A White Paper

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# MOVING LEGACY DATA

# TO YOUR

# ENTERPRISE RESOURCE PLANNING

# SYSTEM

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**OLAV & CO., INC.**

## EXECUTIVE SUMMARY

This paper provides a detailed overview of the data conversion methodology employed in numerous successful large scale Enterprise Resource Planning (ERP) implementation projects.

It is intended for IT Project Managers, Business Functional Area Project Managers and others who are tasked with legacy system data conversion duties when implementing major ERP systems such as SAP, Indus PassPort, PeopleSoft, Maximo, Oracle Financials, Mincom, EPRI Pasta and others.

With the increasing complexity and sophistication of today's ERP systems the use of a formal and proven legacy system data conversion methodology is a critical success factor for any implementation project.

In this paper you will be introduced to the challenges of data conversion and implementation. These include assembling an effective data conversion team, establishing a data conversion computer environment, extracting data from multiple legacy sources and platforms, conducting Business Process Reviews using legacy data, load planning for data conversion, reviews of converted data, managing multiple implementation project regions and functional system testing.

You will also read about the weaknesses of the traditional data conversion methods, such as inconsistent methods of data mapping and system code selections by different business functional teams and late starts on building the new system's user acceptance and how this methodology addresses those weaknesses.

Lastly, you will see how utilizing this methodology will result in consistent conversion data integrity, meet the project schedule, satisfy data auditors, vastly improve the Business Process Review sessions and greatly reduce any post-production data problems.

# A.    INTRODUCTION

This paper presents what OLAV considers to be an effective methodology for successfully migrating legacy application data to a major Enterprise Resource Planning (ERP) software system.  The tools and techniques presented are equally relevant to any large data conversion project.

## *Objectives*

The key objectives of this paper are to:

- Present a thorough approach for converting legacy data

- Discuss the importance of the data conversion team, software and environment

- Emphasize the importance of managing Initial System Code table values

- Highlight other key requirements for a successful ERP system implementation

## *Contents of this Paper*

We start by reviewing The <u>Challenges of Implementation</u> of a large, integrated business or enterprise application, focusing primarily on the task of moving data from the legacy system(s) to a new ERP application.

The <u>Weaknesses of the Traditional Methods</u> of data conversion will be presented, followed by a recommended <u>Solution</u>.

The <u>Step By Step Data Conversion</u> section lists in a relatively chronological sequence the main tasks of data conversion methodology.

The <u>Benefits</u> that will be realized using these tools and techniques, as well as the <u>Results</u> one can expect during the data conversion process help to summarize the advantages of this approach.

Throughout this paper, specific application development software tools, database management systems, reporting tools and connectivity software are discussed.  The methodology presented is not specific to these tools and can be implemented using any number of comparable tools.  What is of most importance is the use of flexible, high productivity PC-based tools and a database server, as well as an experienced, versatile data conversion team.

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## B.    THE CHALLENGES OF IMPLEMENTATION

### Assembling a Data Conversion Team

The best data conversion team is one whose members are well versed in current computer infrastructures, current software tools, legacy ERP systems and processes and possess good communication skills.  Members should be familiar with the legacy application, as well as the new application.  They should work well together as a team and provide complementary talents to the group.  One of the primary rules is to work cooperatively with all team members, and to solve problems as a team.  When there are too many individuals involved in the data conversion process, and/or individuals who are not solely dedicated to the data conversion effort, the implementation results will suffer.

The success or failure of new information technologies is often directly related to the success or failure of an organization's project management of that effort.  A wide range of factors should be considered. These should include technical mastery, and behavioral and managerial factors such as leadership style, motivation, maintaining effective working relationships with other project stake holders and team building skills.

### Establishing the Data Conversion Environment

The data conversion environment encompasses the hardware, networking protocols and software tools employed by the data conversion team.  Exploiting the best features of each component will provide the data conversion team with the rich and flexible tool set required to convert and maintain large amounts of data.  Without an integrated environment, resources will be wasted, efforts will be duplicated and data integrity will be compromised.

### Extracting/Collecting Data from Various Sources/Platforms

Extracting, storing, cleaning and maintaining data from the various source systems can be especially challenging.  Knowing what information is the most current, and transferring information from various hardware platforms and file formats is an arduous task.  Extracting different versions of the same data, storing it in multiple locations and tying up disk space are common pitfalls of the data collection process.

### Defining & Controlling Base System Values

The installation of the ERP system loads the system tables with initial values which contain system defaults (i.e., test data and other example values).  These initial values are often referred to as "seed data."  At some point after the installation, one

must review the seed data, and decide which values are appropriate, and which are not to an installation. Most importantly, these values must be controlled so they are not accidentally changed during the implementation.

### Defaulting Values

Also important is the ability to define default values for elements required by the new system when there is no corresponding legacy data. When creating the load files, any default values should be included.

### Client Participation/Involvement During Data Conversion

One of the most effective ways to involve the end-user in the data conversion process is to display actual legacy system data through the ERP system's screens. The challenge is getting converted legacy data and the associated ERP system's initial system values loaded in a timely fashion so the users can experience the new application with their legacy data.

### Completing an Effective Business Process Review (BPR)

The Business Process Review project task provides an excellent opportunity to begin the definition of initial system values. When the various functional departments involved in the implementation go through the BPR process, a method of capturing initial system values required for each functional business area is required, and coordination and review across multiple BPR groups must be managed and controlled to prevent overlaying or redefinition of system code values. This methodology dramatically enhances the BPR process by using fully loaded, client-specific data during the BPR process.

### Maintaining Review & Sign-Off of Data

During the initial system code values definition and the legacy data conversion, the values should be reviewed by the client and signed off as being correct and complete. This is essential for tracking what data has been converted and what data still remains. This is a significant component of the overall project schedule.

ERP systems often include hundreds of data tables. During each test load and the production load reviewing which tables should be emptied, which tables require data loading and which tables should be left untouched should also be documented.

### Load Planning/Project Planning

When the time to load production data approaches, the data conversion team should know as precisely as possible which load programs must be run serially and in what

order, and which ones are candidates for parallel execution. The team should have documented, based on previous test loads, the elapsed time required for each step in the data conversion process, including extract, cleanup, load file preparation, data file movement and transfers, load program execution, error recovery and any other steps in the process. When there is a production load window defined in terms of hours, not weeks, every minute counts, and knowing the status of the load at every step along the way is absolutely essential.

### Managing Multiple Regions

A typical implementation will consist of multiple ERP system regions including development, test, conversion, training, pre-production (QA) and possibly others. Maintaining consistent data across these different environments, especially the initial system code tables, is important throughout the life of the project. A method to refresh any of the regions with a quality (i.e. reviewed and approved) set of base data, including tailored security definitions, system preferences and initial system code table entries, is essential.

### Data Integrity/Referential Integrity

As with any large, integrated database application, periodic integrity checks should be performed. Before preparing the load files and starting the load process, the team should verify that the load data has both referential and domain integrity. This will prevent errors during the load operation.

### Loading the Data (Inserts, Error Analysis, Load Programs)

Loading data into the ERP system requires the use of load programs and direct table loads, as well as the use of database utilities. Procedures must be established to load initial system code values, execute the load programs in the correct sequence and capture and review any error conditions encountered during the loads. A strategy for error recovery must be developed and tested.

### System Testing and Checkout

Once the data has been loaded, the system should be tested to validate not only the converted legacy data, but the base system data as well. This includes initial system code tables, preferences, security and other system options. A final referential integrity check is also essential.

## C.   WEAKNESSES OF THE TRADITIONAL METHODS

It has been our experience in past implementations of large application systems that traditional methods are not the most effective means of establishing the initial system optional and required code values, or extracting, manipulating and loading legacy data.  (See figure-1). Some of the areas in need of improvement are:

- Separate (inconsistent) methods used per Business  module

- Separate (inconsistent) methods used by different team members

- Multiple copies / versions of data

- DASD space management

- ERP system Region Synchronization and Control

- Inadequate control over initial optional and required code values

- Inadequate control over multiple regions

- Unmanageable data extract process

- Mainframe outages / slowdowns

- Inflexible, low-productivity tools

- Rigid, inefficient conversion environment

- Integrity checking too late in the process

- Security definition and testing too late in the process

- Late start for formulating user acceptance of the new system

- Late start for communicating data cut-off dates with the end-user community

Figure – 1

## D.   SOLUTION

### *First Things First: Clearly Define the Scope and Expectations of Project*

Before starting any project, several things need to be discussed and clearly stated so that the project team can meet the expectations for the project.  The team must document the high-level strategy of what the project is trying to accomplish so that all parties can understand the resources and systems involved.  Once the scope of the project has been agreed to, each party needs to assign one Project Manager /Representative to manage the overall communications and to create an agreed upon process for status reporting and issue resolution.

The Data Conversion Project Manager will complete and deliver a Project Plan for the data conversion to the client point of contact. This plan will include the high-level scope, estimated duration and budget, assumptions, risks and communication and

change control processes. Signing of the contract and agreement to the plan initiates the beginning of the data conversion project.

### *Develop a Schedule to Succeed*

The Data Conversion Project Manager will work closely with the client's Project Manager to develop the project schedule, estimate duration and dates, as well as assign appropriate resources. The Data Conversion Project Manager will report weekly against the Project plan and schedule.

### *Build a Small, Integrated Data Conversion Staff*

The Data Conversion team should be a small team, ideally no more than five to seven people. One or two team members should be primarily responsible for legacy data extracts and the resulting extract files. Two to four people should be dedicated to data mapping, legacy data cleanup, data conversion and data consolidation. One individual should be responsible for managing the data warehouse, importing converted data and preparing the load files.

Team members should also be cross-trained to provide extended support in any of the data conversion areas should any team member become unavailable.

The team members should possess a wide variety of skills including both PC and mainframe programming skills, legacy system knowledge, as well as knowledge of the new ERP system, as well as experience in data manipulation, data transfer between multiple platforms, SQL and other database language skills, good planning, problem determination and communication skills.

The data conversion team should have access to business subject matter experts and to an IT resource. These resources are critical to the data mapping efforts and will require the authority to make data decisions. These decisions will build the foundation of the data being converted from the legacy system. There are times in the schedule where the subject matter expert will be required 100%, such as data mapping sessions and testing. This will allow a quick turn around, as well as early detection and resolution to any issues arising from data mapping decisions.

The members of the data conversion team should be dedicated solely to data conversion. It is imperative that project stakeholders and team members understand data conversion is not a part-time job.

### Establish A Database Server Repository (Conversion Warehouse)

Establish a data repository or warehouse on a database server accessible by all team members. Database servers such as Sybase SQL Server, Microsoft SQL Server, Oracle, DB2 and Informix are good candidates for managing the data warehouse. These are powerful, relational databases with broad connectivity to mainframe and mid-framed PC platforms.

The tables defined to the database server should be exact replicas of the new ERP system tables. This allows definition of a complete replica of all tables used by the system, including legacy data as well as security, preferences, initial system code tables and any other required tables.

Having this "single copy of the truth" provides the data conversion team with tremendous opportunities for data integrity checking, loading and refreshing multiple new ERP system regions, and controlling all data values.

A file server may also be required to store the large extract files from the legacy systems and maintain them in their original format.

### Setup Local/Wide Area Network

The ideal data conversion environment is a local (or wide) area network. It will need to support File Transfer Protocol (FTP), mainframe access, E-Mail, Portal and connectivity to necessary file and database servers. For companies with large geographical areas a Virtual Private Network (VPN) connection is also beneficial to any out of WAN area team members. Early accessibility to these networks is key to the success of meeting the project schedule, and is critical to possible use of actual client legacy data in the Business Process Review efforts.

### Exploit PC-Based, Multi-User Tools

Moving legacy data off the mainframe to network-based PCs and file servers makes it available to a number of very powerful and highly productive software tools. These range from spreadsheets and reporting tools to sophisticated database management and application development tools. Most of these tools provide integrated access to database servers using ODBC, SQL Links and other SQL Connectivity options.

Once legacy data extract files reside in this PC environment, these powerful tools can be effectively used to convert, clean-up, consolidate and transform data. Ad hoc queries can be performed and analysis reports can be quickly generated. Data can be imported and exported by the PC tools, and when necessary, programs may be quickly developed or customized to transform or load data.

When compared to the relatively rigid and inflexible mainframe environment, the PC and network environment is ultimately much more suited to the dynamic nature of data conversion efforts.

### Develop Generic, Cross-Platform Data Transfer File Format

When moving data between various platforms and software packages, it is highly desirable to develop a generic data transfer file format that can be read and written by all software tools employed for data conversion. This implies that all data will be represented in character format (packed and binary fields will be converted to character format) and that field delimiters are standard.

A portable file format should also include the table/file definition for each file. This information can be used by various data conversion programs and import/export utilities to check for changes in file/table structures.

### Extract Legacy Data, Clean Up and Store in Conversion Data Warehouse

Legacy data should be extracted to flat files in either a delimited format or a fixed format. Delimited formats tend to minimize space requirements. Numeric fields, date fields and packed fields should be converted to character formats. Files should be extracted in their entirety, including all rows and all columns without any filters.

Using PC-based tools, including spreadsheets, databases, and ad-hoc query tools, legacy data is cleaned up, consolidated, and mapped into the target table format. The data files are exported in the portable file format and imported into the conversion data warehouse.

Once in the conversion data warehouse, minor data corrections may still be made, and default values for missing data are inserted. Additionally, warehouse tables can

be easily viewed, sorted, queried and reported against. End-user review and sign-offs for each table are also maintained in the conversion data warehouse.

### *Document Review Process*

As individual tables are reviewed and approved by the data conversion team and functional-user department(s), their review status should be recorded, along with the review date and reviewer's initials and comments. This provides an audit trail documenting the data conversion process.

An audit trail should also be maintained for all code values as well as all preference settings.

### *Use Tools throughout the BPR Process*

The Business Process Review (BPR) sessions are a critical step in both understanding the functionality of any given ERP application, as well as the beginning of making decisions about initial system code tables, preferences and security settings. As these decisions are made and values identified, they should be stored and maintained in a PC-based tool, and loaded into the test system at the end of each BPR session, or more frequently as required. Comments should also be maintained with each set of values identifying which BPR group defined the values, along with any clarifying notes or explanations. The BPR tool manages the decisions and values defined by multiple BPR groups, to identify possible conflicts arising among the groups. This allows immediate resolution during the BPR process rather than in post-BPR discovery, with the untimely identification of problems.

## E.    DATA CONVERSION – STEP BY STEP

What follows is a checklist of the main data conversion steps and the key tasks associated with each. They are presented in (mostly) chronological order. Items listed in brackets [] refer to specific tools, protocols and databases, used by OLAV, but not required. Any software that provides similar functionality may be employed in this solution.

### *Project Scope*
Project Management and Project Stake Holders agree upon the scope of the project

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### Project Schedule

Produce a Conversion project schedule and merge this with the overall ERP Implementation schedule [Microsoft Project] or other Project Scheduling tool

### Setup Conversion Data Warehouse (Server) Environment

Setup analysts workstations on a Local Area Network

Install and configure SQL database server [Microsoft SQL Server]

Install warehouse management tool [Paradox Client/Server]

Configure SQL Connectivity options [TCP/IP, Borland SQL Links, ODBC]

Install legacy data cleanup tools [Pick, Paradox Runtime, Visual Basic, Microsoft Access]

### Define Conversion Data Warehouse

Import the new ERP system Meta data from system tables

Create the new ERP system tables in data warehouse

Create supporting tables in warehouse (required by warehouse tools)

### Data Mapping Sessions

Appoint functional users and an IT Lead to the data mapping team(s)

Generally there is a team for each of the ERP system's Functional Business Area's being implemented (i.e. Work Management, Supply Chain, etc.)

A formal data mapping methodology should be utilized for these sessions

Identify mapping session facilitator(s)

Obtain signoff of the final mapping results, but understand that some (limited) mapping changes will occur as the Business Process Reviews continue and later as system cycle testing points out new business realities.

### Import The New ERP System's Original Base Data into Data Warehouse

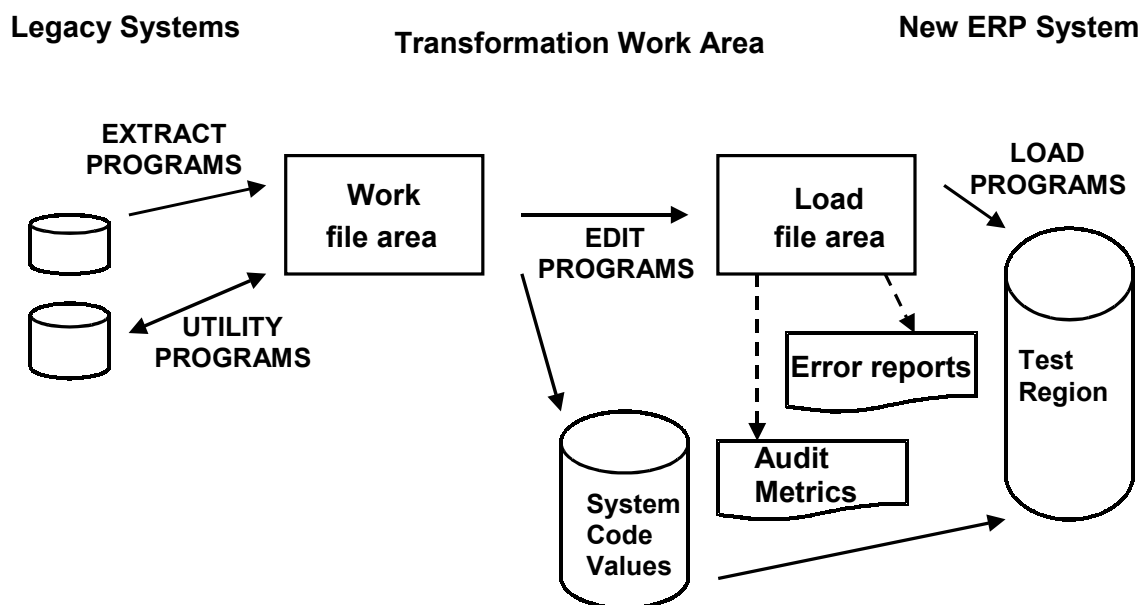Import optional codes and any initial system preference settings into warehouse (See figure-2).

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**Legacy Systems**  **Transformation Work Area**  **New ERP System**



Figure - 2

## Extract all Data from Legacy Source(s)

Clean up as much data as possible in the legacy system

Create flat files in character format – unpack numeric fields

Include all rows, all columns – don't filter

Store on network file server

Establish a schedule and the procedures necessary for periodic legacy extracts

## Manually Enter Data in PC-Based Data Collection Tools

Create spreadsheets for simple data entry tasks

Build database applications for more complex data entry tasks

Use multi-user network applications whenever possible

Distribute standalone applications if required

Use for collecting Contract, Employee, Equipment, Vendor, etc. information not available in electronic formats

Import captured data into data cleanup tools if necessary

Import "clean" data directly into the conversion data warehouse

### Loading Binary Large Objects (BLOBs)

Some ERP environments allow binary large objects (graphic files, audio files, etc.) to be stored and displayed by system screens. If any legacy data exists in one of these BLOB tables then that data conversion must be addressed.

### Cleanup/Consolidate Data

Use multi-user PC tools to analyze and clean up data

Write small programs for repetitive tasks

Provide user interface to assist/review clean-up effort

Generate reports for user review and approval

Can be used for all types of data, both base data and converted data

Export data in portable data transfer format

### Import Cleaned-Up Legacy Data into Conversion Data Warehouse

Import data into warehouse via data transfer format

### Import Manually Entered Data into Conversion Data Warehouse

Import data from spreadsheets, database applications and text files directly into data warehouse

### Define New ERP System Security Matrix

Import security matrix from spreadsheet

Reorganize spreadsheet data into new ERP system table format

Export security definitions into portable data transfer format

### Define and Review New ERP System Base Table Values in Data Warehouse

Update and review Preferences definitions and document review date and comments

Import security definition files via portable data transfer format

Update and review optional and required code values and document review date and comments

Review and document table load action (i.e. load, empty, ignore) for each table with comments

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### Define and Review Application Values in Conversion Data Warehouse

Update and review base application tables containing data such as:

- Company, facilities, departments
- Buildings, units
- Financial, GL, cost centers, cost elements, bank
- Users, employees, agents
- Equipment types
- System codes
- Preferences

### Define and Review Default Values

Define default load values for missing data (i.e., dates, User IDs, etc.)

Generate default values report

### Generate And Review Summary Audit Reports

Print audit reports for all optional and required system code tables

Print audit reports for Element to Screen Where-Used

### Verify Data Integrity

Check referential integrity

Check domain integrity

Check data format integrity

Check major balancing routines

### Table Inventory (Run CREATE TABLE Comparison)

Create Load Files (by Implementation Project Regions)

Update GENARG and TIMESTAMP fields

Update any required number generator entries

Select single table, group of tables or all tables for load file inclusion

Create SQL insert statements

Create Load program files

### Verification & Validation (V&V) of Converted and Loaded Data

Conversion team members pre-review the loaded data prior to turning over to the functional-user team members.

Functional-user team members verify and validate that loaded legacy data was converted using agreed upon data mapping rules and that the correct data was loaded (Inventory quantities/Work Order steps/Purchase Order line item quantities, etc.).

Demonstrate to functional-user team members that their legacy system data was fully converted into the new ERP system tables through balancing routines. Balancing documents are used for legacy data that conforms to counts and totaling. For example, totals that can be "balanced" include inventory quantities and extended dollar values; open purchase order quantities and extended dollar values; and for nuclear sites, radiation dosage tracking totals. Balancing documents are used in addition to the Verification & Validation reports.

This task is an iterative task that is performed multiple times from the first test load and through the production load

Validation is against the mapping rule documents and the extracted legacy data

Functional Leads sign off on the final conversion V&V

### Produce a Final Project Documentation Package

Produce a final documentation package to be presented to the client's project manager. This package serves as an "auditable trail" of the entire project. The final documentation package, generally on a CD-ROM, should contain at least these entries:

- Contents and Conversion Process Overview

- Initial legacy data or where the data resides

- Data Mapping Specifications (by Business Functional Area)

- Client input spreadsheets and cross-reference files

- Data Load Program Input Files

- Final data or where the data resides

- Conversion Balancing and Audit Trail Reports

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## F.    BENEFITS OF USING THIS METHODOLOGY

### *Data Integrity*

Data integrity must be maintained throughout the data conversion process to help ensure error-free loads and a stable production system.  Maintaining all converted legacy data, base system tables, optional system codes, preferences and security tables in an integrated conversion data warehouse powered by a relational database management system provides the ability to guarantee data integrity well before the new ERP system load process begins.  Problems can be identified early, and corrections made in the warehouse, thereby minimizing errors during the data load phase.

### *Interactive Business Process Review (BPR) Support Using Client Legacy Data*

Enhancing the BPR process by loading actual company legacy data dramatically improves the effectiveness of the BPR process, and minimizes overlaying of selected system code values as multiple functional business groups participate in BPR sessions.  By maintaining the agreed upon code tables in the data warehouse, the BPR region can be refreshed at anytime with the latest BPR data, and any other regions can be refreshed at the same time, which helps keep training, testing and QA regions up to date.

Although some ERP implementations use test data during the BPR process, the BPR process can proceed much further when using actual client data.  Because of the large size of ERP systems, reviewers can only envision a limited number of operations without the real data in view.  An initial full load of client data prior to the BPR process (based on the knowledge of an experienced data conversion staff) can save at least 10% in cost during a project.  The cost reduction results from minimizing rework, minimizing post-production problems, minimizing user frustration, and maximizing user acceptance.

### *Documented Review Process*

Maintaining the review status and associated comments of each application data table, optional system code tables, security and preference tables and the new ERP system's base tables ensures that all tables have been reviewed.  Tables may be marked for loading or emptying, or simply skipped.

Without this audit, certain tables and/or values may be missed, while others may be reviewed more times than needed.

### Responsiveness/Rapid Turnaround

Using PC-based, multi-user tools enables the data conversion team with flexible, powerful, integrated software resulting in the highest productivity throughout the data conversion phase.

### Portable Environment

Once the legacy data has been moved to the PC/network environment, the data conversion environment remains fairly independent of the mainframe. With today's powerful notebook computers, the entire legacy data can be loaded and transformed on a single Quality Controlled notebook PC.

### Training with Client Data

What better way to educate new ERP system users than with their own familiar data. It brings relevance to the training tasks by showing them how their data will look in the new system. In addition to the application data, any security profiles can be loaded into the training region in advance, providing the added benefit of enabling further testing, de-bugging and validation of the security profiles, prior to production.

Conducting training with end user data and the proper security profiles will provide a much more effective training environment and a positive learning experience for the students.

When the student finally becomes a production user the new ERP system application will behave exactly as they were taught. This results in no surprises and significantly increases user acceptance.

### Shorter Data Conversion/Implementation Cycle

Eliminating many of the traditional steps in defining and maintaining data in a multi-region environment will dramatically reduce the time spent converting data and loading multiple regions. Supporting the Business Process Review (BPR) sessions with integrated tools, loading education regions with client data, maintaining end-user review audit trails and eliminating data redundancy all help shorten the overall implementation cycle. Data conversion will no longer be on the critical path, and project costs will be lower than historical costs.

### "Single Copy of the Truth"

The data conversion warehouse contains all of the data necessary to reload an

entire new ERP system region.  It is the only source of this data, and all changes required to any data is made in the conversion data warehouse.

### Broad, Consistent Support for Multiple Regions

Because all new ERP system regions are loaded from a single conversion data warehouse, synchronization is maintained between all the project's regions. The importance of properly synchronized Implementation regions has been demonstrated many times during prior system testing and other "expected results" verification periods.

### Production Data Warehouse for Reporting

Building a data warehouse for the data conversion effort paves the way for a production data warehouse.  Since the data conversion warehouse contains a mirror of the ERP system data tables, it can be used in the production environment to support ad hoc query and reporting activities.  This will offload processing from the legacy system environment to the data warehouse.  Depending on the end-user requirements, the data warehouse can be refreshed as needed.

### Provides a Tool to Aid in the Migration to Newer Software Releases

By maintaining a one-to-one mapping between the data warehouse tables and the new ERP system tables in both the current release and the new release, the task of re-mapping and moving data is greatly simplified.  The majority of the data analysis and scoping effort can be automated via software tools.  The migration task then becomes one of evaluating the differences between the system releases.

# G. THE RESULTS AND CONCLUSION

## *Meeting the Project Completion Date*

Using high productivity tools and the data warehouse approach allows the data conversion team to focus on a single set of data in a single environment. Data inconsistency errors will be reduced, regions will be stable and synchronized, the Business Process Review phase will be highly effective and the training environment will more closely represent the final production environment. This eliminates many of the project-delaying interruptions that threaten project completion dates.

## *Provide a Quality Data Platform For Your ERP System Implementation Team*

By maintaining a single copy of the truth, the quality and integrity is maintained and in fact improved as additional data is added to the conversion data warehouse. Since the new ERP System regions are loaded directly from the data in the warehouse, they will contain the most current and consistent information at all times.

## *Prevent Project Cost Overruns*

Project cost overruns due to implementation delays are avoided by:
- Improving the BPR process
- Maintaining the most current converted data in the training, testing, quality assurance, and development regions
- Significantly reducing the number of mistakes, rework, and duplication of effort throughout the data conversion phase.
- Additional costs incurred due to post-production data problems will also be greatly reduced.

## About OLAV & Co., Inc.

Equipped with a suite of electronic tools for database manipulation, database conversion and database management, OLAV & Company, Inc. is a small business based in Hopkinton, Massachusetts. OLAV has gained extensive experience, knowledge and abilities in the design, modification and manipulation of large databases, and the conversion of large legacy databases. Most OLAV clients are in the Fortune 500, and OLAV has the reputation of consistently meeting or exceeding the data conversion needs of its clients.

## For More Information

For more information regarding this presentation, or other OLAV products and services, please visit OLAV's website at http://www.olav.com, or e-mail OLAV at Eric_Jonassen@olav.com.

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