malssen, Kara, 93–94
- Vanderbilt Television News Archive, 46
- Vanderbilt University Libraries, 46
- vendor-hosted instances, 53–55
- Vine, 41
- volunteer coordinator, 83

## W

- web-based applications, 39–40
- website, library, 37, 41

## Y

- Y2K bug, 5
- YouTube, 41