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Mizuho Bank Down for Ten Days

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This is a story of poor Business Contingency Planning. The Japanese bank, Mizuho Bank (www.mizuhobank.co.jp), shut down its ATM network and stopped making salary transfers to its customers in mid-March, 2011. It was ten days before the bank was back in full operation.

What caused this disaster? A nice thing, actually. It was excessive donations made via mobile phones in response to the devastating Japanese earthquake and ensuing tsunamis the week prior. However, the massive load created by the donations hobbled Mizuho's batch processing of money-transfer transactions. As well-intentioned as these donations were, it was little solace to the millions of Japanese who could not get their salaries paid or who could not withdraw necessary funds from their accounts via ATMs for days.

Mizuho Bank

Mizuho Bank is the third largest bank in Japan. It has 440 branch offices and operates 38,000 ATMs throughout Japan. It is focused on providing a wide range of banking services to individuals and to small businesses.

Mizuho Bank came about as a merger of three banks in 2002. Its IT problems started almost immediately. Each of the three banks had a different computer system – IBM, Hitachi, and Fujitsu. Indecision as to how to consolidate these systems led to a banking outage almost as severe as the current one. 2.5 million public-utility automatic payments were delayed. As a result, Japan's regulatory watchdog, the Financial Services Agency (FSA), imposed administrative sanctions on Mizuho Bank.

The Outage

Banking Services Lost

Shades of 2002. Things started to go wrong on Monday, March 14th, when bank customers found that they were not getting their salary payments transferred into their accounts and that many of the bank's ATMs were inoperable. The ATMs were all returned to service by Thursday, March 17th. Then on Friday, March 18th, all of the bank's 38,000 ATMs stopped working. A customer who didn't get his salary payment could not even get money from an ATM managed by the bank in order to buy food and to pay bills. This was just before a long weekend ending with the Japanese holiday celebrating Vernal Equinox Day.

To help provide service to its customers, the bank kept its branches open through the weekend and the holiday. There were even reports that in typical Japanese style, bank employees were standing in line in the cold weather apologizing to patrons for the lack of services.

Inside the bank's back offices, things were even worse. Because of failures of the nightly batch runs, hundreds of thousands of money-transfer transactions worth almost a trillion yen (about $10 billion U.S.) could not be processed. This included salary payments that were to have been transferred into customer accounts.

On the Tuesday after the holiday, the bank's 3500 ATMs in its branch offices opened. The rest of the ATM network was restored over the next two days. At this time, all money transfers were finally being made on time.

The Publicly Stated Reason

Publicly, the bank initially blamed excessive deposit activity. It later tied the activity to an extremely large volume of donations to disaster funds set up after the devastating Japanese earthquake and ensuing tsunamis that occurred the previous week on March 10th. The donations were made by mobile phone and through ATMs. Each donation resulted in a money-transfer transaction that had to be processed during the bank's nightly batch run.

The entire ATM outage was further aggravated by the banking community's practice of turning off some ATMs to conserve power in the wake of the destruction of three of the country's nuclear reactors due to tsunami flooding.

How Did This Happen?

The bank undertook an intensive investigation into the causes of the outage and the steps to be taken to ensure against such a disaster in the future. In an unusual display of transparency, the bank published in May a detailed account[1] of the events that led to the outage of its IT services. It pointed the blame directly at itself and listed many changes that it would make so that such a fiasco would not happen again.

Donations Overwhelmed Batch Processing

The problem started during the day of Monday, March 14th, when donations were first solicited for the earthquake relief funds. The earthquake had just hit Japan the previous Thursday. The Japanese responded overwhelmingly, making donations from their mobile phones via their online banking accounts. This activity presented no problem during the day, but it led to a mass of money-transfer transactions that had to be processed that evening.

The bank processes money transfers that had occurred during the day in an overnight batch run. The result of the batch run is transmitted as transaction files to the participant banks and is used to update the bank's own accounts before its branch offices open. The batch run on this Monday evening proceeded as usual until suddenly, the batch run failed. The abnormal termination of the batch run meant that it could not be completed before the branch offices opened that morning.

[1] Causes and Plans for Improvements and Counter-Measures based on the recent Computer Failures, *Mizuho Financial Group white paper*; May 23, 2011.
Investigation Report, *Special Investigating Committee on System Failures*; May 20, 2011.

Reverting to Manual Mode

The bank's systems are designed to handle the evening batch processing and the daily branch- and online banking support as alternate processing functions. The systems cannot do both simultaneously. Therefore, the processing of the previous day's money transfers had to proceed using manual procedures so that the branches could open. The massive number of manual operations resulted in many human errors that slowed down processing even further. The result was that Monday night's batch run was not completed by the time that the Tuesday evening batch run was supposed to commence.

Tuesday night, the batch runs were attempted again; but once again they terminated abnormally. The bank was forced to revert again to manual processing but was unable to come anywhere near to catching up. By the time branches opened Wednesday morning, almost one million money-transfer transactions worth almost one trillion yen (about $10 billion U.S.) had yet to be processed.

The batch-processing problems continued through Wednesday night and were not solved until Thursday morning. The bank's IT staff finally realized that each batch run had violated the "data ceiling" of the batch run's capability. Simply stated, there were simply too many transactions for the batch run to handle. When it hit its data ceiling, the batch run abnormally terminated.

The Slow Recovery

The bank realized that it could not catch up unless it throttled the rate of new money-transfer transactions. It therefore decided to close down all of its 38,000 ATMs over the long weekend stretching from Friday, March 18th, to Tuesday, March 22nd. Over this period of time, the bank broke the batch run into several smaller batch runs and successfully ran them.

By Tuesday morning, it thought that it had completely caught up. However, it then discovered another 160,000 transactions that were left to be processed. They were processed before the opening of its branches on Wednesday, March 23rd. Another 1,000 straggler transactions were found and were cleared by Thursday morning. The bank was now finally caught up and back to normal operation. It had been over ten days since the bank's troubles began.

The Aftermath

The bank's internal investigative report was scathing. Among other findings, the report concluded that:

- There was inadequate documentation detailing the data ceiling for the batch runs.
- The effects of not being able to complete the batch runs in time had not been considered in the Risk Analysis of the Business Contingency Plan.
- There were no contingency plans that contemplated the abnormal termination of overnight batch processing.
- The protocol manual had incorrect estimates of the time to undertake certain tasks.
- There was no central function that had an understanding of the entire situation.
- The operations staff could not make appropriate decisions due to the insufficient consideration of worst-case risk scenarios.
- There was a lack of human resources with the necessary technical knowledge to analyze the situation.
- There was a lack of management personnel with the ability to oversee the system in its entirety.
- Audits were insufficient, and there was a failure to use external independent audits.

The bank is taking aggressive steps to correct these and other deficiencies. In addition, it is consolidating its three main banking functions under one executive officer. These functions are currently managed by three different executive officers.

The bank is still using the same computer systems that it has used for almost a decade since its formation in 2002. It is accelerating the development of its next-generation IT systems and plans to have them completed by the end of the 2012 fiscal year. It plans to have all of its component systems running in the new environment by the end of the 2015 fiscal year.

Lessons Learned

This outage is an excellent example of the penalties of inadequate Business Contingency Planning. Mizuho Bank clearly did not take this task seriously. The Risk Analysis was incomplete, and procedural documentation was in error or nonexistent. Contingency procedures were unaudited. The bank probably did little if any testing of its contingency plan.

Proper business contingency planning can be time-consuming and expensive. But it probably carries much less cost than a two-week outage. The same applies to proper documentation and operator training. In this case, simply ensuring that the system operators were aware of the batch data ceiling would have prevented this disaster.

Acknowledgements

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