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Building **Solid** Enterprise **Solutions**



Microsoft CRM Integration Case Study



Agenda

- Perspective
- Implementation Description
- Product Overview
- Architecture Overview
- Observations
- Comments
- Best Practices
- Questions



Perspective

- Integration-centric point of view
- Touch points across different areas of the CRM platform
- Limited discussion on CRM product itself



Implementation Description

- Sales force automation
- 350 users – 300 offline and 50 online
- 175,000 accounts
- 2M invoices and 5.9M invoice details over a 2 year period
- Ongoing of 15,000 account updates and 4000 invoices per night
 - Monthly processing pushes account updates to 100,000



Implementation Description

- Heterogeneous Data Sources
 - Oracle Financials
 - In house applications
 - Some data elements sourced from MS CRM after initial load
- Local data mart
- Enterprise Application Integration (EAI)
- “Round Trip” data updates



Product Overview

- Microsoft CRM version 1.2 (latest release)
- Tightly coupled with Active Directory
- Tightly integrated with Outlook
- Web-based interface
- Offline access allowed
 - Local MSDE database installed on the client
 - Only data that user has access to (owned or optionally shared records) is replicated
 - Replication handled by SQL Server

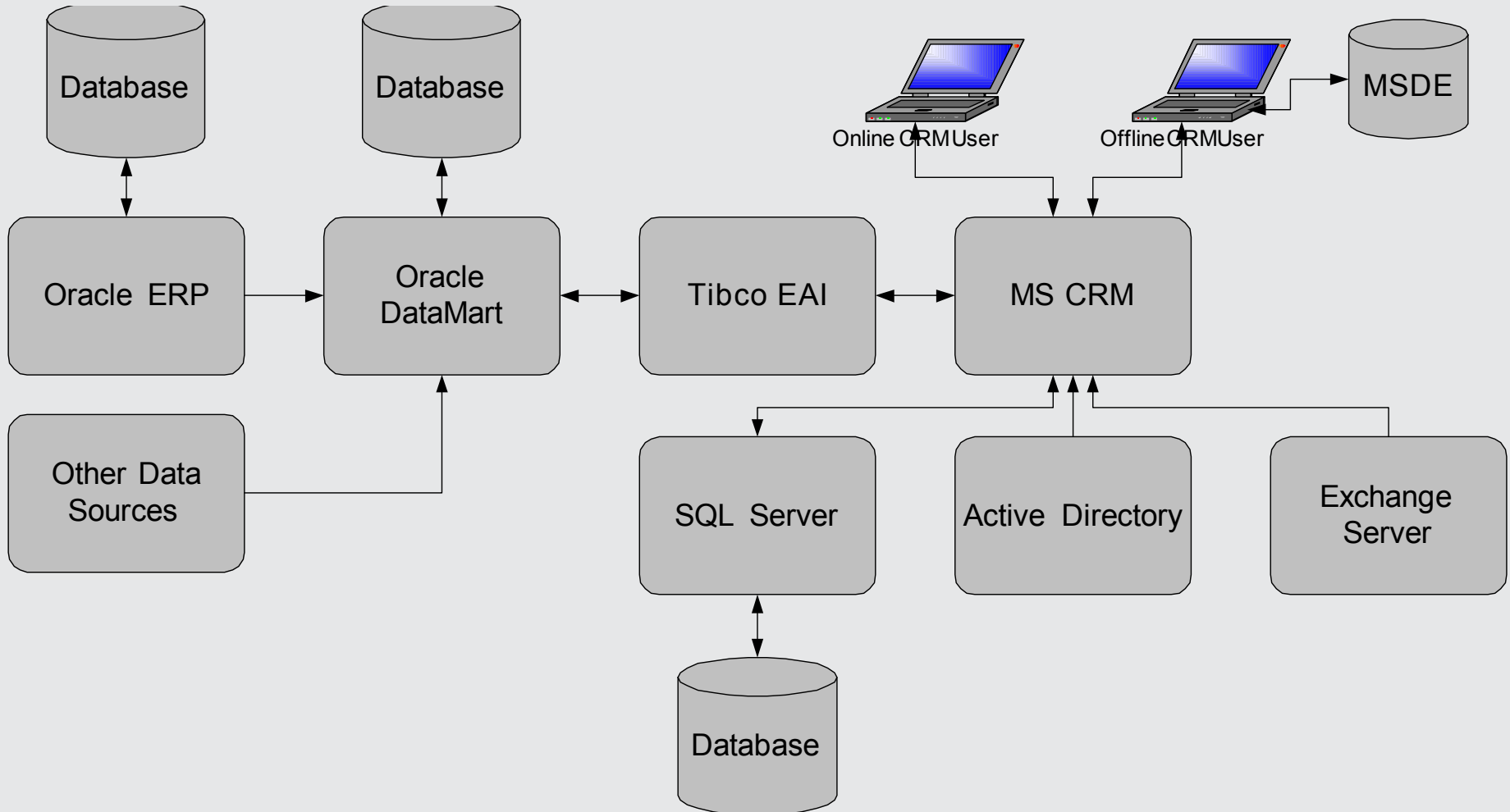


Product Overview

- CRM Hierarchy
 - CRM grants users rights to view data based upon roles, and their place in the organization
 - This project: Organization, Enterprise, Regions, Districts, Territories, Accounts
- CRM Security
 - Managed in the database
 - “Row” or “Object” level security managed by security descriptor in DB
 - Roles defined that allow for CRUD, as well as assign, share, and view



Architecture Overview



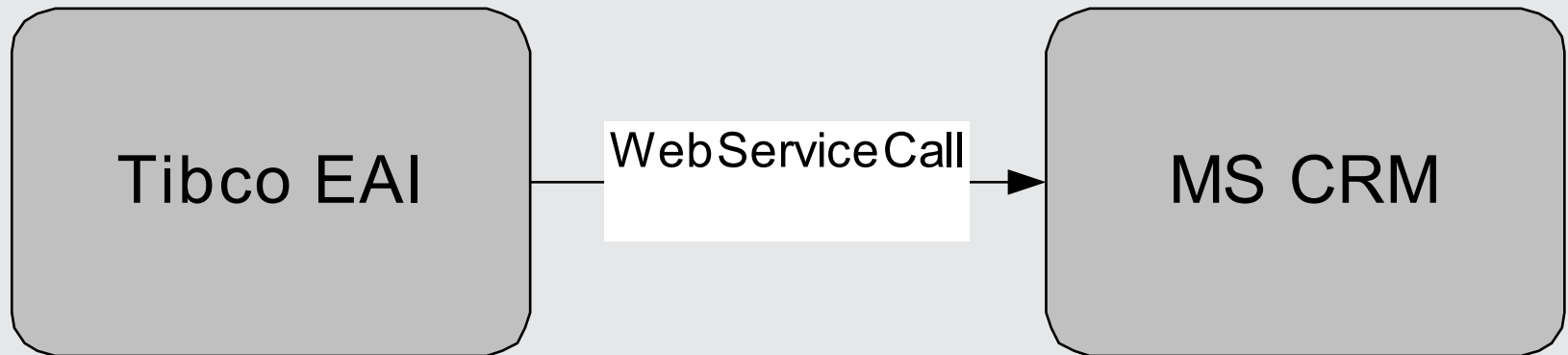
Architecture Overview

- SQL Server Platform
 - 4 Hyper Threaded CPU's – 2.8Ghz
 - 4GB RAM
 - 35GB Local Hard Drive
 - Database on SAN
 - Win 2K
- MS CRM Platforms (2)
 - 2 Hyper Threaded CPU's – 3.0Ghz
 - 2.5GB RAM
 - 35GB Local Hard Drive
- Tibco Platform
 - 2 Hyper Threaded CPU's – 2.8 Ghz
 - 2GB RAM
 - 35 GB Local Hard Drive
 - Win 2K
- Oracle Platform
 - Oracle Apps 11.5.5
 - RDBMS v8.1.7.4.0
 - Tru-64



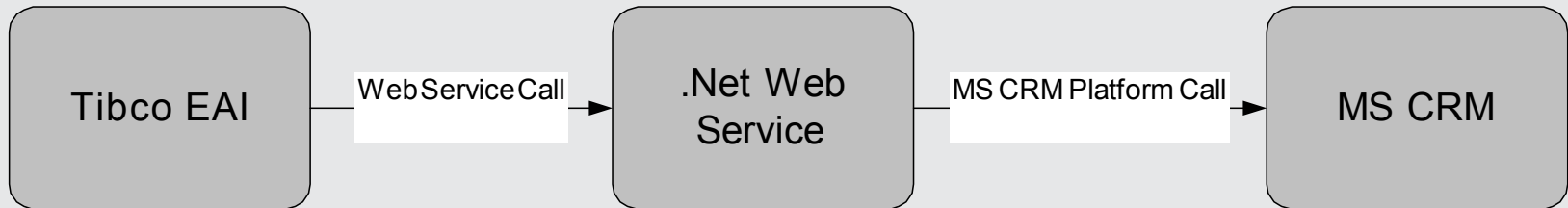
Observations - Integration

- Preferred Integration Design



Observations - Integration

- Actual Integration Design
- Due to tight integration with Active Directory
- Calls to CRM made through .Net platform



Observations - Integration

- Results of architecture
 - Additional point of failure
 - Additional level of effort
 - Additional maintenance point



Observations - Integration

- CRM Integration Operations of Create and Update return Global Unique Identifier (GUID)
- Mapping of GUID to Legacy Unique ID must be maintained by EAI platform
- Return of GUID only way to guarantee success of the operation



Observations – Integration Operations

- Account Create
- Account Update
- Territory Create
- Unit of Measure Create
- Product Create
- Activity Create
- Invoice Header Create
- Invoice Detail Create
- Assign Account
- Share Account
- Revoke Share
- Account Update from CRM (Handled via a COM callout)



Observations – Integration Performance

- CRM Security Architecture
- Major cause of performance issues



Observations – Integration Performance

- Best “per message” performance achieved when processing one message at a time (single thread)
 - Account Create – 3/sec
 - Account Update – 2/sec
 - Invoice Header/Detail Create – 2.5/sec
 - Assign/Share Operation – Variable due to the amount of dependent data an account may have
- Possibility of updating 100,000 accounts overnight – unacceptable time of 13 hours
- Daily processing problem solved by sending multiple messages at once (multi-thread)



Observations – Integration Performance

- Optimum Performance achieved by multi-threading messages
- Optimum threads around 20
 - Account Create – 18/sec
 - Account Update – 7/sec
 - Be careful about sending “owner” data element
 - Invoice Header/Detail Create – 10/sec
 - Assign/Share operations – Varied dramatically depending upon dependent objects



Observations – Integration Performance

- Assign and Share Operations
 - Done on an account
 - Account changes territory
 - Owner of territory changes
 - Very expensive operation due to CRM security architecture
 - Performance directly proportional to amount of objects owned by the account (invoices, addresses, contacts, activities)
 - On assignment, previous owner retains share rights on account
 - Required revoke rights operation
 - Double the operation time



Observations – Integration Performance

- Initial Data Load – Invoices
- Roughly 1.2M headers and 3.7M detail lines
- Load took 9.5 days
- “Empty” database performance at 17/sec, ended at 10/sec
- Problems encountered
 - Oracle database table corruption
 - SAN performance issues
 - SQL Server index corruption (multiple times)
 - Active Directory migration



Observations – Integration Errors

- CRM Business Logic Errors
 - Invalid GUID
 - Invalid Owner
 - Licensing/Role Errors
 - Fixed during development
- Timeout
- General Application Errors
- Database deadlock



Observations – Integration Errors

- Non-business logic errors may be false negatives
 - Timeout, General Application, Database Deadlock
 - Only way EAI knows if successful is return of GUID
 - Above errors may be returned while operation succeeded
- Resubmit of operation usually successful
- Required additional re-processing logic



Observations – Configuration

- Very configurable application
- Easily configurable
- Some fields cannot be removed
- Some forms cannot be configured (activities)



Observations – Configuration

The screenshot shows the Microsoft Business Solutions CRM interface in Microsoft Internet Explorer. The browser title is "Microsoft Business Solutions CRM - Microsoft Internet Explorer". The user is identified as "User: Ott, Randy". The page title is "Account Customization".

The main content area is titled "Account Customization" and asks "What would you like to customize?". It features two main sections:

- Common Tasks:** A list of tasks including "Customize Form", "Customize Preview", "Create a New View", "Set Default View", "Edit Associated View", and "Edit Advanced Find View".
- Customize the Account Form:** A section with a small image and text: "Modify the Account form by clicking [Customize Form](#) on the left. From here you can add, modify, and remove existing and custom fields to this form."
- Customize Account Views:** A section with a small image and text: "Modify the views that users see when they open the Account list page." Below this is a table with columns "Name" and "Description".

The table "Accounts Shared To Me" contains the following rows:

Name	Description
Active Accounts	
All Accounts	
CAGE Account List	
CAGE Territory Sales	
Inactive Account List	
Inactive Accounts	
Inside Sales Account List	
Inside Sales Account Sales (CAGE)	
Inside Sales Account Sales (MEGE)	
Inside Sales Key Account List	
Inside Sales Key Account Sales (CAGE)	
Inside Sales MPV Sales (CAGE)	
Inside Sales MRC Sales (CAGE)	
Inside Sales MVC Sales (CAGE)	
Inside Sales NP/WCP Sales (CAGE)	
Key Account List	
LAGE Territory Sales	
MEGE Territory Sales	
My Active Accounts	

At the bottom of the table, it says "1 of 39 selected." and "Page 1".

The interface also includes a "Quick Create" section with a dropdown menu set to "Contact" and a "Go" button. The bottom navigation bar shows "Location: Settings | System Customization | Account Customization" and "Advanced View". The footer contains icons for "Home My Home page", "Workplace My Work, Calendar", "Sales Sales Automation", "Service Customer Service", and "Reports Metrics, Statistics".



Observations – Configuration

Form: Account - Microsoft Internet Explorer

File View Preview Help

Form: Account

Save

General Companion CAGE Programs Large Animal Equine Inside Sales Administration

Account Information

Account Name Primary Enterprise

Account # Primary Customer Type

Primary Contact **Key Account**

Address

Street 1 Main Phone

Street 2 Fax

City E-mail

State/Province

ZIP/Postal Code

County

Directions

Common Tasks

↑

← →

↓

Add a Tab

Add a Section

Add Fields

Change Properties

Remove

Done Internet



Observations - Customization

- Not recommended/supported
- Examples: additional tables
- Some customizations required
 - Table indexes



Observations – CRM Performance

- Synchronization
 - Some initial synchronization issues
 - Unnecessary data synchronization
 - Resolved by Microsoft
 - Synchronization performance heavily degraded if other processing occurring at the same time
 - Unsure of performance if large number (>10) of clients attempt synchronization at the same time
 - Nightly synchronization times under 5 minutes over dialup (50 objects)
 - 256mb memory minimum, 512mb recommended



Observations – CRM Performance

- Online performance
 - Web-based interface
 - Outlook interface
 - Result sets against the entire database
 - Performance adequate with appropriate indexes



Observations – CRM Performance

- Offline Performance
 - Outlook interface
 - Result sets against local database – only contains user's relevant data
 - Performance good with adequate memory
 - Minimum 256mb, recommend 512mb



Observations – CRM Performance

- Online Report Performance
 - Reports go through the CRM platform to retrieve data
 - Reports run against entire data set
 - Reports against minimal data can be slow if not parameterized
 - Also depends on the amount of data user can see (where they are at in the organizational hierarchy)
 - Do not work with large datasets greater than 70,000 rows



Observations – CRM Performance

- Offline Report Performance
 - No offline report architecture
 - Custom built offline reporting architecture
 - Offline reports bypass CRM platform and go directly to local database
 - Offline report performance good



Comments – Integration Perspective

- Performance very underwhelming
- Web Service interface would be benefit
- False negative errors a nuisance
- Many error messages meaningless
- Security architecture root cause of many integration issues



Comments – Configuration Perspective

- Very configurable
- Some forms limit configuration
- Some data elements cannot be removed
- Security hierarchy and roles can be configured to very low-level



Comments – User Perspective

- Integration with Outlook is very good
- Interface is intuitive if familiar with Outlook
- Web-based interface looks and feels very close to the outlook interface
- Have to drill down several levels to retrieve some data elements
 - Can be mitigated by creating views
- End user community at this client very excited about the application



Best Practices

- Best suited to “out of box” solution
- Online only is easiest implementation, while offline provides best performance
- Limit custom configurations if possible
- Avoid synchronization while integration processes running if possible
- Run proof of concept up front if expecting more than 50 concurrent user synchronizations



Best Practices

- Liberally create indexes on database tables
- Avoid database customizations
- Do not attempt heavy integration in this version
- Stay within the platform
- Strongly consider waiting for 2.0



Comments - Overall

- Overall, a good version 1 product
- Very good out-of-box solution
- Also a good choice if integration is not required
- Maybe a good choice if integrating with Great Plains Back-Office software – more out-of-the-box integration claimed to be supported
- Evaluate closely if using integration or going offline
- Wait for Version 2 (Q2 2005)
 - Report architecture slated to be rewritten
 - Integration platform slated to be rewritten



Questions

- Thank you!
- Presentation available at www.capstoneC.com





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