

Data Migration Strategy

*Prepared for*

Bottomline Technologies

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*Project*

Insight Dynamics AX Implementation

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# Revision Sheet

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# 1 Executive Summary

The purpose of this document is to *outline the broad plan* that will be applied, as data is converted from existing Bottomline data applications into Dynamics AX 2012 R3. Data conversion activity will take place in preparation for the go-live event(s). Various types of data will need to be converted. Determination of the data to be converted is directly dependent on business requirements.   
  
The data conversion strategy is used to:

* Document planning assumptions and decisions
* Determine workload requirements
* Guide the execution and control of data conversion
* Facilitate communication among project and data stakeholders

This is an initial strategy document and it will be progressively elaborated in subsequent phases of the project. The data conversion strategy will set out the general plan, while current status information will be maintained in the project plan and/or project status reports.

This plan document defines the data conversion processes. This document will be supported by detailed project plans that will drive the migration work for Insight. The plan document identifies topics which should be considered at each step in the conversion.

This plan document includes an overview of the scope for the data conversion. A number of legacy tables have been identified as needing to be converted. The EA leads will work with the work stream leads to confirm the required data entities that need to be converted and the master list will be maintained in the Insight TFS system.

Further, this plan document primarily focuses on the “Load” portion of “Extract-Transform-Load” process. It is assumed that Bottomline will be responsible for extracting data from legacy system tables. Bottomline will also be responsible for data transformation prior to loading the data to AX.

# 2 Introduction and Background

Data conversion will be an ongoing process throughout the project timeline and will be carried out in a phased approach to coincide with the master project plan driven by the Program Manager.   
  
Development and testing of the conversions follows an iterative approach, where the conversions will be executed, measured and tested throughout the phases in the project.

# 3 Data Conversion Methodology

The data conversion strategy is broken down into multiple segments across the project phases. Throughout this phased approach, the accuracy of the converted data will improve with each mock conversion run.

The conversion/migration process must be repeatable to facilitate multiple extractions. This will enable the team to refine the process and improve efficiency with each iteration.

All conversion/migration data should flow through an Intermediary database. The use of csv or other text based datasets for direct AX import is discouraged and is not intended for Project Insight.

Extracted data will be uploaded into the Intermediary database. The extracted data will be cleaned as it moves from the Consolidation tables(s) to the Cleansing table(s). It is important to note that Bottomline will not cleanse the data in the legacy systems. All cleansing will be done in an intermediary database prior to importing to staging. Using an intermediary database in SQL Server allows us to write stored procedures to clean the data.

The name of an uploaded file will be used to create or update a table in the Intermediary database. An upload page will be designed to upload data based on the work stream. The tables in the Intermediary database are created using database schemas that correspond to the work stream names – for example, Procure to Pay, Quote to Cash and Record to Report. To avoid confusion, the same data should not be loaded with two different file names.

Any data manipulation of the extracted data from the Consolidation tables need to be performed by authorized data stewards, in conjunction with the work stream leads and Data Migration lead. This work will be done in the Cleansing tables – prior to migrating to the Staging environment. To facilitate DIXF import mapping, the column names in these tables should replicate the AX entity names.

The stored procedures used to manipulate the extracted data to the Intermediary database should be maintained in the Intermediary database and should be separated by work stream schema, unless the stored procedure is to be used for Global Master Data specific fields. The stored procedures must be written to be repeatable. Hard-coding of identifying codes or numbers is discouraged. The stored procedure names and the sequence in which they must be run should be documented.

The diagram below summarizes the high-level migration process.



# 4 Key Business Data Areas

The key business data areas are the work streams that represent high level logical groupings of business data and related structures, i.e. Procure to Pay, Quote to Cash and Record to Report. The set of key business data areas helps to determine and confirm the scope of the data conversion.   
  
The following data conversion scope has been defined and documented in the Statement of Work for this project.

| **Sequence No.** | **Process** | **Area** | **Work stream** | Data in Scope | **Entity** | **Data Type** |
| --- | --- | --- | --- | --- | --- | --- |
| BTDM01 | Design to Retire | 10.20 Product Data Management | Inventory Management | Product codes | Product | Master |
|  | Scope: | Active and/or used within the past 3 years | | | | |
|  | Assumptions: | 40,000 product codes for all entities.  Assumption:  ·        Products will be released to companies automatically via a script developed through the import process. ·        Items will be imported in Product masters form with all the required data fields and attributes ·        Dynamics AX will have data set up and configured for dependent tables before the import can happen, such as inventory item groups. | | | | |
| BTDM02 | Procure to Pay | 20.10 Vendor relationship management | Finance | All active vendors and vendors | Vendors | Master |
|  | Scope: | Used within the past 3 years | | | | |
|  | Assumptions: | Vendor Import- Creation of vendor records.  Assumption: Data in dependent tables is already set up or configured before this import happens. | | | | |
| BTDM03 | Procure to Pay | 20.30 Direct Procurement | SCM | Purchase Orders | Open Purchase Orders & PO receipts | Transactional |
|  | Scope: | Which have not been fully closed | | | | |
|  | Assumptions: | Purchase Order conversion - up to 300 Open PO's in total. This will be a manual conversion effort by Bottomline Assumption:  ·        Vendor and related data required to create a purchase order has been set up and configured.  ·        Purchase Order data will be manually converted as quantity is low. | | | | |
| BTDM04 | Procure to Pay | 20.45 Invoicing & Accounts Payable | Finance | AP Invoices / credit notes | Vendor invoice header, Vendor invoice line | Transactional |
|  | Scope: | With open balances | | | | |
|  | Assumptions: | The vendor invoice journal will be created for bringing open invoices.  Assumption: ·        Tax amounts (if any) will already be included in the invoice total.  ·        Data verification will be done manually by users before posting.  ·        Vendors will be migrated prior to this AP invoice import | | | | |
| BTDM05 | Prospect to Quote | 30.15 Customer Relationship Management | Finance | Customers | Customer | Master |
|  | Scope: | Active and/or used within the past 3 years | | | | |
|  | Assumptions: | Customer Import- Creation of customer records.  Assumption: Data in dependent tables is already set up or configured before this import happens | | | | |
| BTDM06 | Order to Cash | 35.10 Pricing, Contracts & Trade Agreements | Sales & Marketing | Pricing information | Price discount agreement journal | Transactional |
|  | Scope: | Active and/or used within the past 3 years | | | | |
|  | Assumptions: | Customer price book import Assumptions: ·        Trade agreements need to be populated ·        There is one list price per product code. | | | | |
| BTDM07 | Order to Cash | 35.40 Billing & Accounts Receivable | Finance | AR Invoices / credit notes | Opening balance | Transactional |
|  | Scope: | With open balances | | | | |
|  | Assumptions: | Via Journal entry –  Assumptions:  ·        GL journal will be created via import of a csv file.  ·        Tax amounts (if any) will already be included in the invoice total.  ·        Data verification will be done manually by users  ·        Customers will be migrated prior to invoices | | | | |
| BTDM08 | Order to Cash | 35.20 Sales Order | E-Commerce Bookings / Sales & Marketing | Sales and work orders | Sales order header, sales order line | Transactional |
|  | Scope: | Open | | | | |
|  | Assumptions: | 1. Setup DIXF object to import data into the standard sales order tables 2. Approximately 15,000 sales orders Assumptions: ·        This will be imported to the standard Dynamics AX sales order tables. ·        No custom fields considered as part of this import | | | | |
| BTDM09 | Inbound to Outbound | 45.25 Inventory Management | Inventory Management | Inventory items | Inventory journal | Transactional |
|  | Scope: | With any quantity on hand | | | | |
|  | Assumptions: | Assumptions:  ·        Inventory movement journal will be used to record any inventory issues as well as offset expenses against a ledger account.  ·        Inventory items will be migrated prior to an inventory journal. | | | | |
| BTDM10 | Acquire to Dispose | 55.10 Capital Asset Acquisition | Finance | Any Fixed Assets. Closed Fixed Assets are acceptable | Asset | Master |
|  | Scope: | For fixed assets that need a sub ledger and to be reconciled with the GL | | | | |
|  | Assumptions: | 10,000 assets per entity. Creation of fixed asset records.  Assumption: Data in dependent tables is already set up or configured before this import happens. | | | | |
| BTDM11 | Acquire to Dispose | 55.10 Capital Asset Acquisition | Finance | Fixed Asset cost amounts | Opening balance? | Transactional |
|  | Scope: | For fixed assets that need a sub ledger and to be reconciled with the GL | | | | |
|  | Assumptions: | Assumptions:  ·        Fixed Assets are already imported in AX.  ·        FAA Journal would contain fixed asset acquisition values. ·        Posting will be done manually once the imported data has been verified by the user. | | | | |
| BTDM12 | Acquire to Dispose | 55.10 Capital Asset Acquisition | Finance | Fixed Asset Accumulated Depreciation amounts | Opening balance? | Transactional |
|  | Scope: | For fixed assets that need a sub ledger and to be reconciled with the GL | | | | |
|  | Assumptions: | Assumptions:  ·        Fixed Assets are already imported in AX.  ·        FAD Journal would contain fixed asset depreciation values.  ·        Posting will be done manually once the imported data has been verified by the user.  ·        This will cover all depreciation methods and sets of books. | | | | |
| BTDM13 | Hire to Retire | 60.20 Employee Lifecycle Management | HCM | Employees | Employee | Master |
|  | Scope: | Of the past fiscal year and the current fiscal year | | | | |
|  | Assumptions: | Assumptions: ·        2,000 employees overall ·        Non-HR conversion for workflow and time integration. | | | | |
| BTDM14 | Record to Results | 65.10 Corporate Structure, Legal Entity & Chart of Accounts | Finance | Agreed to Chart of Accounts | Main account | Configuration |
|  | Scope: |  | | | | |
|  | Assumptions: | Assumptions: ·        One (1) single global COA design will be used by Bottomline going forward ·        French statutory chart of accounts will be loaded via the same design. | | | | |
| BTDM15 | Record to Results | 65.40 Corporate Operations & Affairs | Finance | GL balances | Opening balance | Transactional |
|  | Scope: | 2-5 fiscal years | | | | |
|  | Assumptions: | Via Journal entry –  Assumptions:  ·        GL journal will be created via import of a csv file.  ·        Data verification will be done manually by users before posting can happen.  ·        GL accounts will be migrated prior to the journal entry import | | | | |
| BTDM16 | Record to Results | 65.40 Corporate Operations & Affairs | Finance | Prepaid Setups | Opening balance | Transactional |
|  | Scope: | Current and future | | | | |
|  | Assumptions: | 1. Create new data migration object for the import of General Ledger Accrual Schemes. 2. Approximately 10,000 items Assumptions:  1. Existing prepaid transactions will be imported via a general journal via the above journal entry imports. 2. New DIXF entity will be developed to import Accrual schemes setup values.  3. Standard error handling and validations | | | | |

This table will up be updated as new information is attained in later phases of the project.

# 5 Conversion Activity Focus Areas

Managing the Data Conversion consists of four major focus areas:

### 5.1 Planning and Discovery

The main goal of this phase is to deliver the Data Migration Strategy document. This document is intended to define:

* The [overall scope](#_14_The_data) of the data conversion, defined by the key business data areas and documented in the Statement of Work
* [Legacy data owners and stakeholders](#_7_Legacy_Data)
* How the [data conversion will be planned](#_12_Data_Migration) and a mechanism for providing feedback on progress and quality
* Required resources to execute the data migration plan
* A list of existing legacy data stores, their system managers and key business data areas which are covered
* An outline for an initial test strategy

### 5.2 Data Preparation

*Note: Although this is typically done during (at the beginning of) the Design phase, we have determined to pull forward some of these activities in order to mitigate risk to the timeline in later phases. It is understood that this approach may result in rework as it will increase the number of iterations.*

Understand how data is used within the business, define quality metrics for data and begin preparations for system retirement policies and data warehouse plans.

Deliverables and tasks will include:

* Validate list of legacy application data stores
* Confirm legacy data owners and stakeholders
* Data profiling to understand quality challenges and what tools or processes to put in place to ensure data quality standards for approving cleansed data
* Revise and review first versions of system retirement policies
* Begin to review data warehouse needs and tool considerations based on reporting and business need

### 5.3 Design

Define mapping between existing systems and new system(s) structures. Updates to the Data Migration strategy (*which is a “living document”*) will be made based on findings.

Tasks will include:

* Complete identification and listing of legacy data stores
* Provide key business data area models for Dynamics AX 2012 R3
* Perform gap analysis (map gaps) and coordinate with implementation team
* Update scope based on quality and ability to retire systems
* Update, then finalize data migration test plans
* Create the data conversion test environment based on the master setup and configurations to data made by the implementation team
* Define the proper tools for the data conversion, which could include: Microsoft Dynamics AX 2012 R3 Data Import Export Framework (DIXF), in-product import/export, Excel, AIF, test data transfer tool, SQL Server backup/restore, intelligent data conversion framework, custom code, others

### 5.4 Develop, Test and Deploy

*This is a cross-phase activity, which will occur during the Design, Development and Deployment phases of the project.*

Key tasks include:

* Develop build mappings
* Build, test and deploy any required ETL (extract, transform and load) programs
* Establish the test plan
* Complete data loads into Dynamics AX 2012 R3
* Prepare the data that will be used for Process Testing, End to End Testing and User Acceptance Testing
* Complete business validation of the loaded data
* Perform mock conversions and month end/ year closing to validate reconciliation activities to be performed
* Finalize required corrections to the approach. Amend cutover plans and deploy.

# 6 Data Entity Dependencies

Data conversion requires that loading data to the target environments follows a systematic, sequenced approach. Dynamics AX 2012 R3 is a highly normalized relational database and the data dependencies between all converted data must be considered. These relationships will influence and mandate the order in which data entities are populated in the target Dynamics AX instance.

The tables below illustrate a suggested general order in which data entities should be loaded.

|  |  |
| --- | --- |
| Sequence | Table type |
| 1 | Configuration (reference and supporting) tables |
| 2 | Master tables |
| 3 | Transactional tables |

As part of the detailed data migration planning process, the load sequence, dependencies among entities and role assignments will be defined.

# 7 Legacy Data Stakeholders and Owners

In the context of data conversion, the legacy data stakeholders are a group of individuals who can affect or be affected by changes in data access. Data owners, are the individuals who can authorize access to data, and are responsible for its accuracy, integrity, and timeliness.

The extraction of legacy data from the legacy data stores is a critical step in migrating data to Dynamics AX 2012 R3. The cooperative and collaborative efforts among IT and Business teams will drive success in managing what data is needed, where the data can be found and how that data will be made available.

The *Master Data Objects Tracker* referenced below will be used to identify the legacy data owners for Project Insight. The owners listed in the document will be responsible for addressing legacy data issues.

Link: [*Master Data Objects Tracker*](http://isites/Finance/Catalyst/insight/_layouts/15/start.aspx#/Workstream%20Documents/Forms/AllItems.aspx?RootFolder=%2FFinance%2FCatalyst%2Finsight%2FWorkstream%20Documents%2FData%20Migration%2FData%20Migration%20Object%20Master%20List&FolderCTID=0x0120000F0AA9DF34C5A149B5E4F3C5AD817F3C&View=%7BD00795C6%2D127E%2D45)



# 8 System Retirement/Decommissioning Policies

Historical data is data that has no reference to post go-live, day-to-day activities. Historical data will remain in legacy systems in accordance with Bottomline’s data retirement policy. The historical data will be used for reporting purposes only. With the exception of the current year ledger summary data and sales history, all historical data will remain in its final state as it existed prior to cutover to Microsoft Dynamics AX.

System retirement policies are outside the scope of this document; however, it is worth mentioning that they should be examined. It is recommended that historical data not be kept in AX.

The general recommendation is to maintain the database that contained previous transactional data for reporting and compliance purposes. Due to licensing and other issues, this may not be optimal, but it is mentioned here to emphasize that this is considered.

# 9 Legacy Data Retention

Legacy Data Retention defines the policies for data and records management to meet legal obligations and long-term business needs. Data retention requirements depend on the type of data and the purposes for which it is used. The following table documents where non-converted legacy data will reside post go-live.

*Note: The data conversion effort will not include conversion of historical data with the exception of summary ledger balances and sales history.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement Description** | **Legacy Source** | **Retention Period** | **Type of Documents** | **Post conversion**  **location** |
| 1. Historical transactions | GP | 7 years [UK], TBD years [US] | * Sales orders * Purchase orders * Other finance transactions? | GP [read-only mode] |
| 1. Historical contracts | GP | 5 years | Contract data | GP [read-only mode] |

This table will be updated as additional information is attained throughout the project.

# 10 Data Quality Standards for Approving Data

Data quality is an assessment of data fitness to serve it purpose in the context of providing proper and viable data to support Dynamics AX 2012 R3.

Data quality represents the degree to which the data is suitable for usage in the required business processes. The quality of data can be defined, measured and managed through various data quality metrics such as completeness, availability & accessibility, currency, accuracy, validity, usability & interpretability, reliability & credibility, consistency. [[1]](#footnote-2) Ultimately, the data quality is achieved through people, technology and processes.

The following Data quality standards may be considered and incorporated into data conversion processes and validation planning.

|  |  |
| --- | --- |
| Data Quality Standard | Description |
| Completeness | Able to represent null values, has data that it is supposed to have, comprehensive (completely represents the value). An expectation of completeness indicates that certain attributes should be assigned values in a data set. |
| Availability & Accessibility | Clear, easy to use/access, securable |
| Currency | Timely |
| Accuracy | Properties are mapped correctly, accurate to reality, correct, concise, and precise. A measure that the data contains the correct value as input. |
| Validity | Conforms to metadata, follows rules. A confirmation that data values fall within acceptable ranges.  For example, salary values should be 60,000-120,000 for position levels 51 and 52. |
| Usability & Interpretability | Comparable, correct interpretation, suitably presented, clear, unambiguous |
| Reliability & Credibility | Believable, quality data, reliable, verifiable |
| Consistency | Coherent, contains referential integrity, mapped unambiguously. In range with other data. |

# 11 Legacy Data Sources

A legacy data source, for the purpose of the data conversion, is any location or medium which is used to store data within the business today. This could include ERP systems, business applications, a SharePoint document library, spreadsheets, Access databases and even someone’s (paper-based) filing cabinet. As part of the data migration planning process, the sources that contain required data for Project Insight need to be identified.

It is important to remember that changes may occur as more information is discovered. For example, a particular database may appear to contain nothing we wish to convert, but later turn out to be a better source of information than what had originally been thought. In some cases, legacy sources may not be converted, but can serve as references to support the data migration and validation activities.

As part of the data migration process, the Bottomline Data Owners and Data Stakeholders should consider and define an appropriate requirement plan each Legacy data source.

**See the *Master Data Objects Tracker* in section 7 of this document for details on legacy data sources.**

# 12 Data Conversion End-to-End Process Description

**The data conversion process is iterative**. The process involves data extraction, data cleansing, data mapping and data loading. The process starts with the extraction of data from the legacy application. There are multiple legacy instances in scope and the extraction process will be run for each legal entity in scope and decided to be loaded automatically. The data entities that qualify for data extraction are determined by the Business; essentially the required data will be determined by what is needed to support business processes in the “to be” configured instance of Microsoft Dynamics AX including dependent interfaces and ISV solutions.

The extraction of data will include master and transactional data. Very limited historical data will be considered for conversion: summary ledger balances and sales history only. The extraction process will use a SQL scripts and other extract tools to read information from the legacy data stores and copy the data to the conversion test environment. With larger data sets, the data extracted should be filtered to include only active data. The intended approach is to be additive, additional filters will be required to extract only changed and new information. This approach ensures that data previously extracted, profiled, and cleansed will not be overwritten or otherwise destroyed during conversion data refresh cycles.

The process continues after extracting all legacy data to the Conversion Test (ConvData) environment. The legacy data must be profiled to determine validity and whether data quality standards are met. The process of data cleansing and data de-duplication requires a concerted and dedicated effort on behalf of the functional and technical teams. As data is cleansed the records meeting quality standards will be flagged to indicate suitability for conversion to target environment. This information, in turn will to be communicated back to the legacy data owners such that any adjustments to legacy data are made.

After the cleansing and script processing completes, the results will be validated. The validation process will involve the functional and technical owners as they will measure the actual results against expected results as stipulated by testing guidelines. After reviewing the test results script remediation and changes to data profiling tools may be required. The cleansing process is repetitive and will continue until desired level of data quality is achieved. Caution will be taken to ensure that extraction of legacy data does not break or overwrite any previously cleansed and validated data.

Data mapping activities will be an exercise in working with pre-defined mapping templates that contain the table elements and data characteristics of Dynamics AX table structures. The data owners will use the data mapping spread sheets to map legacy data columns to corresponding data columns in Dynamics AX. This exercise will be done for all tables that will be converted electronically using the Data Import Export Framework.

Once the mapping is complete, the mapping spreadsheets will be used to create SQL scripts to physically take the validated cleansed data and populate SQL Staging tables. The schemas for the SQL staging tables will match the target column names identified on the mapping spreadsheets. The SQL scripts will be written to correctly map legacy column names from legacy to appropriate columns in the staging tables.

All data conversion activity starts in the legacy application.

The legacy extraction process begins by ensuring dedicated access to the environment. The extracted data is pulled into the Conversion test environment to a SQL database adopted to store legacy data for all legal entities in scope. Attention that the SQL database required to support data cleansing and profiling must be configured to support the extraction of all data sources, all data entities, and all legal entities for data intended to be converted electronically. Legacy application must be configured in the SQL legacy work instance to accommodate legacy cleansing.

The Data Conversion Testing environment will support the Dynamics AX 2012 Staging and Target environments. The environment will host Dynamics AX 2012 application code. The code base will mirror other Dynamics AX 2012 instances in terms of core AX code, Cumulative updates, ISV and Hotfixes. Customization will be applied as builds are validated during the course of the implementation. The Data Import Export Framework (DIXF) will be used to load cleansed data into staging tables resident in the Data conversion test environment. The movement of data into staging will leverage functionality in the DIXF toolset to read data from the populated SQL staging tables.

The DIXF *configuration* process is broken down as follows.

| **Step** | **Activity** | **Detail** |
| --- | --- | --- |
| 1 | Determine entities in source system | Determine whether you are importing one or more Microsoft Dynamics AX entities, whether you are importing a composite entity, or a Microsoft Dynamics AX table. |
| 2 | Identify entities to place in processing group | A composite entity groups multiple related entities together. An example of a composite entity is a sales order and sales line entities combined together. Composite entities support only file data sources.  A table entity enables you to convert data from a source to a target Microsoft Dynamics AX table directly, without going through a staging table or applying any business logic.  Unlike other entities, data cannot be pushed from one source table to multiple target tables. The direct table entity must be a one-to-one mapping from source to target. |
| 3 | Define the source data format (delimited fixed width etc.) | Define the data format for each entity in the source environment. The data format can be a file that is delimited or fixed width, an ODBC data source, or a Microsoft Dynamics AX table. |
| 4 | Define and Determine entity conversion groups | Determine which entities should be convert together in a processing group.  A processing group is a set of entities that must be processed in a sequence, or that can logically be grouped together. The entities in a processing group are convert together from source to staging, and then from staging to target.  When you define a processing group, you must identify sample data for each entity. The sample data is used to validate the source to staging mapping. |
| 5 | Validate source to staging mapping, modify staging if necessary | If you find data in source that is not in staging, and you want to bring the data into Microsoft Dynamics AX, you may have to modify the staging schema. |
| 6 | Review staging to target mapping, modify if necessary | You may have to modify the staging to target mapping to align the mapping with customizations in Microsoft Dynamics AX. This step is required if, for example, you have an additional field for the customer entity. |

The DIXF *processing* steps are as follows.

| **Step** | **Activity** | **Detail** |
| --- | --- | --- |
| 1 | Source to staging processing | When an entity is copied from source to staging, a processing group that is associated with one or more entities runs as a job.  After processing has been completed, you should validate that the entity appears accurate in the staging table, and that the reference data is mapped correctly. |
| 2 | Staging to target processing | When data is copied from staging to target, a job that is already defined, and that is associated with a processing group, runs.  After processing has been completed, you should validate that the entity appears accurate in the target. |
| 3 | Post processing | We strongly recommend that you delete the staging data after conversion is complete. It may contain business information. |

Data validation using AX business logic is enforced through usage of DIXF. All data convert into the target environment will be check for integrity. Records that fail validation will not be convert into the target environment. The validate logic relies in some cases on configuration settings and supporting tables. The master system configuration data will be stored in the Master Staging environment. This information is not static and changes to configuration are expected and will have an impact on data validation. The validation and loading of data into the target application is dependent on the configuration settings. Prior to any data conversion runs from Source to Target, an import of the configuration data from the Master Staging environment should be done to synchronize configuration settings between the two environments.

Upon completion of an end-to-end conversion run, the data may be copied from one legal entity to another using the Compare and copy entity data functionality. The data can also be exported from one instance of Dynamics AX to another instance; facilitating the setup of testing and other environments.

### 12.1 Roles and Responsibilities

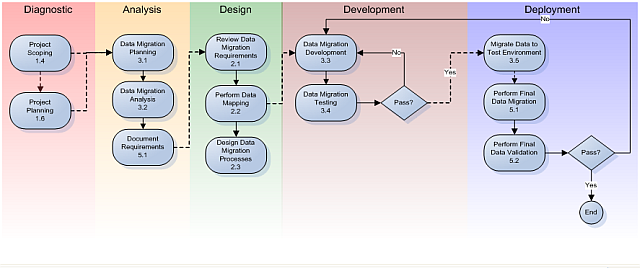
The following table explains the roles and responsibilities related to activities in Data conversion. It is the author’s understanding that there are different IT people involved in the Extract steps as in the load steps. This should be further specified for each business data area.   
  
Bottomline resources will perform the extract and transform.

The load is a shared responsibility: the first round is process testing where the load is performed by Microsoft, the second round is a Microsoft end-to-end test, the third is performed by Microsoft to the User Acceptance Testing environment. The fourth and final round to the Production environment is performed by Bottomline. It is anticipated that there will be additional data migration rounds added.

This table will be updated in later stages of the project as the relevant resources are identified.

| **Process** | **Task** | **Role** | **Resource** |
| --- | --- | --- | --- |
| Extract | Create extraction scripts | EA | Lachlan, Krista |
| Extract | Extract legacy data to intermediary database | EA | Lachlan, Krista |
| Transform | Cleanse data | Business area | TBD |
| Transform | Validation of cleansed data and data quality conformance | Business area | TBD |
| Load | Setup and configure Data conversion environment | EA | TBD |
| Load | Population of all Supporting Tables | Functional and Technical work stream leads | TBD |
| Load | Test execution | Shared MSFT and Functional and Technical work stream leads | TBD |
| Load | Validation of loaded data | Functional and Technical work stream leads | TBD |

### 12.2 Data Conversion Activities

[](http://www.axaptapedia.com/images/5/5d/Ssmigration.png)

**Analysis**: Data conversion planning

During the Analysis phase the ability to utilize the selected tools will be used to demonstrate the ability to extract from source systems; apply at least one cleansing rule on extract and place in the staging area. This is the ETL debug exercise. The proof is the tool, environment is in place to move to Mock cycles and the design phase.

**Design**:

During the Design phase multiple Mock cleansing cycles will be performed until data is clean enough to support E2E testing. Currently this is planned for 3 cycles. Based on learning and success, we may need to perform this more frequently. There is no right or wrong number of cycles rather the “cleanliness and readiness” is the goal to support testing.

**Development**:

During the Development phase, full process testing will be performed and will exercise master data conversions loaded into the test environment at the beginning of testing. The Defect Management process will identify those objects/entities that require further cleansing and readiness for go live. The rules and cleansing adjustments added during Development to the staging area will remain in place to support final extracts from Legacy systems for go live.

Part of the Master data conversion testing in this phase is all open items (AP, AR, GL balances, etc.)

**Deployment**:

During the Deployment phase we will be performing a “dress rehearsal” or “final mock” conversion to demonstrate we know how to successfully build PRD from scratch. This will be done while End User Training (EUT) is underway. Finally, earlier plans to “freeze” new adds of master data during the last 2 weeks of precut over month are in play.

The end of deployment is the “final data load” or “cutover data load” and represents the culmination of all efforts to date.

# 13 Data Migration Milestones by Project Phase

| **Task** | **Microsoft** | **Bottomline Technologies** | **Required By\*** |
| --- | --- | --- | --- |
| Data Migration Strategy | X |  | End of Analysis |
| Extraction from legacy system |  | X | End of Analysis |
| Data cleansing strategy | Supporting | X | Begin Design |
| Design of tools and templates | X |  | End of Design |
| Develop conversion & transformation logic prior to merging into an import template |  | X | End of Design |
| Data mapping (legacy to new) |  | X | End of Design |
| Develop templates and the format data should take | X |  | End of Design |
| Develop automated migration scripts (if any) | X |  | Mid Development |
| Place data in template format and form |  | X | Mid Development |
| Loading data into new system | X |  | Mid Development |
| Testing and validating migrated data (including reconciliation) |  | X | Mid Development |
| Manual data migrations (if any) |  | X | Process Testing, End to End Testing and Deployment Cut-Over |
| Production Data Load |  | X | Deployment Cut-over |

# 14 Validation Plan

Data test plan requires necessary infrastructure, measuring tools and priorities in place prior to execution of test scripts on the target environment

The following tests will be used initially for a part of overall test plan

1. **Row count validation** will help to ensure no data loss, no data duplication and whether any unwanted data has been converted.

This testing is most effective when there is a one-to-one mapping between source and destination, with common primary key. Validation of row counts in this scenario is straightforward.

For more complex conversion with complicated extraction rules and transformation involved, more steps are required. The following validation checkpoints will help in a more complex scenario.

1. Make sure you have source and target data mapping defined and reviewed
2. Data conversion business rules for extraction and transformation are listed and formed as SQL filters
3. Data loss acceptance criterion is defined

With the complex approach once you get both expected and actual count of data converted a report can be formatted to show delta numbers or percentages as long as an acceptance criterion is defined for the delta.

1. **Data integrity testing** to ensure that entity integrity (Primary key constraint) and Referential integrity (Foreign key constraints are maintained during conversion.
2. **Data consistency checking** involves validation of accuracy, integrity, and usability of data after going through transformation, involved during data conversion. The Dynamics AX 2012 R3 consistency checker can help.
3. **Data health check** test to verify that converted data follows all destination system rules and identifies the bad data inserted which needs post conversion cleanup or fixing
4. **Consumable data check** test to identify the amount of consumable data and identify the amount of good data that can be processed by the destination system
5. **Parallel processing** validation of data by processing in the source and destination system and comparing the results. Data can be validated by processing equivalent data in both systems and comparing the results

### 14.1 Validation Tests

One or more tests must be established and documented for each converted entity, including the test and expected result. The table below provides a format for planning and tracking data validation; this should be updated as the team progresses through the project.

| **Data Conversion (see Section 4 for additional details)** | | **Validation Tests** | | **Data Conversion Validation Measure (target/actual)** | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sequence No.** | **Description** | **Test** | **Expected Result** | **Sample %** | **Code Complete** | **Round 1: End-to-End** | **Round 2: UAT** | **Round 3: Go Live** |
| BTDM01 | Product codes | Products record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of products are released | 80% for 1st iteration, 100% for last | 5% | 0% | 0% | 0% | 0% |
| BTDM02 | All active vendors and vendors | Products record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of records match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
| BTDM03 | Purchase Orders | Products record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of records match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
| BTDM04 | AP Invoices / credit notes | Products record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Total $ = total from input system | Yes | N/A | 0% | 0% | 0% | 0% |
| BTDM05 | Customers | Products record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of customers match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
| BTDM06 | Pricing information | Products record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of records match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
| BTDM07 | AR Invoices / credit notes | Record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Total $ = total from input system | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of records match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
| BTDM08 | Sales and work orders | Record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
| BTDM08 | Sales and work orders | Total $ = total from input system | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of records match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
| BTDM09 | Inventory items | Record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of records match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
| BTDM10 | Any Fixed Assets. Closed Fixed Assets are acceptable | Record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of records match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
| BTDM11 | Fixed Asset cost amounts | Record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of records match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
|  |  | Total $ = total from input system | Yes | N/A | 0% | 0% | 0% | 0% |
| BTDM12 | Fixed Asset Accumulated Depreciation amounts | Record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of records match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
|  |  | Total $ = total from input system | Yes | N/A | 0% | 0% | 0% | 0% |
| BTDM13 | Employees | Record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of records match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
| BTDM14 | Agreed to Chart of Accounts | Record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of records match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
| BTDM15 | GL balances | Record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of records match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
|  |  | Total $ = total from input system | Yes | N/A | 0% | 0% | 0% | 0% |
| BTDM16 | Prepaid Setups | Record count equals defined total | Yes | N/A | 0% | 0% | 0% | 0% |
|  |  | Sample of records match legacy system | 100% | X% | 0% | 0% | 0% | 0% |
|  |  | Total $ = total from input system | Yes | N/A | 0% | 0% | 0% | 0% |

This table will up be updated as additional information is attained in later phases of the project.

# 15 Data Entities and Tools

The following table shows the tool which will be used to migrate each entity listed.

| **Functional Description** | **Tool** | **Scope-time** | **Scope-query/criteria/filter** | **Number of Records** |
| --- | --- | --- | --- | --- |
| Inventory Items | DIXF | 3 years | Active and/or used | 40,000 |
| Vendors | DIXF | 3 years | Active and/or used | TBD |
| Open Purchase Orders & PO receipts | DIXF | Current only | Open | TBD |
| Open AP Invoices | DIXF | Current only | Open balances | TBD |
| Customers | DIXF | 3 years | Active and/or used | TBD |
| List Pricing (A.K.A Trade Agreements in AX) | DIXF | 3 years | Active and/or used | TBD |
| Open AR Invoices | DIXF | Current only | Open balances | TBD |
| Sales and Work Orders | DIXF | Current only | Open orders/balances | TBD |
| Inventory transactions | DIXF | Current only | Qty on hand >0 | TBD |
| Fixed Asset Master | DIXF | All | Any Fixed Assets that need a sub ledger and to be reconciled with the GL. Closed Fixed Assets are acceptable | TBD |
| Fixed Asset Acquisitions (FAA) | DIXF | All | If migrated in Fixed Asset Master | TBD |
| Fixed Asset Accumulated Depreciation (FAD) (current and book) | DIXF | All | If migrated in Fixed Asset Master | TBD |
| Employees | DIXF | Last & current FY | All | TBD |
| Chart of Accounts | DIXF | All | Agreed to Chart of Accounts | TBD |
| General Ledger balances | DIXF | 2 – 5 fiscal years | All | TBD |
| Prepaid Setups | DIXF | Current and Future | All | TBD |

# Appendix A: Data Conversion Tools: A Comparison

This Appendix describes the various tools available for data conversion activities in Microsoft Dynamics AX. Some or all of the tools may be utilized to load Bottomline data into Dynamics AX.

## Tools

### Data import/export framework (DIXF)

The Data Import/Export Framework is an extension that helps you import data into Microsoft Dynamics AX 2012 R3 from files, Open Database Connectivity (ODBC) data sources and Microsoft Dynamics AX tables. You can import predefined entities, or you can create custom entities for import. You can modify data as it is imported, and you can also verify that data meets specific rules.

The Data Import/Export Framework is available from the [InformationSource services download page](http://go.microsoft.com/fwlink/?LinkId=255246). For documentation and information about the Data Import/Export Framework, see the [Data Import/Export Framework User Guide](http://technet.microsoft.com/EN-US/library/jj225591.aspx).

* **Intended users:** Application users, developers, and functional users
* **Key features:**
  + Support for import from files, ODBC data sources, and Microsoft Dynamics AX tables
  + Bulk processing
  + Synchronous processing
* **Recommended uses:** Use this tool when you must perform the following tasks:
  + Import data from another ERP system that uses dissimilar data structures. You can use the Data Import/Export Framework to map data to Microsoft Dynamics AX entities.
  + Import data that requires transformation, such as changes to number sequences.
* **Non-recommended uses:** We recommend that you not use this tool when you are working only with configuration settings.
* **Underlying technology:** SQL Server Integration Services

### Excel add-in for Microsoft Dynamics AX

Excel import is a tool that can be used for data that is in an Excel format or in a comma-separated list. You can use predefined or custom templates to help users import data. It is not a recommended tool in the Bottomline implementation. For more information about Excel import, see [Using the Microsoft Dynamics AX Add-in for Excel](http://technet.microsoft.com/EN-US/library/hh781099.aspx).

### Application integration framework (AIF) web services

You can use AIF web services to import and export data. AIF web services are included with Microsoft Dynamics AX.

* **Intended users:** Application users and system administrators for non-customized web services, and developers for customized web services
* **Recommended uses:** Use this tool when you must complete the following tasks:
  + Import many similar records, and repeat the same import at regular intervals. In this scenario, use AIF web services that use inbound ports and pipelines.
  + Take data that is in an existing file format, such as an XML export from another system, and process the data so that it matches the schema that is expected by existing or customized AIF document services. You can author transformations in either XSLT or managed code. Document services must be customized if the underlying tables and entities have been customized.
  + Access Microsoft Dynamics AX business logic. You might have to use this approach when the structure of the data is not easily represented as tables, or if the web service that you want to use is not supported by the Excel Add-in.

For more information about how to use AIF, see [Services and Application Integration Framework (AIF)](http://technet.microsoft.com/EN-US/library/gg731810.aspx).

### SQL Server backup and recovery/restore

You must use SQL Server backup and recovery to move business data to a new environment. Before the restored database can function in the new environment, you must adjust certain values, such as server names, domain names, user accounts, and URLs. For more information, see the blog post [Moving between Microsoft Dynamics AX 2012 Environments](http://blogs.msdn.com/b/axsupport/archive/2011/11/07/moving-between-microsoft-dynamics-ax-2012-environments.aspx).

* **Intended users:** System administrators and database administrators
* **Recommended uses:** Use this tool when you must perform the following tasks:
  + Archive data to another database.
  + Frequently manage database size.
* **Underlying technology:** SQL Server Integration Services

### Intelligent Data Management Framework (IDMF)

The archive function moves data from all related tables from the production database to a standby database called the archive database. Recommended for data archival and purge. For more information, see <https://ax.help.dynamics.com/en/wiki/overview-of-the-microsoft-dynamics-ax-intelligent-data-management-framework-idmf/>

* **Intended users:** System administrators and database administrators
* **Recommended uses:** Use this tool when you must perform the following tasks:
  + Archive data to another database.
  + Frequently manage database size.
* **Underlying technology:** Microsoft SQL Server

### Master Data Management (MDM)

Master Data Management (MDM) is a feature of Microsoft Dynamics AX 2012 R3 that lets you synchronize master data records across multiple instances of Microsoft Dynamics AX 2012. For more information, see <https://technet.microsoft.com/en-us/library/dn720451.aspx>

* **Intended users:** System administrators and database administrators
* **Recommended uses:** Use this tool when you must perform the following tasks:
  + Maintain reference data that is non-transactional and that tends not to change very often across multiple instances.
* **Underlying technology:** Data import/export framework

## Recommendations

The Data import/export framework (DIXF) is the generally recommended tool for data conversions when the requirement is to bring data from an external system into Microsoft Dynamics AX. DIXF is extensible and can accept data from a variety of sources. Data is pulled from a source into a staging area within AX where it can then be processed and logic can be applied in a consistent way to copy the data into the final tables in AX where it will be accessible to end users.

AIF has similar capabilities, but its disadvantages when compared to DIXF is that the external data must adhere to a strict XML format, a system must connect to a web service to send the formatted data, and extending its capabilities isn’t as simple as with DIXF.

### For migrating master data

*DIXF* has out of the box capability for importing many master data entities such as chart of accounts, released products, bill of materials, routes, customers, customer price/discount agreements, vendors, vendor price/discount agreements, and employees. It has been extended in the past to handle default and site specific order settings. Depending on your installation, warehouse locations might fall here rather than in configuration data. It could be extended to handle contacts, prospects, and GTIN codes.

### For migrating transactional data

*DIXF* has out of the box capability for importing transactional data entities such as assets, opening ledger balances, ledger movements, sales orders, purchase orders, and others. The extensibility of DIXF will allow entities to be developed for any transactional data required that isn’t supported out of the box. However, *migrating transactional data carries serious data integrity risks which should be mitigated by minimizing open transactions at time of cutover.* This cannot be emphasized enough. For example, sales orders would require special considerations, depending on what stage of the process they were in (picked, or invoiced?). Production orders, however, are not generally converted in **any** ERP implementation. The general plan is to close all production orders currently in flight, run MRP, and firm planned production orders.

## Conclusion

The Data import/export framework (DIXF) is the most extensible and adaptable tool for bringing data into Microsoft Dynamics AX from outside systems. It supports a variety of source formats and can be extended to handle new data entities quickly, compared with other tools.

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