



Creating the Single Customer View

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Decentralized, Fragmented and Inconsistent Data

In a world so dependent on data that it has become the pinnacle corporate asset, hundreds of companies are deploying dozens of initiatives around data: ERP, shared services, CRM, contact centers, supply chain, RFID, SFA, etc. With the launch of these new technologies, Gartner, in a ground breaking report, predicted that poor data quality would be one of the top inhibitors to the success of any data-related technology implementation. They also predicted that ROI from these initiatives can only be realized when customer-facing technologies are combined with analytic techniques such as collaborative filtering, predictive modeling and business rules. In other words, customer intelligence, blended with historical data via predictive science is required to predict future customer purchase behaviors. Additionally, the information resulting from all the data manipulation is necessary to shape the decisions about how companies innovate products, go to market, and determine customer focus.

“In the 1980’s the main source of data was the address to ship an item and bill a customer. Today the data picture is far more complex.

In addition, to keeping track of vendors, suppliers, inventory and financial records, companies now track customers’ buying habits, preferences and a host of other data.”

—Paul Kirby, AMR Research

Critical to making data-oriented strategies and technology solutions transform customer data into actionable intelligence is access to accurate, reliable, and consistent real-time data. But most companies do not have a master database where information is consolidated and maintained. This means that customer data, often collected from multiple disparate sources, is incomplete and of poor quality. And if the data is not cleansed, updated and integrated, errors, redundancies and delays can be expected. In the end, money spent on all the new data-related initiatives and software packages may be in vain because the data-based applications are only as good as the data that runs them. Garbage in, garbage out.

Analyst Findings on Corporate Data Quality

A number of analyst groups have published alarming statistics about company data quality. Forrester published a study reporting that 37 percent of companies cite duplicate and overlapping files as significant data-management problems. Gartner’s new studies on data show that contact data typically deteriorates at a rate of 33 percent per year. In addition, they found that more than 25 percent of the critical data used in large corporations is flawed due to human data-entry errors, data becoming outdated (i.e., from customer’s moving) and a lack of proper corporate data standards. Gartner also predicts that through 2007, more than 50 percent of data-warehouse projects will experience limited acceptance, if not outright failure, because companies are not proactively addressing the data-quality issues.

In another report on CRM Data Cleansing, Gartner found that more than 40 percent of all companies take on CRM or similar projects without understanding their existing data quality problems. And, at least 60 percent underestimate the resources required to perform data quality clean-up. Without proper attention, the data will inevitably become incorrect, unusable and ultimately untrustworthy. So, the very thing that corporate strategies and tactical plans are being based on is in itself unsound.

Business Reasons for Creating a *Single Customer View*

With the strategic focus on data, one of the most significant challenges facing CIOs today is wrestling with the issues to make data valuable to the corporation. One of the most important aspects of making data valuable is being able to create a single customer view (SCV) with the data. A single customer view means that across all applications, databases and customer touch points, a company has a single accurate, consistent and complete view of their customers and their data.

The business reasons to create a SCV are numerous and span all departments of a company. They include the ability to:

- Better target products and services to current customers to increase revenue
- Identify the company's most valuable customers
- Increase forecast accuracy
- Comply with federal regulations like Sarbanes-Oxley with a complete picture of customers and their transactions
- Provide great customer service, resulting in higher customer retention
- Anticipate customer needs to develop better products
- Better focus marketing initiatives towards customers interested in the products and services
- Assess and then leverage a merger or acquisition by getting a quick, reliable view of the combined customer base and
- Sell more effectively through channel partners

The financial, operational, customer satisfaction and regulatory affects of unreliable data are overwhelming. Examples of negative outcomes include:

CRM Investments

Companies cannot reap the rewards promised in part because the customer data they are storing and managing is inaccurate, outdated or redundant. Lost revenue and dissatisfied customers also result from improperly addressed customer shipments and invoices. More emphasis should be placed on buying a CRM package and implementing it than the data itself. Information quality has been taken for granted, ignored or given second priority to the deployment of a CRM system. Mergers and acquisition are executed many times to leverage the additional customer base. But, without a good view of the customer, the point of the merger may be lost.

Marketing

Sending mailers to undeliverable addresses or duplicate promotional materials because customers are duplicated in the database result in ineffective use of budget. Opportunity costs increase when companies do not send marketing materials to the right prospects because the segmentation data is flawed, and unnecessary printing, postage and staffing costs result. A company's credibility with customers and suppliers erodes by sending them things they are not interested in.

Sales

The sales force calls unreachable phone numbers and the process of integrating internal data with partner or channel data that has different levels of quality, completeness and tags risks violating financial reporting and privacy legislations.

Government Regulations

Government-instituted regulatory compliance laws, including consumer privacy regulations or tracking events for Sarbanes Oxley, or 9/11 regulations that require companies to know who their customers are, such as OFAC, USA Patriot Act, HIPAA, Graham-Leach-Bliley, and Do Not Call legislation, all incur steep fines for non-compliance. Without a single customer view, companies are at risk of violating financial reporting and privacy legislation.

Businesses that can answer the following types of questions have accurate, reliable data and gain return on their investments:

- How can we sell more to our top accounts?
- How effective are our channel marketing programs?
- How well do I understand my customer relationships across departments, lines of business, and geographies?
- What is our financial exposure to customers?
- How can we effectively respond to the needs of our customer?

“People become enamored with data-analysis tools and make assumptions that the data is readily available and in good shape. They gloss over the data issues and that’s a recipe for failure.”

—Ted Friedman, Gartner

Having answers to those kinds of questions provides the strategic advantage over competitors required to succeed in this fast-paced, global marketplace. The real bottom line questions are: What is the cost of a lost customer? What is the true cost of bad data?

The Cost of Bad Customer Data

In the past, the cost of “poor data quality” and the severity of data quality problems were not applied to the bottom line. However, with increasing awareness of the strategic importance of data, a number of firms and organizations are beginning to evaluate the financial impact of bad data. A recent study by the Data Warehousing Institute found that poor-quality data costs U.S. businesses \$600 billion a year.

Additionally, a senior analyst at Yankee Group, Kosin Huang, reported that \$40 billion of that can be attributed to the consumer packaged goods industry and retail supply chain alone. The study quoted experts who found that customer data becomes obsolete at the rate of 2 percent a month because people move, get married, divorced or die. Nearly half of the companies surveyed had no plans to improve data quality. To put this static into perspective, assume that your company has 1,000,000 customers and prospects. If two (2) percent of your records becomes obsolete in one month that equates to 20,000 records per month or 240,000 records per year. In several years, about half of the records will be unusable if left unchecked.

A study published in *Information Week* sited that when 413 manufacturers shared their data with their retail customers they found 2,784 data errors. These errors included bad data about products, quantities and brands. Forty-four of the supplier’s data was so bad that it could sabotage the supply chain, resulting in millions of dollars in lost revenue due to poor merchandising decisions.

An AT Kearny study showed that 30 percent of data reported by grocers was erroneous. They also estimated the consumer packaged goods industry is losing \$40 billion in annual sales due to bad product data. This study found 43 percent of invoices included errors leading to unnecessary price reductions.

Yet another study by Automotive Aftermarket Industry Association (AAIA) found that trading partners sharing product data were forced to manually enter it. The AAIA estimated the cost of manual rework like this, combined with the lost sales, costs the automotive industry \$2 billion a year. Dirty data also resulted in excess inventory, invoice payment deductions and delays in new product launches.

The Unsolved Customer Data Challenge

The issue of a poor data quality and the lack of a single view of a customer is caused by:

- Inaccurate data entry at the source
- Inconsistent definitions of customers across different systems
- Poor data design in legacy systems
- Lack of a data steward department and point person
- Lack of a data management plan and
- Lack of single customer view strategy and tactical plan

While each of these issues can cause problems within single systems, creating a single customer view increases the problems exponentially as a result of connecting two or more databases. The challenge is to gain control over a problem that, if left unsolved, will make many other data initiatives pointless.

Thought Leadership

Businesses need a solution for complete and accurate customer data. As businesses begin to realize their data is a competitive tool, the emphasis may shift to working through the myriad of issues. To help guide management and executives in thinking through their own data maze, the following sections review some reasons why the state of data management has reached a crisis point and provide thoughts to help define future action plans.

Customer Data Governance Framework

Effective management of customer data relies on the alignment of people, process and technology. The Customer Data Governance Framework consists of best practices for organizational design, policies, procedures and data architecture that are aligned to maintain a comprehensive and accurate customer data environment. Governance helps companies to define the new roles and responsibilities, and assess the organization's readiness to deal with such a large and important undertaking. By creating a learning organization that understands the value of good data and the repercussions of bad data, you will be able to identify the true value of taking on such an initiative.

One of the most difficult aspects of dealing with a corporation's data issues is deciding who owns and is responsible for the data. Traditionally, IT has "owned" the systems and applications within the enterprise, and is responsible for building the infrastructure that supports the software applications in use. Business units on the other hand have traditionally employed the end users who must make intelligent decisions with the data. Ultimately, the question then becomes, who is responsible for the definition and the continuous management of data? It is critical that both the business users and IT department embark on this journey working hand in hand. Only then will you experience success.

Table 1 shows how different departments view the customer, which in turn determines how they define, collect, store and use data. It is understandable why each of the groups has a different outlook and agenda for data.

Table 1

Department	Department's View of the Customer
Marketing	Customer is a prospect
Strategic Sales Team	Customer is a global entity composed of many buying organizations
Product Team	Customer needs features and functions
IT Integration Team	Customer is a linked entity with a unique ID across all systems

The key to success is creating a cross-functional data governance team that leverages a mix of expert-level resources from both IT and business functions. The data governance team may be comprised of DBAs and application owners, as well as analysts, managers and business personnel from marketing, sales or customer service.

These individuals must represent different parts of the business and understand a wide variety of topics, including customer lifecycle, business objectives relating to how the company wants to treat customers throughout the lifecycle, implications of privacy legislation, and a host of other matters.

Although traditionally viewed as a service organization, it has become critical for IT departments to strategically align with the business so it can effectively support the information requirements of the company. Whereas the business is responsible for developing the policies and procedures that drive the requirements, IT must be able to facilitate these requirements through the successful implementation of solutions and tools.

Because the governance team is responsible for interpreting business strategy and clearly articulating the business requirements that will govern the customer data environment, the company can be assured the single customer view will be comprehensive and accurate on a continuous basis with a team of key stakeholders at the helm.

Once the team defines the single customer view, they can develop and deploy the policies, procedures and enabling technologies necessary to maintain the environment. This governing body will periodically meet to address issues and evolving requirements, and then task the appropriate organizations that contribute to and manage the environment. Given all of this, it is vital that the data governance team be given the authority by the executive team to develop and enforce the governing policies of the customer data environment.

Customer Data Management Roadmap

Within our Customer Data Governance Framework is a data management roadmap that consists of long and short term activities. These activities enable companies to develop a unified and complete customer data hub. They work together to provide a seamless technology platform that manages the entire process of customer data management and integration. The process includes analyzing customer data sources to creating an integrated, accurate and reliable source of customer data.

The customer data hub stores high-quality information from the various systems and stores linking information to the data sources. The hub also provides the most comprehensive and accurate customer information available to any enterprise-wide system. To deliver a comprehensive roadmap, Hitachi Consulting works through the following phases:

- Data profiling
- Data quality analysis
- Data integration
- Data enrichment
- Data monitoring

Data Profiling: Where is the Data and What State is it in?

To understand the problem (or problems) your company is facing, it is important to assess where data is housed and how is it consumed. An inventory of data sources can also include frequency and distortion reports to understand patterns, characteristics, relationships, corruption, phrase and element analysis and business rule discovery. Most companies have customer information in many databases, including:

- Enterprise resource planning (ERP)
- Sales force automation (SFA)
- Order processing and fulfillment systems
- Customer service systems
- Marketing databases
- Billing and logistical systems
- Legacy systems

In this assessment, you will also discover how your practices compare to best practices. For instance, you may determine how to code a data element or how to assign access rights to add, update or delete data. Questions you might pose to the data management team include:

- What sources contain the best data?
- What information do each of the groups need to know about their customers and why?
- How do we know our data is in fact good or bad?
- What data entry standards make sense to deploy?
- Do the current systems produce data that is within business parameters and if not, what will it take to change it?

Having customer data in separate databases creates issues because each database may contain contradictory or redundant information, be sourced from different systems, be inaccurate or any number of other issues. If the goal is to create a single customer view, then every time a customer data element is put into the system, there must be agreement from all departments on how that information will be collected and stored in each separate database.

For example, if customer information is input into two systems in a single day, which system contains the most accurate record? Once this and other issues are agreed upon, the business processes can be embedded within the appropriate applications. Companies can leverage a variety of methods and data quality technologies to automate data entry rules so they meet the business requirements on an ongoing basis (i.e., create accurate data).

Without these rules, it becomes difficult to determine if a record has the same information or if it is a different record altogether. It can be as simple as “street” versus “boulevard” at the end of an address. Is Washington Street the same as Washington Blvd? Names are another example. Is Bill Smith the same as William Smith? Is it a relative or someone completely unrelated? The fact is, we don’t know. Even within the same database, a customer may have multiple identifiers. Changes in business locations, name, mergers and acquisitions all dramatically increase the difficulty of maintaining a clear view of key customers. Not having a single customer view becomes even more complicated when a company is selling to large companies with multiple lines of business. These large customers may have hundreds of discrete accounts that must be correlated for a complete understanding of their relationship with them.

Data Quality Analysis

During data quality analysis, the team is able to identify and correct errors, standardize data and validate information that is inconsistent and inaccurate. Data is often invalid, out of range, incompatible or inconsistent with current business rules. It is important to understand that all data is accurate only within a window of time. As such, this phase analyzes your data so it meets all business requirements and standards defined by the data governance team.

Data quality analysis can verify whether or not addresses or other contact information are correct. Understanding this and performing further analyses will enable the team to develop automated processes for correcting these errors and prevent corruption in the future. Similar to data validation, there are a number of methods and technologies that may be leveraged to minimize corruption and promote accuracy.

The most important aspect of this phase is to define metrics that will distinctly qualify the overall quality of the data environment. These metrics in turn will be leveraged on a continuous basis to ensure the Governance Framework is effective in its ability to maintain the overall quality of the environment. It is important to remember though that since business requirements will inevitably change; so must the data quality metrics.

“Data stewards, those responsible for maintaining a company’s information quality are a must.”

—Gartner

Data Integration

In this phase of the roadmap, we focus on integrating customer data from various source databases. This phase leverages the accurate customer data sources, which we now have as a result of the previous phases, and constructs the single customer view leveraging the governance framework's reference architecture. The reference architecture is typically very complex and has many interlocking pieces, each piece with a specific purpose. It is not complete until all interlocking pieces have been connected.

A good starting point for the development of this architecture is to evaluate the applications and source databases that are within or feed the customer environment. All various data entry points must be considered in this process, including electronic points of sale, call centers, direct mail catalogue orders, credit card transaction, bank transactions, online transactions and electronic mail. All of these data entry points lead to the plethora of ambiguous, duplicate or inaccurate representations of a record. Each business unit (sales, operations, support, marketing, etc.) may each have their own method for recording and archiving information. The differing data element entry rules, nomenclatures and protocols are what make the data in each database inconsistent.

This phase involves identity management, customer matching to find the same customer within the various data sources. Customer information will be consolidated across all data sources and errors and redundancies are resolved. Integration links are developed between data sources to gain an aggregate understanding of the interrelationships between customers. Linking, also known as clustering, can occur at different levels depending on the need: at the customer level, at the household level (all customers at the same address), at the corporate or business level, or some combination of characteristics.

By linking already existing information from a variety of sources, an organization can create a single customer view to support marketing, sales and customer service efforts or any other effort requiring customer information. Complete this phase of the roadmap and you'll reduce or eliminate the possibility of duplicate messages or brochures going out to customers or prospects.

"The biggest issue with data quality is the completeness of data: holes, gaps, and wrong information. If you have garbage in, you'll have garbage out."

—Doug Laney, META GROUP

Data Quality Assurance

In this phase, the quality metrics defined in the data quality analysis phase provide the foundation for data quality assurance activities. Continuous measurable improvement imparts the examinations necessary over time to assure the cleansed data remains accurate. Continuous monitoring provides instant insight to recognize when quality has dipped below acceptable limits. Data monitoring tools can alert the data owner when the data no longer meets the business requirements. In addition, when bad data is found, the processes that caused the bad data must be identified and corrected.

It is not unusual for companies to think that once they have cleaned their data; their quality problems are gone forever. However, due to variable and dynamic nature of customer data, data management requires constant vigilance.

Data Enrichment

The data enrichment phase, an optional phase, allows a company to further enrich its customer data with additional information supplied from third-party customer databases. Many companies may not possess the resources to acquire and maintain customer information. As a result, there are a number of customer data vendors that provide data and services that will enrich corporate customer databases. A missing phone number or apartment number can be added to an already existing record.

An organization can also add behavioral data to customer records to help understand their preferences, individual characteristics and previous buying patterns. There are also demographic, financial, geographic and lifestyle information available about your customers, which can provide a glimpse into potential future purchases and help to improve your understanding of, and ultimately your relationship with, each customer.

Solutions and Best Practices Data Check List

"Data quality improvement is not a one-time project. Rather it is important to have on going programs in place for continuous improvement. A key element of these programs is measurement and the establishment of agreed-to targets.

—Greta James and Ted
Friedman, Gartner

- ✓ The first question to ask is "How does your company deal with data? Is it seen as a valuable asset worth spending time and money collecting, organizing and storing it? Is it valuable enough that your company has appointed an Information Steward with a Strategic Information Office to monitor the quality of the data?"
- ✓ Has your company considered choosing an Information Quality Solution (IQS)? If yes, have they considered how it will seamlessly integrate with the CRM and other systems? Can the IQS handle the various platforms and sources of information from customers? (i.e., web, retail, telesales)
- ✓ Have you considered the business rules you will use? Software solutions that allow for greater flexibility to change or refine rules as your business grows and evolves are important. Consider the processes by which you market and sell products and services as these will affect business rules. For example, you would use different business rules if you were selling to individuals versus targeting entire households.
- ✓ Have you considered how each of your different departments or divisions uses your customer data? You must consider what information will be exchanged and for what purpose.
- ✓ What is your data cleansing strategy? Is it immediately cleansed one record at a time when entered into the system? Or for existing databases, would you cleanse it all at once before entering it into the CRM database?
- ✓ When you cleanse data, do you do all three steps: identify it, standardize it and correct it? At this stage of the game, you can integrate data from other sources, for example a marketing data base from third-party vendors.

Author Bio



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Liem Vu is Vice President of Customer and Channel Solutions for the Pacific Southwest region for Hitachi Consulting. In this role, he serves as the practice leader driving business development and client delivery.

Prior to Hitachi Consulting Liem spent 15 years in the consulting industry. Most recently, he spent 9 years at KPMG Consulting (now BearingPoint) where he attained the level of Managing Director for National CRM Solutions. As a Managing Director he was responsible for CRM solutions development nationally and strategic sales across all industry lines. Prior to KPMG Consulting he held a number of consulting positions and has served Global 2000 companies across many different industries segments.

Liem earned his Bachelor of Sciences degree in Information and Decision Systems from Carnegie Mellon University.

About Hitachi Consulting

As Hitachi, Ltd.'s (NYSE: HIT) global consulting company, Hitachi Consulting is a recognized leader in delivering proven business and IT solutions to Global 2000 companies across many industries. We leverage decades of business process, vertical industry, and leading-edge technology experience to understand each company's unique business needs. From business strategy development through application deployment, our consultants are committed to helping clients quickly realize measurable business value and achieve sustainable ROI.

Hitachi Consulting's client base includes nearly 30 percent of the Fortune 100 as well as many leading mid-market companies. We offer a client-focused, collaborative approach and transfer knowledge throughout each engagement. For more information, call 877-664-0010 or visit www.hitachiconsulting.com.

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About Hitachi

Hitachi, Ltd. (NYSE: HIT), headquartered in Tokyo, Japan, is a leading global electronics company, with approximately 326,000 employees worldwide. Fiscal 2003 (ended March 31, 2004) consolidated sales totaled 8,632.4 billion yen (\$81.4 billion). The company offers a wide range of systems, products and services in market sectors including information systems, electronic devices, power and industrial systems, consumer products, materials and financial services. For more information on Hitachi, please visit the company's Web site at <http://www.hitachi.com>.

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