



Analytical Customer Relationship Management

A Whitepaper from Sybase, Inc.

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Introduction

The need to find new sources of revenue is a fundamental requirement for business growth. Typically it means reaching current customers and prospects in ways that will encourage them to do more business with you. From your customer's perspective, there are so many choices in products, services, delivery, and packaging that your efforts to sell them more products can result in an onslaught of information — often confusing information. And from your business's perspective, there are so many “touch points” where information is exchanged between you and your prospective or current customers such as customer support centers, direct mail, telesales, direct sales, e-commerce, and the Web, that it is difficult to determine which methods deliver the best results.

Over the last 30 years, we have moved from a mass-market culture of relatively few products with a limited number of options to a dynamic market where many products may be easily customized to fit the specific requirements of an individual customer. For example, not that long ago, banking customers had relatively few product choices—savings accounts, checking, CDs, and fixed rate mortgages. Today, every bank provides a variety of investment choices, loan types with fixed and variable interest rates, direct deposit accounts, electronic banking options, leases, credit cards, and more. Banks even offer insurance and brokerage services.

Prospective and current customers are, at times, overwhelmed with invitations from their existing suppliers to increase their use of products and services. At the same time, they are repeatedly courted (and provided incentives) by their supplier's competition to move their business for a “better deal.” In the past, many organizations depended on personalized service to develop and maintain the loyalty of their customers. As the customers' relationship with their supplier has become more electronic, the traditional source of customer loyalty—personal service—has been impacted. The one-to-one contact with an organization now occurs most often by telephone or on the Internet.

Customers order products by fax, e-mail, over the Internet, and computer to computer via electronic data interchange. They also interact with a telesales operator or sometimes even an automated attendant. Customer service is quite often conducted by Internet, e-mail, or by telephone. The only constant in the relationship contact is the customer. While this may facilitate the process and make the sales and service aspects of doing business more cost-effective, it can lead to a more impersonal relationship between the customer and the organization. This adversely affects the relationship from both the customer's and the supplier's point of view.

First of all, if you're the customer, you want to be remembered! Doesn't everyone? Remembering your purchase patterns to remind you when it's time to restock is important. So is monitoring them for aberrations to detect and uncover fraud. You want your recent contacts with the supplier recalled so you don't have to repeat your interests over and over to each new contact. Many of us have experienced this kind of “remembering” in dealing with Internet-based firms like those who sell books. By knowing your buying pattern, the supplier can make reasonable recommendations on new books for you to purchase. And by “remembering” your delivery and billing information, you facilitate and expedite the placement of an order.

Today's consumers are both educated and demanding. They demand that any interaction with their suppliers be quick and efficient. With the increasing impact of the Internet and telesales operations, customers can shop for alternatives without leaving their chairs.

“Companies are realizing that the keys to long-term, sustainable revenues and profits are identifying, acquiring, and retaining profitable customers. Unfortunately, most companies don’t know which customers are profitable and which are not. They also don’t know which customers are likely to defect and which are likely to respond to particular offers and products. Most importantly, few companies can identify those customers or prospects that have the greatest potential to become profitable customers over time, given the right marketing investment.”

— Wayne W. Eckerson
Senior consultant/analyst
Information Assets
Patricia Seybold Group

Think of your own buying decisions. Have you ever made a purchase because:

- * One supplier had the item in stock and another did not?
- * One supplier could meet your specific needs promptly with just what you wanted?
- * One supplier was more responsive to your inquiries and “remembered” previous contacts?

And this “memory” concerning customers is important to suppliers as well. Many organizations have recognized this opportunity already. They have implemented operational customer relationship management (CRM) software such as call center technology for customer care or sales automation technology to improve their sales process. If used properly, these tools can personalize the process of sales and support more, addressing the customer’s needs in the “touch points” of sales and service. The supplier wants to leverage these tools to deepen their customer relationships — especially with those customers whom they regard as low-risk and highly profitable.

CRM has too often been used as an opportunity for one-way communication. Put more crudely, cleverly targeted mailings and sophisticated profiling techniques may have helped the direct marketers increase their response rates. But, used in isolation, they will not, and cannot, deliver true customer relationship management. “The real benefits of CRM are located in the customization of service, not literature,” says Sean Kelly, Vice President, European Operations for Sybase, Inc., and author of the first authoritative text on data warehousing, *Data Warehousing — the route to mass customization*.

“Far too many organizations are focusing on CRM simply to up-sell or cross-sell their products and services without giving enough thought to how they will enhance their customer care strategy. By focusing exclusively on the sales opportunities that CRM presents, they ignore other forms of interaction such as the analysis of customer consumption patterns, levels of customer contact (including complaint procedures), and more effective analysis of customer profitability.”

So how does a business in today’s world begin to understand who its low-risk, high-profit customers are? And even if it establishes who its best customers are, how can it leverage this to determine how to reach and keep customers whose demands are changing and whose attentions easily shift from one company to another within the marketplace?

The early adopters of data warehousing understood the power of customer information—and the benefits to be gained from the business intelligence solutions needed to deliver that information. The data warehouse technology provides the location where data may be centralized, integrated, stored, and accessed. But without business intelligence, it may not be exploited. Organizations that have had the expertise and the resources to implement a customer-focused data warehouse now are reaping the rewards of true CRM — simply by understanding what their customers want from them.

This paper examines a new approach to implementing a Business Intelligence solution focused on the analytical aspects of CRM. This approach will help businesses better analyze their target markets. From there, they will gain the insight needed to formulate profitable strategies and tactics to reach their customers more effectively. It will provide an insight on how a customer-focused data warehouse can be implemented faster with fewer resources at the same time as it delivers reduced risk. Implemented effectively, Business Intelligence combines technology with business strategy to give your customers the services and products they want, thus better protecting them from being taken away by your competition. At the same time, Business Intelligence allows you to grow your business with new customers who share the profitable characteristics of your current customer base.

Challenges for Customer-Oriented and Market-Oriented Companies

Currently, many customer-oriented and market-oriented companies evaluate their customers along demographic (age, sex, geography), lifestyle (buying habits, activities, and affiliations), and family (household) groupings. With these database-marketing techniques, marketers use traditional methods such as direct mail to “touch” potential customers for new business. For example, it is common to do mailings by specific groupings or segments for, let’s say, “all prospects 55 or older who play golf.” This kind of modeling yields virtually no insight regarding the profit potential of this group or even if these prospects respond to direct mail. In fact, many questions are left unresolved by these kinds of traditional database marketing techniques. Among the questions are:

- **Increased Acquisition Costs.** How do we reduce the cost of gaining a new customer, which often exceeds the profit that can be generated from that customer?
- **Increased Customer Service Costs.** How do we move customers toward more cost-effective service channels like the Web?
- **Inadequate Knowledge of the Customer.** What are the customer’s service needs, profit performance, and lifestyle choices?
- **Complex Customer Profitability Models.** What are the right combinations of products, services, sales, and marketing support needed to drive profitable business?
- **Increased Account Churn.** How can we retain customers and build loyalty?

The New Approach for Business Intelligence

Today, with the advent of Business Intelligence applications and integrated supporting data models, it is possible to deliver fine-tuned analyses of the needs of individual customers, based on buying habits, preferred marketing interactions, and lifestyle choices. This helps create more profitable and more personal business relationships that can drive every “touch point” in your organization, including customer service, telesales, direct sales, e-commerce, Web marketing, and business operations.

For example, a business analyst can use the customer’s buying needs and preferences to deliver a specifically designed service package that addresses the customer’s business needs directly. This builds a stronger business relationship with that customer and provides the company with new revenue opportunities. At the same time, the marketing department not only can evaluate direct marketing programs, but also can determine the optimal follow-up activities for every customer based on the relevant customer segmentation combinations. Ideally, all this new customer intelligence enables you to direct your most profitable customers to your most experienced customer service or sales representatives.

Analytical CRM Defined

Analytical CRM is the focused analysis of data created by the operational side of CRM and legacy applications for the purpose of business performance management. Analytical CRM is necessarily dependent on the existence of a data warehouse infrastructure that integrates CRM data and facilitates access to it. Analytical CRM, therefore, enables organizations to identify and balance needs, patterns, opportunities, risks, and costs associated with existing and potential customers to maximize the overall enterprise value.

An integrated Analytical CRM solution addresses all of the following:

- Customer Profiling (segmentation, risk, propensity)
- Campaign Management (analysis of campaign effectiveness)
- Customer Care (analysis of customer contacts and service)
- Customer Loyalty (persistency, retention, churn)
- Sales Analysis and Prospecting (sales by product, category, store, channel, customer acquisition, cross-sell, up-sell)

A Recipe for Closed-Loop Business Intelligence

The key to success for developing a sophisticated and functional Business Intelligence system begins with understanding the business problem to be solved and a realistic assessment of the data needed and available. From there, it is possible to develop an end-to-end solution to deliver a Business Intelligence system that:

- Performs customer analysis
- Applies market segmentation information to that analysis
- Analyzes ongoing target marketing activities
- Models various ways of predicting customer behavior

In addition, an analytical CRM solution should allow all the accumulated knowledge and activity to be reapplied to a new customer analysis. This is often called a “closed-loop” system. Figure 1 illustrates the system’s primary functions within the Business Intelligence model.

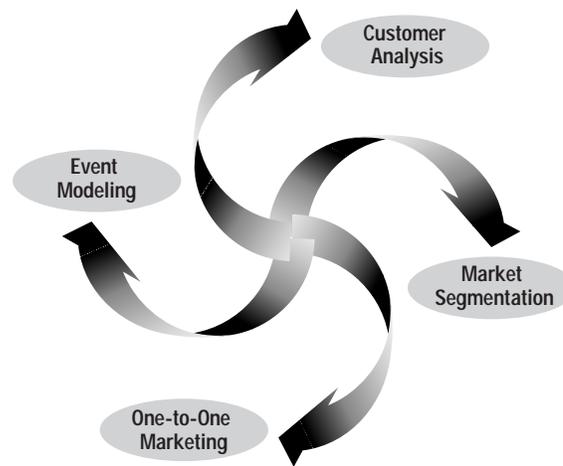


Figure 1. Closed-Loop Business Intelligence

Customer Analysis

The key to any information system is quality information. Customer Analysis not only requires quality information, but lots of it, and from a variety of data sources. This information must be integrated and placed into a customer data warehouse in a way that enables both standard reporting and ad-hoc analysis, provides the means for segmentation, and enables data mining. With a well-constructed customer data warehouse, it is possible to answer such questions as:

- Are newly acquired customers more profitable than current customers?
- What is the lifetime value of your top customers?
- Are customers under 35 years of age profitable?
- Is the Internet helping your business grow and, if so, how?
- Government statistics tell us people are saving more. Are you attracting your customers' increased savings dollars or do they take their discretionary money elsewhere?

Getting the Right Information—A Customer Analysis Example

The information needed for customer analysis typically represents key “touch points” for customers (customer service, World Wide Web, automated teller machines), key revenue points (point of sales, e-commerce, order entry), and external data (demographics, lifestyle, householding).

Before any analysis can begin, it is essential to know the information available, the quality of that information, and the level of integration and cleaning (extraction and transformation) needed to deliver a functional data warehouse. The emphasis here is on “functional” rather than “complete” because with any decision support system, including Business Intelligence systems, new sources of information are constantly being identified, cleaned, and added. Also, older information should continually be evaluated for relevance in light of current business and market demands.

The key information often associated with the customer analysis phase includes customer service history, customer marketing history, sales and revenue by customer, and customer demographic and lifestyle data.

These numerous sources of information must be integrated to create a complete view of the customer in the data warehouse. Once customer information is integrated to reflect product purchases, revenue, service history, demographics, and lifestyle information, it is now possible to rank customer behavior and profitability, and to develop scoring models that begin to predict future behavior. By maintaining a complete history of each customer’s revenue, cost, and utilization, it is possible to:

- Determine customer profitability
- Score customer receptiveness to different forms of marketing
- Determine the number and type of products in use
- Measure customer retention and determine degree of loyalty
- Assess customer self-service patterns based on their activities recorded on your Web site.

Market Segmentation

With a customer data warehouse in place, it is possible to perform sophisticated customer segmentations to analyze and target both strengths and weaknesses in your customer and prospect base. Some common market segmentation questions include:

- Which customers buy product A but not product B?
- Which customers respond directly to particular marketing programs?
- Who are the most profitable customers?
- Does our customer profitability vary according to geographic or demographic characteristics?

A Market Segmentation Example

Ad-hoc analysis and data mining may be used to evaluate permutations and combinations of variables, allowing you to discover new ways to segment the customer base. For example, your data-mining tool of choice may discover that customers whose primary hobby is sailing have a high interest in vanity VISA cards. The data warehouse may also reveal that not only do these customers like vanity VISA cards, they also use the cards frequently. By doing ad-hoc queries against this customer group, you may discover that many of these sailing customers do not currently have boating loans with your bank. With additional analysis, you might discover that customers who did obtain loans responded well to direct telesales calls, but not to direct mail campaigns. Finally, you may determine whether your current sailing customers are “low maintenance”— i.e., they use the Web for self-service needs.

This example illustrates the value of developing an integrated customer data warehouse for Analytical CRM. With the right tools and information, it becomes possible to discover market segmentations that would not be visible with conventional data analysis techniques.

One-to-One Marketing

Having discovered a number of potentially profitable market segments, it is now possible to deliver tailored marketing campaigns for every “touch point” in the organization, from telemarketing to customer service designed for the specific needs of the customer segment. These end-to-end programs are often called “treatment strategies,” not unlike the treatment strategies of a medical doctor who uses “best practices” to deliver the most optimal, efficient, and complete patient care.

A Treatment Strategy Example

Continuing with the boating customer example, imagine that you develop a treatment strategy for your sailing customers to promote a new line of boat loans. As an incentive for this promotion, you have decided to include a “no fee” direct deposit and VISA account for one year, using vanity cards in a choice of four nautical themes. Not only do you develop a telemarketing plan to reach customers with an interest in sailing, but you also create special Web pages and appropriate customer service scripts.

Through this kind of detail-level analysis, you can put together similar treatment strategies designed around the relationship needs of golfers, triathletes, and Home Network shoppers. Through your use of targeted marketing and execution, your company can make a significant and lucrative transition. Where you once promoted your products to customers who may not have wanted them, you now can become a builder of specific customer relationship programs designed around the needs of your high-potential, high-profit customers.

Event Modeling

Event modeling enables business organizations to deliver more accurate and successful marketing campaigns and treatment strategies. Event modeling takes advantage of statistical tools to build models that “explain” the behavior of customers and predict the response of customers and prospects to future marketing promotions. Event modeling enables you to understand which events in a customer’s life — birthdays, purchase of a new car or house, birth of a child — can lead to opportunities that add value with your products and services. These events, which can be ascribed to market segments, are also powerful tools to evaluate customer and prospect profitability. Event modeling seeks ways to reduce the number of promotions, manage the costs of business strategies, and increase the percentage response rates to promotions — all of which ultimately boost profits.

Some typical questions addressed with predictive event modeling are:

- Which customers by age segmentation are most likely to respond to a reduced price promotion?
- How long after buying a new car (securing a car loan) are customers likely to pursue a home mortgage?
- Who is likely to buy only if contacted in person?
- Is our marketing strategy for high-profit customers impacting profitability and retention as predicted?

The objective is to learn which of the possible variables most effectively predict customer response. You then can identify customers or prospects with similar characteristics to target. In many cases, you can use the newfound knowledge about buyer characteristics to test

alternative treatment strategies. With further refinement, your treatment strategies can produce greater customer satisfaction with your message, service, and products—leading to a higher response rate.

An Event Modeling Example

Returns and Early Predictions

To continue with our boating example, imagine you are now three months into the boat loan promotion. Your telesales campaign reached 10,000 customers and prospects, and generated a whopping 8% response rate of which 50% closed—that is, you acquire 400 new boat loans. The close rate was well within expectations, but the number of loans rejected was high. Of the 800 prospects who responded, 300 were rejected mostly because of credit risk. Your next step might be to model the sailing customers using a variety of modeling techniques—including regression, chaos classifiers, and neural networks—to determine what variables best predict the propensity for credit risk. These models would consider group and individual risk factors such as family income, home value, type of dwelling, age, number of children, and geography.

Now, imagine your team has determined that the 300 rejected prospects had a high propensity to live in an apartment (30% of population), with an annual income under \$35,000 and an average age of less than 27 years. The average size of the loan this segment requested was \$23,000. On the other hand, your team determined that those prospects who did obtain a loan generally own a home (66% of population), earn \$72,000 annually, and on average are 34 years old. The average loan approved for this segment was \$37,000.

Refining Treatment Strategies

Your next step is to do some quick ad-hoc analysis and, behold, you find that 70% of the rejected loans were for a first-time boat owner. This leads to a special treatment strategy that includes loans for used boats. You modify your Web site to include a Web search window for used boats being sold in the area. You also include a boat loan calculator to help first-time boaters determine the size of loan for which they can qualify.

You also can explore the key characteristics of those customers who qualified for loans greater than \$50,000, \$70,000, and \$100,000. This leads to a three-segment treatment strategy. For medium-risk customers who make less than \$35,000, you provide new and used boat loans. For customers making \$35,000 to \$100,000, the treatment strategy described earlier will be used. And for those prospects who make more than \$100,000, you team up with a boat insurance company to offer \$1,000 in free merchandise if they qualify for a loan and also purchase boat insurance. As part of the treatment strategy for your high-end prospects, you feed your prospect leads into the new sales force automation system. Your campaign management system then could automatically generate an e-mail to the field representative for all top-level prospects who respond to the telesales campaign. It would include all appropriate customer information (name, address, birth date, secondary interests, and hobbies) needed to help close the deal.

These refinements in the strategy lead to increased response and close rates for the most lucrative customers and increased profitability of the low-end segments as well.

The Ultimate Refinement: Your Bottom Line

Effective Analytical CRM will allow you to see your customers in new ways that increase revenues and profits from your installed base. You can gain a better working knowledge of how, when, where, and what your best customers respond to — and this knowledge allows you to improve your prospecting strategies. Ultimately, an analytical CRM solution designed for Closed-Loop Business Intelligence that allows you to explore your interactions with your customers and prospects becomes the hub of your corporate information systems. This approach gives you the means to convert knowledge obtained from your sales, marketing, and operational systems into strategies that yield significant competitive advantages.

Challenges in Delivering Analytical CRM

Today, conventional large-scale data warehouse development projects typically cost up to several million dollars. They may require many months and often years in development time. To gain the benefits of Business Intelligence solutions focused on Analytical CRM, the following challenges must be addressed:

- Source data for Analytical CRM comes from multiple and disparate systems within an organization and frequently from outside the organization as well. Therefore, information must be captured from multiple systems, integrated, cleansed, modeled and presented in a way that reflects how you do business with your customers. Users need analysis capabilities to devise marketing strategies that will effectively drive your operational systems.
- Information must be easily queried and analyzed to determine the success of business and marketing decisions. Successful Analytical CRM solutions—including on-time and on-budget delivery—require the right applications, data models, meta data management, Extract/Transform/Load (ETL) tools, and database technology. With this necessary infrastructure, you can integrate relevant data from operational systems and deliver a productive, effective environment for business users.
- Analytical CRM solutions require quick, flexible access to business information—potentially by a large number of business users. An abundance of technology exists for storing data. But few of these technology choices enable the flexible analysis needed to support all the various users of your system.
- Current operational systems are built to manage product and service delivery—not to manage customer relationships. And those operational systems typically were developed and implemented independently, resulting in “stovepipes” of information. To build an Analytical CRM solution, information from those operational systems dispersed throughout an enterprise must be integrated. This allows a comprehensive view of the customer’s relationship with your company, enabling an integrated view of this relationship as well as a closed-loop business analysis.

Typical Data Warehouse Project Development

Building a data warehouse has historically been a long and often risky proposition. Industry analysts estimate the failure rate to be as high as 60% to 70%. In many cases, the failure rate was driven by trying to apply traditional project development and data modeling techniques to the design of the data warehouse. Projects were often staffed with resources that had little to no experience in developing and implementing data warehouses. As well, they often used tools acquired from different vendors to build the warehouse, resulting in integration problems.

The key project tasks associated with designing and implementing data warehouses are identified in Figure 2.

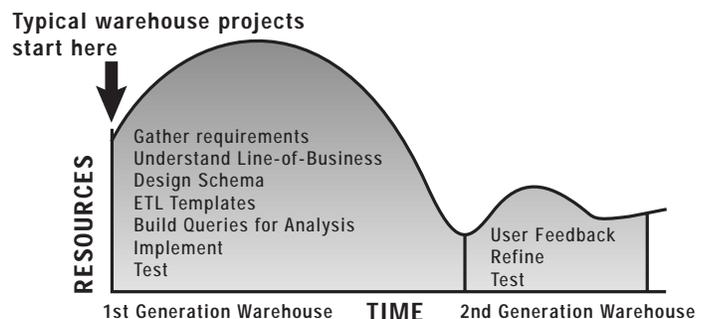


Figure 2. Typical Data Warehouse Project Tasks

- **Gather Requirements** refers to the process of identifying the business needs and defining the key elements and relationships important in solving the business problem.
- **Understand the Line of Business** is necessary so that the data and relationships identified may be validated as representing the business process or logical model and providing the infrastructure to respond to the business need.
- **Design Schemas** refer to the physical implementation of the data models. This is critical since you may design a very elegant business model that meets all requirements, but if it is implemented ineffectively from a physical perspective, it can lead to queries that take hours or days to finish, if they get completed at all.
- **Create ETL Templates** refers to the process of developing and implementing the transformation/ loading scripts. These define the source to target mapping and transformation rules that must be applied as data is extracted from their source locations and as the target data warehouse is populated.
- The project also must develop and **Build Queries for Analysis** that provide examples of how to access and use the models effectively. These queries are typically designed to address a set of key questions that will assist the user of the data warehouse in understanding the value of the data available. They are meant to position the decision maker for creative exploration of an information domain, rather than the more predefined, static user interface generally associated with packaged operational applications.
- Finally, the project must **Implement** and **Test** the data warehouse before it can be critiqued via **User Feedback**, then **Refined** or customized to more accurately meet the customer needs, and then **Test** again. This process associated with building and maintaining a data warehouse is usually referred to as the Iterative Development process.

Benefits of Using a Packaged Data Warehouse Infrastructure

As the data warehousing market matures, it also undergoes substantial changes. Most significantly, it appears that the data warehouse market is moving from a “build” to a “buy” market. That is, rather than conceive and build their data warehouses starting from a “blank page”, today’s data warehouse implementers prefer to buy a packaged data warehouse infrastructure designed as “solutions” to address specific business problems or opportunities in their industries. By using these “packaged data warehouse infrastructures” and customizing them as necessary on implementation, the entire process of data warehouse implementation may be speeded up considerably. As a result, the customer can realize the benefits of access to the data warehouse information sooner.

The key components of a packaged data warehouse infrastructure include:

- **Predefined business models** that define the key elements and relationships important in solving the industry-specific business problems.
- **Predetermined database structures** that define the physical implementation of the data models. This is critical since you may design a very elegant business model that meets all requirements. But if it is implemented ineffectively from a physical perspective, it can lead to queries that take hours or days to finish, if they get completed at all.
- **Predeveloped meta data definitions** that serve as the documentation that describes the data in the data warehouse in terms of what it is, where it came from, when it was last updated, and more. As the number of users of a data warehouse increases in the future, this will become increasingly more important. Extensive documentation of the data warehouse in the form of meta data in technical and business terms will be considered a valuable asset.

- **Transformation/loading scripts** that define the source to target mapping and transformation rules that must be applied as data are extracted from their source locations and as the target data warehouse is populated.
- **Reporting templates** that in the implementation of a packaged data warehouse solution show ways to use data. The 80/20 rule shows it is more important to deliver reporting templates that provide examples of how to access and use the data warehouse models most effectively.

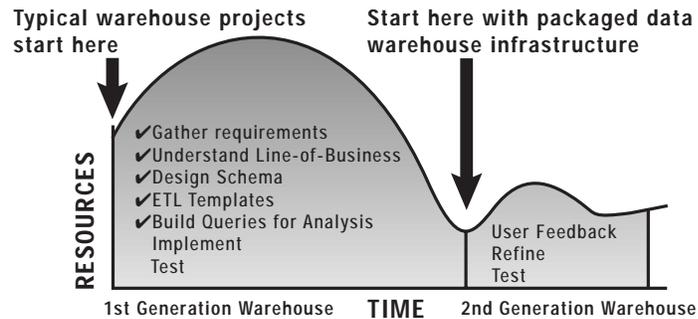


Figure 3. Benefits of Using a Packaged Data Warehouse Infrastructure

Figure 3 illustrates the specific steps in which using a packaged data warehouse infrastructure speeds the project development process. The most time-consuming steps associated with the startup design and initial implementation of a data warehouse are greatly reduced by choosing to use a solution based on a packaged data warehouse infrastructure.

The packaged data warehouse infrastructure solution delivers the following key benefits:

- Implementation of the data warehouse is accomplished at a much lower cost and with the requirement for far fewer resources than traditional development methods.
- It enables earlier access to and use of the data warehouse by the end user.
- It reduces the risk normally associated with building a data warehouse.

Introducing the Sybase Industry Warehouse Studio

Vendors such as Sybase have gained significant experience through numerous engagements that dealt with the development and implementation of data warehouses and their associated Business Intelligence or analytical applications. At Sybase, we have studied our implementation with the objective of understanding what makes developing analytical applications based on a data warehouse such a lengthy process, involving high costs and great risk. At the same time, through our experience we discovered that within specific industries, there are common treatments of workflow, measurements, reporting requirements, terminology, and data types.

The result of these efforts has been the development of a series of customer-focused, industry-oriented packaged data warehouse models and accompanying analytic applications. They take the risk out of delivering Business Intelligence capabilities while reducing the costs involved and optimizing application value.

By implementing Sybase Industry Warehouse Studio™, our customers gain a complete business intelligence packaged solution containing the following components:

- Industry data model
- Packaged application reports
- Database design tool suite
- Meta data repository and Web client
- Database independence: integration with standard databases such as IBM, Informix, Microsoft, Oracle, and Sybase
- Methodology and project plans optimized for industry-specific implementation

By providing a detailed analytical template mapped to defined applications that have a proven business benefit in a specific vertical industry, each Business Intelligence packaged application takes the risk out of data warehousing, reduces the costs involved, and optimizes application value. And because it is designed to meet the requirements of a targeted industry, these customer-focused, vertical solutions provide benefits faster and more consistently within the targeted industry compared with a technology-based decision support implementation.

Says David Wells, principal analyst at Ovum, Europe's leading market research company: "Sybase's idea of a packaged data warehouse application infrastructure is valuable; it is very useful for people implementing data warehouses or data marts to have a framework that guides development. A common . . . difficulty (occurs) when there is a disconnect between users (and their needs) and developers in the first iteration of development. Sybase Industry Warehouse Studio helps avoid this scenario."

Sybase Delivers the Right Solution Today

Business today is a dynamic environment of mergers and consolidations, global competition, and encroachment from other business sectors. In this environment, the ability to analyze your business to understand the impact of your business decisions on sales revenue, market competition, financial costs, and operational effectiveness becomes even more important. Every decision you make not only affects the way your business works, but also how your customers perceive you versus your competition. Across every major industry, firms look at new ways to discover business opportunities by better understanding customer needs, analyzing profitable market segments, providing specific products their profitable customers demand, and measuring how well their organizations are executing these demands. Sybase Business Intelligence delivers industry-leading applications and technology through partnerships with the Sybase Professional Services team and our network of system integrators and solution providers to enable business success.

Industry-Focused Warehouse Studios

Today, conventional large-scale data warehouse development projects typically cost several million dollars and require many months—and often years—of development time. Sybase recognizes that data warehousing and Business Intelligence solutions are rapidly evolving toward packaged vertical applications. Sybase, today, provides proven industry applications for Business Intelligence. These applications, combined with Warehouse Studio, form the basis of Sybase's new Business Intelligence offerings.

The Industry Warehouse Studios function as an integrated application infrastructure that addresses the different, but related, aspects of customer behavior, customer value, and customer potential. The component-based approach, which has been used to construct the solutions, facilitates an incremental deployment strategy that ensures the seamless integration of the entire data architecture. The richness, flexibility, and performance of the database design unlock the key to application capabilities that truly facilitate the development of real sustainable customer relationships.

Industry Warehouse Studio Packaged Application Reports

The Analytical CRM focus of the Industry Warehouse Studio is delivered through the following cross-industry application areas:

- Campaign Analysis
- Customer Profile Analysis
- Sales Analysis
- Customer Loyalty
- Customer Care Analysis

Each application area is delivered with several packaged reports designed to exploit the accompanying data models and provide the information to address and answer key business questions related to the application domain.

The reports described in this paper are those defined for the initial delivery of the Industry Warehouse Studios. Since additional reports are being developed on a regular basis, please check with your Sybase representative for the most updated list of available reports.

“By providing a common technology base for different industries, Sybase offers a unique advantage by making it possible to integrate information across industry sectors. For example, if an insurance company acquires a healthcare firm, then the information for both segments can be integrated because the technology framework is common to both.”

— Michael Burwen, President
Consortium for Business
Intelligence and Data
Warehousing Research

Campaign Analysis

Accurately targeting customers in campaigns and promotions as well as analyzing their responses to promotion episodes is a key part of the learning process that enables the transition from mass marketing to mass customization. Most organizations launch many different kinds of promotional campaigns for many different products using many different media. This application enhances the organization's understanding of the entire process—from selecting customers to be targeted to analyzing how they responded. It is clearly an analytical application and a prerequisite for any operational software package to manage the campaign episode itself.

The Campaign Analysis application supports an analysis of campaigns by both households and individual customers. It includes an analysis of customers who are highly responsive to campaigns. It compares the characteristics of customers who are highly unresponsive with the characteristics of customers who have opted to be excluded from campaigns. As well, it provides the ability to measure the effectiveness of individual campaigns and the effectiveness of different media, and has the ability to conduct several cost-benefit analyses of campaigns.

Campaign Analysis — Sample Packaged Application Reports

- **POSITIVE RESPONSE PROFILE ANALYSIS BY HOUSEHOLD** Establishes the characteristics of households that have had a historical pattern of responding positively to promotions and campaigns. Identifies the attributes of customers who respond positively to a campaign, then identifies all customers who share the same attributes.
- **NEGATIVE RESPONSE PROFILE ANALYSIS BY HOUSEHOLD** Establishes the characteristics of households that have had a historical pattern of responding negatively to promotions and campaigns. Identifies the attributes of customers who respond negatively, then identifies all customers who share the same attributes.
- **PROMOTION CAMPAIGN EPISODE ANALYSIS BY CUSTOMER** Analyzes the response to a particular campaign or promotion and identifies the characteristics of customers who responded to that specific campaign episode. In addition, identifies those customers who did not respond (but who share the characteristics of those who did) for the purposes of remaining information only to those identified.
- **COST/BENEFIT ANALYSIS OF PROMOTION CAMPAIGNS** Analyzes the relative costs and revenues of similar campaigns that have been executed.
- **PROMOTION CAMPAIGN EFFECTIVENESS ANALYSIS** Analyzes the efficiency and effectiveness of campaigns by comparing outcomes, media, channels, and regions to compare and contrast the effectiveness of one campaign episode with others.

Customer Profile Analysis

This application allows organizations to distinguish, among the mass of customers, the many microsegments that make up the whole. Increasingly, customer segmentation forms an essential element of marketing strategy as markets become more fragmented and customer segments exhibit distinct and different characteristics. This application helps build genuine customer relationships in the era of one-to-one marketing.

The Customer Profile Analysis application includes an analysis of both households and individual customers. The analysis features profiling by product use and frequency, by product holding pattern, by demographic characteristics, by psychographic characteristics, and by geographic characteristics.

Customer Profile Analysis — Sample Packaged Application Reports

- **HOUSEHOLD PRODUCT UTILIZATION ANALYSIS** Profiles households on the basis of the product mix and product consumption. The purpose of the report is to facilitate segmentation based on the product dimension.
- **HOUSEHOLD BEHAVIOR ANALYSIS** Identifies the value of households based on purchase history. The purpose of the report is to facilitate household segmentation based on value.
- **HOUSEHOLD PROFILE ANALYSIS** Profiles households on the basis of household attributes. This report facilitates segmentation based on demographics, geography, and profession.
- **CUSTOMER PRODUCT UTILIZATION ANALYSIS** Profiles individual customers on the basis of the product mix and product consumption. This report facilitates segmentation based on the product dimension.
- **CUSTOMER BEHAVIOR ANALYSIS** Identifies the value of individual customers based on purchase history. This report facilitates household segmentation based on value.
- **CUSTOMER PROFILE ANALYSIS** Profiles individual customers on the basis of customer attributes. This report facilitates segmentation based on the customer's demographics, psychographics, geography, and profession.

Sales Analysis

The Sales Analysis application provides an analysis of sales presented from a variety of viewpoints, such as sales by channel, outlet, or organizational unit; sales by product, product category, or product group; sales by region; and sales by season.

This application gives the organization an integrated perspective on sales results and enables sales managers to understand the underlying trends and patterns in their sales data.

Sales Analysis — Sample Packaged Application Reports

- **SUMMARY SALES ANALYSIS** Provides a consolidated summary of sales by product over time and identifies the organizational unit responsible for the sales.
- **SALES/CUSTOMER ANALYSIS** Describes any relationships that exist between customer categories and product preferences.
- **SALES/SATISFACTION ANALYSIS** Analyzes the relationship between sales and cancellation events with customer satisfaction. Customer satisfaction is measured with reference to resolved and unresolved contact events during the preceding 12-month period.
- **CUSTOMER LOYALTY ANALYSIS** Identifies product usage and frequency by customer over time and any relationship that exists between usage patterns and the number of products held by a customer or the mix of products held by a customer.
- **CUSTOMER LATENCY ANALYSIS** Identifies the attributes of customers who have more than “n” products and identifies those customers with the same attributes who have fewer than “n” products in ascending order. This analysis identifies customers with few products who share the same profile as customers with many products.
- **SALES/ORGANIZATION PERFORMANCE ANALYSIS** Identifies the high-performing and low-performing organization units and channels in the enterprise.

Loyalty Analysis

One of the keys to profitability in any enterprise is customer loyalty. Yet so few organizations measure customer loyalty in a structured way or seek to understand the underlying causes of customer attrition. This application is designed to do just that.

The Loyalty Analysis application measures customer loyalty with reference to the duration of the customer relationship; the range of services and products consumed by the customer; and the demographic, psychographic, and geographic influences on customer attrition.

By itself, the Loyalty Analysis application measures and monitors customer loyalty and facilitates the development of customer retention programs. When combined with the other applications in the full IWS suite, the customer loyalty can be assessed in the context of their value, their contact history, the segments they belong to, and individual transaction events that may influence their loyalty.

Loyalty Analysis — Sample Packaged Application Reports

- **CUSTOMER FREQUENCY ANALYSIS** Identifies the number of purchase events by customer, by region, and by product during the past 12 months, and calculates the average frequency.
- **CUSTOMER RELATIONSHIP DURATION ANALYSIS** Identifies the duration of the customer relationship and orders by product, region, demographics, and psychographics for the longest duration of customers.
- **CUSTOMER PRODUCT RANGE ANALYSIS** Identifies the relationship between the number of products held by the customer and the duration of the relationship.
- **CUSTOMER REVENUE ANALYSIS** Identifies the relationship between the revenue generated by customers and the duration of the relationship.
- **ATTRITION ANALYSIS** Identifies customers who have cancelled a product or service, along with the product, region, demographics, and psychographics involved.
- **RETENTION ANALYSIS** Identifies customers who share the same demographic or geographic attributes as customers who have cancelled a product in the past 12 months.

Customer Care Analysis

Customers interact with organizations in many ways using different “touch points” to initiate inquiries, make complaints, give compliments, provide feedback, report faults, or make suggestions. This information provides valuable insight into the behavior of customers and the track records of the organizations servicing customers. The likely level of satisfaction or dissatisfaction of a customer can be determined by their customer contact history.

Analyzing customer contacts is essential in maintaining and nurturing customer relationships and preserving the loyalty of customers into the future.

The application enables users to analyze the customer contact history of individual customers; resolved and unresolved complaints; the number of positive and negative contacts; the time taken to resolve customer complaints; and inquiries and the response of customers to these interactions.

Customer Care Analysis— Sample Packaged Application Reports

- **CUSTOMER COMPLAINT ANALYSIS** Identifies customer complaints by complaint type, product, day, time of day, time taken to resolve complaint, sales person, and region for the past 12 months. It also identifies complaints that were resolved successfully and those not resolved successfully.
- **CUSTOMER INQUIRY ANALYSIS** Identifies customer inquiries by product, organizational unit, day, time taken to resolve inquiry, and region for the past 12 months. It also identifies those that were resolved successfully and those not resolved successfully.
- **CUSTOMER FAULT REPORT ANALYSIS** Identifies customer fault reports by product, organizational unit, day, time of day, time taken to clear the fault, and region for the past 12 months. It also identifies those that were resolved successfully and those not resolved successfully.
- **CUSTOMER SUGGESTION ANALYSIS** Identifies customer suggestions by product, organizational unit, and region for the past 12 months. It also identifies those that were implemented and those not implemented.
- **CONTACT CONTENTION ANALYSIS** Identifies the number of unsolicited contacts made to the customer during the past 12 months by organization unit, product, and week. It also identifies if the customer received more than one communication in any week from more than one organizational unit.
- **CUSTOMER SATISFACTION ANALYSIS** Identifies the customer satisfaction rating of the top 20% of customers and the bottom 20% of customers, as well as their orders by product, region, and demographics.

Getting Results Today

At Sybase, we've built Business Intelligence technology that focuses exclusively on the information needs of your business. Our dedicated staff of sales, support, marketing, partner relations, product development, consulting services, and technical experts provide high-yield solutions to your problems.

Through our network of partners and system integrators, we can provide the services you need—from project management, to full-scale development, to business collaboration. We know your industry. We're here to help.

Business Intelligence is a sophisticated and powerful way to retain and engage your customers. Now, Sybase customers enjoy stronger revenue growth, better market penetration, and reduced cost of customer acquisition and service while improving customer satisfaction and retention. For more information on Sybase's capabilities and product offerings for data warehousing and Customer Relationship Management, visit us on the Web at <http://www.sybase.com/bi>, or call us at 1-800-8-SYBASE.

Appendix A: Sybase Industry Warehouse Studio Components

In the past five years, Sybase has examined the processes surrounding the development of analytical applications—taking care to catalog all factors that typically contribute to high costs and lengthy development and implementation cycles.

Industry Data Models (Included with IWS)

Our Business Intelligence applications minimize design and implementation risk through proven, detailed data models that map to your specific business analysis needs. Our data models and business applications have grown and evolved through five years of successful implementations at large-scale installations throughout the world. With our data models and methodology, we have provided significant value to our customers by:

- Reducing risk of failure, design costs, and implementation time
- Ensuring scalability, data integration, and enterprisewide scope
- Providing extensibility that allows you to add information critical to your business
- Exploiting proven designs that “future-proof” the database while reducing disk space requirements
- Reducing the complexity of application development and enabling graceful change management
- Offering integrated models with conformed dimensions to provide a consistent “snapshot” of information across multiple areas

Packaged Application Reports (Included with IWS)

Each Industry Warehouse Studio application module comes with a set of packaged application reports or “report templates” in the form of SQL that provide a starting point for customizing the applications to meet the specific customer needs. These reports answer key business questions related to the application area. Sample reports for each of the core Analytical CRM applications are described elsewhere in this document. Partners such as Cognos, Business Objects, and others will be developing sample applications using the SQL templates that will highlight their own product strengths in providing “view access” to the IWS models.

Warehouse Architect (Included with IWS)

It starts with the design. Warehouse Studio gives you PowerDesigner® WarehouseArchitect™ so you can graphically design exactly what you want. WarehouseArchitect then creates scripts to load the warehouse and even delivers information to business applications so users can interact with the warehouse immediately. With support for relational, star, and aggregated multidimensional schemas, WarehouseArchitect gives you the tools to build your warehouse, no matter how complex your business requirements.

A full range of reporting capabilities ensures the documentation and availability of warehouse-specific objects like external tables and columns, facts, dimensions, attributes, matrices, and source mappings. You can share this information throughout your organization.

Warehouse Control Center® (Included with IWS)

Whether you're in the initial stages of developing a data warehouse or you have multiple data marts, you need to manage your investment. The key is meta data. Meta data provides descriptions and attributes of warehouse contents in terms a business user can understand. From warehouse design through delivery, Warehouse Studio's Warehouse Control Center lets you capture, synchronize, manage, and use logical, physical, and contextual meta data throughout your data warehouse, while storing it in a central repository. You also can synchronize the meta data with query tools so users can immediately access data using meaningful business terminology rather than complex database nomenclature. And users can easily navigate through and search the data using the Warehouse Control Center's Meta Data Browser.

Methodology and Project Plans (Included with IWS)

The IWS methodology has evolved as a full life cycle methodology to help design, develop, and administer data warehouses and data marts. The methodology is broken into four phases and is composed of nine separate steps or tasks. It provides a description of each task and includes a task summary table that guides the consultant through the task.

The summary table refers to each of the following components of a task:

- **Purpose**—identifies the benefit of performing this task.
- **Deliverable(s)**—describes what is to be delivered from each task and indicates how that deliverable is to be used.
- **Dependencies**—shows which tasks must be completed before another task may start and which tasks run concurrently.
- **Participants**—identifies the different participants in the data warehouse project that need to be involved in the task. Any special responsibilities are defined in this section.
- **Activities**—describes a set of activities that may be used to complete the task. These are suggestions based on the author's experiences and should be modified to fit the unique characteristics of each project.
- **Techniques and tools**—represents a means of completing the task, and where one or more options exist, how to select the optimum tool or technique. It is assumed that the project has a standard office suite (word processor, spreadsheet, etc.) and a project management tool.
- **Estimating and project management guidelines**—estimates how much effort should be involved (in elapsed calendar days and in labor) in the completion of a task on a typical project; estimates the guidelines that indicate the factors that may cause the task completion to take more or less time.
- **Quality assurance guidelines**—discusses measures for the success of each task or the content of each deliverable.

Project management tasks are incorporated in the methodology steps. Some important activities such as status reporting and change control are required throughout the project, and are not specifically addressed in the work breakdown.

Database Independence (Standard feature of IWS)

To guarantee the success of our application-driven approach, Sybase delivers database-independent solutions that support all the major database platforms including IBM, Informix, Microsoft, Oracle, and Sybase. The IWS applications also run on Sybase's analytic engines, exclusively designed for Business Intelligence: Adaptive Server® IQ¹² and Adaptive Server IQ¹²—Multiplex.

PowerStage™ (Optional feature of IWS)

Designing your warehouse is just the beginning. You need to populate that warehouse with information, and that process involves more than simply dumping in bits of data. Data must be extracted from a variety of sources and transformed into information that makes sense to the business user. Warehouse Studio's PowerStage™ provides an easy-to-use, component-based solution for just that—automating the extraction, transformation, and cleansing of data from multiple operational sources.

Using PowerStage's graphical drag-and-drop environment, developers easily design the data integration process from the source through transformation to the target warehouse. PowerStage breaks the process into a series of easy-to-understand, discrete steps that can be scheduled for execution or performed on demand. And PowerStage's component-based architecture increases productivity by allowing you to build components that reflect specific needs and then package and reuse those components.



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