



# **Microsoft® CRM Data Migration Framework**

## **White Paper**

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Published: April 2003

### **Abstract**

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Powered by Microsoft .NET technology, Microsoft® Business Solutions CRM is driven by customer and financial data. Businesses with existing information systems can take full advantage of Microsoft CRM by leveraging the data stored in both front-end and back-end systems so that it is accessible to Microsoft CRM. This paper describes a framework for migrating that data, including how to approach data migration, what to expect from each step of the process, and which tools to use at each step.



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## Introduction

Microsoft® Business Solutions CRM is a line-of-business solution that empowers businesses to make informed decisions, increase sales success, and provide superior customer service. Built from the ground up using Microsoft .NET technologies, Microsoft CRM transforms the way businesses acquire and retain customers, and creates an interconnected workplace that extends across business systems and XML-based Web services.

Businesses with existing information systems can take full advantage of Microsoft CRM by leveraging the data stored in legacy systems so that it is accessible to Microsoft CRM. This paper describes a framework for migrating that data—a significant business asset—to Microsoft CRM. This paper is designed to help you:

- Understand how to approach data migration.
- Know what to expect from each step of the process using the Data Migration Framework v1.0 for Microsoft CRM.
- Learn about available Microsoft tools that support a smooth transition to Microsoft CRM.

The individual overseeing the implementation of the Data Migration Framework for Microsoft CRM described in this white paper should possess expert knowledge of the source systems, Microsoft CRM, Microsoft SQL Server™, and the data migration process, as well as understand how these systems are used by the business. Typically, an organization will use a certified Microsoft CRM partner or other knowledgeable consultant to manage the data migration process.

## Data migration overview

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Data migration is a set of activities that moves data from one or more legacy systems (or “source systems”) to a new application (for example, Microsoft CRM). The purpose of data migration is to preserve core business knowledge and make it accessible from the new application.

Data migration typically involves planning and scoping the project, extracting data from the source application, cleansing to repair corrupt data or invalid records, removing duplicates, transforming the source data to conform to Microsoft CRM data requirements, translating source values to new data

based on translation tables, loading the data into Microsoft CRM, validating the data against Microsoft CRM business rules, and verifying the data for accuracy.

Data can be moved to Microsoft CRM three ways:

- **From Microsoft Outlook® Contacts and other comma-delimited text files** containing lead or contact data using an Import utility built into Microsoft CRM and accessible from the Tools menu.
- **As a one-time migration with ongoing integration**, for data in Microsoft Business Solutions Great Plains®, using the Microsoft Integration architecture. (The Data Migration Framework is not for ongoing integrated solutions. For more information, refer to the *Microsoft Business Solutions Customer Relationship Management Integration Guide*.)
- **From a group of targeted source systems**, by way of a common data format staging database, using third-party extraction tools to extract data from the source systems and data migration framework tools to migrate the data to Microsoft CRM. (For more information, refer to the *Data Migration Framework for Microsoft Business Solutions Customer Relationship Management*.)

## Success factors

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Because data migration is a complex process, success is dependent on several factors:

- **Viewing data migration as its own project.** Project management resources should be allocated, the scope of the project defined in writing, and appropriate funds made available.
- **Setting up project expectations with customers and managing them throughout the process.** End users typically do not understand the time and effort required to migrate data, a misconception that causes them to have unreasonable expectations for project requirements and scheduling. By clarifying expectations up front, customers will be better prepared to make the necessary decisions and tradeoffs throughout the migration process.
- **Understanding the data requirements for the business.** Understanding what information is important and how it is to be used is critical to the success of your endeavor. Data migration requires a thorough understanding of the organization's business model and database use so that end users will support the necessary decisions about which data to migrate.

- **Defining project responsibilities clearly.** In simplest terms, defining project responsibilities is describing who does what at various stages of the project. You will help avoid misunderstandings and time delays once the project is underway by having defined—up front—what and when the customer and the project team each provide, and when and how changes and problems will be handled, and who is responsible for extracting the source data.
- **Understanding the Microsoft CRM entities.** Familiarity with the way Microsoft CRM represents data is essential for successful migration. Data relationships may exist in multiple systems with the expectation that all relationships will be handled centrally after migration to Microsoft CRM. Mapping legacy data, confirming with project sponsors, end users and other knowledgeable resources, and then obtaining signoff will help reduce rework caused by misunderstandings and miscommunications.

## Customer expectations

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You can help mitigate customer frustration with the migration process by helping them to understand the following:

- Data migration is rarely a straightforward process. Unexpected issues are very likely to come up, requiring additional work that has direct impact on budget and schedule.
- While many tasks can be automated, others must be done manually. Taking the time to carefully perform manual tasks can pay off in the end by helping to ensure data integrity.
- Businesses rarely migrate 100 percent of their data. Often, customers must make tradeoffs, particularly when deciding whether to migrate data that does not map easily from the source system to Microsoft CRM. The business value of the data may not warrant the time and cost associated with making the migration work. Find out from the customer what the acceptable threshold is for each legacy data set identified for migration.

## Legacy data migration decisions

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Although legacy data is an important business asset, inevitably customers must make tradeoffs when determining which data is of value to migrate. Some data, such as customer profile information, is essential and must be moved. The value associated with other data may not be as obviously clear. To make decisions about which data is worth the time and effort, you must understand clearly the data requirements for the business. Data that provides a diminishing

return against the cost of migration can be skipped during the migration process.

## Management challenges

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Even with a clear project plan, a thorough understanding of which data to migrate, and a set of customer expectations, data migration presents several management challenges:

- **Short turnaround time.** Typically an organization freezes data entry while performing data migration. During this time, data cannot be changed in either the destination or the source system, so organizations must minimize downtime for migration as much as possible. Very large data sets may even require benchmarking, established by measuring the amount of elapsed time for migration of similar smaller data sets, to ensure that required migration can be performed within an acceptable timeframe.
- **Unreasonable customer and end-user expectations.** Setting customer expectations and helping them to understand the time and effort required to migrate data is critical to the success of the project.
- **Manual processes.** Although Microsoft and other third-party vendors provide automated data migration tools, many activities are essentially manual.
- **Staging.** Depending on the complexity, the migration may need to be staged, moving some parts of the data before others.
- **Disparate data models.** Data from the source system may not map directly to Microsoft CRM because of its structure, and multiple source databases may have different data models. Decisions must be made as to how to best map the data to take advantage of features of Microsoft CRM. Microsoft provides tools to streamline this process.
- **Inconsistent or corrupt source data.** Data in source databases may not have consistent formatting or may not be represented the same way as Microsoft CRM.
- **Lack of expertise in source data formats.** Understanding how data has been formatted in the source system is critical for planning how data entities will map to Microsoft CRM.
- **Limited options for accessing source data.** There are application level restrictions on which objects or entities can be extended. The business must



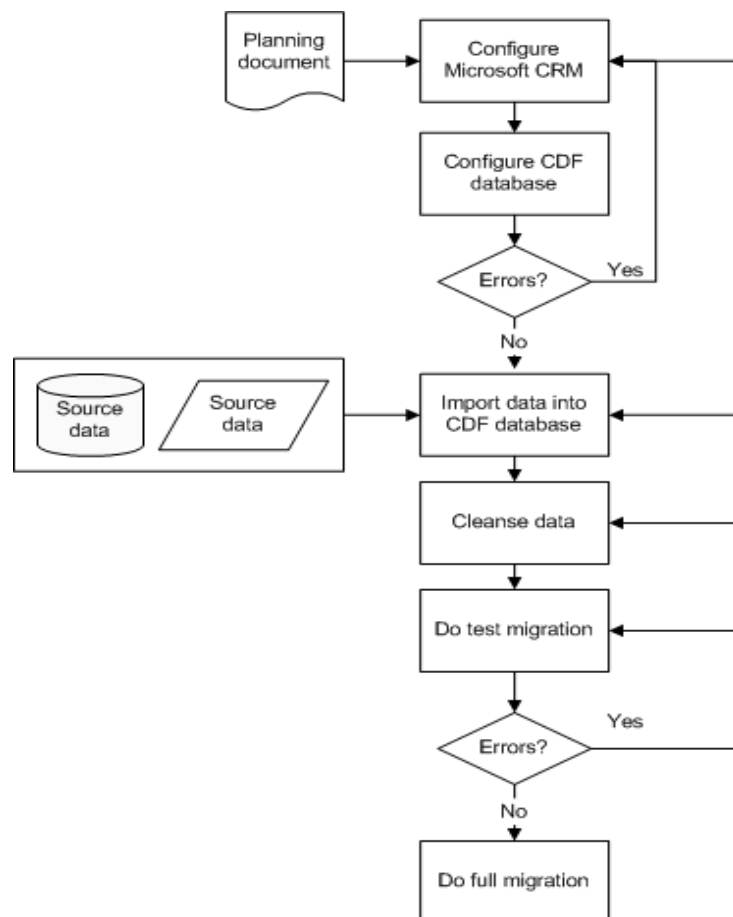
make a decision about which ones to extend. Some legacy systems may be limited in the formats provided for the export of data (for example, comma-delimited text only).

- **Unpredictable timeline.** Even with meticulous planning, during the migration unexpected situations may arise, causing problems that have an impact on schedule. Key decision-makers need to be available to resolve issues as they arise.

## Data migration phases

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The illustration below shows the six phases of the data migration framework for Microsoft CRM: Phase One: planning, Phase Two: configuring Microsoft CRM and the Consolidated Data Format (CDF) database (or a staging database), Phase Three: importing data into the CDF database, Phase Four: cleansing, Phase Five: test migrating data, and Phase Six: fully migrating and deploying Microsoft CRM. Below is a brief description of each phase, and the following sections which discuss them in more detail.



### **Phase One: Planning**

Planning involves scoping the project, establishing expectations, setting schedules, and describing the mapping between the old and new data, including data dependencies. It also involves the identification of critical points in the process for backing up and managing data in the event that data corruption or system problems arise.

### **Phase Two: Configuring the Microsoft CRM setup and the CDF database**

The target Microsoft CRM system has to be customized as per the requirements of the business for Users, business units, territories, drop-down lists, and any custom attributes required. The Microsoft CRM configuration information is then loaded into a staging database called the CDF database.

### **Phase Three: Importing to the CDF database**

During this phase, the staging database is populated with data merged from current source systems into a single, intermediate (staging) database.

### **Phase Four: Cleansing**

Cleansing the extracted data involves a number of activities including removal of old or inactive data, merging duplicates, and updating the remaining data to the new format requirements of Microsoft CRM, the destination system.

### **Phase Five: Test migrating the data**

During this phase, test data is extracted from the CDF database and validated for successful migration. This is the time for resolving errors and problems, and then bulk loading the remaining data into Microsoft CRM.

### **Phase Six: Fully migrating and deploying**

Deployment occurs only after a final validation pass to ensure that data has been migrated correctly. Manual data entry, user training, and final project documentation also take place during this phase.

## **Microsoft CRM Data Migration Framework tools**

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Microsoft provides several automated tools to help streamline the data migration process. These tools are provided as part of the Microsoft CRM Data Migration Framework, and include:

- **CDF**, a common data format staging database that serves as an intermediate stop for extracted

data, where it is cleaned and consolidated into a format for final migration into Microsoft CRM

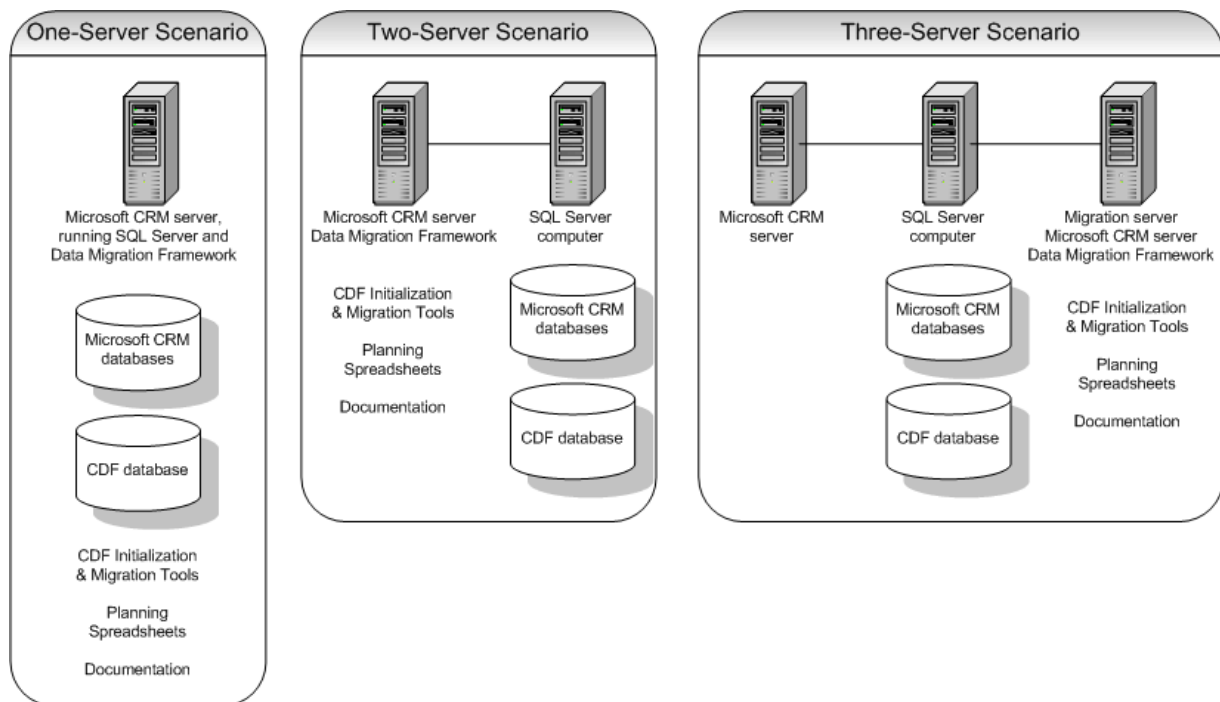
- **CDF Initialization Tool**, used for extracting Microsoft CRM configuration information and loading it into the CDF database.
- **CDF Migration Tool**, for moving the data from the CDF database to Microsoft CRM.

# Implementing the Microsoft CRM Data Migration Framework

## System requirements

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The Microsoft CRM Data Migration Framework can be installed on your existing Microsoft CRM server and SQL Server, or on a separate migration server. The following figure shows three potential configurations.



In the case where the Data Migration Framework is installed on a separate migration server, the migration server also must be configured as a Microsoft CRM server, and the source application (or export files from the source application) would be installed on the migration server.

For detailed instructions on setting up the Microsoft CRM server and computer running SQL Server, see the *Microsoft Business Solutions Customer Relationship Management Implementation Guide*.

## PHASE ONE

### Planning Your Data Migration

The data migration plan describes, in detail, the scope of the project and resource requirements. The plan also sets expectations up front with customers about the complexity of the migration, timing, and potential issues and concerns. In addition, your plan should identify which data to migrate and what decisions and tradeoffs will be made. Criteria for a successful migration should be documented in measurable terms whenever possible; for example: *Our goal is to migrate 80 percent of all customer records from the past year.*

With a written plan, you also:

- **Set a schedule**, including when data will be ready for analysis and testing, when data entry to the source system will cut off, when post-cutoff data will be added to the new system, what will be the migration verification timetable, and when the new system will be ready for users. The schedule also notes dependencies, such as go-live coaching, payroll, or accounts payable check processing.
- **Determine whether your migration will be phased**, including how many phases will be needed, and what types of data will be migrated in each phase. For example, Phase one might migrate general ledger history; phase two, core master records and transactions; and phase three, the remaining data.
- **Describe the source and destination data**, including which sources and how much data (number or records and size) will be migrated to Microsoft CRM; the criteria for deciding which records will be migrated, limitations, and exceptions (for example, excluded data such as closed accounts); entity definitions for Microsoft CRM (such as Customers or Accounts), field mappings, dependencies between Microsoft CRM entities; and whether drop-down lists must be migrated.
- **Identify resources and responsibilities**, especially when customer duties and decisions create dependencies in the migration plan. Determine who is responsible for each task, deadlines, dependencies and so on, as well as how changes and unexpected issues will be handled. Document hardware resources. Minimizing assumptions helps ensure a successful migration.
- **Describe the impact data migration will have on the business**, in terms of training, costs, system downtime, and so forth.

- **Identify data mapping requirements**, including the structure of the data at the source, the intermediate structure of the consolidated data in the CDF database, and how it will ultimately look in Microsoft CRM. (See *Data Migration Framework for Microsoft Business Solutions Customer Relationship Management* for more detailed information about the CDF database.)
- **Define how data will be managed**, including at what points in the process data will be backed up for both the old and the new systems.
- **Plan for data verification and testing**, including which data will be test migrated, how exceptions will be resolved, and how success of the migration will be evaluated. Success criteria should be developed based on database results, as well as cost and business value metrics.
- **Establish a contingency plan**, specifying how to handle time-critical business processes, such as payroll and accounts payable, in the event of schedule delays.
- **Define next steps**, including whether the source system will be available for historical data, if the source system will run parallel with Microsoft CRM for a period of time, and whether data migration is the first step in an ongoing integration.

## Understanding what data can be migrated

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The Data Migration Framework can migrate data to standard attributes in Microsoft CRM entities and to any new attributes added to the schema for these entities. The following table lists the Microsoft CRM entities that can receive data through the Data Migration Framework.

Microsoft CRM Entity	Microsoft CRM User Interface
Account	Accounts
Activity	Activities
ActivityParty	People referred to in Activities (names in To, From, Cc, Bcc, Call Initiator, Call Recipient, Sender, and Recipient attributes)
Annotation	Activities, Notes tab
Competitor	Competitors
Contact	Contacts
CustomerAddress	Addresses in Contacts and Accounts
Discount	Discounts

DiscountType	Discount Lists
Incident	Cases
Invoice	Invoices
InvoiceDetail	Products in Invoices
Lead	Leads
Opportunity	Opportunities
OpportunityProduct	Products in Opportunities
PriceLevel	Price Lists
Product	Products
ProductPriceLevel	Price List Items
Quote	Quote
QuoteDetail	Quote Detail
SalesOrder	Sales Order
SalesOrderDetail	Sales Order Detail
Subject	Subject Manager
UoM	Units
UoMSchedule	Unit Groups

The Data Migration Framework includes a planning spreadsheet that specifies the name, type, and size of each attribute in each of these entities.

## Setting up the CDF database

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The CDF table structure is designed to facilitate the extraction and cleaning phases of data migration. Understanding the table structure of the CDF is essential for planning mapping requirements from each source system. The CDF includes three types of tables:

- **CDF system tables.** These tables are pre-populated as part of CDF setup, ensuring compatibility with the Microsoft CRM database, and summarizing the overall migration status. The Microsoft CRM Migration Tool uses these tables to control the migration, and the CDF database includes stored procedures for modifying migration control fields, such as the test batch size, and whether or not to migrate a specific attribute or entity.
- **Entity tables.** For each Microsoft CRM object that can be migrated, the CDF database has

three entity tables to hold source data:

- Entity Base Table (named cdf\_<entity>) for data storage
  - Entity Extension Table (named cdf\_<entity>\_ext) for information about any schema extensions for the entity
  - Entity Migration Information Table (named cdf\_<entity>\_info), for storing migration status information.
- **Microsoft CRM metadata tables.** These tables correlate data between the source data in the entity tables, and Microsoft CRM. All data in the entity tables that reference users, organization name, business units, territories, and drop-down list values must be transformed or cleansed to match the data in these correlation tables.



## **PHASE TWO**

### **Preparing Microsoft CRM for Migration**

#### **Configuring Microsoft CRM**

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Before migration can occur, Microsoft CRM must be set up so that the migrated data can correlate properly with Microsoft CRM. During setup, the organization name, business units, territories, and users must be specified; changes to existing drop-down lists (such as adding or deleting values, changing the default, or changing the display order) should be entered; and custom fields can be added to Microsoft CRM entities. You should back up your configuration in case the test migration fails. Once you have backed up your databases, no users should add data into Microsoft CRM until the migration has been completed.

#### **Configuring the CDF database**

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Use the CDF Initialization Tool to extract configuration information from Microsoft CRM and load it into the CDF database. Once the CDF database has been initialized, the basic structure of the database is set up, including all tables required for mapping information to Microsoft CRM. At this point, the CDF database should be backed up in case problems occur later.

## **PHASE THREE**

### **Importing Data into the CDF Database**

After Microsoft CRM has been configured and the CDF database has been set up, data can be extracted from the source system(s) and imported into the CDF database, which serves as a place to store the source data and its relationships.

Data extraction involves five main activities:

- Preparing the legacy systems for cut off
- Collecting copies of the source databases
- Defining your data maps to Microsoft CRM
- Extracting your data and loading it into the CDF database
- Verifying the source data.

#### **Preparing the legacy systems for cut off**

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Performing as many closure activities as possible prepares the source data and facilitates the smooth transfer to the CDF staging database on the cut-off date. For example, you might post all transactions for all modules in the general ledger, run the end-of-period payroll and reports, and pay down accounts payable.

#### **Collecting copies of the source databases**

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Back up source systems and make copies of the source data to be collected for extraction.

#### **Defining your data maps to Microsoft CRM**

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Use the planning spreadsheet, Detailed Data Planning, to map the fields from your source databases to the CDF database and the Microsoft CRM user interface. Then, do a trial import into the CDF database using test data from each source and validate it to

make sure the data is where you expect it to be in the CDF database.

Before you can transform and consolidate data from multiple sources, you must determine how to reconcile competing customizations. Similar data with different field names or formats must be normalized to the Microsoft CRM format. For example, one source may present users with “state names” on a drop-down list. Other sources might offer two-character or multi-character fields.

## **Extracting your data and loading it into the CDF database**

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There are two ways to extract your data and load it into the CDF database:

- Use custom applications available from third-parties.
- Use OLE DB provider(s), if one exists, based on your data source
- Use the Data Transformation Services in Microsoft SQL Server to implement the mapping you defined in the Detailed Data Planning spreadsheet.

## **Verifying the source data**

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Once source data has been imported into the appropriate CDF table(s), compare the record counts from the source data with record counts from the corresponding CDF table, as this import process may have resulted in data transformation as well as data loss. Data loss during the extraction process will be frequent, which would require cost-benefit analysis for identifying any discrepancies in specific records and correcting any issues. The planning document provides guidance by documenting the acceptable percentage for data migration.

## **PHASE FOUR**

### **Cleansing the Data**

After extraction, the CDF database contains the data from one or more source systems. Some of the data may be duplicates, especially if you are migrating from non-integrated front- and back-office systems, and the data may contain corruptions and inconsistencies. Duplicates and other data that you do not want to migrate (such as leads with no activities in the last year) should be removed for a successful migration. Data cleansing also ensures that associations between records use valid data, and all required fields have data. The CDF database structure makes it easy to perform cleansing tasks to improve the quality of the data, so that it imports smoothly into Microsoft CRM.

Data cleansing is primarily a manual process. Once data inconsistencies and other issues have been identified, customized tools can be developed using a Microsoft Visual Basic® or SQL script, a full Visual Basic data cleansing application, or by exposing the intermediate data through a Microsoft Access front-end.

## **PHASE FIVE**

### **Migrating Data to Microsoft CRM**

The final migration of data from the CDF database to Microsoft CRM includes five steps:

- Backing up the CDF and Microsoft CRM databases
- Running a test migration
- Verifying the results
- Running a full import
- Verifying the results

Before full import, three actions occur: a back up of the CDF database and Microsoft CRM database, a small test migration run, and verification of the results. If the test is successful, a full import is run; if not, the databases restore and any problems must be resolved before starting over.

The CDF Migration Tool moves all the consolidated and cleansed data from the CDF database to Microsoft CRM while performing these tasks: correlating users and organizational entities, such as organization, business unit, or territory; running the migration; and creating relationships between entities.

The migration log file makes troubleshooting easy, identifying—in one place—any migration failures and successful moves. Once migration log failures have been fixed, the Microsoft CRM screens (Accounts, Contacts, Opportunities, Quotes, Sales Orders, and Invoices) can be reviewed for problems.

Correcting the data may involve additional data cleansing in the CDF database, resolving setup problems in Microsoft CRM, and, if the migration fails completely, repeating data extraction from the source systems.

## **PHASE SIX**

### **Data Verification and Preparing for Deployment**

Before Microsoft CRM can be deployed throughout the organization, the migrated data must undergo full verification and validation, and manual data entry must be completed. Any additional Microsoft CRM configurations, including such tasks as setting up workflow rules and customizing the reporting system, must also be done.

#### **Data validation**

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Although data has been validated throughout the migration process, a final pass must be taken to ensure that all the data has been migrated and that it performs within the business rules established in Microsoft CRM. This stage inevitably requires manual data entry, some of which may have been anticipated in the migration plan.

Validation is best performed by a group of users familiar with the data and who can evaluate the data in a controlled setting. The group members perform their usual activities, creating accounts, reviewing data, sending email, and so on, while being careful to identify any other, potential problems. In addition, all views should be checked for a specified number of accounts (for example, every 50 records), and reports should be run to check against the source systems.

Some validation issues to be aware of include:

- Double-posting to the general ledger from different sources
- Double-allocating inventory when importing quantities and open sales order processing records
- Year-to-date numbers, inventory quantities, and so forth that might need to be reset
- Parent records that might need to be created for orphaned records
- Calculations that might need to be verified in all views.

## Importing from Outlook Contacts and Comma-Delimited Text Files

If the source for contact and lead data is Microsoft Outlook contacts or available as a comma-delimited text file, an import utility accessed from the Microsoft CRM Tools menu, enables you to import your data to Microsoft CRM quickly and easily, rather than having to migrate it. Be aware, however, that the Import Wizard has no duplicate checking. Additional information about importing contacts or leads can be found in the Microsoft CRM online Help.

## Migrating Data for Ongoing Integrations

If you plan on running Microsoft CRM integrated with Microsoft Business Solutions Great Plains and you are migrating data from Great Plains, see the *Microsoft Business Solutions Customer Relationship Management Integration Guide*. The Data Migration Framework should not be used to migrate data from Great Plains to Microsoft CRM in an integrated environment.

## Custom Migrations

This paper has focused on a basic migration framework. Migrations from some custom databases may require custom conversion programming for the data extraction phase—moving the data from the source to the CDF database. However, once the data has been staged in the CDF, the cleansing, migration, and validation stages are the same. Migrating data from one of these systems may require the help of a certified Microsoft CRM partner or other knowledgeable consultant.

## Conclusion

The Microsoft Business Solutions CRM Data Migration Framework version 1.0 facilitates your migration process by providing the framework and tools to move your data from disparate source systems to Microsoft CRM. Custom migrations from other sources may be designed by working with an ISV or other knowledgeable consulting company. Microsoft recommends that any design include the CDF staging database and the migration tools to ensure that you maintain data quality for the transition to Microsoft CRM.

## **Appendix A**

### **Additional Information**

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*Microsoft Business Solutions CRM Implementation Guide*

*Microsoft Business Solutions CRM Data Migration Framework Guide*

*Microsoft Business Solutions CRM Integration Guide*

*Microsoft CRM Integration white paper*

Microsoft CRM Software Developer Kit (SDK)