

American Eagle's Eight-Day Outage

September 2010

It's one thing to have a major system go down for four hours while it is being recovered. It is another thing for a three-billion dollar retailer to lose its entire web site for eight days. That is what happened to American Eagle Outfitters in late July.

American Eagle had done everything right. It had backups of backups. It had a disaster-recovery site. It had detailed business-continuity and disaster-recovery plans. So what went wrong? Testing and verification.

American Eagle Outfitters

American Eagle Outfitters (www.ae.com) is a Pittsburgh-based, multibillion dollar retailer. 12% of its revenues come from its apparel web sites including American Eagle for teenagers, Aerie for women, and 77kids for babies and toddlers.

Its online web operations are outsourced to IBM. American Eagle also provides a mobile web site, managed by Usablenet, that provides access to its products from cell phones and PDAs.



The Disaster

During the evening of Monday, July 19, 2010, American Eagle's web site came crashing down. It was reported that the crash was caused by the loss of a major storage subsystem at the IBM hosting center. The failed storage held a great deal of the critical information needed by American Eagle to process web orders.

No problem. American Eagle was prepared for server and storage failures such as this with full backup facilities. However, as the IBM staff attempted to fail over to the backup system, the secondary storage system failed as well. The joint failure of the primary and secondary disk drives has a probability of occurrence of much less than a million to one, but it happened.

No problem. American Eagle had gone so far as to keep magnetic tape backups of its databases. Restoration of 400 gigabytes of data was started. However, for some reason, the staff was only able to get a restoration rate of one gigabyte per hour. At this rate, it would take over two weeks to restore the database. After much tuning, the restoration speed got up to five gigabytes per hour; but the restores kept failing.

No problem. American Eagle was prepared even for these unlikely eventualities. It had built a remote disaster-recovery site, and IBM staff initiated a failover to the remote site. However, they soon discovered that the remote site was not yet operational - a big surprise to American Eagle,

since IBM was supposed to have had the site operational months earlier. Though transaction logs were replicated to the disaster-recovery site, the staff could not get the logs to roll forward with Oracle Data Guard so that the remote databases could be recovered.

Now it was a big problem. American Eagle's online stores were down, and it would take four days to restore purchasing capability to the web sites. Even then, operations limped along as several important ancillary functions, including order tracking, wish lists, and order history, were inoperative for another four days.

The outage couldn't have happened at a worse time. The start of the back-to-school heavy shopping days had just begun.

The Timeline

The timeline of American Eagle's communication with its customers tells the story of its initial optimism, its early frustration with the recovery efforts, and its ultimate resignation to the disaster.

When the website crashed early during the evening of Monday, July 19th, visitors to the site were greeted with an optimistic message:

"Sorry. We need a few minutes to reorganize our closet. We promise to be back in a bit with even more."

Two days later, American Eagle had come to the realization that it had better do something to appease its customers. It posted the following offer on Wednesday, July 21st:

"We're making updates to our sites. Free Shipping on us when we're back, thru July 25."

However, full functionality to the website was not restored until July 27th.

By Thursday morning, July 22nd, the website was back online with limited functionality. Purchases could be made, but several ancillary services such as order tracking and wish lists were still not operational. On Friday morning, July 23rd, the following message greeted visitors to the site:

"We're still working through some issues, but you'll be able to shop! Everything should be completely fixed very soon. Thanks for hanging in there. Stuff we're still working on: Order Tracking, Registered Information Functionality, Wish List, Order History."

On Tuesday afternoon, July 27th, IBM informed American Eagle that all services had been restored; and the warning notices came down. As a parting good-will offer, on Friday, July 30th, American Eagle noted in a Facebook posting:

"Thanks for hanging in there while our site was down ... This Friday and Saturday (7/30 & 7/31) online only take 25% off your entire order & we'll throw in free shipping too!"

This three-billion dollar retailer had been down for eight days with lost revenue and untold loss of its customer base, even though it had invested heavily in disaster recovery.

Why Not Switch to its Mobile Site?

Like so many companies with an online presence, American Eagle maintains a mobile website in addition to its primary online site.¹ The mobile website provides convenient access for browsing and purchasing from a cell phone or PDA.

¹ <http://mobile.usablenet.com/mt/www.ae.com/web/index.jsp>

So why not post a message on its online website that simply points users to the mobile web site? The pages are not as rich in content, but customers could still browse American Eagle products and place orders.

The problem is that there are two ways to build a mobile website. One is to have a completely autonomous web site with its own database. The online website and the mobile website databases are synchronized via replication. Thus, they are independent; and one can substitute for the other in an emergency provided each has sufficient capacity – the ultimate active/active architecture that comes for free.

Unfortunately, American Eagle elected to build its mobile site as a proxy to its online website. The mobile site uses the database of the primary site. Should the primary site go down, the mobile site is down as well. Therefore, American Eagle could not fail over customers to its mobile site.

Some marketers do not like to fail over to a mobile site since they feel that the displays are too bland when presented via a standard browser. This attitude may not be shared by the CFO.

Lessons Learned

Many lessons can be learned from the American Eagle disaster. Perhaps the foremost lesson is that disaster-recovery plans and business-continuity plans are not very effective if they are not tested periodically. Clearly, this was the case for American Eagle. For one, it appears that the restoration of the database from magnetic tape was never tested, which would have uncovered the slow restoration problem. For another, American Eagle clearly never tested failover to the disaster-recovery site, or it would have discovered quite quickly that the disaster-recovery site was not yet operational.

All too often, companies take shortcuts when it comes to failover and recovery testing because such testing is considered to be too complex, too expensive, and too risky. But the expense of a failover fault can do major damage to a company's bottom line.

However, shouldn't this testing have been the responsibility of IBM, which had contractually taken responsibility for the website? IBM is one of the powerhouses in the outsourcing business. But as capable as it is, it has had a series of failures such as this one. Just two weeks before American Eagle's debacle, DBS Bank, the largest bank in Singapore, lost all of its online banking, ATM and credit-card services, and branch operations for nine hours when an IBM employee used an outdated procedure to replace a cable. DBS Bank had outsourced its data-center operations to IBM in 2002 for \$850 million.²

In 2006, the State of Texas outsourced to IBM a major migration of 27 agencies to two data centers for \$863 million. The migration was supposed to have been completed in two years. Now, four years later, only five agencies have been fully migrated. Furthermore, the state has accused IBM of failing to make required backups. Texas is now rebidding the contract four years before its expiration.³

This leads to the second important lesson. A company can never give up ownership, responsibility, or governance of its systems and data to another service provider. There should have been periodic dry runs of all backup and failover procedures properly witnessed by American Eagle staff as part of the contract. In this case, IBM failed to detect that there were fatal problems with recovery procedures and failed to verify that the disaster-recovery site was

² Singapore Bank Downed by IBM Error, *Availability Digest*; August 2010.

³ IBM and Texas – Outsourcing Troubles Part Two, *CIO*; August 23, 2010.

operational. Even a company as competent and experienced as IBM needs to be periodically audited with respect to its responsibilities.

This is a clear indication of the risk of using a managed hosting firm rather than a company site for critical IT functions. In this economy, the auditing of a service provider may not be high on the CIO's priority list. After all, the SLA guarantees that the expected level of service will be provided. Right?

Not necessarily, as was shown in this case. Speaking of SLAs, it is not known whether American Eagle got hit with the SLA "gotcha." SLAs are typically written so that in the event of a major outage, the customer is entitled to a partial or full refund of the hosting fee for that period. There is no provision for compensating the customer for loss of business. There have been many reports of small online stores being taken out of business for days due to a hosting-site failure, and the total of the remunerative damages received by those retailers was the refund of their \$10 hosting fees.

Acknowledgements

Material for this article was taken from the following sources:

Down For 8 Days: American Eagle's Site Disaster, *StorefrontBacktalk*; July 29, 2010.
Oracle Backup Failure Major Factor in American Eagle 8-Day Crash, *StorefrontBacktalk*; July 30, 2010.

The above-referenced sources provided the major investigations into this incident. Some ancillary information was also obtained from the following references:

American Eagle Blames IBM as Website Down For Third Day, *Biznews*; July 23, 2010.
American Eagle Credits IBM for Ecommerce Site Outage, *ZippyCart*; July 23, 2010.
Down for 8 Days: American Eagle's Site Disaster, *CBS News*; July 30, 2010.
Oracle, IBM Caused American Eagle's Eight-Day Outage, *Direct Commerce Systems*; July 31, 2010.
Inside American Eagle Outfitter's 8-Day Website Nightmare, *CIO*; August 9, 2010.
American Eagle Outfitters learns a painful service provider lesson, *IDG*; August 30, 2010.