State of North Dakota
Information Technology Department

Post-Implementation Report
Second Data Center Project

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Post-Implementation Report

PROJECT IDENTIFICATION:

Project Name:	Second Data Center Project
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CATEGORIES: Categories of the report correspond to the categories in the Post-Project Survey. For each category, the Overall Rating is the average of the ratings provided on completed survey forms for that category (1 – poor, 2 – fair, 3 – satisfactory, 4 – good, 5 – excellent)

INTRODUCTION:
The post-implementation survey was sent to the executive committee and project team. Of those members, 11 responded to the survey.

A. PRODUCT EFFECTIVENESS

The completion of the Second Data Center project provides ITD and state agencies with a disaster recovery capability where none previously existed. A disaster recovery capability now exists for the following key platforms:

- Oracle
- SQL Server
- Exchange
- BND Core System
- Z800
- C01AS400
- Tivoli Storage Manager

The anticipated benefits, project objectives, and cost/benefit analysis are summarized in this report:

Anticipated Benefit	Increase the availability of services
Actual Benefit	Ability is there, although ITD has not yet had to utilize the capability since the project was completed.
Anticipated Benefit	Cut the recovery time by restoring locally (reduced RTO)
Actual Benefit	This benefit has been met for all platforms at the Second Data Center. Travel time has been reduced from 24 hours to less than 1 hour.
Anticipated Benefit	Cancellation of disaster recovery contracts
Actual Benefit	The contracts have been cancelled. Contracts that would provide the same level of coverage would have cost over $30,000 per month.
Anticipated Benefit	Data sent to the second data center on a regular basis.
Actual Benefit	This benefit has been met. The RPO for the systems in the second data

center has been reduced dramatically, from as much as 10 days in some cases to less than 1 day.

Anticipated Benefit	A faster, more reliable recovery capability.
Actual Benefit	This benefit has been met. With the reduced RTO's and RPO's, and with the site being local, recovery can take place quicker and be sustained longer than at a hotsite located on the other side of the country.
Anticipated Benefit	Provide true 24/7 availability for critical systems.
Actual Benefit	ITD did not implement an automatic fail-over system due to cost issues. After the project began, it was determined that providing this capability was too expensive. Had it been implemented, the equipment in the second data center would have automatically assumed the workload in the event the equipment in the Judicial Wing data center no longer functions. It is not likely that ITD will try to implement this in the future. However, the activation time for the equipment in the Second Data Center should incur a very short outage as compared to a hotsite recovery capability.
Project Objective	Establish a storage area network capability.
Objective Met:	The storage area network was established at the second data center and is used by the zSeries, TSM, Oracle, SQL Server, Exchange platforms.
Project Objective	Establish a tape capability at the second data center.
Objective Met:	This was met with the installation the LTO tape system in the second data center. It is used to house backup data for TSM.
Project Objective	Establish a database server capability and key application server capabilities.
Objective Met:	This was met with the installation of the Oracle database system and the SQL Server database system.
Project Objective	Reduce the downtime for critical services hosted by ITD.
Objective Met:	This was met with the installation of the Oracle database system, the SQL Server database system, Exchange, and TSM systems. Downtime for some critical services was reduced from as much as 7 days to less than 1 day. In some cases, no recovery capability even existed for the service.
Project Objective	Provide a disaster recovery capability for critical services hosted by ITD.
Objective Met:	This was met with the installation of the Oracle database system, the SQL Server database system, Exchange, and TSM systems. ITD will be adding additional equipment to the site over the next few months in order to broaden the list of critical platforms covered at the site.

No specific comments were added by the respondents regarding product effectiveness.

Overall Product Effectiveness Score: 3.9 (good)

B. CSSQ MANAGEMENT

Cost:

The project costs are summarized in the table below:

Initial Budget	Revised Budget	Actual Expenditures
$667,255	$964, 796	$1,100,303

Schedule:

The project was completed approximately 2 months after the original estimated date. This was due mostly to factors outside ITD's control. First, Montana Dakota Utilities (MDU) completed the installation of network fiber approximately 1 month later than originally estimated.

The project was affected by a concrete shortage which occurred in late summer of 2005. MDU was able to obtain concrete without significantly impacting the completion schedule.

Scope:

Major changes to the project plan included:

- Finishing the entire 1st floor area with raised floor. This gave greater flexibility to ITD in terms of arranging equipment at the site. It also allows a large amount of equipment to be housed at the site.
- Removing the inclusion of a restroom on the first floor. This also gave greater flexibility and room at the site.
- Cover the front of building with cinder blocks rather than drywall/studs. This provided a greater level of protection to the equipment. It is now less susceptible to bad weather and vandalism.

Quality:

Changes made to the Second Data Center project provided for a more protected environment for ITD's equipment.

Overall CSSQ Management Score: 3.4 (satisfactory)

C. RISK MANAGEMENT

Risks for the Second Data Center project and the actions taken to address each risk are listed in the following table:

Risk ID	Risk	Risk Assigned	Risk Response Plan	Actions Taken
1	The completion of remodeling or fiber installation could be delayed.	Executive Committee	Accept	ITD waited for MDU to complete the installation of the fiber connection
2	Use of new technologies	Project	Accept	ITD will require 'proof of

		Workgroup		concept' before accepting product

MDU experienced a concrete shortage during the construction phase of the project. This was alleviated by having smaller amounts of concrete delivered over time. MDU also experienced a delay in the installation of fiber to the site.

ITD experienced a delay in making its Kashya equipment operational.

Overall Risk Management Score: 3.2 (satisfactory)

D. COMMUNICATIONS MANAGEMENT

Communications amongst the stakeholders is listed in the table below.

Type of Communication	Stakeholders Involved	Frequency	Facilitator(s)
Status meetings	PM & TL	Weekly	PM & TL
Status reports	PM to PS	Weekly	PM to EC TL to PM
Memos	All groups	As needed	All groups
Executive Correspondence	EC to PM and TL	As needed	Executive Committee
Meeting Notes	All groups	As needed	All groups
Executive Steering Committee meetings	PS, EC, PM	Monthly	Executive Committee
Project Team meetings	TL, TM, PM	As needed	TL & TM
Explanation of abbreviations in the 'To Whom / Stakeholders Involved' column: PS = project sponsor EC = executive committee PM = project manager TL = team leaders TM = team members			

Lessons learned:

It is extremely important to have regularly scheduled meetings with the Executive Committee, architects, and work group members. It is in these meetings, particularly with the work group members, that details are addressed and problems are avoided. Attendance should be mandatory and roll should be taken.

Overall Communications Management Score: 4.3 (good)

E. ACCEPTANCE MANAGEMENT

The most significant deliverables of the project are summarized in the table below. The Executive Committee and key team members approved the acceptance of the major deliverables. Testing and Executive Committee review were critical to acceptance management for the project.

Deliverable Name	Action Date

1.1.1 Power Availability	May 5, 2005
1.2.1 Network Layout	Oct 4, 2005
1.2.2 Platform List	Oct 10, 2005
1.2.5 Bandwidth Requirements	Sep 1, 2005
1.4.8 Electrical Power Requirements	Oct 12, 2005
1.5.1 Room Layout	Oct 5, 2005
2.1.1 Connect Network	Dec 6, 2005
2.1.2 Establish SAN	Jan 11, 2006
2.1.3 Establish Work Area	Dec 8, 2005
2.1.4 Install Telephones	Dec 8, 2005
2.1.5 Establish Racking	Dec 7, 2005
2.1.6 Establish KVM	Feb 3, 2006
2.1.8 Cardkey Installation	Dec 9, 2005
3.1.1 TSM – Tape Access	Dec 17, 2005
3.2.1 TSM – Disk Access	Dec 17, 2005
3.3.1 Backups – Oracle / Email / ConnectND	Dec 17, 2005
4.1.1 Disk System – Oracle / Email / ConnectND	Dec 15, 2005
4.2.1 ConnectND Install & Test	Feb 18, 2006
4.3.1 Oracle Install & Test	Feb 11, 2006
4.4.1 Email Install & Test	Feb 17, 2006
4.5.1 SQL Server Install & Test	Feb 25, 2006
5.2.1 Cancel D/R Contracts	Dec 13, 2005

Overall Acceptance Management Score: 3.4 (satisfactory)

F. ORGANIZATIONAL CHANGE MANAGEMENT

All changes to the project had to be approved by Executive Committee members. Only a few changes were made to the organizational structure. It became evident that the addition of someone with site management experience was necessary after the site was turned over to ITD. Additional members with networking and wiring experience were also required.

Overall Organizational Change Management Score: 3.1 (satisfactory)

G. ISSUES MANAGEMENT

Issues were addressed with the Executive Committee. Decisions were then relayed to the work group.

Overall Issues Management Score: 3.2 (satisfactory)

H. PROJECT IMPLEMENTATION AND TRANSITION

Implementing hardware at the Second Data Center was done on a platform by platform basis. Testing of platforms took place after the equipment was installed in order to ensure proper operation.

Training of ITD staff took place prior to their being given access to the Second Data Center. This ensured that they knew the rules for the site and the expectations placed on them.

The major milestones of the project included signing a contract with MDU to obtain access to the site, having the site built to specifications by Computer Sites, Inc., and installing hardware platforms at the site.

Overall Project Implementation and Transition Score: 3.6 (satisfactory)

I. PERFORMANCE OF PERFORMING ORGANIZATION

The performing organization was ITD. All members of ITD who had a role in the performing organization also were members of the project team, either as Executive Committee members, architects, or as team members.

Overall Performance of Performing Organization Score: 4.3 (good)

J. PERFORMANCE OF PROJECT TEAM

The work group consisted of an executive committee, project manager, architects, and team members.

The Executive Committee made the key decisions and functioned well in that capacity. The Project Manager served as a liaison between the Executive Committee and the Project Team. The architects designed the relationship between the hardware in the Judicial Wing computer room and the Second Data Center. Team Members installed the equipment in the Second Data Center and ensured that it worked in conjunction with the equipment in the Judicial Wing computer room.

Overall Performance of Project Team Score: 3.4 (satisfactory)

K. KEY PROJECT METRICS

Cost:

The final approved baseline cost was larger than the original cost estimate due to the inclusion of a backup system for ITD's z800 platform.

		Percent Difference
Original Cost Estimate:	$667,255	N/A
Final Approved Baseline Cost:	$964,796	+ 44%
Final Cost:	$1,100,303	+ 14%

Schedule:

Number of milestones in baseline schedule: 4
The milestones include:

- Obtain a rental agreement for the Second Data Center (ITD worked with MDU)
- Build the site according to ITD's specifications (MDU's responsibility)
- Install network connectivity to the site (MDU's responsibility)
- Install and test equipment at the site (ITD's responsibility)

Number of baseline milestones delivered on time: 2
The delay in completing the network connectivity to the site delayed the remaining milestones.

Difference in elapsed time of original schedule and final actual schedule: 2 months

Scope:

Number of baseline deliverables: 49

Number of deliverables delivered at project completion: 39
This number is less than the original number of deliverables due to some deliverables being de-scoped and others not being necessary once the project began to take shape. A few deliverables were determined to be on-going regular maintenance items rather than specific deliverables.

Number of scope changes in the post-planning phases: 11

Quality:

No defects or quality issues were identified after delivery.

ITD identified 5 success measures in the Business Case. They were:

- Access to a second data center via a rental agreement.
- Telecommunications equipment to connect ITD's primary data center and second data center.
- Telecommunications circuits to connect the primary data center and second data center.
- Storage equipment to provide backup of critical data and 24/7 availability.
- Establishment of a data storage area at the second data center.

ITD obtained and achieved all 5 of the measures.