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UNDERSTANDING DISASTER RECOVERY PLANNING THROUGH A THEATRE METAPHOR: REHEARSING FOR A SHOW THAT MIGHT NEVER OPEN

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ABSTRACT

Disaster recovery planning for organizations is fundamental and often urgent. Planning supports the firm's ability to recover the core business functionality of its software, data, and systems after the occurrence of a natural or man-made disaster. Organizations must take steps to protect their software, systems and data backups from natural disasters, power outages, and even terrorist attacks. However the issue of disaster recovery is often awash in checklists or marooned in mundane statistics. Such sterile approaches tend to lead key managers, CEOs, and CIOs to relegate disaster recovery planning to a lower priority when they become overwhelmed with planning minutiae or bored with staid presentations. This paper introduces a theatre metaphor to enable a lively discussion and deeper understanding of disaster recovery planning. Specifically, we introduce the concept of workshopping a play. We explore this new approach from the world of theatrical productions to illuminate and deepen understanding of the importance of testing, evaluation, and reworking of scenarios for each potential disaster.

Keywords: disaster recovery planning, disaster recovery, business continuity management, off-site data storage, hot site, recovery planning, theatre metaphor

I. INTRODUCTION

Most business and IT managers readily acknowledge that disaster recovery, particularly for information technology, is a serious issue for the survival of an organization. Unfortunately, the language of disaster recovery is grindingly boring. At the mere mention of disaster recovery, many people who are otherwise alert and intelligent tune out, with eyes glazed over. The present is so engaging and planning for disasters seems so remote. Others dislike the emphasis on negative or emergency scenarios. They prefer denial; pretending that their organization will escape major disasters and believe that speaking about negative possibilities only engenders more negative thinking. Many firms take an ostrich approach, burying their head in the sand and pretending not to see the impending disaster.

However, the literature and common experience both bear out the truth that disasters do strike and it is those for which we are unprepared that we pay the most dearly and often regret the most heartily. Disasters range from the mundane and familiar (power outages) to the severe and

unexpected such as combinations of events triggered by natural disasters (e.g., the 2005 hurricanes Katrina and Rita and, the 2004 tsunami that wreaked havoc with Southeast Asia) or terrorist attacks (World Trade Center attacks on 9/11, the Bali bombings, the London tube bombings). Each disaster is in some way unexpected, entails loss of life, and curtails business functions amidst almost unfathomable chaos.

In this article we use a theatre metaphor to engage the reader in hope of avoiding the oft-noted dryness of this issue. We also use the theatre metaphor to describe aspects of disaster recovery planning that are not evident when it is considered on its own.

THE THEATRICAL METAPHOR

The theatre metaphor has been used successfully in organization research over the last two decades. Crossan et al [1996] used a dramaturgical approach to examine an emergent organizational skill they label "organizational improvisation." The improvisational idea also was taken up by Kanter [2002]. Bryant [1993] extended the theatrical metaphor to learning the concepts of operations research.

Organizations as stages for action in which the roles of organizational actors are put together theatrically for role-playing and for constructing a carefully manicured and stage-managed image were examined by Czarniawaska-Joerges and Wolff [1991] and Mangham and Overington [1987].

Kendall and Kendall [1993 and 1994] successfully used a metaphor approach to understand the language of information systems users and the usefulness of metaphors in mapping systems development methodologies to users' metaphors.

In particular, the theatre metaphor serves to inform planners about the importance of thinking through likely scenarios and required actions in new, alert, and lively ways that uncover some unexplored aspects of this type of planning. The correspondence between elements of disaster recovery planning and producing a show is serviceable and informative, presenting new ways of thinking and stretching the imagination in ways to extend disaster recovery thinking.

II. DISASTER RECOVERY PLANNING

This section presents the conventional wisdom on disaster recovery planning. While disaster preparedness focuses on the steps of what a company should do in the event of a crisis, disaster recovery focuses on the continuation and restoration of essential systems within the information technology infrastructure. The two methodologies are interdependent and build upon each other.

Where daily business operations are affected by unforeseen events, more is at stake than just losing money. A company's reputation, client assets, proprietary assets, and personnel are just as susceptible to loss. For any firm great and small, taking the right course of action can mitigate loss of company assets and save a business from going under. Selecting the right course of action is where disaster preparedness and disaster recovery planning begin.

A disaster need not be catastrophic to cause a business disruption. While earthquakes, wide-area flooding, and fires are detrimental to business, in reality, it does not take much for a disaster to happen. The failure of an air conditioning system in an office on a hot summer day can force the evacuation of personnel. One of the authors was returning to work from a doctor's appointment when he received a phone call that a company's air conditioning system went out unexpectedly. Disaster recovery was invoked and business users were sent to an offsite recovery setting, with no problems, due to semi-annual disaster recovery testing. It takes little effort to define a list of dozens of potential business disruptions. Some of the more common occurrences are power spikes, power surges, power outages, computer viruses, hardware failures, and bomb threats.

ROLES AND RESPONSIBILITIES

During a fire drill, when the fire alarm is activated in the building, employees know where to evacuate and where to assemble. After the exercise is over, everyone returns to the building and continues their work as if nothing happened. In the case of an actual evacuation, employees may not be able to return to the building (sometimes for long periods) and continue their daily business operations.

THE WHITTIER EARTHQUAKE: AN EXAMPLE

The Whittier earthquake, which killed 8 people, occurred in Southern California in 1987. It struck near El Monte, California where the headquarters of Southern California Edison (the local power utility) and most of the area's major banks are headquartered. When the earthquake struck, the people at Southern California Edison were evacuated into the street. Their power and their phone lines went down. Their only means of communications was through a cell phone (then quite a rarity) that happened to be in one of the employee's cars. They could not re-enter the building because the fire marshal declared the building unsafe. They did not know at that time that their computers survived.

The earthquake struck on a Tuesday. The nearby banks knew that they had until Saturday at the most to get their ATM machines back up or they would start losing customers in droves. All the transactions ran through their headquarters buildings. They made their deadline, but not by much.

If a situation arises that requires employees to evacuate the premises or denies employee access to a building, efficient emergency logistics planning is important. The question to ask is, "In an emergency, do personnel know where to go and know what to do?" In most cases, employees understand where to go. It is the question about what to do that brings concern.

Here is some of the conventional wisdom concerning what issues to consider in creating a disaster recovery plan.

- **Identify teams responsible for managing a crisis.** It is important to know who will be responsible for making decisions regarding: continuing business operations, supporting *ad hoc* computer and voice communications, where personnel will go in an emergency, taking care of the personal needs of employees, and restoring the main environment, if possible [Frey, 2004]. The disaster recovery team manages the tasks, while the tasks themselves are completed by the restoration team.

- **Eliminate single points of failures.** Redundancy is the key for eliminating single points of failure for servers running Web applications.

- **Determine data replication technologies that match your company's redeployment time objectives**. Some companies are moving away from unreliable physical tape and are using virtual storage (SANs - storage area networks) instead. Synchronous remote replication, or data mirroring, is as close to real-time backup as it gets, but any distance over one hundred miles can start to affect the data mirroring process. In asynchronous remote replication, the data can be sent to the secondary storage location at designated time intervals.

- **Create detailed relocation and transportation plans**. Evacuation routes and employee assembly points should be given to all personnel in a one-page memo. Employees may be sent home, stay on-site or relocate to a recovery facility to continue operations. All possible forms of transportation should be taken into account.

- **Establish multiple communication channels among employees.** If email is unavailable for broadcasting an emergency message, an emergency information Web page or emergency hotline can serve as viable alternatives. Some other communication tools include emergency notification systems, call trees, wallet-sized contact cards, conference bridges, and bulletin boards.

- **Provide off-site recovery solutions.** New regulations stipulate that bank off-site locations must be at least 100 miles away from the original site [Bruno-Britz, 2005]. Since paper files and backups also present a monumental problem and are highly vulnerable (virtually all paper was destroyed in the collapse of the World Trade Centers), it is recommended that firms move toward a document digitization strategy that will convert all paper within five years [Stephens, 2003].

- **Ensure the well-being of employees.** Water should be plentiful and easily available, food is also important, although less so. Employees should be issued a safety kit containing water, a dust-mask, a flashlight, glow sticks, and a whistle. The American Red Cross Web site (www.redcross.org) contains valuable information on preparing a personal workspace disaster supplies kit.

The traditional disaster recovery process consists of planning, a walkthrough, practice drills and recovery from the advent of a disaster. One of the identifiable problems with this approach is the lack of evaluation and systematic work through of possible scenarios. This process moves too rapidly from a theoretical plan to practice drills. However, our contention is that the disaster recovery process can be markedly improved by adding a step that is borrowed from the production of a theatrical work.

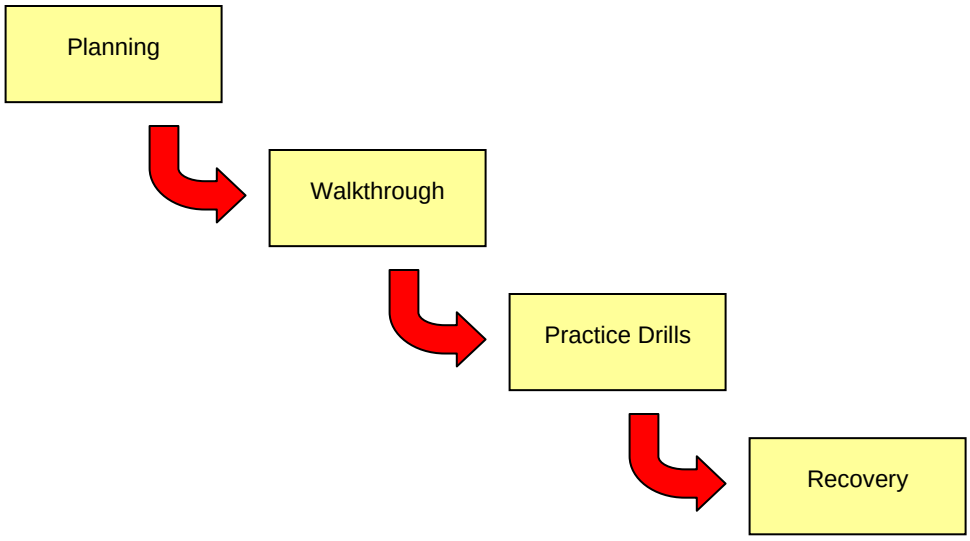

Figure 1. Traditionally Disaster Recovery Consisted of Planning, a Walkthrough, Practice Drills, and Recovery.

III. THEATRE PRODUCTIONS ARE SIMILAR TO DISASTER RECOVERY PLANNING

We can learn much from the mounting of a theatre production that can be useful in disaster recovery planning. In this section we examine various players that are common in the theatre and point out their equivalents in disaster recovery planning. Table 1 shows the theatre participants who are called actors, directors, playwrights, dramaturgs, and even critics.

Table 1.Theatre Occupations, Their Equivalence in Disaster Recovery, and Roles Played in Disaster Recovery

Player	Equivalency in disaster recovery	Roles played in disaster recovery
Actor(s), protagonist(s)	Data recovery specialists, network administrators, systems analysts, and IT professionals	Disaster recovery team (planning), initial response team, restoration team, and recovery operations team
Actors, supporting cast members	IT staff and supporting staff from other business functional areas	Support for disaster recovery team, initial response team, restoration team, and recovery operations team
Stage hands, lighting and sound designers	Other organizational members, human resources personnel	Logistical support team that complements the IT professionals (often in the background)
Playwright	Head of disaster recovery team	Describes disaster scenarios, prepares action scripts for each potential disaster
Director	CEO/CIO	Oversees the disaster recovery project from beginning to end
Dramaturg	An assigned member of the disaster recovery team	Examines scenarios, organizational resources, forecasts, and the interconnectedness between them
Critic	Outside consultant	Evaluates scenarios, action plans, and tests

Participants in disaster recovery planning, perform similar functions to actors in a theatre. They are the disaster recovery specialists, network administrators, systems analysts, and other IT professionals. They are the main actors. In addition a supporting cast and other organizational members are needed in disaster relocation for example. To support the actors, stage hands need to be present to move props, sets, and equipment for the actors. The equivalent to stage hands are all of those involved in logistics. They can supply food and water, places to work, and computer resources that are necessary in case of an emergency.

Of course, a head of the disaster recovery team (the playwright), is responsible for writing up scenarios and steps that need to be taken in executing the plan. A separate member of the team needs to examine all of the scenarios and plans, forecast events, analyze potential effects, and determine how everything is interconnected. This person is a researcher, and is equivalent to the theatre person called a dramaturg.

> *"The position of dramaturg includes the hiring of actors and the development of a season of plays with a sense of the connectedness between them, the assistance and editing of new plays by resident or guest playwrights, the creation of programs or accompanying educational services and even helping the director with rehearsals."* Wikipedia [2005]

As with every system, an evaluation is needed. The disaster recovery plan evaluator, like the theatre critic, is someone who does not possess a vested interest in the recovery plan itself.

The theatre metaphor can help with organizing all of the necessary tools, media, and assorted items that a disaster recovery teams needs to complete their work. We list these items in Table 2 under the heading of props. In the theatre, props (such as a piano, a staircase, a rug to trip on) are necessary items used to move the plot or play action forward. In any of the recovery scenarios they are necessary items for the teams.

It is useful to discuss the teams as four separate groups with different functions although some of the participants may belong to more than one group. These teams and their roles are listed in columns 1 and 3 of Table 2 [Hawkins, et al, 2000]. The people and their props are shown in columns 2 and 4 of Table 2.

Table 2. Disaster Preparedness Teams, Actors, Their Roles, and Props Used in Disaster Recovery

Teams	Actors	Roles	Typical Props Used
Initial response team	Network administrator	Observes problem, evaluates, situation, decides appropriate actions such as continuing onsite or moving to alternative location	First response items (backup generators; flashlights; restore disks); one-page disaster response plan; contact information
Restoration team	Systems analysts, network administrators	Coordinate damage control, reestablish data files, communication lines, software, and IT infrastructure	Lists (list of computer programs and versions; licenses; contact names; off-site storage); scripts regarding each disaster scenario
Recovery operations team	Data recovery specialists	Set up and run an alternative site (if needed), reestablish infrastructure, and help with reestablishing access to data, systems, and software	Technologies (satellite phones; Blackberry-type devices; wireless connectivity; Instant Messaging); scripts regarding each disaster scenario
Logistical support team	Other organizational members	Facilitate human elements such as counseling, providing for emergency expenditures, help with relocation, as well as accessing the workplace	Contact information for employees; one-page disaster response plan

IV. ANOTHER PHASE IS NEEDED IN DISASTER RECOVERY PLANNING

Continuing with the theatre metaphor, we found it is helpful to examine the activities needed to develop a theatre production and learn lessons that would be applicable to disaster recovery planning. Table 3 lists the main activities: scriptwriting, initial reading, workshopping, rehearsals, and the performance itself. Five steps comprise play development.

In Figure 1 we noted most disaster recovery plans involve four, not five, activities. We believe that disaster recovery would benefit from introducing this additional fifth step. As in play development, we will call this activity *workshopping*.

In planning for a disaster, workshopping can be a significant tool. Disaster planners can demonstrate the process involved with disaster recovery by placing the key players in positions they would assume in the crisis. The recovery team needs to know when to begin (enter) and when to leave (either figuratively or in reality) during a disaster. Supporting organizational

Table 3. Comparison of Producing a Theatrical Play with Managing a Disaster Planning Project

Activity in Theatre	Activity in Disaster Planning	Description of Activities in Disaster Planning Phase
Scriptwriting	Planning	Describes disaster scenarios, prepares disaster recovery scripts for each potential disaster
Initial Reading	Walkthrough	Initial walkthrough of steps in each of the disaster recovery scripts
Workshopping	Workshopping	Testing, evaluation, and reworking. Acting out scenarios and testing; reworking scripts for each potential disaster (may or may not involve people who carry out the disaster recovery if it occurs)
Rehearsals	Practice drills	Those who will be responsible for acting out disaster recovery use trial runs to practice
The Performance	Actual Disaster Recovery	Only necessary if a disaster occurs. Key individuals, teams, and supporting organization members work together to recover from a disaster.

members need to know their assigned places and agendas, and key members of the recovery team need to try out their dialog and actions. This is the time to try out the tactical plans. Activities can be changed at this point rather easily. An audience is helpful at this time. They should be organizational members who were not directly involved with the development of the disaster recovery process so far [Kennedy, 2005; Kovar, 2005; Mearian and Wiess, 2005; Lundquist, 2005 and Britt, 2005].

WORKSHOPPING

In a theatrical production, workshopping means that a work is in progress. It is not frozen for purposes of rehearsal or performance and is open to change. Workshopping a play is much more than a reading. Directors try blocking the scenes and allow the actors to perform activities (sometimes with props). Blocking means trying out different entrances, exits, and places to stand on stage. When blocking a play, it becomes apparent very quickly if there are actors on stage who look uncomfortable because their assigned lines are too few. In a play, if a supporting actor is on stage, they sometimes remain in the background but remain “in character” by performing maintenance functions such as primping or stretching, or some other activity that fits the character the actor is portraying. In a workshop, the playwright changes the play by adding, deleting or editing lines, stage directions, or anything else does not seem to fit in with the scene. A hand-selected audience is often present during a workshop, so that the playwright can obtain appropriate perspective and critical feedback.

Note that the participants in the workshop may or may not be the participants who would take on the responsibility and perform the activities during a disaster. The workshop is different from a rehearsal. The point of the workshop phase is to modify the tactical plan where it needs to be changed, not let the actors (disaster recovery team) practice their lines. Therefore this part of the

disaster recovery process could even be outsourced to a consulting firm. When the workshop concludes satisfactorily, the rehearsal process can start.

In the theatre, workshopping is very different from the rehearsal. In the rehearsal, the actors are already cast by the director. Some lines and scenes may be changed, but the production is fully-formed, waiting for a performance. In early rehearsals no audience is present – only the director and actors who practice, revise, and practice some more, to deliver a flawless performance. In a rehearsal, the disaster recovery teams needs to practice, analyze, and practice further in preparation for a flawless performance that may never happen.

As shown in Figure 2, workshopping adds another step to the disaster recovery process. This added step slows down the development process, but also tames it somewhat. Workshopping allows for the testing, evaluations, and reworking of disaster recovery scenarios. Employees act out scenarios and carry through on testing. In addition, in the workshopping phase they can rework scripts for each potential disaster that is assessed.

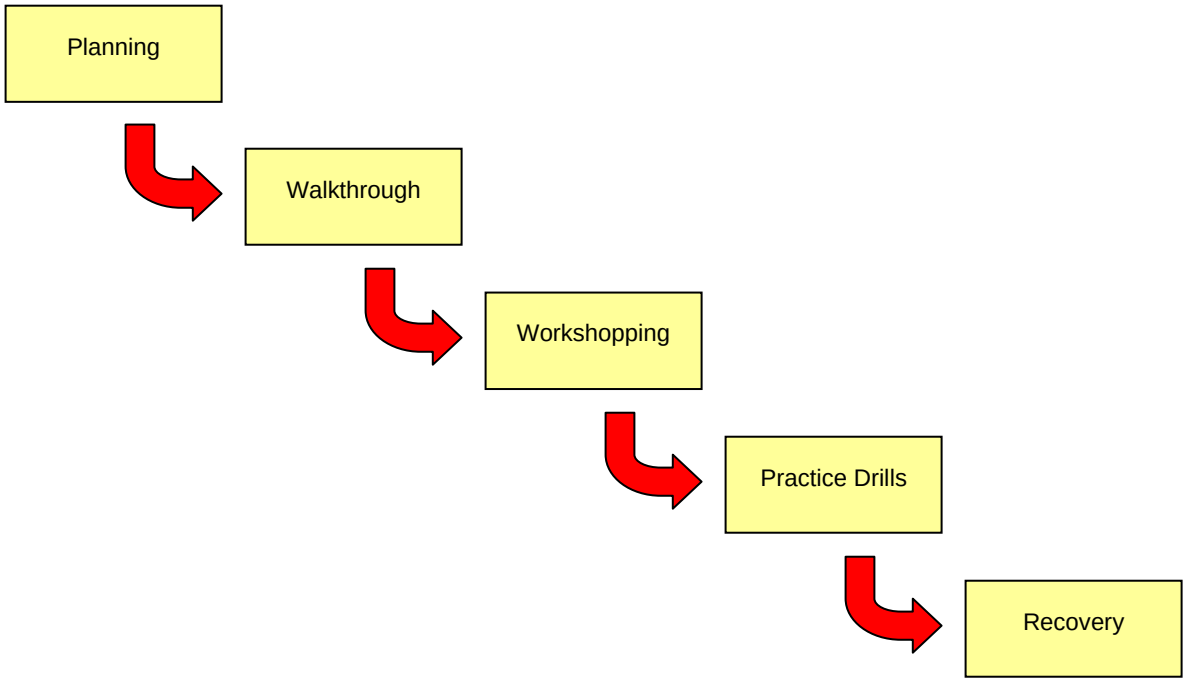

Figure 2. Disaster Recovery Preparedness can Benefit from an Extra Phase Called Workshopping, Which Critically Looks at Scenarios Developed

V. WORKSHOPPING: AN ESSENTIAL ELEMENT FOR BUSINESS CONTINUITY MANAGEMENT PROGRAMS

A successful business continuity management program [Hecht, 2002] is not complete without an extensive disaster recovery testing methodology. Disaster recovery testing provides an opportunity to ensure an organization can continue supporting its necessary business functions in the event of a disruption. Because most business functions depend on information technology, an IT outage of any kind will prove detrimental to the organization.

Workshopping can be department or enterprise-wide. Testing during the workshopping phase can encompass an entire organization, or a small, essential part of an organization. However, disaster recovery testing is not something to be ruminated over, like Hamlet's fateful and infamous quandary "To be, or not to be." It just must be done.

The outcome of disaster recovery workshopping should focus on disaster recovery testing as a learning tool, to gain valuable experience in case of an actual disaster, and to make certain all IT recovery teams involved are thoroughly versed and familiar with the recovery process. The point of workshopping is not to assess whether a particular test turned out to be successful or not.

Time spent workshopping provides the necessary hands-on experience. It demonstrates what to do (and not to do) in the event of an actual disaster. Issues that arise during a disaster recovery test might also arise during a real event. Being able to solve potential problems beforehand and knowing how to execute a plan saves valuable time in a disaster. Effective workshopping gives all the teams involved clear direction. The byproduct of preparedness is peace of mind knowing the team is fully cognizant of how to address effectively whatever a disaster delivers.

TWO IMPORTANT COMPONENTS OF DISASTER RECOVERY WORKSHOPPING

The two significant components of disaster recovery workshopping are:

1. Ensuring essential business software applications, and the technology that supports them, can be recovered [Avery, 2005].

2. Ensuring business users are able to continue basic business functions using recovered data.

Disaster recovery workshopping can be thought of as an iterative recovery exercise, a set of run-throughs of recovery tasks in preparation of a disaster. Remember, the data is only as good as the hardware on which it resides. In turn, the hardware is only as good as the network on which it resides. If essential data is replicated to another server[1], the integrity of the back-up data must be accurate.

A disaster recovery test provides the opportunity to ensure the data is being replicated properly and that it can be assessed. The storage media of the data can make a difference; however, no matter whether an organization's data exist on tape or a distributed storage environment, it must be functional. Workshopping bridges the gap between expected and actual results. A level of expectation for performance must be predetermined. Once set, whether the disaster recovery team is initializing the recovery mainframe, building the backup servers, or setting up hundreds of workstations, an outcome can be assessed and measured against a standard.

Once the essential data is restored in the recovery environment, it is time for business users to test out these applications. End user testing is fundamental because users will need time to become accustomed to the recovery environment. It is highly probable that the layout of the work area will be different (sometimes markedly) during recovery from that of the current production environment. Equipment such as workstations and phones might also be different from those used in the production environment.

An important item to consider is whether the recovery location is at an alternate office or at a recovery facility. Even something as basic as providing the correct number of chairs so that every worker can be accommodated in the new work area, as well as ensuring that enough workstations are available needs to be planned for.

ALLOW TIME TO TEST

A thorough business continuity management plan [Hecht, 2002] should be completed and supported by the highest levels of management. After senior management approval, it is time to

[1] Such servers are usually called Disaster Recovery servers (or DR servers). They contain a replica of an in-house server and are usually located at a different location. Care must be taken that the remote location is sufficiently far away that it, too, is not affected by the disaster. For example, some backup servers for the World Trade Center on 9/11 were located in nearby buildings that were also destroyed.

gather the requirements for disaster recovery testing. The best place to start the workshopping phase is to review all the business functions detailed within the business impact analysis section of the business continuity plan.

These are the steps to be followed:

1. List all the critical functions.
2. Work with the technology groups involved to see which disaster recovery capabilities exist and which don't.
3. Define the test scope and test objectives.
4. Decide on a general scenario[2] on which to base the test (For example, a typical scenario to address might be the loss of a data center or denial of access into a building.)

Most businesses test their indispensable business functions once a year. Workshopping allows for more than one test, so take the opportunity. Although it is somewhat problematic to determine the exact number of times to test, the axiom is that the more often a business tests, the more efficient and effective it will be at managing a disaster.

Before the workshopping phase of a disaster recovery test begins, create a schedule of estimated start and completion times for all tasks. As the disaster recovery test progresses, review the task list and capture the actual start and completion times. Compare the estimated times versus actual times to measure the gap between them and to see how far away you are from your goal.

If you are dissatisfied with how much longer the test took than you estimated, investigate why the delay occurred. In most cases, actual times cannot be assessed until the task is performed. Also, log all issues and resolutions and time stamp them. At the end of the test, the issues and resolutions log serves as an archive for all future disaster recovery tests and actual disaster recovery events. At the end of a test, create a lessons learned document to see what went right, and what went wrong.

VI. CONCLUSION

Many CEOs, CIOS, and IT managers look only at the costs of disaster recovery planning and testing and fail to see the benefits. They are put off by the seeming aridness of the work. They view disaster recovery as an operational tactic rather than a strategic thrust. In fact, they can use disaster recovery planning for their organizations in an interactive, engaging way.

One path to deeper understanding of the dynamic and interactive aspects of disaster recovery is to use a theatre metaphor as an informative and instructive way to understand disaster preparedness. The theatre metaphor entails actors, scripts, the playwright, a director, and critics. A complete theatrical production shares many similarities with disaster recovery planning, in particular through its melding of distinct and sometimes chaotic attributes into a coherent, working ensemble performing a gripping scenario.

In this paper, we add a phase to the disaster recovery process called workshopping. The concept comes from a trend in developing a theatrical production. In the theatre, the workshopping phase occurs before moving into rehearsal. Extending the theatre metaphor to disaster recovery brings new understanding of the dynamic, creative, and responsible roles that we must assume in disaster recovery planning.

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[2] For software to support scenario generation see Wild et al, [2005]

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EDITOR'S NOTE: The following reference list contains the address of World Wide Web pages. Readers who have the ability to access the Web directly from their computer or are reading the paper on the Web, can gain direct access to these references. Readers are warned, however, that

1. these links existed as of the date of publication but are not guaranteed to be working thereafter.
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3. the authors of the Web pages, not CAIS, are responsible for the accuracy of their content.
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