The Place of PIM and CDI in Master Data Management

Delivering consistent information for operational
and analytic processes

White Paper

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The Role of MDM

Organizations today face not only stepped-up demand for timely business information but an increasingly intense regulatory environment. To respond effectively, they need systems that enable them to integrate all their business data, definitions and rules and then provide it quickly to line managers and decision-makers. Increasingly, that need is being satisfied with a new generation of master data management (MDM) systems – systems that can integrate fully with the operational and analytic processes that generate information in the organization and at the same time impose new standards for storing and handling data.

Master data is indispensable to doing business. It includes the business objects, definitions, classifications and terminology that in sum constitute business information. Master data also includes format specifications for transaction data. Master data management makes it possible to define and link master data, including those definitions, references, rules and metadata, and to ensure that it is secure and of high quality.

While from a functional perspective an organization's master data should appear to be a seamless whole, in fact it consists of components that correspond to an organization's business structure. Typically, two key components of an MDM strategy are product information management (PIM) and customer data integration (CDI). These systems aggregate, rationalize and distribute the product and customer data that is generated and utilized throughout the organization.

CDI and PIM systems can be, and have been, created and used outside of an MDM environment. However, organizations relying on them will always benefit if they apply the systems philosophy of master data management, and these systems will deliver the most value as components of an enterprise-wide MDM initiative.

This white paper examines how customer and product information fit into the MDM environment, their role in optimizing operations and analytics and what tasks are precursors to establishing CDI and PIM systems. It also highlights best practices for establishing CDI and PIM systems within the context of an MDM system. And it addresses the key practical question of whether companies should build CDI or PIM systems in-house or purchase them from business software vendors. To ensure that our recommendations are grounded in real-world organizational experience, research for this white paper included interviews with business and IT leaders at organizations deploying PIM and CDI systems.

First, let's be clear on what the systems under discussion do. Master data management seeks to make uniform throughout the organization all information, data definitions and rules sets through data stewardship and governance. A fully implemented MDM system and its components operate bidirectionally; that is, they both feed uniform data to all systems,

operational and analytic, and take updates to the data as transactions occur.

More and more, MDM is being acknowledged as an essential next step for organizational performance management. It is a new approach in IT environments and not yet widely adapted in the U.S. or internationally. Of 515 respondents to a recent master data management research study by Ventana Research, 22 percent said they are already involved in MDM projects, and another 25 percent are actively investigating the benefits, yet only 6 percent reported having previous experience with an MDM project.

Product information management systems ensure that uniform product information is available to all operational and analytic systems within the organization. Product information is derived from many sources, including engineering and design teams, manufacturing, logistics systems, suppliers and shippers; it also can include service data from technical support systems. This variety of sources alone creates a need for PIM. What's more, some of this product information must pass along the entire supply chain and be accessible and easily intelligible to both internal employees and external partners.

In the typical heterogeneous landscape, it is difficult to create and maintain a consistent set of definitions and measurements for these product-related data items – but a well-managed PIM system can do it. In addition to data definitions, the system provides metrics and source system information. It also specifies the data governance framework and rules.

The ability of a PIM system to manage product data is not confined to manufactured goods. Service industries have complex definitions of deliverables as well and can have as many sources of data as there are professional employees providing service products to customers. In addition, the nature of service industries makes strong data governance both a critical and an extremely challenging issue. Whether for manufacturers or service providers, deployment of a PIM system can create an environment in which product data quality ceases to be an issue obstructing organizational performance.

Customer data integration systems perform similar functions for customer data, which is at least as diverse as product data. The very definition of "customer" often varies from unit to unit and system to system within an organization and can use several references titles – "party," for example – as well. The measure used to define the customer entity can change, or the same customer may be identified by a slightly different variant of its name. In business-to-business commerce, for example, a customer group or individual for one line of business – say, software – may be identified differently from the customer for another line – for example, business consulting. Yet the enterprise needs to know that both belong to the same corporate customer.

CDI systems create and maintain an accurate, timely and comprehensive profile of customers that is usable throughout all enterprise applications. Deploying CDI creates an environment in which customer data is rationalized, can be used consistently and can be handled within a governance framework. The resulting data consistency and quality are an essential precondition for improving customer-facing performance.

Like PIM, CDI functions best within an MDM environment, where it inherits all the operational and analytical characteristics of the MDM system.

Ventana Research believes that MDM is an essential component of the next-generation information management architecture and of the technologies that support performance management. In addition, we believe that even with MDM in place, failing to incorporate PIM or CDI components will limit the effectiveness of MDM as an optimizer. However, our research study of MDM found that PIM and CDI systems are not yet widely adopted; only about one-third of companies with active MDM projects responding to our survey said they have implemented these critical MDM components. Yet according to our survey, the most important master data items are *customer* (21 percent) and *product or service* (19 percent).

Common Objectives of PIM and CDI

In their particular focus areas, PIM and CDI carry forward the overall objectives of master data management. It is useful to divide these into systems and business objectives, although there is some overlap. In addition, there is one overriding financial objective that impacts the entire organization.

Systems Objectives

- Data Quality – A data quality initiative is a precursor to any MDM project, and it is particularly important for CDI and PIM projects. Data must be defined and calculated consistently. A successful data quality project creates those definitions and ensures that all existing data that will flow into the CDI or PIM system will conform to them. As part of the project, the data also is cleansed and standardized.

  Managing a data quality initiative can be complex. A major food processing company we interviewed reported it encountered enormous problems with data quality and consistency and viewed this as an important issue. As the lead architect said, "In an integrated world, you don't get away with data errors because dirty data flows all the way through the system." Cleaning the data, he said, was "a lot of hard work with a lot of people with different tools trolling through the data from different systems."

- Common Data Sources – Compounding the definition problem is variability in data sourcing. Several different sources often are

required to provide customer or product data to a variety of applications, and many of those sources have data that overlaps, resulting in inconsistency. The food processor cited above, for example, has nearly 100 systems creating product data.

At times the source for key data may not be known, which can lead people to question its accuracy or ignore it altogether; in other instances, data has been derived through formulas and algorithms that are not documented and were developed by people no longer affiliated with the organization. Rationalizing several data sources into a well-documented and agreed-to set is a key objective of all MDM systems; given the vital importance of customer and product data, this is especially true for PIM and CDI components.

- **Automated Data Interfaces** – Definition and sourcing problems are not the only causes of damaged data. Unsynchronized or manual transfer of data from one system to another often produces poor-quality data, as does the failure to maintain a rigorous data governance methodology that includes review and editing of the information. This is a particularly acute problem when users attempt to share or move data between operational and analytic applications. The automated data interfaces that are components of CDI and PIM systems eliminate these and other data quality problems.

Business Objectives

- **Accurate Measurement of Business Performance** – Any system that uses inadequate or inconsistent measures of product or customer information necessarily will yield performance yardsticks that are simply wrong. Even mediocre management requires business processes that rely on correct measures of performance. Properly implemented CDI and PIM systems will create an environment in which it is possible to measure accurately these key components of business performance.

CDI systems contain the definitions, measures and data necessary to evaluate an organization's sales and revenue; PIM systems house the definitions, measures and data required to evaluate costs. These two measure-providing components of any MDM system in turn feed a third, the finance component, which creates the bottom-line definitions of business success.

Product and customer information touch so many aspects of business that CDI and PIM systems often serve complex business objectives within the organization. For example, at a life insurance company we spoke to, the objectives included better organization of customer information for use in customer relationship management (CRM), but the project also was intended to enhance sales and marketing information and to support the administration of life insurance and annuity contracts.

- A Single Version of the Truth – A lack of consistent data definitions and sources can lead to more than one version of a key operational or performance number, with the result that no one knows which is true. Such wrong, inaccurate or uncertain customer and product data all too often leads to bad business decisions; at the very least, it leads to uncertainty about what to do to resolve a given situation. Companies therefore must have only one version of the truth.

  MDM systems create and enforce this single version of the truth, and one of the most important aspects of a PIM or CDI system is to deliver that to any business unit using any business operational or analytical application within the enterprise.

- Data Governance – A systems environment in which various applications use different sources and definitions for what is purportedly the same data will have data whose quality is suspect. In addition, it's likely no one has responsibility for the ownership and quality of the data. Part of the aim of CDI and PIM systems is to create data ownership and control, document it and give data owners the tools they need to maintain data consistency and quality as the business environment changes and grows over time.

The Key Financial Objective

Above all else, the goal of any MDM system must be to reduce the costs of errors and minimize inefficiencies resulting from inconsistent data. Errors in customer data can lead to incorrect billing, poor customer service and costly disputes; incorrect product information can lead to pricing and inventory decisions that damage profitability. And any of these errors can lead to ill-advised (and costly) business decisions that hurt the potential of a business unit or promote a business that ought to be shut down. In the long run, repeated errors based on bad data can destroy an organization.

An organization embarking on a PIM, CDI or overarching MDM project likely also will want to define additional objectives that reflect its own business and systems environment and interests. For example, manufacturing industries may want to include in PIMs information needed to optimize sourcing to manufacturing processes; online retailers may wish to add CDI information that can help streamline customer interactions and transactions.

How critical is this information optimization? One interviewee in the early stages of planning a PIM system told us, "The challenge across business lines that roll out new services is consistent definition, which originates in creating new product requirements."

The Importance of MDM

Ventana Research classifies CDI and PIM as instances of operational master data management (O-MDM). Operational MDM is focused on the

use of master data to ensure consistency in transactional operations. Our research has shown that it is primarily in these operational areas that companies first realize they need to reconcile different data definitions and formats.

However, the two types of software also have roles in the other branch of MDM, analytic master data management (A-MDM), which is concerned with the management of master data items and associated hierarchies required for aggregation and analysis. That's because as companies face the globalization of both the supply and demand sides of their businesses, A-MDM facilitates consistent reporting and delivery of underlying business metrics across all business lines, and the CDI and PIM components of MDM are crucial to meeting that need.

Even were globalization not a driving force, CDI and PIM components would be essential to a fully integrated MDM approach to enterprise-wide information management, and thus they are key building blocks for any company determined to maximize its competitive efficiency and effectiveness. The foundation of an integrated approach to MDM must be consistent customer and product information. Without that, all other applications will be compromised, especially the finance component that is the ultimate arbiter of business results. Fully 70 percent of respondents to our MDM survey said that their organization has difficulty getting from disparate applications and data sources consistent results that agree with each other.

There are, of course, instances in which CDI or PIM systems are deployed without an MDM environment to house them. Such deployments are useful, and we do not mean to denigrate any step that demonstrably will contribute to performance and competitive improvement. But their value inevitably will be limited as a result of not being connected to a system that ensures the consistency of their data with other data in the enterprise. Nonetheless, deploying a stand-alone PIM or CDI system as a stepping stone toward a full MDM system can be a wise management move.

Launching a Project

To realize the business and systems potential of a CDI or PIM project, you must undertake some fundamental tasks early in the deployment process. If the project is part of a wider MDM initiative, these initiatives should be applied to all components of that initiative as well. Start by doing the following for your organization:

Set assumptions. If your CDI or PIM project is the first implementation of an MDM system, declare that master data management will encompass the entire organization, not just customer or product information. If it is to be a stand-alone project, we recommend that you stipulate that it will take an MDM approach to the data and definitions involved in CDI or PIM. This foundation is critical to designing or acquiring a fully functional system that can deliver business value.

If your project is to be a part of an MDM project, you'll have to define which components of MDM will be implemented and in what sequence. It is not uncommon for PIM and CDI components to be deployed first, as they are the areas where the organization has the most to gain. Decide what projects are already under way into which CDI and PIM should be incorporated. These are likely to include data quality, data integration and data governance projects but may also include repository projects such as data warehouses or data marts that are focused on product or customer data.

Establish project ownership and governance. Our research indicates that most master data is maintained at the enterprise level. Other candidates for ownership are IT and finance departments. At what level and by whom the MDM project is to be managed needs to be determined at the start of the project and should not change. Our research found that 40 percent of companies maintain product master data at the enterprise level and 38 percent maintain customer master data there. Alarmingly, however, a full one-third – 33 percent – of respondents said they don't maintain either product or customer master data at any level, and percentages were even higher for all other types of master data. It is evident that many organizations do not have appropriate processes or systems in place to support master data management, and so risk the consequences of having inconsistent, unreliable data.

Ownership of the CDI and PIM components also must be established. This is particularly critical because in these areas business results typically are determined by consulting multiple transaction systems. A CDI or PIM owner will have to be responsible for analyzing the data, cleaning it and rationalizing the definition and sourcing of each item. For example, the manager of a CDI project at a life insurance company told us he had to coordinate and validate data from both its new business systems and its existing annuity and life insurance systems, both of which reach into many divisions within the company.

Interviews with organizations that have implemented CDI and PIM systems make clear that ownership of any MDM component needs to be at a high organizational level because so many groups and individuals have a particular interest in the data. We found that, regardless of industry, there is no such thing as departmental data for products and customers, since both of these are touched by enterprise-wide processes and systems in the organization. The MDM manager at the food processing corporation said, "No longer can you be in a world where you can just live with it being wrong in one system and put it right in the other one. If you get it wrong at the source, it's going to be wrong all the way through. We had a number of battles with someone saying, 'Can't we just look at that later? Can't we get these definitions right after we've gone live?' The simple answer was no."

Such issues can be resolved only by the person or team who owns the project. That person ultimately will create and administer the data

governance rules and procedures without which the CDI or PIM, as well as any MDM projects, will not work. There must be a final decision-maker and an arbiter of any dispute concerning the data, and the rules of governance will establish who that person or team will be. The governance rules also need to control data usage and how change is to be managed in any part of the CDI or PIM repository.

The governance structure also includes workflows. CDI and PIM systems have data that is derived from multiple systems and has wide-ranging uses. They require formalized workflows and synchronization procedures to ensure that information in the data repositories is created, updated, used and retired properly and that those activities and the rules governing them are documented fully.

Establish a repository structure. CDI and PIM systems, whether or not they are a part of an MDM strategy, must have their own master data repositories. Even if the systems are not part of a larger MDM framework, those repositories must be integrated into the enterprise data infrastructure to facilitate communications across the business objects that use and/or feed the data. The manager of the MDM system at the food processing company advised, "Put your building blocks in place first. Build the repository, then look at the best ways that you can use it."

The CDI or PIM repository will have to be structured to allow two types of synchronization: to the internal transaction systems that create the data and between those repositories and trading partners or customers. External synchronization is critical for PIM systems because it enables supply partners to manage their data more accurately; it is equally important for CDI systems that enable customers to manage their own data profiles, because that data is constantly updated and monitored.

Only after these tasks have been accomplished is it appropriate to begin evaluating systems. Trying to assess systems any earlier can place the project in jeopardy because, lacking a complete view of the project's foundation, you may not make the right systems decisions.

System Requirements

The requirements for a CDI or PIM system, as for any other master data management system, are dictated by the business process at hand. There are two categories of requirements, those that are specific to CDI, PIM or any type of MDM system and those that are generally required for any modern information management system.

Specific CDI or PIM Technology

The CDI and PIM technology capabilities described here are basic to any master data management project. They apply to stand-alone CDI or PIM projects as well.

- Synchronization – The most critical technology required for a PIM or CDI system is the ability to synchronize data across the organization. Synchronization means that every time a change occurs – as a result of a transaction, for example – the update propagates not only within the transaction system handling the activity but also into the master data of the PIM or CDI system. Only in this way can the CDI or PIM master data have a meaningful impact on both operational and analytic systems.

  Synchronization must also enforce established workflow mechanisms while at the same time conforming to the rules of governance. The system must have tools that enable these workflows to operate in a message-bus, event-centric architecture.

- Replication – This complement to synchronization ensures that any changes to master data are propagated across the organization into other systems. Through this process, operational systems are constantly refreshed with PIM and CDI information, and analysis can proceed with data that is up to date.

- Semantic and Hierarchy Management – This enables a number of different methods that can be used to define master CDI or PIM data and establishes the relationship among them. Multiple methods will be necessary to accommodate the variety of data sources that normally feed CDI and PIM environments.

- Transformation – One aspect of the definitions applied to CDI, PIM and other master data is their format, and each data definition must contain a specification as to how it can be transformed into other formats used in systems throughout the organization. The system must be able to support these changes and transformations.

- Data and Event Integration – CDI and PIM data elements deliver the most value when they are integrated into other elements of the enterprise IT environment. Integration of master data elements is a necessary part of any MDM design, but these master data elements must also be available for use wherever they are needed in the IT infrastructure, and the system must support that propagation and use.

General Requirements

Some features of a CDI or PIM system are basic to any modern IT system. They are noted here so they cannot be overlooked.

- User Interface – A business interface allows users to access and manage the system. Business users and repository owners and managers must have an easy yet functionally efficient way to interface with the system to carry out their jobs.

- Search – Data in the system must be easy to search, and searches must be easily saved for future use.

- Reporting – The system must enable easy ad-hoc reporting and also create reports that can be saved and shared.

- Data Security – The system must be able to enforce the access rules defined by data governance protocols established for the CDI or PIM data.

- Catalog – Reporting and searching require a CDI or PIM catalog that is easily accessible through the business interface.

- Repository – The CDI or PIM data should be housed in a central repository that is linked to the MDM repository if the system is a component of an MDM initiative.

Preparing for CDI or PIM

Processes are required to move data automatically into a CDI or PIM environment. If enterprise application integration (EAI) or event- and message-based data integration technologies are in place, they can carry out these tasks; if not, you will have to build or acquire appropriate tools. In either case, you will need an audit-style system that will help ensure that source data integrity is maintained as it moves, and you also will have to make sure it can provide data in the outbound direction so enterprise applications can take advantage of your CDI or PIM environment.

It may require a considerable amount of analysis to parse and extract the data found in enterprise resource planning (ERP), customer relationship management and other systems that feed the master data to the CDI or PIM. Several users told Ventana Research that their organizations underestimated the magnitude of creating data extraction technology. A life insurance manager said, "You have to do a couple of projects, then reuse and rearchitect the rule base for consistency across projects." In other cases, CDI and PIM implementers found they had to replace legacy feeder systems entirely. They also noted that updating systems to use the new master source information was a substantial effort, in some cases also requiring complete replacement.

A CDI or PIM solution also must address the data needs of external partners. Data will need to be extracted or synchronized from the CDI environment to provide to your customers, and in turn you will need to receive data from them. Similarly, materials suppliers and trading partners will need to transmit their data to your PIM environment, and you will need to transmit data back to them. Internally, product catalogs need to be maintained for systems on both the buy and sell sides of the organization, and both feeding and using systems must be updated to use them. Customer directories need definitions appropriate for various lines of business to correctly identify buying entities for both marketing and administrative purposes.

Storage and security cannot be slighted. The data repository should be created in a common database environment robust enough to meet the data security and integrity requirements to support data governance. Data security is an issue that is especially critical in CDI and PIM systems. The requirement for access by external users in particular calls out for strong

security because the data must travel across external networks. The complex patterns of access for such data require that a variety of security handles be created and maintained.

Data governance is a set of processes, policies and rules to support the management and use of data across the organization. Successful governance requires a system that can establish a complex set of rules that set the standards for data definitions while at the same time establishing access modes to the data that prevent access to those rules and standards. With pressure from external factors such as increased regulatory compliance and the need to respond faster to new market opportunities burdening companies, this is a vital concern, yet it still is being overlooked by many organizations; while 49 percent of respondents said their organization has implemented data governance or data management, 40 percent have not.

Your system also will have to provide an efficient, accessible user interface and interactive access to the tools for data definition and auditing, access, governance and usage that you create within the PIM or CDI system.

Building Your Own

The decision to build or to buy CDI or PIM software is a challenging one. In the planning stages, building it in-house often appears to be a compelling option because it allows you to tailor the system to your organization's needs. However, building from scratch is inherently risky and can be more costly in the long run than buying software that the vendor can tailor to meet your needs.

Building an environment as complex and wide-ranging in its influence as CDI or PIM involves definition and design tasks that must take into account the business issues of the system itself as well as the integration of such a complex system into the organization's IT environment. And the design needs to be flexible, allowing changes in the business environment that occur over time to be reflected in the system.

Building CDI or PIM requires input and effort from across your organization. In addition to the business users and owners of the data, software engineers and development managers, database experts and security analysts must be involved. The system must acquire data from and feed data to every required transaction system on the product or customer side of the organization. Moreover, the requirement that all data, results and input and output feeds be validated creates tension with the need to make the system flexible enough to incorporate ongoing changes in business structure – changes that in some instances will have to be implemented and tested even before the project is complete.

Large enterprises have many systems that are impacted by a CDI or PIM project. It is not unusual to have 100 systems that create or use data involved, and it is likely that they are built on several different technology

foundations. That broad heterogeneity has implications for the magnitude of the design and implementation of a CDI or PIM project (as it does for the size of the maintenance job that will ensue).

On the positive side, the actual construction in-house of your CDI or PIM system will almost certainly be less expensive than the cost of buying a packaged system. The rapidly growing availability of open source software has brought down both the cost and the time required to build in-house business applications. You can not only use open source components at no cost, but your organization probably already has licenses for all of the compiler, debugging, optimization and other software it will need to implement a CDI or PIM system. In addition, while you may need to hire temporary development management and staff with relevant experience for the duration of the project, much of the core development management staff is already on board.

That said, an online retailer we interviewed noted that the additions to staff that would have been required made the cost of in-house PIM development prohibitive. Furthermore, there are three additional costs to building a CDI or PIM system in-house that are not incurred in buying a packaged solution and so must be considered: the cost of a long implementation period, the cost of maintenance and the possible cost of failure.

The cost of implementation time is the monetized difference between the time it would take to develop an in-house PIM or CDI system and the time it would take to implement a purchased system. Because a purchased system is already developed and will almost certainly come with an installation team, the time for installation will be less.

Maintenance is a challenge for any system built in-house. It's especially cumbersome in the case of CDI and PIM systems because every update to any component has to be tested to determine its impact on all other components that could be affected. In addition, all systems attached through synchronization and replication need to be tested for possible impact as well. The inverse also is true; when feeder systems change, the impact of those changes must be tested within the CDI or PIM.

Personnel turnover, which most IT managers will testify is endemic to development teams, also impacts maintenance. One developer's solution to a problem can be the next developer's problem to solve when maintenance or upgrades to the system are required. Open source modules do not alleviate this issue.

Interviews conducted by Ventana Research indicate that even though the initial cost of in-house development may make for a less expensive CDI or PIM system, maintenance costs can wipe out that advantage. In explaining his company's choice to buy, the food processing company project manager observed, "We could have probably built something cheaper than the cost of the product we bought, but the cost of

maintenance and keeping up with the standard would have been prohibitive."

The relative inexperience with this technology noted earlier suggests that companies have not made up their minds about how to address this issue. In our recent MDM research, less than half (39 percent) of respondents from organizations planning to implement MDM said they would seek to purchase packaged MDM software, and 19 percent expressed the intention to build it in-house. The largest segment (42 percent) said they didn't know which course they would choose.

The cost of failure is difficult to estimate, since it depends on the duration of the implementation, when a failure is detected and the project is abandoned – and, of course, the cost of lost opportunity from not having chosen the other deployment path is even more uncertain. Any in-house project requires the diversion of business and technical staff from other work. If the project is determined to be a failure, the cost of staff diversion must be written off.

Buying a Solution

Purchasing CDI or PIM software is inherently less risky because the software has already been implemented, debugged, tested and validated at other organizations. You can use those installation experiences to assess whether the vendor will be able to meet your needs through either its standard product or modifications to it.

It's also less risky because commercial CDI or PIM software comes with an implementation team prepared to install the product in your organization. Most vendors of such software also offer business consulting services that will help you to assess how best to fit the software into your environment.

You can reduce the risk still further by seeking out a vendor with experience in master data management and CDI or PIM applications and a track record that suggests it is capable of satisfying your needs. As well as evaluating a package to see how closely it suits your requirements, examine how flexible the software and its vendor are when it comes to adjusting the product to meet your needs precisely and completely. And make sure of the quality of the consulting services offered with the software, especially the business consulting. As a manager from a consumer packaged goods manufacturer told us, "Software managers sell software, and the software group really focuses on the implementation of the tool, as opposed to worrying about the end-to-end process and where it fits in it. But you've got to get the process right as part of implementing the tool, and the business consultant services are probably better able to manage that."

Ventana Research advises organizations – even those not looking at CDI or PIM as part of an overarching MDM initiative – to consider vendors whose CDI or PIM products are positioned as part of a larger MDM technology framework. If a vendor has taken this approach, its product is

more likely to have the most desirable characteristics of master data management technology. In addition, if your organization later moves toward MDM in the enterprise or functional units, you will be one step farther along in that effort.

The decision to buy is not entirely without risk. It is possible to choose a product that doesn't fulfill your needs closely enough, that doesn't fit into your systems environment or that doesn't work well with your business process. Without a rigorous selection process that includes knowledgeable people, you face the danger of choosing a weak or inflexible CDI or PIM product. Addressing this issue, one of our interviewees advised, "Make the tools fit your process, as opposed to letting the tools dictate the process."

Overall, the selection process when buying PIM or CDI software should be as careful and detailed as possible. Research into the product, the vendor and customers that have experience with it is essential to ensure that you'll be satisfied with the product you select.

Evaluating Your Options

Several factors should influence your decision to buy or build your organization's PIM or CDI software. Their relative importance will vary with the financial and technological structure of your organization.

- Initial vs. Total Cost **–** The large majority of users who have implemented PIM or CDI told Ventana Research that on first examination, they thought it would be less expensive to build it in-house and so would building an entire MDM structure. But when they examined the long-term costs, it became clear that the total cost of ownership of a purchased product would be less. The exception to this pattern is organizations in which a substantial portion of the IT infrastructure is homegrown.

- Staff Diversion Costs **–** In the case of in-house development, the cost of diverting design, development and business staff from their primary responsibilities to a project around PIM or CDI may be large. This cost factor should be included when deciding how to proceed. In most cases, that cost can be significantly reduced when purchasing a package because the various staffs can focus on the narrower business and technical issues of how to link the new CDI or PIM system into the existing IT infrastructure.

- Incorrect Purchase Risk **–** As one user told us, "You need to focus on what your business needs are in a CDI or PIM system, not what the vendor is selling. It is easy to get caught up in a sales pitch and lose sight of your own needs." For example, it can be wasteful to buy more capability than you need; on the other hand, it will cost you more if you buy too little and have to go through a second project to meet your needs.

- Time Risk **–** The decision to add a CDI or PIM system usually is made to rationalize the business's operational information flow and to create an environment in which decision-making is based on sound, consistent information. That usually means there is a genuine need to be met as quickly as possible, and typically the quickest route to a working CDI or PIM system is to purchase it.

- Data Quality Risk **–** Data quality problems can be challenging. Seasoned software vendors that have developed MDM and associated business products are likely to have expertise and experience at fixing those problems. In many cases, dedicated data quality and data mapping technologies are needed to prepare for a change to MDM-centric processes. In addition, in contrast to interested parties within your organization, they have no stake in any particular definition, source or formula behind data in systems that they implement. In our observation, the final result with purchased systems is generally better quality of data than with in-house systems, although this benefit carries with it some risk, since outsiders are not familiar with your data or processes.

- Integration Risk **–** Data synchronization and replication are keys to the success of any MDM system. Both are crucial for both CDI and PIM applications, which depend on other systems as their sources of data. Successful integration with those systems is one of the services that CDI and PIM software vendors provide. However, in some cases in-house familiarity with those other systems may reduce the risks and costs of integrating CDI and PIM systems into the business software mix.

- Upgrade Risk **–** Adding new features to any software product should be routine, and it generally is with purchased products. With an in-house system, though, developers often are diverted to other projects after completing a major effort such as a CDI or PIM system. That diversion of human resources may make the upgrade and maintenance of an in-house CDI or PIM system difficult to carry out.

- Merger Risk **–** A series of changes will occur if your organization is involved in a merger or acquisition, and CDI and PIM systems will be heavily impacted by them. This sort of consolidation usually requires a major overhaul. We note it here to emphasize the upgrade risk associated with CDI and PIM systems developed in-house.

How To Move Forward

Implementing a system as complex as CDI or PIM requires careful management throughout the planning and deployment process. The implementation begins with **assembling the team**. A CDI or PIM system design and implementation project will require the participation of groups from various parts of the organization. Among them will be product

engineering, design and management, call center, customer management, IT, marketing, sales, fulfillment and perhaps manufacturing or customer service. Every organization's list of players will be different, but it must include the individuals and groups that are key to the success of your CDI or PIM project.

The next step is to **determine project ownership**. Understand that there is no such thing as a departmental MDM system for customers or products. Most respondents to our survey reported that master data is "owned" at the enterprise or organizational level. There needs to be an IT owner as well as a business owner, and they should work as a team to bring the CDI or PIM project into the processes of the organization.

Determine system needs next. If done diligently up front, the hard work of determining what needs can be fulfilled by a CDI or PIM system will pay dividends in the final product. Get the right groups involved, and find project owners who are willing to manage the process of identifying functionality. Going back later to add features that were missed will be costly and difficult.

The fourth step is to **assess surrounding systems**. Evaluate feeder and user systems for their ability to work with the proposed CDI or PIM system; you may need to specify modifications or replacements. In addition, assess efforts already in place or under way that may fulfill some or all of the CDI or PIM functions in the new environment.

Next, **determine data ownership and governance**. At the outset, identify the key players who own the data that the feeder systems produce and the user systems consume. In the end, decide whether data components of the CDI or PIM system will be owned by them or others in the organization. Then **audit data quality**. There isn't much point in using data from ERP and other transaction systems in your CDI or PIM unless its quality is assured. MDM users interviewed by Ventana said they underestimated the importance of accurately profiling and rationalizing the quality of the data and so did not do it thoroughly enough.

Once you've completed your assessments of your data, move on to **review development alternatives**. It is at this point that you make the larger decision regarding in-house development or purchase of the software and the specific choice of development tools or products to use. As the next step in this phase of the process, **assess timing needs**. Make sure that the project owners have specified a timetable for implementation that is both realistic (which is especially important if you decide to build in-house) and able to fulfill the business needs of all participants and users on the project.

Finally, **monitor the system in place**. Once your CDI or PIM system has been implemented, make sure it is working to all users' satisfaction. Subsequently, establish an ongoing assessment of needs fulfillment to make sure that any needs for change or upgrade are known and implemented.

The Key Decision

Of all the decisions that you must make, the decision to build or buy your software is the most important. It will determine much about the economics of the project and perhaps its ultimate success or failure. At some organizations, this can be as much an emotional issue as it is a business or technical one. Those organizations are culturally bound to a particular software acquisition paradigm, and the business and technical advantages of a decision that goes against that culture will have little or no bearing on the final decision.

While Ventana Research generally counsels against in-house solutions, your situation may be different. Your choice must reflect your business, technical and cultural issues, the sum of which will determine the best route for you to take when implementing a CDI or PIM solution.

That said, let's review the four key areas of focus that should make the purchase or in-house development choice apparent to you:

- Cost – It is clear from studies done by Ventana Research and others that in most installations the total cost of ownership of a purchased CDI or PIM software solution will be lower than an in-house solution. The only cases where that may not be true are those in which the data infrastructure created by an in-house team is incompatible with any packaged solutions on the market.

- Business Structures – Some organizations have customer or product constructs that cannot be modeled in a packaged CDI or PIM solution. Most vendors will invest in adapting their solutions, but if that will delay the project or raise the cost excessively, an in-house solution may be preferred.

- Timing – There are almost no circumstances in which a purchased CDI or PIM solution will take longer to implement than an in-house solution.

- Compatibility – In the rare case in which a purchased CDI or PIM solution will not be compatible with the hardware and operating system environment of your organization, use an in-house solution. This is likely to occur only in places where an in-house systems culture is firmly ingrained.

About Ventana Research

Ventana Research is the leading Performance Management research and advisory services firm. By providing expert insight and detailed guidance, Ventana Research helps clients operate their companies more efficiently and effectively. These business improvements are delivered through a top-down approach that connects people, processes, information and technology. What makes Ventana Research different from other analyst

firms is a focus on Performance Management for finance, operations and IT. This focus, plus research as a foundation and reach into a community of more than two million corporate executives through extensive media partnerships, allows Ventana Research to deliver a high-value, low-risk method for achieving optimal business performance. To learn how Ventana Research Performance Management workshops, assessments and advisory services can impact your bottom line, visit www.ventanaresearch.com.