Welcome!

MEDITECH Data Repository Implementation Best Practices

Presented by:
Thomas Harlan
(978) 674-8330
Thomas.Harlan@iatric.com

Technical Support: 978.674.8121 or Amanda.Howell@iatric.com

If you are connected to Audio Broadcast and would like to call the conference line, please turn off your speakers and dial 1.650.429.3300| Access 653 516 292.

This teleconference may be muted while we wait for all attendees to join.

Thank you for your patience.
• Be courteous. Please refrain from putting your line on hold. Utilize the mute function on your phone or the conference line (*6 to mute and “unmute”).

• During open Q&A periods, if you are not actively asking a question, please mute your line in order to reduce background noise on the teleconference.
To ask a question through the Chat function in WebEx, please type your question in the Chat box and send to the Host.
To ask a question through the Chat function in WebEx when the presenter is in share mode, hover your mouse at the top of the screen to pull down the menu. Click the Chat button.
• If you are connected to Audio Broadcast (streaming audio through your computer speakers) and would like to call the conference line, please turn off the speakers and dial **1.650.429.3300** | Access # 653 516 292.

• If you have any technical difficulties, please call our technical support at **978.674.8121** | Amanda.Howell@iatric.com.

• Please complete the short survey at the end of the session. Your feedback is important to us!
Welcome!
• Gaps in perceptions exist
• Today we’ll learn how to fill them
• Set the stage for success
• Results – efficient, robust DR
What is this DR anyway?
Much more than a module inside of Meditech

MEDITECH Data

- Copy of MEDITECH LIVE and TEST data
- Maintained on separate server
- Uses different database (SQL)
- Supplements NPR and RD reports
- Therefore, another application entirely
What is this DR anyway?
Much more than a module inside of Meditech

Another application means:

• New administrative requirements
• New/repurposed FTEs, skills, training
• New tools to manage and use
• Users will access it in a new way
• Needs maintenance, backups, and upgrades
Data flow from MT to the DR
How it works, high-level

Transfer (xfer) logs and queues:

- DR accesses xfer logs continuously
- Then updates DR database
- Transfer logs are queues
- Changes aren’t in DR instantly
- Normally, about a 15 minute delay
- Therefore, all reports can’t come from DR (for example, labels)
When a xfer queue gets stuck:

- No new updates flow to DR
- Almost always requires support ticket
- Time to resolve = backup in queue
- **Queue stuck for 1 day = DR reports for that module down for 2 days**
What do I do about that?
New application = new requirements!

To avoid stuck queues:

- Queues must be checked daily
- Server must be backed up, re-indexed, and rebooted regularly
New Infrastructure

New application = new requirements!

Implement and maintain a new infrastructure:

• Need to build DR-based reports
• Need a way to deliver reports
• One platform: Microsoft SQL Server Database
• Microsoft reporting solutions aren’t required, but may be easiest path
A Tier One Application
If you’re going to use it, be serious

Treat DR as a tier one application:

• Validate DR backups regularly
• Assign at least 1 analyst to DR as a primary responsibility
• Hire a SQL Server DBA
• Train report writers in SQL
MEDITECH provides a page of expected DR-related customer responsibilities:

http://www.meditech.com/prdr/Pages/DRbbASCustome rResponsibilities.htm

Your enterprise is expected to:

- Monitor the transfer jobs daily; reviewing errors and watching for delays in processing
- Monitor SQL Server errors and event logs; confirm backups are working
- Monitor space usage in the DR (it will only ever grow...)
- Monitor concurrent users to size the connection pool properly
- Watch for un-needed indexes and user logins

These requirements do not include report development. These are the tasks for the system admin(s) and/or SQL DBA to undertake.
MEDITECH’s staffing recommendations (minimum requirements):

https://www.meditech.com/prwdr/pages/draiascoreteam.htm

Our recommendation:

• 1 SQL Server DBA (1 FTE)
• One half-time DR Team Leader (0.5 FTE)
• At least one full-time DR Report Writer (1 FTE)

NOTE: The skillset for implementing, managing, and using the DR for report development and delivery is not the same as the skillset for NPR, except...
Business Knowledge is King

Know where the data is!

Report Developers must have Business Knowledge:

• Don’t just hire a SQL report developer

• **It is easier to teach SQL to an NPR expert than NPR to a SQL expert**

• If you know where something is in MEDITECH, it’s easy to find it in DR

• But if you don’t know where it is in MEDITECH, you’re starting from scratch

• There are excellent resources for learning SQL
DR Reporting Toolkit

But how do I make and distribute a report?

MEDITECH does not provide a report development and delivery toolset.

You’ll need to decide on:

• SQL coding environment
• SQL-based report builder
• Delivery mechanism for reports
• Version control software to manage code and reports
For starters, Microsoft can provide a lot

**MS SQL Server standard edition (or better) provides almost all the tools you’ll need:**

- SQL Server Management Studio
- Business Intelligence Development Studio (or Report Builder)
- SQL Server Reporting Services
- Still need version control software:
  - MS Team Foundation Server
  - Or use an open-source solution

**NOTE:** SQL Server Management Studio not efficient for building and debugging SQL queries and data.
What you’ll need:

- Hardware to run the DR
- SQL Server database engine
- DR databases on the server
- Database Administrator
- SQL coding tool
- SQL report development tool
- Version control software
- Delivery mechanism
- Hardware to host the reports
- Appropriate workflow and report writers
Minimum Recommended Hardware Platform:

- LIVE SQL database Server
- TEST and DEV share a SQL database Server (as named instances)
- Reporting Services web server
You need three (or more) servers

**Recommended Hardware Platform:**

- LIVE SQL database Server cluster
- TEST SQL database Server
- Development SQL database Server
- Reporting Services integrated into an existing SharePoint farm *OR...*
- Reporting Services LIVE web server *and*
  Reporting Services TEST web server

**Server Specifications:**

- Minimum 16GB RAM per server (prefer 32GB)
- All data storage SAN connected with extendible partitions/LUNs
Do not accept the default DR database configuration. You want a custom setup that looks like this (for a MEDITECH 6.x environment):

**LIVE Database Server** (connected to LIVE ring)
- focus database container
- npr database container
- zcus database container

**TEST Database Server** (connected to TEST ring)
- focus database container
- npr database container
- zcus database container

**DEV Database Server** (weekly copy of Production)
- focus database container
- npr database container
- zcus database container
Why that configuration?

• Make report developers’ lives easier
• Reduce errors when moving code
• Address performance issues preemptively
• Prevent updates from breaking reports
Why that configuration?

- Store queries in *zcus*
- *zcus* won’t be wiped out by updates
- Use TEST (when LIVE isn’t required)
- Use DEV (if LIVE is required)
- Promoting to LIVE becomes a simple change
- Test code against real data without risk
SQL Coding Environment

SQL Server Management Studio is ok...

Supplement Microsoft tools with:

• Third-party SQL editor
  • Toad for SQL Server
  • Rapid SQL
  • SQL Prompt Pro

• Dual monitors
  • >20% gain in efficiency
Save queries as stored procedures:

• What does it mean?
  • Each query is given a name
  • Each query is stored in the SQL Server engine

• Why do it?
  • Faster when executing
  • Easier to maintain
  • Searchable
  • Can be reused
Options:

• Least Expensive:
  • Business Intelligence Development Studio (BIDS)
  • SQL Server Reporting Services (SSRS)

• Significantly More Robust:
  • Business Objects (Crystal Reports)
  • Cognos (a little less expensive than Crystal)
Options to avoid overwriting good code, losing a directory, working on the same file at the same time, etc.:

• **Microsoft Team Foundation Server:**
  - Expensive, but robust
  - Requires server, SQL license, and capital dollars

• **SubVersion:**
  - Open-source, almost-free
  - Requires server, but it can be Linux VM and low cost
Report Delivery
Finally! Something the users can see!

• SQL Server Reporting Services:
  • Has its own web-server OR
  • Can use an existing Sharepoint installation

• Crystal Reports:
  • Can be delivered through Business Objects Enterprise or Crystal Enterprise Server
  • Require their own server
  • Require trained analyst/administrator (another FTE)

• Cognos Reports:
  • Can be delivered through Cognos Enterprise
  • Require their own server
## Gap Analysis

### Summary of Potential Implementation Gaps

<table>
<thead>
<tr>
<th>DR Component</th>
<th>MEDITECH Expectation</th>
<th>Possible Issue or Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database requires dedicated server</td>
<td>Site will purchase DR hardware and license Microsoft SQL Server</td>
<td>Default MEDITECH install of the DR has structural issues</td>
</tr>
<tr>
<td>Database runs on MEDITECH SQL Server</td>
<td>Site will hire a SQL Server DBA</td>
<td>No SQL Server DBA on staff nor FTE in budget</td>
</tr>
<tr>
<td>New reports must be developed</td>
<td>Site will hire one or more SQL-savvy reporting resources</td>
<td>No SQL skills among site reporting staff nor FTEs in budget; SQL developers who know MEDITECH are very rare, so hiring an FTE may be quite difficult</td>
</tr>
<tr>
<td>Reports cannot be delivered through MEDITECH itself</td>
<td>Site will implement SQL Server Reporting Services or Crystal Enterprise or Cognos to deliver reports</td>
<td>No SSRS/CE/Cognos administrator, no server to host web-site, no skillset in how to manage the reporting portal or report development</td>
</tr>
<tr>
<td>Not all reports can be from the DR</td>
<td>Site will know where to build reports appropriately</td>
<td>Site has been told by MEDITECH sales that all of their reporting can come from the DR, or site does not know which modules transfer to the DR, or what the latency is on the xfer process</td>
</tr>
<tr>
<td>DR Component</td>
<td>MEDITECH Expectation</td>
<td>Possible Issue or Gap</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Transfer process must be monitored</td>
<td>Site will check transfer queues regularly and open tickets with MEDITECH as issues arise</td>
<td>No analyst assigned to the DR, little understanding of DR issues or how to resolve them; little visibility (in pre-6.x) to what is happening in the transfer queues</td>
</tr>
<tr>
<td>Transfer process is accurate</td>
<td>Site will review data between the DR and NPR/Focus and report errors to MEDITECH</td>
<td>Has no comprehensive way to test data validity (in pre-6.x environments); data validation process in 6.x is astoundingly slow</td>
</tr>
<tr>
<td>New Data model</td>
<td>Site will explore and learn how the data model fits together and maps to NPR/Focus structures</td>
<td>Site may have NPR-savvy reporting resources who know nothing of SQL, or SQL resources who know nothing of NPR</td>
</tr>
<tr>
<td>Data model not indexed</td>
<td>Site will identify tables needing indexes and create them as needed</td>
<td>Has no SQL Server DBA to create indexes for them; is unfamiliar with indexing best practices; does not know what indexes will be needed.</td>
</tr>
<tr>
<td>Data model incomplete</td>
<td>Site will identify tables in the DR which exist, but are not turned on to receive data from NPR/Focus, and request they be turned on</td>
<td>Has no idea what tables they will need in the future, so they only turn them on as needed – which means data may have purged out before the tables are turned on</td>
</tr>
</tbody>
</table>
## Gap Analysis

### Summary of Potential Implementation Gaps

<table>
<thead>
<tr>
<th>DR Component</th>
<th>MEDITECH Expectation</th>
<th>Possible Issue or Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No example reports</strong></td>
<td>Site will find example SQL on MEDITECH KB or internet and turn into reports using their reporting tool of choice</td>
<td>Has no idea where these examples are; the examples may or may not work with their configuration; no actual report examples (everything from MEDITECH is just queries)</td>
</tr>
<tr>
<td><strong>No best practices</strong></td>
<td>Site will develop own DR-related processes, procedures, and best practices</td>
<td>Has no idea (having no SQL experience) how they should build queries, what tools they should use, how reports should be managed and tracked, etc.</td>
</tr>
<tr>
<td><strong>Server Maintenance</strong></td>
<td>Site will know how to backup and maintain a SQL Server instance</td>
<td>Has no SQL database administrator, so they are unlikely to know that the database needs re-indexing jobs running weekly, that the server needs to be rebooted monthly and backups need to be validated regularly</td>
</tr>
<tr>
<td><strong>New Implementation</strong></td>
<td>Site will let MEDITECH know how the database containers should be named, what initial tables (beyond the core set) will be turned on</td>
<td>Has no idea how the database containers work, or what they should be named, or which servers they really need in their DR environment</td>
</tr>
<tr>
<td><strong>PCS data is difficult to access</strong></td>
<td>Site will figure out that some key Focus data elements do not come to the DR properly and devise workarounds</td>
<td>Has no SQL report writer who can identify the issue, figure out where the data is, and write the necessary functions/stored procedures to get the data out effectively</td>
</tr>
</tbody>
</table>


A successful DR implementation requires:

- A new hardware platform with multiple servers
- New server-related software licensing
- New or repurposed FTEs with appropriate training
- New development and management software
- A new place for users to get reports from
- New report development
Benefits

And in the end, what do you get?

✓ Easier HITECH/ARRA reporting
✓ Faster historical reporting (over quarter+ spans of time)
✓ Business and clinical data held past the purge setting in MEDITECH
✓ Reporting that can combine MEDITECH and non-MEDITECH sources
✓ Easy combined reporting from NPR and M-AT data sources
✓ Vendor-file exports with integrated SFTP delivery
And in the end, what do you get?

- More attractive reports with graphing, charting, in-report filtering
- More delivery options for your reports – by email, by smartphone, via web-pages or RSS, direct export to Excel, Word and PDF
- Ability to investigate data issues with ad-hoc querying
- Ability to combine data across modules which are not normally “open” to each other
- Data Quality reporting and alerting
- Ability to define your own indexes and get at data (particularly in PP) that is often very slow to access
A number of vendors supply additional DR-related products and services:

**Iatric Systems**: DR custom report and extract development; SQL+DR training; implementation planning:

**Blue Elm** DR Auditor:
[http://www.blueelm.com/DrAuditor.aspx](http://www.blueelm.com/DrAuditor.aspx)

**Acmeware**: DR custom report and extract development; SQL+DR training; implementation planning and management services:
MEDITECH DR Homepage: http://www.meditech.com/prdr/homepage.asp

MEDITECH 6 Data model: http://www.meditech.com/prdr/Pages/DRxbASTables.htm

CS Data model: http://www.meditech2.com/prdr/Pages/DRcbASTables.htm

Magic Data model: http://www.meditech2.com/prdr/Pages/DRmbASTables.htm

DR KB Articles: Go to http://www.meditech2.com/kb/Custsearch.asp and then search for: Application [ALL], Platform [ALL] and Subject [SQL Query]

Acmeware DR Articles: http://www.acmeware.com/muse.aspx

Comstock DR Articles: http://www.comstock-software.com/meditech-blog/?Tag=Meditech%20Data%20Repository
Survey says:

Please take the survey that appears when you close your Internet Browser after this webcast. You could win a $100 Amazon.com Gift Card.

Stay Connected:

**MEDI-Talk** - [http://medi-talk.com](http://medi-talk.com)

Follow us:

[linkedin] [twitter]

For more information:

Please contact your Iatric Systems Account Executive or send an email to [info@iatric.com](mailto:info@iatric.com) or visit [www.iatric.com](http://www.iatric.com)

Thank you for attending!