Jet Enterprise

The Big Secret to
Painless Data Migration

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Insights from Jet Reports

The world is a dynamic place. Businesses change, companies merge, and technologies shift while applications come and go. Change is constant, so the ability to manage change is always in demand.

When we are talking about Enterprise Resource Planning (ERP) systems, change is more prominent than ever. ERP software publishers come out with significant upgrades every year or two. The companies using the ERPs tend to change at about the same pace, upgrading in a major way, or even switching ERPs entirely at about the 5 year point.

Organizations change their ERP systems in search of efficiencies to be gained from a new data structure, a new set of software tools, and hopefully the better integrated processes these systems are designed to support.

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When discussing ERP systems we are talking, in large part, about data. How that data relates to the business, its environment and the users who make the business work.

The catch is, ERP data itself is often less dynamic than the environment it lives in. For instance, the historical sales figures in the system do not change just because some of the customers are not customers anymore. A company might re-draw sales geographies, but the sales transactions themselves – the items chosen, quantities shipped and revenue collected – happened in the past and don't change.

There are exceptions. Some dimensional data will change over time – salespeople will likely come and go and shipping warehouses might be added, moved or shut down. But in general, once an event has happened, the facts about that event are static.

This is legacy data, and it can present a major problem when we are talking about a big switch to a different ERP system with a new data structure, new posting methodologies and new workflows.

So, what happens when legacy data meets a shiny new ERP system rife with promises of efficiency, improved process and a better functioning world? All those facts, events and transactions, happily living in their legacy format, won't automatically snap right into the new format.

For instance, the task of bringing forward old or outside data not only requires transforming it into a suitable format for the new system, but also posting that data. Because the process of posting also transforms the data, it can be very challenging to get the various data sets to gel into a functional whole.

Many businesses attempt to avoid this by importing beginning balances and open documents. This simplifies the process, but can leave businesses at a competitive disadvantage versus companies that have found a way to solve this problem with their history intact.

And there you are: facing the complex plans, time consuming decisions and high costs of data migration.
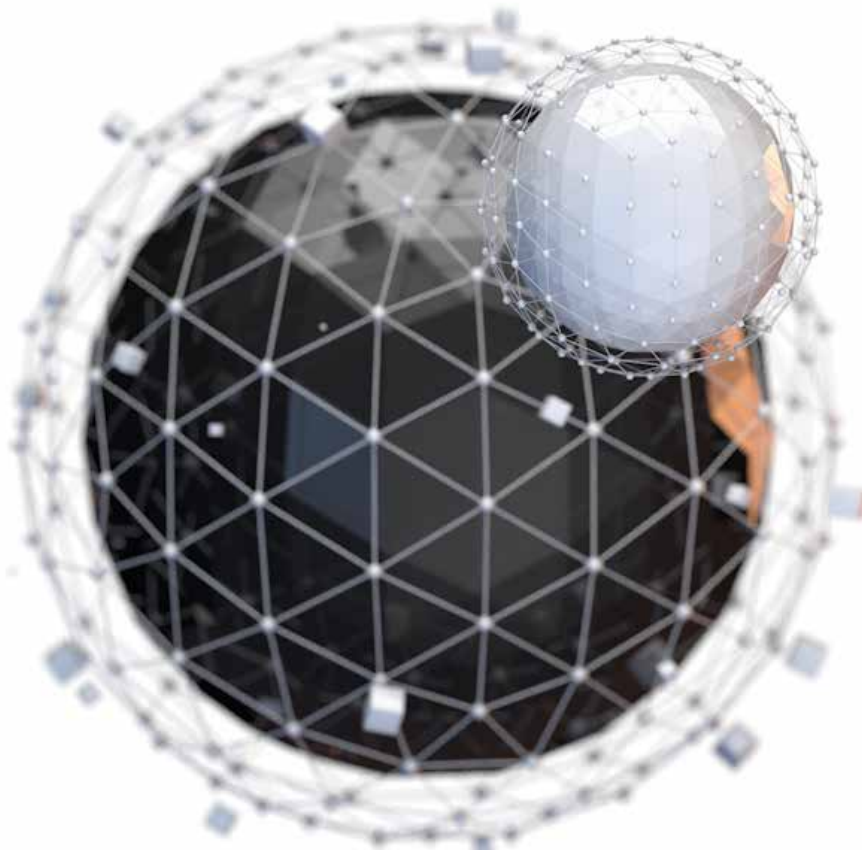
> Legacy data is valuable – and it might even represent the very lifeblood of the company itself.

Unpleasant choices

Every business wants to keep legacy data and preserve its integrity. And who can blame them? A company might have spent decades compiling it. It's the only way to show trends, reveal patterns and guide the way forward. Legacy data is valuable – it might even represent the very lifeblood of the company itself.

Important as it is, legacy data can sometimes get ignored, until it rears up 'Fatal Attraction' style and demands attention. Data migration is one of the last steps before the production phase of a new ERP implementation. The main focus up to this point is placed on choosing, planning for and customizing the various ERP modules to be deployed. The actual data the ERP was designed to house sometimes receives scant attention until go-live is imminent and time becomes a scarce commodity.

This situation is tragic because legacy data is a key component to the success of a new ERP implementation. People love their old data not only because it is valuable, but because it provides context, and context equals reassurance in the new system. When users can access old data in a new ERP with its new screens, new commands and new processes, it understandably proves to them that the new ERP is 'working'. This builds confidence, which can be a major factor in user adoption, powering through the learning curve and shortening the time-to-value of the project.

Regardless of the timeline for doing so – earlier is better – decisions and tradeoffs must be made about the historical data. These generally bubble up out of a collection of seemingly innocent questions that invite emotional responses and have far reaching implications.

- ► What is going to be migrated, and what is going to be left behind?
- ► How should we clean the old data?
- ► How should we restructure it?
- ► How much history do we need?
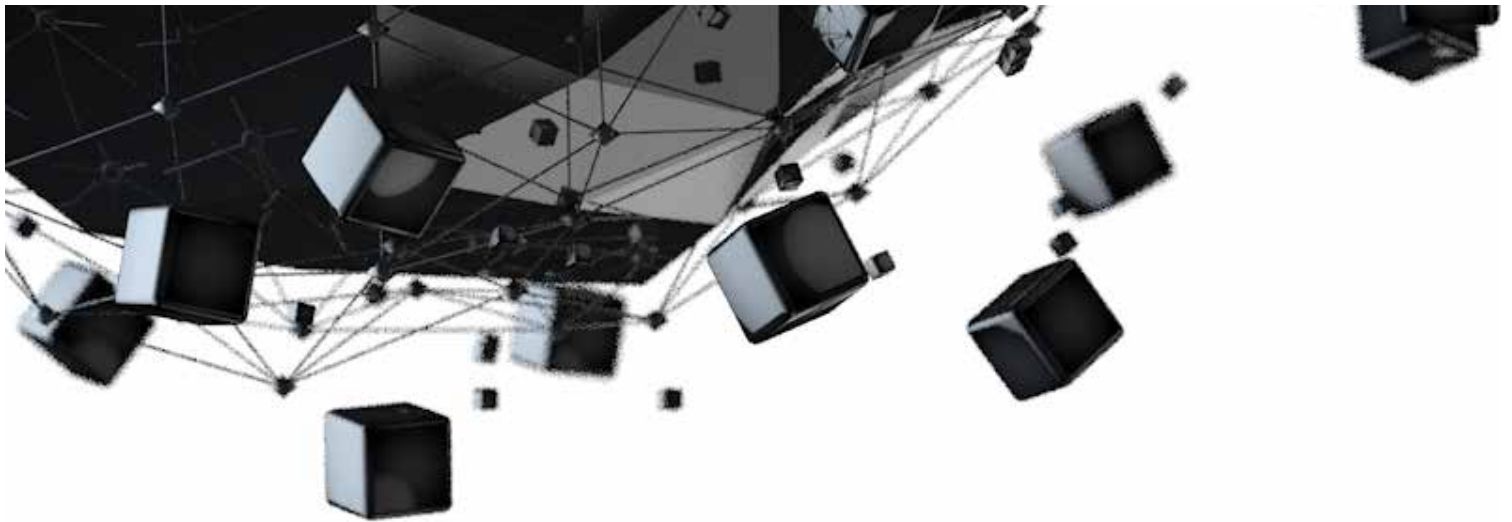
Welcome to the black art of data migration – making old data mesh with new data structures and integrating with new data that will populate those structures.

ERP data — what is it exactly?

There are two main components to ERP data: **master data and transactional data.**

Master data spans all organizational business functions and consists of information about a person, entity or object. For example, in the sales, marketing and customer service functions, master data can consist of customer numbers, contact info, service codes, warranty information and distribution details. In the finance function, master data might include GL Accounts, cost centers, department codes and company hierarchies.

This master data can be very detailed. For example, a master vendor record contains not only general information such as a vendor's name and address, but also specific information, such as payment terms and delivery instructions.

Master data remains somewhat constant over time and is really the core data about your company which forms the basis of an enterprise-wide "system of record" for the business.

Transactional data typically involves facts like quantities shipped, amounts invoiced and hours worked. They are essentially random and unpredictable and can easily add up to millions of records.

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The problem with transactions

The volume of transactional facts is usually where a large part of a migration project's difficulty comes into play. Difficulty comes in two forms. The first: in order to successfully migrate the large volume of transactional records, an intimate understanding of the old system is necessary. What are the naming conventions, what is the posting process, what and where are all of the associated records?

The second difficulty comes from the decisions these innocent questions bring about. Which facts need to be migrated? What do we need to do to them so that they fit in our new ERP data structure? This is sometimes described as the "breadth and scope" of the migration, i.e. what facts are to be migrated – breadth – and how many of them – scope?

The people concerned with doing the actual migration, those folks who have a timeline and budget to meet, will generally argue for migrating less in terms of breadth and scope. This is due to the time-consuming nature and high cost of migrating transactions. The new ERP likely does not have the same data structure and posting methodologies as the old system. Getting the legacy data to exist inside of it is arduous at best.

The actual users of the system who are operating the business, using the data to make decisions, and generally making the business run day to day, will argue for migrating more.

The resolution to this tension will come from organizational needs, but you can expect a long conversation about it, if not a full-throated and spirited debate.

A data migration strategy

What if we could make this conversation easier? What if there was a way to make fewer hard decisions about your transactional data, to be able to use more of it without the pain and high cost of integration with the new ERP?

There is an easier way: use a data warehouse.

Load the master data into the new ERP application in the traditional way, complete with all of the mappings and adjustments that are needed. Then, leave the transactional data out!

It isn't gone for good because it isn't left out entirely. Instead, bring the transactional data into a data warehouse so that it can be used for reporting purposes. A data warehouse will technically exist outside of the ERP system and this is an advantage. It will allow legacy data to be used in conjunction with the new ERP without having to go through the difficult decision processes about the data or the arduous and numerous steps necessary to actually move it from one system to the other.

This idea helps to drive an entirely new strategy behind a data migration project. Time to completion is drastically reduced, errors are all but eliminated, and testing time becomes a small fraction of what is needed with the traditional method. The result is legacy data combined with new data to show a seamless record of business transactions with no gaps in history for reporting and analytics purposes.

The key to success with this approach is the ETL tool that is used for the data migration tasks. ETL stands for "Extract, Transform and Load." The acronym is accurate because it is used to take data out of an existing system(s), transform its structure to match the new data conventions, and then transform the data itself to be optimized for reporting and analysis. The final step is to load the data into an environment where it can be easily retrieved.

Not all ETL tools are created equal, some are much easier to use than others. The key is using one that programmatically executes the bulk of the tasks necessary for moving and preserving legacy data from the old ERP.

What follows is a list of steps for a data migration project. The traditional way is outlined, and then a new approach is discussed – using an ETL tool and a data warehouse.

As you will see below, the advantages of this new method are vast: speed, simplicity, preservation of data, saving time, saving money and fewer heated conversations.

> Data extraction involves pulling data out of legacy systems. With an appropriate ETL tool, this entire process is automated and can be done in one sitting.

Data extraction

Data extraction involves pulling data out of legacy systems, usually for further manipulation, before loading into the new system. The traditional method for doing this involves porting the data using a script that must be written using the native ERP programming language. This is an expensive and time-consuming process involving manual coding and testing. If the data is in a SQL database for example, then complicated SQL scripts with Integration Services (SSIS) packages must be written. These are complex enough that they can only be written in small sections at a time. Each section is tested when the 'draft' is complete, errors identified, code rewritten, and then tested again until it is correct. It is hard, tedious and very exacting work. If a word is misspelled, or a comma misplaced, then a given script must be revisited – and re-tested.

With an appropriate ETL tool, this entire process is automated and can be done in one sitting. It can read the database schema automatically and then lay it out in a graphical format so that tables and fields can be chosen for inclusion. The Integration Services script which transfers the data from the old ERP is written automatically and correctly. Customer numbers, item numbers, posting dates, quantities and amounts are all extracted, transformed and loaded without ever touching the code or going through multiple testing cycles.

Data cleansing and harmonization

Data harmonization is the standardization of data, often from different sources, into a single format. A simple example of why this is necessary is when different parts of the organization use different customer, warehouse and supplier codes even when they are describing the same entities. Even worse is where fields in the old system have been used for more than one purpose, the result of which is that one field will hold multiple pieces of unrelated information. This is especially prevalent if multiple databases are in play and are being combined.

In the traditional way of harmonizing data, multiple manual processes are used, including dumping data to Excel and going through the records one by one. Any manual mapping exercise like this is extremely error prone, and those errors are hard to detect until the data is live. Using this traditional method, the task can be so arduous and expensive that an organization is forced to abandon its original plans for how much data it will bring over.

An ETL tool will use programmatic data cleansing rules that can be enforced easily and executed automatically. It will also allow you to create verification rules to make sure that history is accurate and that new data can also be verified. Extreme cost and time savings can be realized here. Business rules can be written to harmonize the data en masse, and if the ETL tool has a full set of features, it will allow users to even use the database meta layer itself, e.g. enumerated values in Microsoft Dynamics® AX or option values in Dynamics® NAV.

The traditional way of cleansing data involves multiple manual processes. Extreme cost and time savings can realized with a programmatic approach.

Data loading
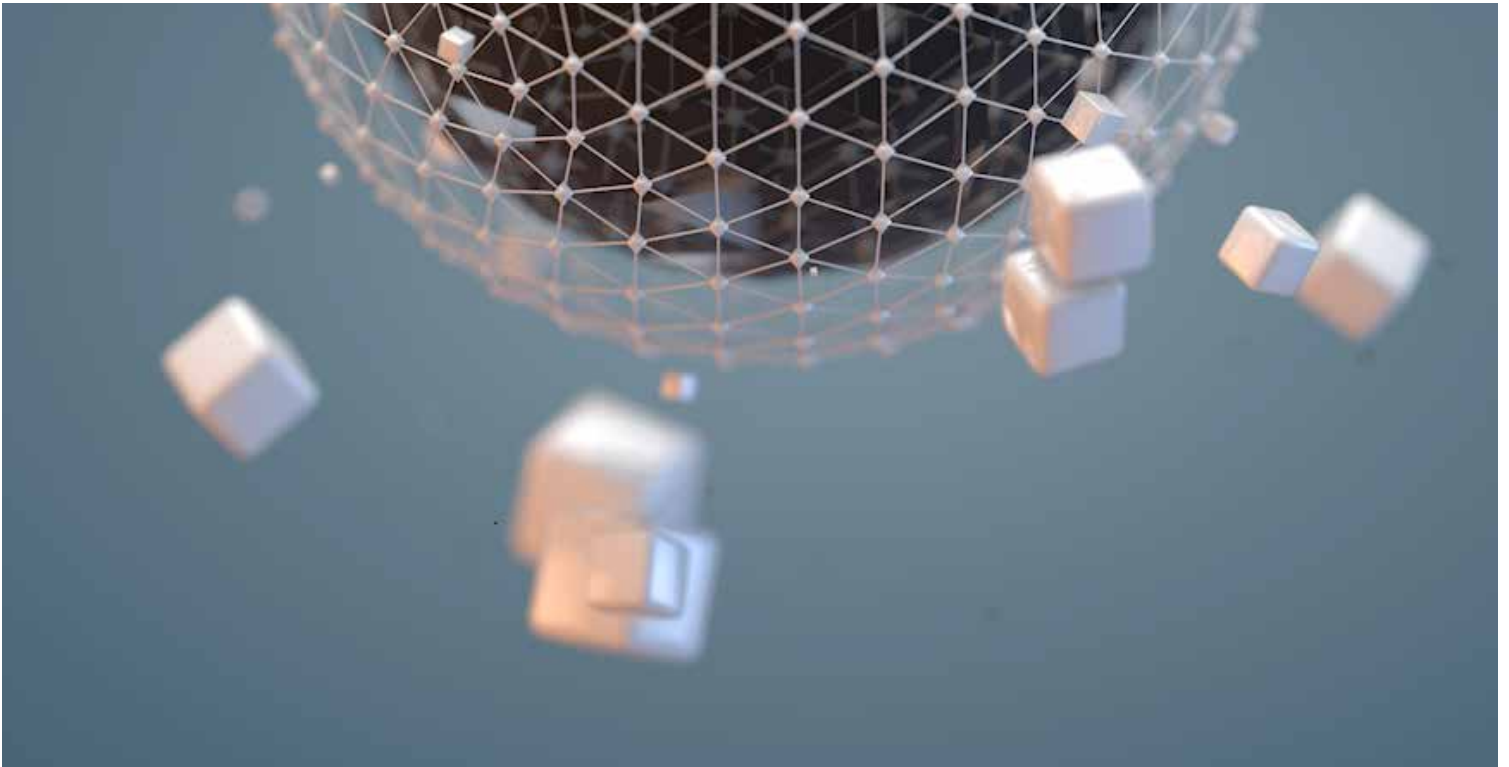
Loading the fully cleansed data files into the new ERP system is a highly detailed process typically done by a systems integrator or an ERP implementation partner. Despite being done by professionals, everyday tools like Excel or other file based applications will be used; all of which are laborious and error prone.There are some ERP-based tools that are coming to fore (DMF for AX2012 for instance), but using them is still an extremely time consuming job due to the highly specific nature of the task and the many iterations of test cycles that need to be performed to ensure accuracy and usability.

This entire process can be averted by using a data warehouse to hold data for reporting. Data is loaded programmatically into a reporting environment at the same time it is extracted from the legacy database. This greatly reduces the number of test cycles needed since an ETL process will automatically generate SSIS scripts to move the data from the old system to the data warehouse.
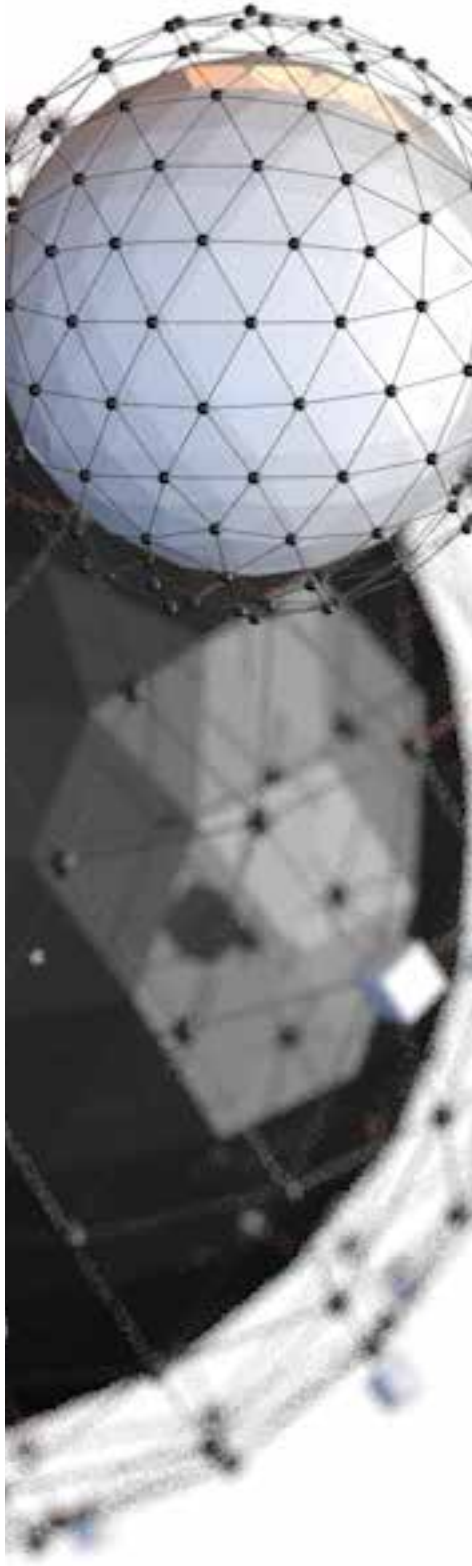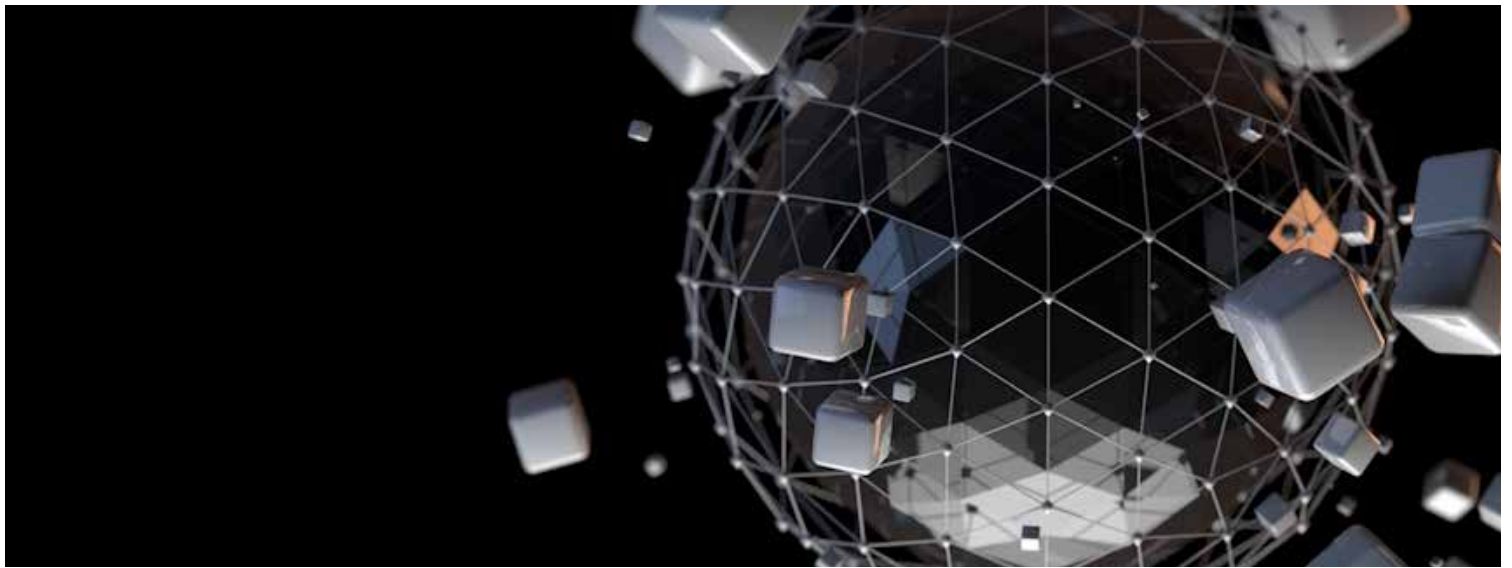
Testing

Testing is a critical activity in any migration project, and companies typically find themselves employing a combination of manual and programmatic cycles. A manual test involves checking a predefined sample of records or of specific fields. Programmatic testing may include checking data formats or searching for specific errors. These will be extensive. It includes checking individual data conversions, end to end testing of all conversions in sequence, and in tandem, with related manual processes. Especially time consuming is the process of flowing transactions through the system using converted master data.

Even if the new approach of warehousing for data migration is used, a thorough set of test cycles will still need to be conducted. The difference is that since the scripts used to migrate data have been generated automatically, errors will have been greatly reduced, if not eliminated completely. Reworking will be minimal and the whole process will go much faster.

Testing can't be avoided, but an automated approach will increase its success rate.

Data archival

Data archiving is usually a necessary step in the traditional method of data migration. This is because some data might exist that does not have obvious business value, but needs to be retained for regulatory compliance or other non commercial reasons. In these cases a secondary repository must be created and maintained. Its usefulness is often low since so much effort will have been put into defining, loading, testing and otherwise fully integrating the most important data. What data is left over is often not used on a daily basis, but must be maintained as if it is. It must be housed in secure place and then special tools put in place to query it. What results is a high effort, with low return.

Like data loading, the new approach to data migration using a data warehouse eliminates the need for any special archiving measures to be taken. The 'non commercial' data can be placed into the data warehouse in the same manner as the rest of the data. It can be housed in a special section of the data warehouse and accessed using the same familiar processes as transactional data is for reporting.

A Happy Tale

We were recently approached by a well-known food manufacturer who was transitioning from their aging Deacom ERP to Dynamics. Due to the time and expense involved they were contemplating leaving their historical transaction detail behind. This was more than 7 years of history on sales trends, utilization rates in the factory and delivery performance – historical information that was vitally important to measuring the ongoing success of the business.

After mapping their legacy master data to match the new Dynamics structure, we consolidated all of the historical transactions into unified tables in the data warehouse: all sales information into a single sales transaction table, all finance transactions into a single finance table and so on. This has made detailed, chronological reporting available from a unified set of tables, allowing a streamlined and easy to understand experience for end users.

Their reporting is also much faster. One of their major departmental expense reports that used to take 75 minutes to execute now executes in under 5 minutes. Sales and operational reports which used to take over 6 minutes to run now take less than 20 seconds, allowing their users to be more productive on a daily basis.

Tying it all together

Data migration projects are rarely seen as value-added technology activities. Rather, they are seen as a necessary evil deriving from the need to upgrade and replace systems, or merge and rationalize technologies. Using ETL and a data warehouse that is tightly integrated with the new ERP system goes a long way in reducing the time, expense and organizational struggle associated with a typical data migration project.

There is an added benefit to this methodology when using a richly featured ETL solution that enables not only data migration, but a full Business Intelligence environment as well. Data migration experts have long recommended implementing a Business Intelligence solution at the same time as conducting a data migration exercise. With the right ETL solution the data warehousing methodology changes a necessary evil into a value-add project. Using the same tool for data migration, consolidation and Business Intelligence allows the use of the same set of resources, processes and techniques, saving time, money and lowering the risk of a major IT project going astray.

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