

Ace Hardware Corporation

**New Retail Focus and Customer Insight Make
Ace Hardware a Fast-Growing Place**

I. Executive Summary

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Ace Hardware Corporation is blazing into its 83rd year of business on a growth and performance tear that would be remarkable in a company a tenth its age. The firm recorded \$3.46 billion in wholesale sales during 2005, a 5.4 percent increase over 2004 and the largest annual gain since 1998. It added 131 new stores with 1.7 million square feet of retail selling space during the year, opened a 788,000 square foot retail support center, and welcomed the 10 millionth customer to its Helpful Hardware Club loyalty program.

The outstanding financial performance and robust growth that Ace enjoys today are driven by a strategic campaign of reinvestment and infrastructure renewal, initiated in 2000, that has refurbished its retail stores and reinforced the ranks of local owner-investors. Less visible but equally important has been a wholesale-to-retail shift in the firm's business model that has allowed the firm to forge new bonds with its retail customers while maintaining the unique independence of local Ace retailers. Technology has played a key role in enabling this strategy, and no technology has contributed more to the transformation than Ace's enterprise data warehouse environment from Teradata.

Retooling the Wholesale Cooperative as a Retail Powerhouse

Throughout its 82 years Ace's wholesale business model and cooperative organization have been the twin themes of a uniquely long-running success story. The company was founded in 1924 to pool the buying power of several independent hardware stores in the Chicago area. Consolidating their purchasing and distribution helped Ace stores compete more effectively with larger chains, and the storeowners' independence provided the type of entrepreneurial energy, attentive service, and creative response to customer needs that are only possible when the owner is in the store.

This happy combination produced almost seven decades of uninterrupted growth. The number of Ace stores climbed into the thousands, a network of regional distribution centers was built, and in time the cooperative was sold to its retailer members. The company ran the wholesale side of the business, sourcing high-quality products at low-cost and developing retail support services to offer its retailer-owners. Ace retailers retained complete control of their own operations, picking and choosing from the co-op's products and services as they saw fit.

By the 1990s, however, major change was afoot in the retail industry, driven by consolidation and advances in information technology. "Big box" operators Home Depot and Lowe's came to dominate the home improvement sector. These firms

made history with rapid expansion, made possible in part by their aggressive exploitation of end-to-end operating data – purchasing data, inventory data, retail transaction data and customer data – to eliminate inefficiencies, reduce costs, optimize pricing and product selection, increase sales and maximize margin.

For the first time, Ace's decentralized organization began to seem a competitive challenge. While the company had a solid command of its wholesale operations, it was virtually blind to events at the retail level. Only summarized sales were reported back to the co-op, and no customer data was captured at all. Because many stores had not embraced the co-op's retail technology recommendations, the POS environment was highly heterogeneous, and most stores had only dial-up network access. In short, Ace not only lacked retail sales visibility, it lacked much of the infrastructure necessary to acquire it.

With sales and customer visits in slow decline at many locations, it seemed an open question whether a loosely organized cooperative like Ace could adopt the new generation of data-driven management tools and adapt them successfully to its own unique culture and decentralized decision-making processes.

Building a Bridge to the Retail Transaction

In 1997, Ace's marketing department, determined to acquire more detailed retail sales and customer data, sponsored two experimental developments. To address the issue of retail sales visibility it worked

with Ace's IT department and POS vendor to create a low cost, pay-as-you-go data warehouse. Starting with a single store and an outsourced 250 GB SQL database, it began organizing nightly uploads of POS transaction records over the available dial-up connections. Storeowners were recruited for the project with the promise of shared reporting and sales performance analysis. All ETL processes were manually coded, and five Cognos licenses were acquired for marketing and merchandising analysts.

The Ace marketers then turned their attention to customer insight, creating a card-based loyalty club – the Helpful Hardware Club (HHC). Customers were recruited to the program with the promise of purchase discounts and special offers. Retailers were incented to support it with the promise of new marketing and merchandising tools to increase sales.

Both efforts were immensely successful. The number of stores sending daily POS records climbed first to 100, then to 700: less than 20 percent of all Ace stores, but a statistically useful sample, and one that included many of the firm's most successful members. Helpful Hardware Club membership reached one million when the deteriorating warehouse forced a halt to new sign-ups. Queries that had originally run in a matter of hours now required days. Ace's marketers were getting exactly the data they needed, but had exhausted the capacity of their warehouse platform. Actually using the data would require a more powerful and scalable enterprise platform.

Ace Audits ADW ROI

One year after Ace Hardware's Teradata system entered service, an ROI review conducted by the firm's corporate audit department concluded that hard dollar impacts attributable to the new Teradata enterprise warehouse included:

- > A \$1.03 increase in the average retail transaction value.
- > An increase in same customer visits of 1/year.
- > A retail price margin increase in 3 Ace departments.¹

Annual value = \$42 million

Annual value = \$24 million

Annual value = \$19 million

Total annual ADW ROI (as of 2002) = \$85 million

Vision 21: A Business Driver for Business Intelligence

Fortunately, the warehouse capacity challenge coincided with the design phase of a major new enterprise growth initiative. Vision 21 is a retail renewal program designed to increase sales, reduce costs and improve profitability by upgrading and standardizing key aspects of store appearance, merchandise assortment, pricing, retail technology, and customer service. Standards are based on best practice operations at Ace's busiest and most profitable stores. Like all Ace programs, participation is voluntary, but members are strongly incented through a special rebate on wholesale purchases, paid to stores that have been certified Vision 21-compliant.

Ace's IT and marketing departments made a strong presentation to management that a true enterprise data warehouse – a single repository for retail and wholesale sales, customer information, purchasing, inventory and finance data; with the performance to support large and varied workloads – would provide essential insight and decision support for the Vision 21 initiative.

After an exhaustive business analysis that included detailed ROI projections and three-year TCO analyses comparing the full cost of competing solutions from IBM and Teradata Corporation, Ace management approved the acquisition of a new Teradata system. The new facilities were installed in early 2001, and were operational by June.

“To store and analyze the high volume of POS transactional data and combine it with our masses of historical data, we needed a powerful data warehouse system and a strong partner,” explained Frank Murphy, Manager of Retail IT. “Teradata is the world leader in data warehousing solutions, with a proven track record in retail, as we discovered when we sought vendor references. That experience, including customer relationship management, category management and business intelligence, made Teradata the right choice for Ace Hardware.”

Finding Dollars in Retail Data

When the new Teradata Ace Data Warehouse (ADW) system entered production, the constraints on new data sources and

reporting workloads were immediately relieved. 2,500 stores now transmit daily POS transaction detail to the warehouse, and the number of Helpful Hardware Club members is approaching 11 million. Query execution times fell from days to hours or minutes, even as hundreds of new users began accessing the warehouse. The ability to manage and report on that data has given Ace's merchandising, marketing and operations departments a vastly better understanding of what's working at the retail level, and how Ace retailers as a whole can benefit. As a result, the average value of retail transactions has increased, the number of same-customer store visits is up as well, and all nine Ace product departments have recorded retail profit margin increases.

“We've come to the point where we realize that data warehousing is a critical capability for Ace Hardware,” says Frank. “The Teradata ADW has become a kind of plug-in to the business, and our operations really depend on it – not to mention our customers.”

¹ A subsequent analysis documented margin improvements in all 9 Ace product departments.

II. Ace: The Helpful Place

With 4,600 independently owned stores in 50 states and 70 countries, Ace Hardware is the world's largest hardware cooperative and the fourth largest franchise enterprise in any category. The firm averages more than \$3 billion in wholesale revenue and \$13 billion in retail sales annually. Its 14 retail support centers stock and distribute more than 65,000 brand name products, including more than 8,000 Ace label products and its own line of award-winning paints. The company also offers local retailers a comprehensive portfolio of support services that include store planning and décor, optimized merchandise assortments, POS and IT solutions, employee training, national advertising campaigns, a centrally-administered customer loyalty program, an e-commerce and customer self-help website, and upgrade and expansion financing assistance.

But Ace's single most valuable asset may very well be its brand. The company's "Helpful Place" trademark is known and trusted worldwide, and the company has been named to Fortune magazine's list of most admired American companies three years running. In a recent survey by Corporate Research International, Ace scored the highest customer service rating of any company in the home improvement industry. In fact the concept of success through helpfulness is not only the unifying thread in all of Ace's external communication, it is an integral element of the company's internal culture.

Ace Hardware by the Numbers

- > Years in business: 82
- > Headquarters: Oak Brook, Illinois
- > Number of employees (cooperative): 5,000
- > Number of retail stores: 4,600
- > Number of Retail Support Centers (Distribution Centers): 14
- > Number of retailers and associates: 80,000
- > 2005 wholesale sales: \$3.466 billion
- > 2005 Retail Sales: \$13+ billion
- > 2005 net earnings: \$100.4 million
- > 2005 retailer rebate: \$103.6 million

A Uniquely Cooperative Business Model

That culture of helpfulness may well have its roots in Ace's corporate structure. As a cooperative wholly owned by its member retailers, Ace presents a distinct business model with a unique set of competitive strengths and operational challenges. Unlike a conventional franchise organization, the cooperative can recommend and incent, but not command, any aspect of member store operations, including appearance, physical configuration, inventory selection, pricing, technology choices or staffing practices. Every Ace retailer is a true entrepreneur, with complete autonomy to customize his store to the local market, drawing on the resources of the cooperative and the strength of the Ace brand as he sees fit.

As a result, decision-making is necessarily decentralized and collaborative. The cooperative's products, services and operating recommendations must compete on their merits for retailer adoption, and successful policy must be grounded in a clear understanding of, and positive contribution to, the retailers' needs and interests. It's an environment in which a genuinely helpful approach is the only path to progress and all success is shared. It must also be a fertile environment for successful dealerships, because in comparison to non-Ace hardware stores, the typical Ace store achieves:

- > 85% higher annual sales
- > 146% higher net profits before tax
- > 42% higher ROI2

III. Catalyst and Transition

In late 1999, as Ace prepared to roll out the Vision 21 initiatives that would re-ignite growth and profitability in its retail stores, the SQL server warehouse that provided the company's only reporting access to customer and retail transaction data was significantly overloaded. Some routine queries required two days and more to execute, and the company was forced to temporarily bar the doors to its bustling customer loyalty club due to its inability to manage additional customer information.

"We had a pretty decent loyalty program taking root," recalls Frank. "We needed to keep pushing the envelope, to get into more CRM applications. We knew we weren't going to scale on what we had, and we knew we had to get into data warehousing seriously."

In particular, the company needed reporting and analytical capacity to support several objectives of the Vision 21 program, which proposed to optimize pricing and merchandise assortments based on practices at the most productive and profitable stores. It also envisioned tightly targeted promotions based on granular customer segmentation, and improved tracking of same store sales and margin performance. Each of these initiatives would introduce significant new workloads on the already overloaded warehouse. Ace management resolved to bring the warehouse in-house, and began the search for a more scalable solution and a long-term vendor-partner.

"We looked at several potential suppliers, but it quickly came down to IBM and Teradata," recalls Murphy. "The deciding factor was really Teradata's retail focus, and particularly their client list, which is riddled with retailers. And we thought they came in with a better vision for retail. They had pre-built Retail Decision database views that we knew would give us a big head start.

"Teradata was not the least expensive of the solutions we looked at, but we were comfortable that they had the right vision. That was important to us because you're not just buying the software; you're buying the company and all the resources that come with it. That's really what it came down to."

Bringing the Warehouse In-house

In January 2001 Ace took delivery of a 2-node 4850 Teradata system, and began the installation and transition from its outsource SQL server facility. The complete Ace Data Warehouse (ADW) solution includes data integration software from Informatica, together with front-end access and reporting tools from MicroStrategy.

One of the most challenging aspects of the implementation was the creation of a new quality control process for incoming POS data. Because of the diversity of POS systems in the field, every line of data has to be validated before it can be loaded.

"We take the sales information from the stores and keep it intact as they gave it to us, but we also supplement their data with our own interpretation of what we believe they sold," explains Mark Cothron, Technology Business Manager. "For example, the store might report that they sold something under stock number 12345, but we know that that's really a hammer and the actual stock number is 54321. We match every line either by SKU, by UPC or by price range to try and figure out what they actually sold, and to match it to our Ace corporate world.

"We now get something like 3.5 million lines of POS data every night. Every single line is interrogated before we load it into the warehouse for corporate reporting purposes. We put a quality level on every line of data, and that's how we manage it. All the business rules are stored in Informatica now, and the process is fully automatic."

Currently, POS data from about 500 stores is loaded at two-hour intervals, while uploads from the other 2,500 reporting stores are received nightly. Other key data sources for the ADW include the Helpful Hardware Club membership system, a J.D. Edwards system that manages wholesale transactions at Ace's Retail Support Centers, finance, purchasing, and the firm's eCommerce and customer information website, acehardware.com.

Opening the ADW to New Users

An immediate impact of the new Teradata system was the ability to extend access and reporting capabilities to a far greater number of business users, in a wider range of functional and business areas than ever before. Report developers in the ADW team began working with business units to identify routine reporting requirements and create ready-to-run MicroStrategy reports that can be accessed through Ace's Intranet portal. About 40 power users across the organization also use MicroStrategy WebProfessional to create ad hoc queries. Where the previous SQL solution had supported fewer than 20 users, the new Teradata ADW provides thousands with timely data access, operational insight and decision support.

Current ADW Users include:

- > 350 Field Staff
- > 400 Corporate Users
- > 4,600 Retailers
- > 2,600 Vendors

Opening the HHC to New Members

One of the most dramatic impacts of the Teradata ADW came with the re-opening of the Helpful Hardware Club to new members. From one million in 2000, HHC membership has risen to nearly 11 million today, with more than 2,200 stores partici-

pating. Member accounts, demographics and purchase histories are all loaded into the warehouse, providing not only the ability to track award eligibility, but a rich resource of demographically-linked sales data that is invaluable for customer segmentation analyses and promotional campaign design.

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Ace Hardware Corporation

IV. The Helpful ADW in Action: Campaign Management

Customer Data Drives More Productive Promotions

The new Teradata ADW combined with the rapidly expanding HHC gave Ace's marketing department the precision targeting capability it needed to launch the company's first national direct mail promotion, and the group's ambitions have grown steadily with experience and success. The ability to narrowly segment its customer base and tightly target promotional communication has increased the average response rate to HHC promotional offers from 5 to 10 percent, while significantly reducing production and distribution costs.

Ace took another major step to streamline and automate its marketing processes in 2004, when it deployed Teradata CRM. Teradata CRM is an integrated family of campaign design tools, analytics, and communication management applications that leverage the Teradata system to help companies develop timely demand creation promotions that are relevant to customer buying behaviors.

With these expanded capabilities, Ace was able to plan and execute 50 national mail and email promotions in 2005, in addition to providing targeted lists for catalog mailing and the distribution of two seasonal issues of *Homeplace* magazine.

Inside a Data-driven Promotion: Ace Brand Trash Bags in April

To see how the Teradata ADW and Ace Hardware's arsenal of communication design and management tools work together to create and execute a product campaign, consider this real-life example: a combined mail and email promotion to HHC members from the spring of 2005.

The offer: \$3 off a \$10 purchase of Ace brand trash bags with the presentation of a coupon, between March 1 and April 16.

The origin: Ace marketers working with buyers in the merchandising department identified this opportunity in a database search of widely stocked consumable product lines. Transactional data on trash bag purchases was used to identify possible distribution quantities, and to determine the promotion offer based on average transactions.

Target segments: Three segments were identified based on their trash bag purchase histories, and separate goals were set for each.

- > Previous purchasers of Ace brand trash bags were targeted to maintain purchases and reward customers for previous purchases.
- > Previous non-Ace brand trash bags purchasers were targeted to prompt a transaction and brand switching.

- > Top Ace customers that have not purchased trash bags from Ace were targeted to generate an additional transaction and grow the number of products these customers are purchasing from Ace.

Special features: This promotion included a test of delivery methods to evaluate response rate differentials between direct mail and email. A random group with valid email addresses was selected from each target segment and contacted by direct mail. Their response rates were compared with those of the customer group who were contacted electronically.

Performance forecast: This promotion was forecasted to receive a 5.00 percent overall response rate, with an average transaction of \$12.00 in Ace brand trash bags, for a total value of \$195,000 during the promotional timeframe.

Actual results: Results were very comparable to forecast. The promotion received an actual overall response rate of 5.24 percent, with an average transaction of \$13.98 in Ace brand trash bags. The total Ace brand trash bag sales were \$247,698, or \$52,698 above forecast. Direct mail demonstrated a 3.23 percent response advantage over email.

Performance against key campaign metrics:

- > Response Rate – The response rate was successful in that it was above the forecasted response rate, and produced enough responders to be profitable overall.
- > Lift over control group – The lift was 2.69 percent, which shows that this promotion did change the behavior of HHC members. In particular, previous Ace brand trash bag purchasers demonstrated a lift of 4.03 percent.
- > Incremental sales – Total sales were \$52,698 above forecast.
- > Average store profit – The average store was profitable for this promotion.

Tools used in the analysis: Both Teradata CRM and MicroStrategy were used to analyze customer and transaction data stored in the ADW. Teradata CRM provides the ability to dissect each segment individually in order to make recommendations for future targeting. MicroStrategy can identify responders based on a barcode and specific criteria that qualify a customer as a responder. Both tools also aid in the calculations of sales and profit information.

Putting New Dollars on the Bottom Line

Precision promotions like the one described above have had an impressive impact of the value of HHC member spending in Ace Hardware stores. In 2005:

- > Same customer sales were 26 percent higher than same store sales.

- > HHC member average transactions were \$7.08 higher than non-member transactions.
 - HHC member average transaction value: \$22.62
 - Non-member average transaction value: \$19.14
- > HHC member sales were more profitable than non-member transactions.
 - HHC member average gross profit/transaction: \$8.62
 - Non-member average gross profit/transaction: \$6.25
- > The overall result: significant increases in store traffic, sales volume, sales value and profit.

V. The Helpful ADW in Action: Category Management

Category Management is the art and science of getting the right product on the right shelf at the right time and price, and at Ace Hardware it's a core application for the Teradata ADW. "We have something like 65,000 products in each of our Retail Support Centers that we can ship out to a retailer," explains Matt Bieber, a Business Analyst in Ace's Category Management department. "The average store, however, stocks somewhere between 15,000 and 25,000 items. So our job is to help retailers select their core mix, and to identify what some of their niches might be. We have nine product departments, and within each one we make stocking recommendations and provide a plan-o-gram book that allocates an optimum shelf location for each product. We make the ordering process as simple as possible."

Discovery – Searching for the High-Turn Assortment

Determining the optimum assortment for a particular store is the focus of Ace's Discovery program, an ongoing effort to understand and replicate sales patterns in the best performing stores. Analysts segment stores in the ADW using a variety of size and demographic factors, looking for patterns in their sales histories.

"We use POS information for what we call our best-in-class retailers, based on the size of the store," Matt continues. "We have four size formats – a convenience format, a neighborhood format, a super

The ADW Approaches Active Status

As the Teradata ADW has become a "plug in" for more daily operations at Ace Hardware, it has also begun acquiring the attributes and applications of an active data warehouse. It has recently been linked with Ace's email system, for instance, to provide event-triggered narrowcasting and alert distribution. Field managers now receive automatically generated alerts whenever a store is put on credit hold. Buyers get alerts when a product exceeds a defective item threshold, and many other applications are planned.

The ADW also supports active access by several production applications. When the Helpful Hardware Club call center receives a customer assistance call, it immediately retrieves a wide range of profile and transaction history information, much of it sourced from the ADW.

format, and we've just recently added a super plus format. We run reports on things like penetration, sales and inventory turns to see what's selling and what isn't, and we use that information to develop efficient assortments for other, similar stores. We're constantly updating these categories as new products come into the marketplace and others are discontinued, always trying to determine not only what items should be on the shelves, but which ones shouldn't."

Like all Ace recommendations to its retailers, assortment recommendations are voluntary. The Category Management department tracks the performance of both compliant and non-compliant stores, both as a measure of its own performance, and as a sales tool for promoting its recommendations. In 2004, compliant stores experienced an average sales growth

of 3.5 percent, compared to 2.5 percent for non-compliant stores. Within those stores, compliant departments experienced an average sales increase of 5.9 percent, while non-compliant departments saw an increase of only 4.8 percent.

CIO Magazine Honors the ADW

In 2004 Ace was recognized by CIO magazine for its accomplishments in using the ADW to drive significant improvements in marketing efficiency and profitability. In naming Ace the Retail segment winner in the 12th Annual Enterprise Value Awards, judges cited the firm's 55 percent increase in gross retail sales due to improved category management, and the 80 percent increase in gross sales for stores participating in the Helpful Hardware Club.

VI. Conclusion

In just a few short years Ace Hardware Corporation has created a centralized data management infrastructure in an organically decentralized organization, developed a new set of relationships with its retail customers, and revitalized grass-roots growth across its worldwide network of 4,600 locally owned and managed stores. The multitude of strategic and tactical initiatives that have contributed to these accomplishments nearly all share a structural dependence on a single new element of analytical and operational infrastructure, the Teradata Ace Data Warehouse.

The Teradata Ace Data Warehouse has given Ace Hardware a single, integrated view of its retail level transactions, despite the vast diversity of local operating environments. It has carried the Helpful Hardware Club to the verge of 11 million members with no end in sight. It has provided the reporting capability and analytical insight to guide dozens of new business initiatives, and furnished the performance documentation to win broad member support. In the Teradata ADW,

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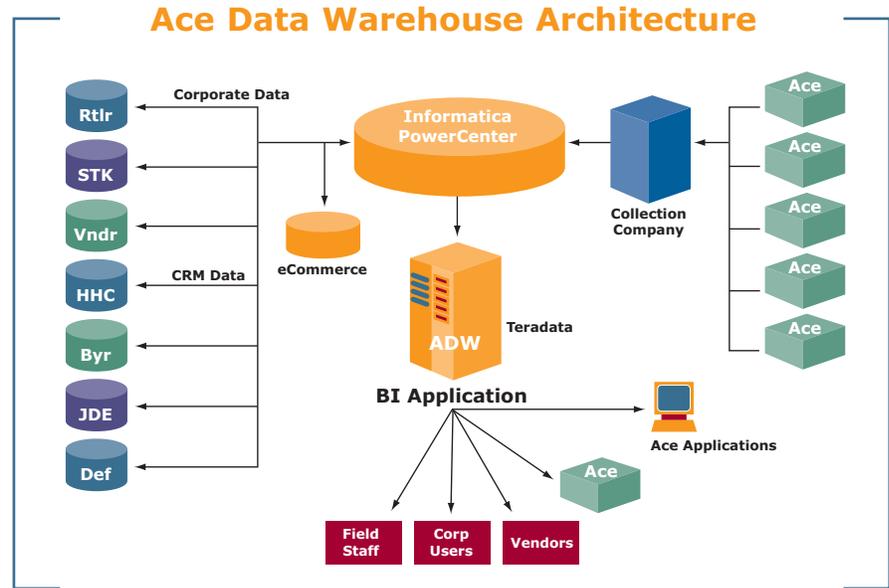
Ace has a scalable business intelligence platform through which to understand and manage its distributed, cooperative enterprise, no matter how large and complex it becomes. By enabling Ace to combine the end-to-end visibility of a

corporate organization with the free-ranging innovation of a 4,600-member co-op, the ADW may have helped it become more creative and competitive than either.

VII. Technical Appendix

Ace Data Warehouse Solution Components

- > Hardware Platform: 4-node NCR 5380
- > Operating system: UNIX SVR4 MP-RAS
- > Database version: Teradata V2R5.1
- > 8 Terabytes spinning disk
- > Management software & utilities
 - Teradata Utility Pak
 - Teradata Dynamic Query Manager
 - Teradata Manager
 - Teradata Analyst
 - FastLoad
 - MultiLoad
 - Teradata T-Pump
- > Data integration software: Informatica PowerCenter™ and Informatica PowerConnect™ for IBM® MQSeries®
- > Business intelligence software: MicroStrategy, Teradata CRM



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