



# Eprentise<sup>®</sup> Consolidation Technical Overview White Paper



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Eprentise<sup>®</sup> provides automated consolidation software that copies, changes, filters, and merges enterprise data and applications.

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# Eprentise® Executive Summary

<p><b>Business Pain:</b></p>	<p>Inability to change (mergers and acquisitions, different configurations throughout the organization)          Silos of information (inconsistencies, incomplete or incorrect view of the data)          Maintenance of multiple systems with similar functionality.          High cost of implementing alternatives (Enterprise Application Integration, Service-Oriented Architecture, Reimplementation of ERP systems)          Duplicate data (adversely affects customer service, increases cost of maintaining redundant information, impedes globalization)</p>
<p><b>Eprentise® Solution:</b></p>	<p>Eprentise® is a generic software product offering that is used to copy, merge, filter, and change different applications within an enterprise. This product can be used for mergers and acquisitions, divestitures, finding and reconciling duplicates, or simply bringing together different applications that employ the same business processes.</p> <ul style="list-style-type: none"> <li>➤ Software that provides consolidation of any two relational databases.</li> <li>➤ Software that merges data, structures, and business processes - no coding</li> <li>➤ Software that resolves duplicates and inconsistencies between databases</li> <li>➤ Software that produces repeatable, rules-driven outcomes</li> </ul>
<p><b>Eprentise® Value:</b></p>	<p>Savings over manual methods and alternatives can range from \$200,000 to tens of millions.          Annual savings result from reduced costs of maintaining multiple systems and duplicate data.          Time for a consolidation project is reduced by as much as 85% on both large and small projects over more manual methods.          eprentise facilitates the alignment of systems with business changes such as mergers, acquisitions, divestitures, reorganizations and hastens the implementation of new technologies by changing data at the configuration, master, and transaction levels automatically. By allowing applications to be changed, eprentise provides the ability to recognize the financial rewards of these business and technology initiatives quickly and reliably.</p>

<p><b>Eprentise<sup>®</sup> Competitive Advantage:</b></p>	<p>Alternative solutions keep the existing systems and implement a middleware solution, create a warehouse or repository, or create a services-oriented architecture to tie the existing systems together. Each of these alternatives is very expensive, requiring a significant amount of consulting resources initially and on an ongoing basis. Allowing existing applications to remain doesn't accommodate business changes or resolve inconsistencies among disparate applications. Though the alternatives mentioned do provide an “enterprise view” of the data, the ongoing operation of different systems with the same functionality prevents the business from operating in a consistent way.</p>
<p><b>Eprentise<sup>®</sup> Management:</b></p>	<p>Helene Abrams is a well-known world leader and Subject Matter Expert on Consolidation and serves as the CEO and President of eprentise<sup>®</sup>, LLC. She is credited with conceptualization and architecture of a pioneering software product for consolidation that has helped marquee organizations to leverage the synergies of existing software solutions. The product offering of the company is the brainchild of Helene. Her technical knowledge and expertise along with her prior experience in development of similar technology solutions are pivotal in development of a solution that is projected by industry experts as the only full consolidation solution in the world. Helene is recognized as a visionary leader with demonstrated excellence in strategizing operations at the macro as well as micro level for driving the growth of technology start-ups and turning around the performance of organizations.</p> <p>Prior to eprentise, Helene founded Crystallize, a company that provided the first ever solutions for Consolidation of ERP packages. She successfully architected the original product design and defined a new market category. Helene managed the start-up and growth of the new organization and drove the growth of the company to a team of over 100, securing over \$25mm in commercial, venture and private equity financing. She provided leadership in development of strategies and established tactical goals in the identification, acquisition and retention of customers that included Sun Microsystems, Honeywell, British Telecom, Intel and Cummins Engine, with average sale prices to these customers exceeding \$400K.</p> <p>Helene's prior experience included executive level</p>

	positions with Big 5 Technology companies including Deloitte & Touche, Ernst & Young and Oracle.
<b>Eprentise® Proposal:</b>	<p>The major consolidation steps include:</p> <ol style="list-style-type: none"> <li>1. Identification of pilot databases</li> <li>2. Establishment of project environment</li> <li>3. Identification of target system</li> <li>4. Confirmation of configuration of target system</li> <li>5. Assessment of consolidation requirements including required business changes and data changes</li> <li>6. Mapping of source database to target database</li> <li>7. Definition of consolidation rules</li> <li>8. Identification of inconsistencies</li> <li>9. Identification of redundancies</li> <li>10. Modification to target database</li> <li>11. Changes in source and target data that include resolution of duplicates, resolution of inconsistencies at the metadata level, and resolution of business processes</li> <li>12. Testing of mappings, rules, and results</li> <li>13. Loading of data into target database</li> <li>14. Verification and validation of data in target database</li> </ol>
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## What is Consolidation?

Consolidation is the merging into a single system of two different applications or two separate, non-identical implementations of the same application. The merging process takes all of the data from each of the systems and resolves inconsistencies and redundancies. Combining the systems in this way results in a single target system that represents the union of the source systems including all history, and is available to support all of the business systems and requirements that were formerly supported by the individual applications before merging them. The consolidated destination application is a complete, consistent, and correct source of enterprise information.

## Business Drivers for Consolidation

There are several reasons for a company to consolidate their applications. These business drivers are listed below:

- Organizations tend to proliferate applications to meet new business requirements, but the separate applications are not able to work together.
- Regulatory and statutory changes, or changes in the way a business operates or is organized mandate changes in existing systems that are difficult to accommodate.
- Globalization and the Internet demand a consistency among applications.
- IT departments are under significant pressure to reduce costs while providing more and better information quicker.
- Business changes such as mergers and acquisitions introduce a new set of applications that must be integrated with the existing applications.

Initially, the multiple application strategy occurred as the result of normal technology evolution. The mix of legacy systems, spreadsheets, and databases were developed over many years and on platforms spanning several technology generations. As they developed, these applications met short term requirements or addressed a specific task such as managing inventory for a plant. A company had many similar systems either to support the operations of different locations or to support specific functions and meet the statutory and regulatory requirements of that location resulting in silos of applications that didn't work together.

In the 90's, many companies selected sets of integrated systems such as Enterprise Resource Planning (ERP) applications and spent millions of dollars and years of effort for those applications to be implemented throughout the enterprise. However, there were three problems. The first of these is that these applications were often configured differently for different locations (i.e. Asia Pacific would configure the system to meet their own needs, and Europe would set up the application to meet different requirements) or implementations might vary across different product lines (i.e. brakes and axles). The second problem is that these systems are very flexible and can meet a variety of business needs, but once they are configured and the first transaction is entered, the base configuration cannot readily be changed. This means that if a company

undergoes a major business change such as a merger or acquisition or a change in regulatory requirements or even a change in functional currency (for example the move to the Euro), the application cannot be changed to accommodate the change in the business. The third problem is that ERP systems are typically transaction systems and don't provide the analytics that a company needs to forecast future trends.

Globalization, free trade, and the introduction of technology are breaking down the borders between units within organizations (a customer can be serviced from anywhere). The explosive growth of the Internet has created the need for companies to transact business on-line with customers and suppliers. The Internet, like globalization, bypasses physical and application boundaries, highlighting the need for companies to reorganize using all of its applications across geographies. There is a need for a customer to be treated consistently whether he is buying from the Internet or from a storefront. There is a need for an analysis of sales and profitability across all operating units. Right now, companies must morph existing ERP systems and legacy systems to accommodate Internet-enabled business models and technology; formerly disparate operating units must consolidate their information. At best, this has been expensive, time consuming and, usually, far from complete integration.

The most obvious business driver for consolidation is generated by large scale business changes. Corporate mergers, acquisitions and reorganizations demand that companies consolidate the information systems of the multiple business units found within the enterprise in order to operate as one. Much of the projected cost savings envisioned as part of the merger comes from reducing headcount involved in redundant processes. Many of the benefits of increasing market share and profitability are recognized by leveraging existing customer and supplier relationships.

Finally, there is a significant opportunity for cost savings by consolidating data centers, and applications throughout the organization. This savings can be recognized from hardware, from software licenses, from entry of data in one place, and even from operations - producing catalogs, and sending consolidated invoices and statements.

### **Data Quality**

Consolidation is reliant on good data in order to be effective. Challenges relating to data quality include differences in the semantics, or meaning of data across systems. Another challenge is that after duplicate data is identified, it is very difficult to merge the duplicate records in a relational database.

The problem of managing master data (data describing core business entities such as customers, products, suppliers, employees, etc.) is a challenge that IT professionals have been working on for years. Historically, each application cares only about the portion of master data it needs to process its own transactions. It is virtually impossible to obtain a single view of the customer if

the word "customer" has multiple definitions in different systems. There are different data values such as customer name, address and date of birth. The same is true for part numbers, item codes, or component parts. There are different identifiers assigned to each unique instance of a business entity and different hierarchies among business entities - for example parent and subsidiary companies. All these facts across a heterogeneous systems environment make it difficult to come up with answers to simple questions such as "how many customers do we have?", or "who are the most profitable customers?" or "which products have our customers purchased?" Neither can the business report profits consistently if the business concepts of "revenue," "expense," and "allocation" are not defined accurately as meaning the same thing in all information systems.

## **The Eprentise<sup>®</sup> Consolidation Solution**

Eprentise<sup>®</sup> is developing the only application consolidation software on the market. The eprentise<sup>®</sup> software automatically profiles the structure of the data (the metadata) of each application, mining the integrity rules and constraints, the semantics of the data, and the business logic of the application.

Eprentise<sup>®</sup> defines and creates a repository of rules for the application and stores those rules in a knowledge base for reuse. Eprentise<sup>®</sup> then automatically maps the source application to the target application enforcing the rules of both the source and target. As part of the mapping process, eprentise<sup>®</sup> identifies gaps, redundancies, and inconsistencies among the applications. After the automated process is complete, the software presents the analysis to a business user who can refine the rules, create new rules, and resolve some of the inconsistencies between the source and the target application. These rules are kept in the knowledge repository so that other subsequent consolidations can "learn" the rules of the data and the business. Next, a test run of the full consolidation determines the load sequence, identifies any remaining inconsistencies, and resolves outstanding issues. Finally, the result is populated into the production destination database.

Advantages of the eprentise<sup>®</sup> approach include the following:

- All data integrity maintained automatically.
- Rules and knowledge built into system.
- Historical information consolidated for simplified reporting.
- No hard coded, undocumented scripts to write or maintain

### ***Alternative Approaches to Consolidation***

There are several alternative approaches to consolidation. Each of these is directed toward a different set of goals and requirements. The current approaches include establishing a user interface layer on top of existing applications (a service-oriented architecture), connecting applications through adaptors (enterprise application integration) or hard-coded interfaces, building a

repository to which data is translated into a common standard, loaded into the repository and retrieved (data warehouse, enterprise information integration, and business intelligence), or finally, implementation or reimplementing of a new enterprise wide application (enterprise resource planning or customer relationship management) and migrating older, heritage systems into the new implementation (conversion).

Each of these approaches is applicable to different business requirements, and many companies currently use a combination of approaches to get information to those who need it. None of the current approaches provide all of the benefits of consolidation listed above. The following sections provide a brief overview of the current approaches, the major features of each approach, and the limitations of those approaches.

### ***SOA (Service Oriented Architecture)***

A Service-Oriented Architecture (SOA) is a collection of services that communicate with each other. The services are self-contained and do not depend on the context or state of the other service. A SOA provides a universal access mechanism to all systems via Web services and a universal data representation via XML. Also, this allows access to data not conveniently located in a database - commercial packages, custom applications, Web content, documents, images, feeds, etc. Having an SOA as a foundation supports the integration and development of information from structured, transactional systems as well as unstructured, content-based systems. With a SOA, all data is left in its original system which means that duplicates are not removed and values are not adjusted. A SOA provides an integrated view of the data for the users, but because the original systems are left intact, there are minimal savings to be recognized for maintenance, storage, and operating costs.

### ***Data Warehouse, Business Intelligence***

A data warehouse is a repository or data store for information from different systems that is designed to support analytics, decision-making and forecasting. Operational data is extracted from the source systems, mapped and translated to match the format of the repository, and then loaded on a regular basis into the repository (The Extract, Transform, and Load processes are known as ETL.) Business intelligence tools and reporting tools are then used to analyze the performance of the business for management.

A limitation of data warehouses is that a data warehouse never tries to fix the business processes by which inaccurate data is created in the applications, nor does it try to correct the data in the source applications. The information provided is not traceable and may be ambiguous or inaccurate and the environment may fail or become outdated every time a business rule or data source changes. Data warehouses and business intelligence systems are like a rear-view mirror. They allow analysis and forecasting based on past trends, but are not designed to manage operational transactions in real-time.

### ***EAI (Enterprise Application Integration), Middleware***

Enterprise Applications Integrators (“EAI”) currently provide software and services that allow discrete functional modules of an ERP, such as customer relationship management systems (“CRM”) and production control systems, to communicate with each other and with Intranets and the Internet. Generally, these connections are based on a hub system with adaptors connecting the various applications through their APIs (Application Programmatic Interfaces). The systems pull data from a source system, translate it, and pass it on to a target system with messages and alerts to notify the participating system that an activity or an error has occurred in the transmission of the data. EAI companies, however, do not provide solutions to change the ERP configuration without major efforts that often include re-implementing the ERP. EAI works by linking systems so that they can send and receive messages from one another. Frequently, they rely on custom-coded links (adaptors) that have to be maintained and altered with every upgrade or relevant change in the linked systems. This is an incomplete, high maintenance alternative. EAI solutions are a point-in-time asset offering no future roadmap and upgrade path. The client is left with the responsibility and cost of maintenance, product support, and the significant cost of migrating and keeping up with infrastructure platform releases.

### ***EII (Enterprise Information Integration)***

EII provides a virtual, federated view of the data of multiple systems as a unified, consistent presentation to the user. Data is aggregated, restructured and relabeled (if necessary) before being presented to the user. EII is often referred to as a real-time data warehouse as represented by a metadata layer and implemented as part of a service oriented architecture (SOA). As with a SOA, the original applications remain, need to be maintained and updated, and are not flexible enough to accommodate changes.

### ***ERP (Enterprise Resource Planning), CRM (Customer Resource Management)***

Enterprise resource planning systems (“ERP”) are intended to bring together disparate information systems and business units within an organization to create a single environment, capable of providing consistent, correct, and complete information in real-time, anywhere, anytime. ERP promises organizations enormous improvements in efficiency. Lured by that promise, organizations around the world spent an estimated \$300 billion on ERP systems during the 1990s.<sup>1</sup>

CRM systems are designed to manage specific customer-facing processes (sales, customer service, marketing), but they are not designed to manage customer data and customer transactions across all systems in the enterprise, and are therefore reliant on receiving data from other systems. CRM solutions' APIs are low-level (no business logic) and their design point is based on loading

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<sup>1</sup> McKinsey & Company, “A Second Wind for ERP”, McKinsey Quarterly 2000, volume #2.

data into the CRM database, not on managing customer transactions. As such, CRM systems are consumers of customer data, not the managers of that data. Without a single view of the customer to provide to CRM applications, organizations do not realize the promise and value of CRM. In order to transform to a true customer-centric model, organizations must consolidate customer knowledge and insight from back and front office silos to an enterprise level.

Characteristics of ERP and CRM applications include:

- Series of interrelated “modules” that share data across multiple organizations
- Provides a “unified” view of the data and standardizes the business processes such as financial operations, manufacturing operations and HR operations for transaction processing
- Provides a “consolidated” view of the customer
- Often integrated through EAI or loaded into a data warehouse for analysis.

The implementation of an ERP or CRM system brings with it great promise of better information, consistent systems, and reduced operational costs. Achieving this promise is a multistage process. Few companies have foreseen or understood the entire lifecycle. Companies do not recognize that a successful implementation is really much more ambitious than what was envisioned when the implementation was started. Many reach a stage at which the system is up and running, the old data has been imported and new data can be entered and they can treat the implementation as finished.

The stage at which the applications are up and running can be described more fully. It is the point at which companies safely can elect to move their existing processes and data into their new Applications. The resulting applications work adequately in the sense that they don't crash too often, but the company is still doing things in the old way. They engage in “work-arounds.” For example, some companies still use their old chart of accounts and add new “intelligent” values even though those values aren't in ranges that make allocations and reporting easier. Other companies maintain separate books for each legal entity, or don't take advantage of the common accounting practices across the enterprise. Still others don't take advantage of the features of the ERP systems, or of industry best practices.

The list of “continued” old practices is probably as long as the imagination is fertile, but all of those practices have two overriding common elements: they are costing the company money and the ERP system can, if properly implemented and adapted, save them that money. Indeed, the *raison d'être* of ERP packages is to obtain efficiency gains in a whole host of ways. Some gains inhere in improved systems that generate economies of scale, some gains flow from increased efficiency in processing data and reduced expenditures for maintaining systems. Most of all, but hardest to obtain, is total enterprise integration that permits information to flow from its point of entry into the company's data stream to all of the places where it will be used without cumbersome intermediate steps. In the e-world of instantaneous customer-company and company-supplier

interaction via the web, corporate integration is the strategy for greatly enhanced profitability. ERP systems should facilitate that, too. But the ERP or CRM implementation, after millions of dollars spent, and a very long implementation cycle<sup>2</sup> very seldom recognizes those benefits because companies have found that once deployed, ERP systems are inflexible, and fail to accommodate subsequent changes in technology and/or business. ERP's failure to accommodate change results in information that is neither complete nor consistent, and often not aligned to the way in which the organization is changing its operations. Many companies opt to reimplement their ERP.

Re-implementing an ERP system is a two-step process. First, consultants configure a new system while the old system is still in operation. After the new configuration is completed, consultants write software code to migrate open transactions from the old system by copying the data (or portions of it) into the new system. Closed transactions (historical data) are "archived," in that they are left in the old system for as long as that system is maintained. Configuring the new system requires that consultants understand and map the business rules and other parameters embedded in the existing ERP configuration. The learning curve for consultants is steep, especially if those consultants did not originally implement the existing ERP. The effort of writing code to migrate data into the new system is also complicated and time-consuming. Limited tools and templates are available to assist consultants, but the process is still labor intensive and error-prone. The process of moving data from an old ERP into a new ERP is further complicated by changing organizational structures and business practices. If a division is spun-off, for example, consultants will need to write code to identify certain data and migrate it into a different portion of the new system, or a different system altogether. Again, tools and templates offer only limited assistance in these situations.

Re-implementing an ERP system can take almost as long (and sometimes longer) as it takes for an original implementation. Re-implementing the ERP requires expensive, highly skilled consultants. These are frequently multi-month and million dollar plus efforts. The business disruption costs of re-implementing the ERP also are significant, as IT staff resources are required to work with the consultants and historical data is consigned to inactive systems or discarded altogether.

### ***Conversion and Interfaces***

Many times, a company will attempt to integrate their applications manually by writing conversion or migration scripts or creating point-to-point interfaces between two systems. Characteristics of these conversions and interfaces include:

- ▲ Custom code (scripts) used to move data from one system to another.

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<sup>2</sup> The average Oracle implementation takes 23 months. ERP/ERM Strategies: Beyond the Backbone, page 5. Catalyzing the Extended Enterprise: Clicking with your Customers Conference Proceedings. Meta Group. 1999.

- ▲ Interfaces are ongoing movement of data and may be one-way or two-way between a source or target
- ▲ Conversion permanently moves data from a source to a target (usually historical from legacy system – may only convert a year or so of history)
- ▲ Conversions and interfaces are written by developers in languages such as SQL and loaded into the target database or application.
  - May be done as detail or summary
  - Translation or reformatting of data is specific to source or target
  - Verify number of records transferred
  - Validate data that has been transferred
  - Reconcile transferred data between source and target

Conversions and interfaces are one-time efforts that have no residual effects the next time data needs to be integrated. These hard-coded, point-to-point migration efforts are difficult and expensive to maintain and are totally reliant on the skills of the programmer.

## **Technology**

At the heart of the eprentise<sup>®</sup> software is a rules-based engine that performs four major functions: copy, change, filter, and merge. The engine uses automated mining techniques that extract the semantic and database rules from any relational database. Those rules are combined with rules gleaned from the experiential knowledge of experts to form a proprietary knowledge base of constraints and business rules about applications. After the mining is complete, the eprentise<sup>®</sup> software automatically maps the structure of the data, the relationships, the constraints, the business processes and the data itself of the source environment to that of the target environment, identifying gaps or inconsistencies, and analyzing appropriate merge procedures and sequences.

This knowledge, too, is stored in the rules repository so that subsequent activities can reuse the analysis. The business user adds to the knowledge base by creating rules for identifying and resolving duplicate data. For example, a user might identify duplicate products by similar bills of material or inventory storage parameters. The software identifies candidate duplicates within each entity type by matching entities according to rules created or selected by the user (for example, customers with the same name and address might be candidate duplicates). The user can accept the rule-generated results en masse or review and revise them individually. Each set of entities judged to be duplicates is then merged to become a single entity in the destination. Conflicts among the descriptions of entities being merged are resolved automatically by user-selected rules or manually by the user. Once the duplicates are identified, the eprentise<sup>®</sup> software automatically locates all related data in the application and repoints it to the survivor of the duplicate resolution process.

Using both the software-created rules and the rules added by the user, eprentise<sup>®</sup> automatically generates and executes any code necessary to copy, change, filter, or merge data and populate the resulting data set to an

appropriately configured applications environment, without violating the referential integrity or any other constraints imposed by the application or its underlying database. Eprentise<sup>®</sup> manipulates configuration, master, and transaction information across different databases, systems, and different business environments.

The same underlying technology supports an array of changes that are based on the copy, change, filter, and merge functions including reorganizations, data quality improvement, data filtering, and data migration. These functions support a variety of business initiatives such as mergers and acquisitions, creating an internet store, spinning off or divesting a part of a company, reorganization, setting up a shared-services center, or complying with statutory and regulatory requirements that require a change in business practices.

### ***Why is Merging Data Hard?***

The beauty and the efficiency of a relational database depend on properly maintaining the relationships among all of the data being stored. The goal of maintaining the data in that fashion is to ensure that the root data is maintained in a single place and, when that source is changed, other parts of the system using that source refer to and use the information that is now correct.

A relational database is made up of tables (arrays of columns (fields) and rows) that are linked together by relationships in which fields in one table are linked to fields in other tables. For the purposes of this explanation, each of these relationships, together with other critical information, comprise a set of "Rules." To give an example of scale, the Oracle 11i suite of Applications has over 72,000 objects each of which could be related to each other or be governed by a set of data constraints potentially resulting in over 5 billion rules about the data that need to be checked and validated every time a data element changes. In general, everything is related in some way to everything else. Application of those rules in a structured way and in the proper sequence allows changes to be made to the database and still maintains the integrity of the system. These rules recognize both standard, defined relationships and those customized within a particular customer environment.

The first thing that is difficult is identifying the rules. In most systems, they are not fully documented in any source or combination of sources. In fact, generally even the technical documentation of a packaged system describes less than one third of the relationship rules that are needed. The expertise of consultants can supplement some of the gaps, and some firms have specialized in studying the 50 or so tables that relate to customers in an attempt to provide narrow ranges of data manipulation functionality that can work with that subset of enterprise data. Built into the eprentise<sup>®</sup> software are methods that automate the process of automatically identifying and learning all of the rules and of identifying patterns that might create new rules. These methods add a degree of rigor that tests for relationships and other data constraints in a way that traditional sources of this information cannot match.

The second difficult matter is to know not only the rules, but also the nature and consequences of their interactions. Rules cascade in a relational database. The rule that links one data item to another in a parent-child relationship may be tied into a rule about the child in which the child is a parent in another series of relationships. It is impossible manually to comprehend all of the combinations of relationships. Even with automation, it is an impossibly large task for a user to manage the relationships unless software assists in decision making.

Eprentise's rules library has built in that expert systems knowledge. Resolving duplicates is an example of a process that sounds simple, but has not previously been automated to a meaningful extent.<sup>3</sup>

Consider an example of finding duplicates in a list of products (a.k.a. system items in Oracle) in a customer's Oracle Applications. First, how does the customer know what is a duplicate? A duplicate can be identified as either a single criteria or a combination of many criteria. Very often, the data has been entered in a different format in different systems or by different users. Any single rule about identifying duplicates is likely to miss several instances of duplicate data because of the inconsistencies in the data entry. Eprentise<sup>®</sup> identifies patterns of text (similar text strings), creates standardization rules (convert case, eliminate punctuation, uses lists of standard abbreviations and codes) to cleanse and standardize the data before identifying duplicates. These too, are rules within the repository. Once the data is cleansed, multiple rules can be used to identify duplicates (i.e. address line one **and** telephone extension **or** tax ID or any combination of attributes). eprentise<sup>®</sup> analyzes the content of the data in a system and can report on what fields are likely to contain information that can be used to identify duplicate items and suggests these criteria to the user. Once the user agrees that certain criteria would identify potential duplicates in the system (perhaps key words in the item description, or common component items in a bill of materials might identify duplicate items), the user can create a duplicate rule to test. The task is not done. Other tools can do parts of this task, the last step of which resembles a sophisticated search and replace across a series of related tables. That replacement, however, is one of the more trivial parts of the task. When I decide that Item XX is a duplicate of Item QQ, simply re-labeling all "XX" entries to "QQ" is an invitation to disaster. What if the price terms were different? What if the units of measure were different? The user has to be prompted to do a series of reconciliations at all different levels of data and those, in turn, may result in other duplicates within child relationships throughout a cascade of related entries. So, simply resolving 100 duplicates and all of the related associations and reconciling all the reference data could touch billions of rows across thousands of tables. The same cascading effect occurs when changing a primary key. The results literally impact changes at every level of the application.

eprentise<sup>®</sup> automatically generates SQL code to enforce each rule and resolve any inconsistencies. Eprentise<sup>®</sup> also comes with a rules tester that

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<sup>3</sup> Resolving duplicates is different than identifying duplicates.

automatically verifies that the rules have been applied correctly and completely in the system and in the proper sequence so that the integrity of the data is not compromised.

### **Benefits of Consolidation and ROI Considerations**

The following list provides a partial list of considerations when calculating a return on investment for the migration to a consolidated environment. An ROI cannot easily be calculated for all areas; therefore a number of the items listed below should be considered as tertiary benefits to consolidation.

#### **Global enterprise management and visibility**

- ▲ Ability to drill down to the detail of the entire enterprise's operations.
- ▲ Leverage power of the enterprise
  - Purchasing (discounts, payment terms, etc.)
  - Customers (How much business do I do with this customer? How profitable is this business?)
  - Single employee records (Allow the ability to transfer within the organization)
- ▲ Collapse business processes and make the processing common
- ▲ Leverage a mature information management environment to enforce policy, promote reuse, rationalize data assets and ensure consistency

#### **Intracompany consistency**

- ▲ Same contracts, credit limits, depreciation methods, accounting for intercompany transactions
- ▲ Standards (naming, quality, business processes)
- ▲ Reports (all reports are based on same set of numbers so I don't get different sales figures or expenses that I need to reconcile with each other)
- ▲ Security practices
- ▲ Provide unambiguous business definitions for the data so as to deliver high quality business information from the data environment

#### **Ability to change and respond quickly to changes**

- ▲ Know what the entire enterprise looks like, enabling intelligent decisions
- ▲ Access key information sooner
- ▲ Provide the agility to support changes to the business, its rules, and IT's systems
  - Store business logic and rules in a central and open way, thereby increasing business agility and reducing dependence on proprietary integration vendors and products

#### **Administrative cost reduction<sup>4</sup>**

- ▲ Less time and expense required for upgrades, patches
- ▲ Less support for interfaces and enhancements (Do it once)
- ▲ Less support and documentation for customizations

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<sup>4</sup> Many enterprises can directly attribute 30% - 50% of their IT spending - often hundreds of millions of dollars - to the maintenance of redundant systems

- ▲ Increased productivity (quicker close cycles)
- ▲ Faster, more efficient balance reconciliation and cross-company reporting
- ▲ Lower costs for operations (processing invoices, payroll, accounts payable, receiving cash, etc.)
- ▲ Reduced facility, headcount and other costs (training, F&A, etc.)
- ▲ Reduced disk space, hardware resources
- ▲ Reduced deployment time of integration projects
- ▲ Reduced time for data entry<sup>5</sup>
- ▲ Reduced storage

### **Better data quality**

- ▲ Improved customer service & retention<sup>6</sup>
- ▲ Increased customer satisfaction
- ▲ Fewer administrative errors
- ▲ Reduced mailing and production costs
- ▲ Reduced clerical staff

### **Some Examples of Cost Savings**

These benefits clearly address both the bottom line costs and contribute to the top line growth as demonstrated by the following examples:

A major US bank had tens of terabytes of redundant and overlapping data following a series of acquisitions. By cleaning up the duplicate data and consolidating their enterprise data, the bank reduced storage by \$30 million per year on a single project.<sup>7</sup>

A major global chemicals company was running twelve SAP instances and struggled to get a consolidated view of the business. By consolidating to a single global instance of SAP and reducing all the administrative and infrastructure overhead, the company will save operating costs of \$40 million per year.<sup>8</sup>

A global logistics provider who grew by merger found themselves maintaining 18 data centers, 1500 applications and 2600 servers. They embarked on a huge consolidation project to reduce to four data centers, 200 applications and 1600 servers, and rollout a new enterprise application. This restructuring and

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<sup>5</sup> In setting up a new product, a business has to enter product information in many different systems (for a retailer, these applications can number more than 30; in a manufacturer, they can number in the hundreds)

<sup>6</sup> Customers use multiple channels to interact with an organization, often within the context of a single business process. Organizations that do not share a unified customer view across multiple channels are unable to provide seamless multi-channel integration. This results in poor customer service and retention issues. In addition, customers are dissatisfied with frequent errors and inefficiencies. Silo-busting solutions improve customer service and retention by providing all channels with an accurate and complete view of the information.

<sup>7</sup> Evans, John. Data Integration Challenges & Benefits for Enterprise Application Migrations, Consolidations and Upgrades. IBM Information Integration Solutions White Paper, June, 2005.

<sup>8</sup> *Ibid.*

consolidation is predicted to increase profit by over 1 billion euros by the end of 2005.<sup>9</sup>

## Competitive Analysis

There is no software product that provides a complete consolidation solution. IBM is the preeminent provider of a suite of software (including EAI products, ETL products, EII products, and Web services) that covers the spectrum of activities from extraction, assessment, standardization and alignment, cleansing, mapping, transformation and movement, target connectivity and meta data management. These tools provide the component parts of consolidation, but as discussed above, each has its limitations.

Searches on consolidation software found the following (with excerpts from their respective web pages):

**DataFlux** - Provides technology for data cleansing, data augmentation, data consolidation and conversion and data scrubbing. The Data Transformation and Merge enhancement enables users to work on multiple database tables simultaneously regardless of the type of database system.  
<http://www.dataflux.com/>

**envisage Information Systems, LLC.** - envisage has been in the forefront of designing software that automates data processing, and moves data efficiently and securely to a data warehouse. Our hosting facility also provides our clients with a secure redundant location to locate their servers.  
<http://www.envisagesystems.com/>

**Evoke Software Corp** - At the core of the profiling product suite, AXIO performs the sophisticated and complex process of Data Profiling, in which the content, structure and quality of highly complex data structures is defined.  
<http://www.evokesoft.com/>

**Evolutionary Technologies, International, Inc.** - ETI's software solutions integrate, transform and deliver data for your CRM, e-business, ERP, EAI and data warehouse initiatives. <http://www.eti.com/>

**Information Builders, Inc.** Information Builders sets the standard for enterprise business intelligence and reporting by adhering to the same mission: WebFOCUS, our flagship product, is a fully integrated enterprise business intelligence suite (EBIS) that enables customers to make better decisions based on complete information by providing more access to more data sources and running on more platforms than any other vendor.  
<http://www.informationbuilders.com>

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<sup>9</sup> *Ibid.*

**Innovative Systems, Inc.** Industrial-strength data integrity and data linking tools, systems integration, and customer-centric databases. Innovative Systems' software solutions for data profiling, integration and quality management enhance customer initiatives such as CRM, BI, ERP, and data warehousing. <http://www.innovativesystems.com/>

**Hi-Mark Software.** HiMark's coordinated data mart design is the core foundation for an Enterprise Business Intelligence Solution. Hi-Mark's data mart shares business dimensions, such as customer, time, and location, so they are fast and easy to build. <http://www.himarksoftware.com/>

**Kalido Group** - Specializes in data warehouse lifecycle management software including DIW, a tool to create and maintain data warehouses and marts, and MDM, web-based master data management. <http://www.kalido.com/>

**Metabula Limited** - Metabula now offers a solution whereby information from systems across an organization, can be unified into consistent and validated views, even though the information in different systems can be, and probably will be, inconsistent. The ability to assemble and present data from disparate and inconsistent systems will be a major benefit to users trying to make sensible business decisions. <http://www.metabula.com/>

**Netrics** - Netrics error-tolerant technology identifies duplicate records in: Hospital Medical Records, Transaction Logs, CRM Databases, Product Catalogs, Vendor and Customer Lists, and more...even when names, ID numbers, dates, addresses, and other fields do not match exactly. [www.netrics.com](http://www.netrics.com)

**Open Solutions, Inc.,** Developers of e-business solutions for customer relationship management, sales force automation and enterprise resource planning. <http://www.opensolutionsinc.com/>

**PartsRiver, Inc.** Database of industrial equipment parts. Though proprietary translation software, PartsRiver can map data to our master catalog. <http://www.partsriver.com/>

**Pervasive Software** - Pervasive Software (formerly Btrieve Technologies) is a global value leader in data infrastructure software. The company's award-winning products enable customers to manage, integrate, analyze, and secure their critical data. <http://www.pervasive.com/>

**Prism Group** - PRISM is the proven leader in data management including consolidation, normalization, and warehousing. <http://www.prism-grp.com>

**Sypherlink** - In an automated, unattended manner, Sypherlink: Harvester determines the location of data elements and how they relate across an enterprise full of disparate systems. Additionally, users can leverage Harvester: VCD to deliver a new approach, data federation, which enables interoperability

without requiring that data be duplicated, physically centralized or transformed to conform to a standard. <http://www.sypherlink.com/>

**Trillium Software** - Trillium Software identifies potential duplicate data. The Trillium Software Discovery suite analyzes data at its most granular level to reveal data anomalies, broken data rules, misaligned data relationships, and other characteristics. <http://www.trilliumsoftware.com>

## **eprentise<sup>®</sup> Experience**

The eprentise<sup>®</sup> team has extensive experience in building consolidation solutions and has references of several customers who have consolidated multiple instances of their applications. The team understands the process, has developed the intellectual capital to build the software, and knows the issues that accompany consolidation efforts. The team has a track record of successful, referenceable customers who were able to consolidate their disparate systems in less time and at a significantly lower cost than alternative approaches. The advantages of using eprentise<sup>®</sup> include a full-life cycle methodology to accelerate change in an organization and automate the process of application integration. The following case studies illustrate some of consolidations completed by the eprentise<sup>®</sup> team:

### **Case Study A- Profile**

A global manufacturer of electronics with five separate Oracle Applications instances around the world.

#### **Needs**

In order to better manage customer relations and the supply chain, the company wished to consolidate their five data centers around the world into one master database at headquarters.

#### **Challenges**

- ▲ The company needed a fast and efficient solution in order to meet a tight deadline.
- ▲ Maintain all data and relational integrity.
- ▲ The instances had varying patch levels, unique Oracle Application modules and customizations, and were all set up differently.
- ▲ The customizations were created over a period of six years and some were not well documented.
- ▲ Each of the different businesses supported their own customer and supplier base resulting in different business practices.

### **Case Study B - Profile**

A major telecommunications company was restructuring their organization in order to consolidate several legal entities into one. The changes were completed in less than two months, using a small team of resources.

#### **Needs**

- ▲ Change their chart of accounts structure in order to meet new SEC reporting requirements.
- ▲ Change from a seven to a five-segment accounting structure by combining two segments and deleting one.

### **Challenges**

- ▲ Meet a two-month SEC reporting deadline.
- ▲ Complete the project without having to write and test programming scripts.
- ▲ Update references in more than 1,800 tables so that historical transaction data will not be lost and period-to-period comparisons to the new structure can be made.

### **Case Study C - Profile**

A global manufacturing company running Oracle Applications recently acquired a smaller competitor using another ERP system for its manufacturing operations.

### **Needs**

- ▲ Standardize Oracle Financial and Manufacturing Applications to operate as one company.
- ▲ Identify synergies between companies quickly.

### **Challenges**

- ▲ Obtain an enabling technology that can be re-used for future acquisitions.
- ▲ Quickly identify gaps between systems.
- ▲ Quickly determine common customers, suppliers, and product lines so duplicates can be resolved.
- ▲ Obtain an accurate view of current and future operating requirements.
- ▲ Launch new initiatives quickly with Application and systems support.
- ▲ Resolve all primary key conflicts and different values for all configuration data.

### **Case Study D - Profile**

A French company in the entertainment industry utilizes the GL, AR, AP, AX (localizations), INV, WIP, OE and PO modules in Oracle Applications. The company's management group required a modification to each of its 11 operating chart of accounts' structures for management reporting purposes. Using the eprentise<sup>®</sup> team's solution, the change occurred in one weekend with zero errors.

### **Needs**

- ▲ Mapping multiple charts of accounts to a new chart of accounts
- ▲ Changing each chart of accounts and correctly post all transactions to the new account numbers

### **Challenges**

- ▲ There were 11 different Charts of Accounts that needed to be merged into one new target Chart of Accounts.
- ▲ All Charts of Accounts and corresponding transactions needed to be changed over a weekend.

- ▲ The integrity of all financial statements needed to be maintained.
- ▲ The client changed the target chart of accounts just one week prior to final testing. The new chart of accounts and all reports had to be verified and all accounts reconciled before the cutover weekend.

In sum, the eprentise® team has a track record of successes with a marquee customer base. They have developed and implemented software that copies, changes, filters, and merges disparate Oracle Applications installations. The team has now expanded its horizons to consolidation of any relational database application. Eprentise® is seeking customers for this new technology.

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