



Household: e-business Technology Speeds the Auto Lending Cycle

An IDC e-business Case Study

THE SUBJECT

Household provides consumers in the US, Canada, and the UK with a diverse array of financial services, ranging from consumer loans and credit cards to mortgage services and credit insurance. The company's auto financing unit, which lends money to consumers purchasing automobiles, maintains relationships with over 5,000 auto dealers.

THE GOAL

Household sought to speed up the turnaround of loan applications received from auto dealers, who represent an important strategic partner. Household also sought to streamline its loan application review processes, further strengthening its industry-leading efficiency ratio.

THE SOLUTION

Household's solution, known as EBridge, receives auto loan application data from dealers and loan aggregators (networks that pull together information from multiple dealers and lenders) and returns a response (approval vs. disapproval) in realtime. Designed and developed by IBM Business Partner Kanbay, Incorporated, the solution provides a secure gateway between dealers' proprietary loan origination systems and Household's suite of enterprise loan origination systems.

WHY IBM

"Overall, we concluded that IBM had the best engineering capability, the best R&D strategy and—in its WebSphere platform—a set of products that fit very well into our environment."



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Executive Summary

The speed with which loan applications are turned around is one of the key factors differentiating lenders from each other, because it favors both the auto dealer (who seeks to close a sale) and the consumer (who seeks to purchase a car). Household needed a platform through which to funnel loan origination information from dealers and loan aggregators into its own backend approval systems. The system needed to employ standard technologies to accommodate the disparate platforms used by dealers.

To design and develop the solution, Household selected IBM Business Partner Kanbay, Incorporated, which had a longstanding relationship with Household and was very familiar with its systems and business processes. Completed in August 2001, the EBridge solution employs a J2EE-based architecture. Externally integrated, the solution receives loan application data generated from dealers' proprietary loan origination systems and sends it to Household's suite of backend loan origination applications running on IBM AS/400 and IBM eServer zSeries servers.

Household's Solution at a Glance

e-business Stage	Integrating
Core Functionality	Household's solution, known as EBridge, receives auto loan application data from dealers and loan aggregators (networks that pull together information from multiple lenders) and returns a response (approval vs. disapproval) in realtime. The EBridge system complements Household's HAFC Superhighway, an extranet solution targeted to dealers.
Software	IBM WebSphere Application Server (Advanced Edition, V3.5.3), IBM WebSphere MQ (V5.1), IBM DB2 Universal Database, IBM VisualAge for Java (V3.5)
Servers	IBM AS/400, IBM eServer zSeries (formerly S/390)
Business Partner	Kanbay, Incorporated
Key Benefits	<ul style="list-style-type: none">• Household was able to grow its loan volume without a proportional increase in staffing and administrative costs—further strengthening its industry-leading efficiency ratio.• The EBridge and HAFC Superhighway platforms have enabled Household to cut its loan application review process from days to minutes.• Increases in efficiency related to the EBridge and HAFC Superhighway platforms enable dealers to utilize these services with no additional spending.• The EBridge infrastructure has made it much easier for Household to capitalize on emerging market opportunities such as the loan aggregator market.

Background

Based in Prospect Heights, Illinois, Household is one of America's largest and best known providers of financial services. Through its 14 business units, the Fortune 200 company provides consumers in the US, Canada, and the UK with a diverse array of services, ranging from consumer loans and credit cards to mortgage services and credit insurance. The company, which is perhaps best known for its 120-year-old Household Finance Corporation unit, employs 32,000 and services more than 50 million customer accounts.

The key factor determining the speed of loan approvals is the efficiency with which dealers (i.e., loan originators) and lenders communicate critical information such as employment and vehicle information.

This case study examines the activities of Household's auto lending unit, whose principal business is to lend money to consumers purchasing automobiles from dealers. The auto unit's operations are built on a network of relationships with over 5,000 auto dealers, which originate auto loan applications and forward them to Household (and other competing lenders) for consideration. After reviewing an application, Household issues an approval or disapproval and, for approved applications, delineates the terms of the loan to the dealer. Not surprisingly, one of the key factors differentiating auto lenders from each other is the speed with which loans are evaluated, since faster loan turnaround favors both dealers (who seek to close a sale) and consumers (who seek to purchase a car).

The key factor determining the speed of loan approvals is the efficiency with which dealers (i.e., loan originators) and lenders communicate critical information such as employment and vehicle information. The earliest and most basic mode of communication was fax, with dealers "broadcasting" hard copy applications to multiple lenders. The rise of Internet technology presented Household with the opportunity to communicate more efficiently and cost-effectively with auto dealers. However, while many dealers had in-house loan origination systems that could conceivably be linked to Household's internal loan review infrastructure via the Web, their proprietary nature made integration highly impractical.

The Need: An Open Platform for Realtime Data Sharing

Put simply, Household needed an infrastructure through which it could funnel loan origination information into its own backend approval systems to speed the approval process. Moreover, it needed to employ open, standard technologies to accommodate the disparate platforms used by dealers and be simple to use. According to Eli Sinyak, Vice President of Business Systems for Household, the importance of dealers as strategic partners, and as the ultimate source of customers, required the company to make doing business as easy as possible—regardless of the challenges. "We needed to serve a base of partners who were critical to us," says Sinyak, "but whose ability to collaborate and interact with us was highly limited due to their technological diversity,"

One of the most important priorities was to leverage its legacy system which—while built in the 1980s and 1990s—delivered stable, reliable performance. Similarly, on the front end, Household sought to build a solution flexible enough to be used by all of its dealers without the need to perform custom integration.

While the need to facilitate collaboration with dealers sprang from a clear business imperative, it also followed a long-term pattern of IT-based innovation within Household. At the root of the company's IT strategy is an unwavering focus on gaining maximum *leverage* from technology infrastructure investments. A good example of this is the company's use of a single account administration infrastructure for all of its multiple revolving credit businesses (e.g., credit cards) and another for its non-revolving businesses (e.g., fixed-term loans)—both being deployed in a single data center. Household's practice of leveraging a common technology infrastructure across a wide range of businesses has likewise been a major factor in the company's industry-leading efficiency ratio (a key measure of profitability). Given the commodity nature of the industry (i.e., "selling" money), the ability to deliver low-cost, high-value services represents a true competitive advantage.

For Household, the issue of leverage was also seen as critical on many levels. One of the most important priorities was to leverage its legacy system which—while built in the 1980s and 1990s—delivered stable, reliable performance. Similarly, on the front end, Household sought to build a solution flexible enough to be used by all of its dealers without the need to perform custom integration. With these guidelines established, Sinyak and his team sought to further define the parameters of the Household solution in late 2000.

Action Plan and Decision Process

First Steps

Like all of Household's IT initiatives, initial planning for the auto solution was driven by centralized IT staff working in close collaboration with key line-of-business staff. This collaboration—a hallmark of Household's approach to ongoing IT planning—is driven by dedicated IT personnel who function as *de facto* "divisional CIOs," working closely with their respective business units to nurture and support IT initiatives from an early stage. Household's IT planning also relies heavily on its e-Commerce group, a separate unit within the corporate IT organization focused on e-business initiatives. Through relationship owners known as "channel architects," the e-Commerce group maintains close communication with each of Household's business units.

To assist in the planning and development of the solution, Household contracted with Kanbay, Incorporated—an IBM Business Partner and a long-time provider of solutions for the company—in early 2001. One of the key outgrowths of the planning process was the decision to employ an n-tier architecture, featuring a Web server and application server on the front end and messaging middleware to enable integration with backend legacy applications. Household's selection process focused on two overlapping sets of criteria, defined generally as:

- product attributes (i.e., best-of-breed)
- provider track record (i.e., a function of expertise, resources and future development focus).

For the application server portion of the solution, Household considered offerings from IBM (WebSphere Application Server), BEA Systems (Web Logic) and Sun Microsystems (iPlanet Application Server). Key product parameters included the depth of support for Java and other mainstream Internet standards, support for distributed object-oriented applications, and the ease of application development. According to Sinyak, it was in the latter area—application development—where WebSphere most stood out. “We were very interested in the integration between the development environment and the production environment,” says Sinyak. “The fact that the development tools were designed and built to work seamlessly from the ground up—allowing us to test a WebSphere application in the [IBM] VisualAge development environment—was very appealing.”

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— Eli Sinyak, Vice President of Business Systems, Household

In the area of provider stability, IBM emerged as the preferred vendor largely on the strength and sustainability of its R&D capability as well as the direction of development within the WebSphere product line. Sinyak explains: “IBM’s R&D organization did a terrific job of explaining the future trajectory of their product development efforts. Overall, we concluded that IBM had the best engineering capability, the best R&D strategy and—in its WebSphere platform—a set of products that fit very well into our environment.”

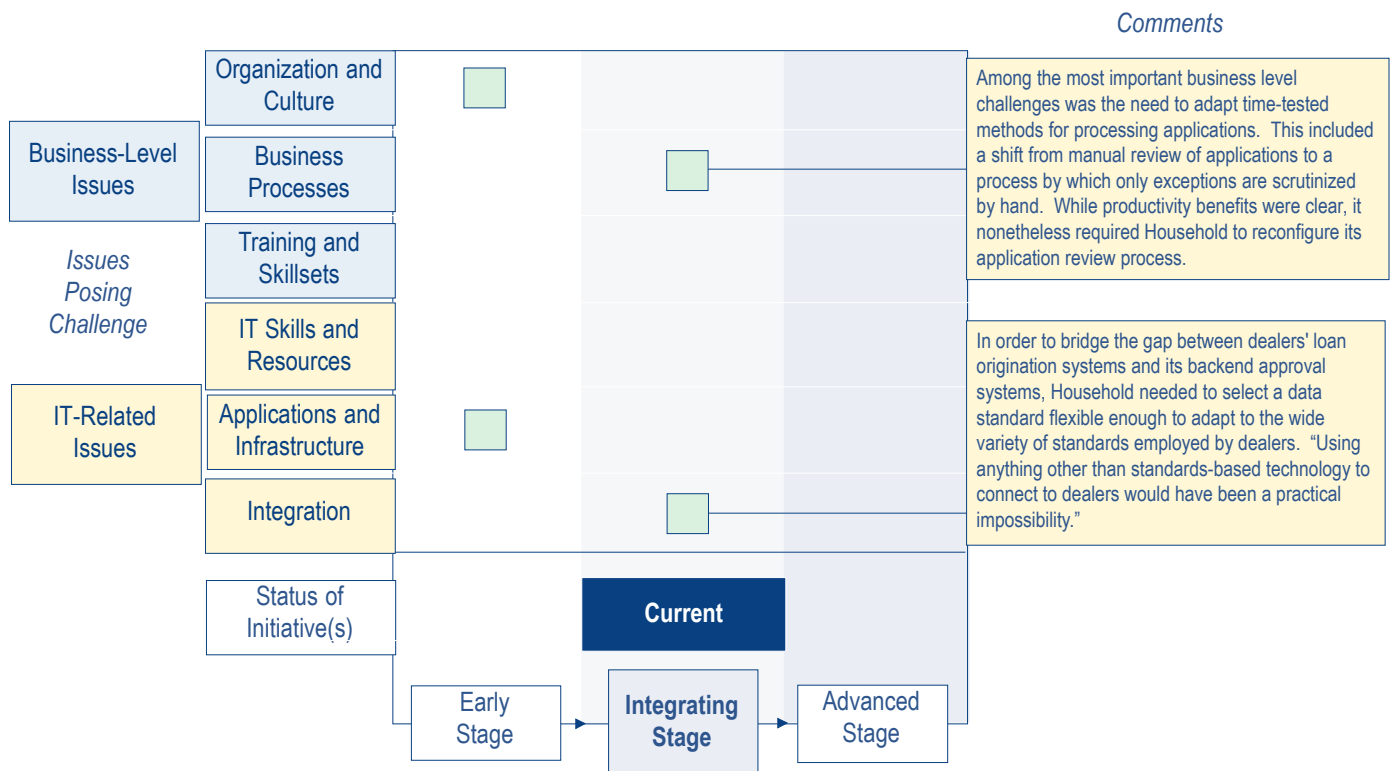
In early 2001—after a rigorous evaluation process—Household selected a range of IBM products to build the dealer solution. In addition to WebSphere Application Server, the company chose WebSphere MQ as the messaging middleware to connect the front-end application to Household’s backend loan origination system—an integrated set of applications running on an IBM AS/400 and an IBM eServer zSeries (formerly S/390) server. WebSphere MQ’s selection was driven by its superior throughput, reliability and multi-platform support. The success of other WebSphere MQ deployments throughout the company also played a role in its selection.

The final software component required was a database to store user authentication information and to provide persistent storage of credit application data (which needed to be maintained during the time Household processes the transaction). To perform these functions, Household selected IBM DB2 Universal Database, citing its “strong native fit” with the solution’s other IBM software components and its best total cost of ownership.

Challenges

In order to bridge the gap between dealers’ loan origination systems and its backend approval systems, Household needed to select a data standard flexible enough to adapt to the wide variety of standards employed by dealers. As Sinyak explains, the feasibility of the project was predicated on the ability to provide standard interfaces to dealers—eliminating the need for extensive customization. “Using anything other than standards-based technology to

Challenges Encountered in Household's e-business Evolution



Source: Household and IDC

connect to dealers would have been a practical impossibility, since we would in effect be building a series of 'one-off' implementations," says Sinyak. "By using XML, we were able to create a solution that could easily be adopted by our partners."

The move to electronically transmitted loan applications also posed a number of business-level challenges—the most prominent of which was the need to adapt time-tested methods for processing applications. One such adaptation was a shift from manual review of applications by Household's credit analysts to a process by which only exceptions are scrutinized by hand. While such a shift provided clear productivity benefits, it nonetheless required Household to reconfigure its application review process. Another positive byproduct presenting an intrinsic challenge was the higher volume of applications the system drove into Household's backend systems. With more loan applications (and resulting lending volume) being handled by its backend systems, Household needed to ensure that its efficiency ratio—a core element of its competitive advantage—was undiminished.

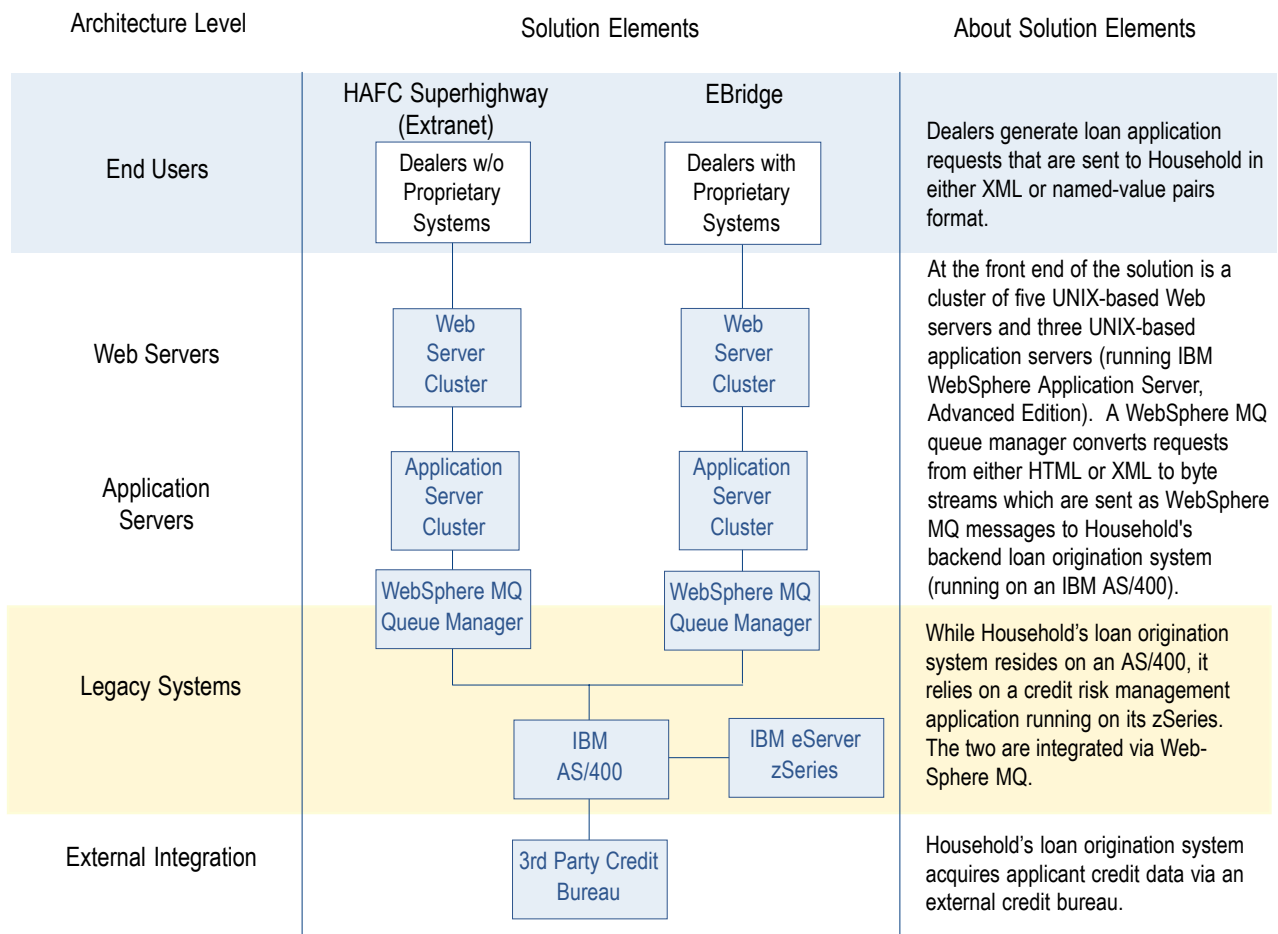
Solution Profile and Implementation Strategy

The Solution: Core Functionality and Architecture

The basic function of the Household solution is to receive auto loan application data from partners—defined as dealers and loan aggregators, which pull together information from multiple lenders—and return a response to them in realtime. For partners that operate in-house loan origination systems, Household offers a B2B gateway known as EBridge, which establishes a seamless, realtime link between these in-house systems and Household’s backend loan processing infrastructure.

The EBridge solution is built on an n-tiered, J2EE-based architecture. At the front end of the solution, running in Household’s Chicago data center, is a cluster of five UNIX-based Web servers (running Netscape Enterprise Server) and three UNIX-based application servers (running IBM WebSphere Application Server, Advanced Edition). Behind the application server and behind a firewall resides another UNIX server functioning as a WebSphere MQ queue manager. The basic function of the queue manager is to convert partners’

Basic Architecture of Household's Solution



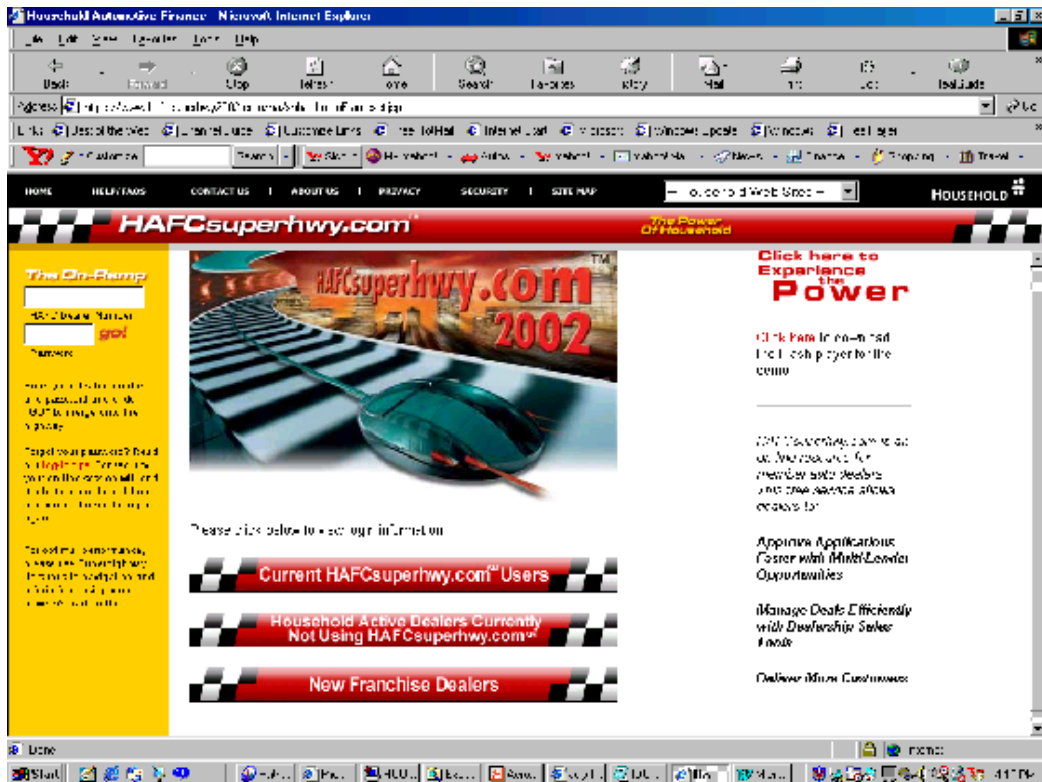
Source: Household and IDC

transaction messages from either HTML or XML format to byte streams, which are then sent as WebSphere MQ messages to the company's loan origination system (described in detail below).

For partners that either have no in-house loan origination system or choose not to integrate their system with Household's backend, Household offers a B2B extranet solution known as HAFCSuperhighway, which allows these partners to input loan application data through a Web-based interface. Like EBridge, the Superhighway solution runs on the WebSphere Application Server platform within Household's Chicago data center and integrates with the company's backend loan origination system.

The Solution in Action

Partners using the EBridge solution follow the standard procedures for their in-house systems, which results in the generation of a transactional data stream (i.e., an approval request) in either HTML or XML format—depending on the dealer's implementation. Upon receipt from a partner, loan application requests are then processed by a Java servlet (running on WebSphere Application Server), which translates them into Java BusinessObjects. [Upon translating a request, Household sends the dealer an acknowledgment message in XML.] These BusinessObjects are then processed by Java business engines whose function is to gather and validate these Objects (i.e., the submitted loan application data). If errors are detected (such as a date in the wrong format), the partner is notified. If the data contains no errors, it is sent to the WebSphere MQ queue manager, where a Java program converts the Business



Objects to byte streams and sends the data (via WebSphere MQ) to Household's core backend loan origination system running on the AS/400. [From this point on, the backend processes governing Household's loan origination systems are executed leveraging techniques and technologies the company has used for more than a decade.]

One of the solution's defining features is its ability to quickly and easily adapt to a variety of message formats for requests from (and responses to) dealers and aggregators. The chief benefit of this flexibility is the ease with which new dealers and/or aggregators can be brought on as users of the solution. The key enabler of this flexibility is the solution's use of a "configuration file" approach to defining message types, under which users are associated with specific message formats. By maintaining user profiles in an IBM DB2 database, Household is able to determine the message format required by a user, and to quickly and easily add or change formats within the configuration file.

Security Profile

As a provider of financial services, Household ranks security and privacy at the top of its priority list. As Sinyak explains, this intense focus on security pervaded all aspects of Household's auto loan initiative. "We are extremely sensitive about the subject of security and privacy," explains Sinyak. "From the very beginning, we focused unremittingly on building an e-business infrastructure that would fully preserve the integrity and security of our network."

Not surprisingly, the most critical component of the solution vis-à-vis security is the connection with dealers and aggregators because of its vulnerability to hacking. To address this, all loan application data is encrypted via SSL and sent over a secure channel via HTTPS (HyperText Transport Protocol Secure). Dealers and aggregators using the system are authenticated by the data that they provide in their input data stream.

The Project: Development Approach and Timetable

The Household solution was designed, developed and implemented by IBM Business Partner Kanbay Incorporated, using IBM WebSphere Studio Application Developer (formerly VisualAge for Java). The project proceeded in three general phases. The first phase, planning and designing the solution, ran from March through April 2001. The actual development of the solution (phase two) occurred in the May through June timeframe, while testing (phase 3) occurred in July and early August. The solution went live in August 2001.

Kanbay's development effort included a combination of on-site development staff as well as developers working from its Global Technology Center in Pune, India. According to P.V. Narayan, Project Manager for the Household engagement, Kanbay's development strategy was highly iterative and followed the Rational Unified Model: "Our first step was to identify requirements and channel them into use cases. Once the use cases were identified, we ran them

Development Timetable for Household's EBridge Solution

	4Q2000	February 2001	March 2001	May 2001	July 2001	August 2001
Household begins framing the key broad outlines (goals, functionality, etc.) of the EBridge initiative.	■					
Household selects Kanbay to design and deploy the EBridge solution.		■				
Kanbay begins planning and designing the EBridge solution.			■			
Design phase completed; development of the EBridge solution begun.				■		
Development of EBridge solution completed; testing begun.					■	
Testing of EBridge solution completed; system goes live.						■

Source: Household and IDC

by the business users to make sure that our understanding of the business requirements was complete. We then prioritized these use cases and divided them into multiple iterations, with a set of use cases designed and developed as part of each iteration.”

Business Results

As discussed, the EBridge initiative followed Household's established strategy of using technology to improve the efficiency of its lending processes. Importantly, these improvements are synergistic—applying to both Household's internal processes as well as those of its dealer and aggregator partners. Arguably the best example of EBridge's value was that it allowed Household to further strengthen its industry-leading efficiency ratio. One of the key enablers of this efficiency improvement was cost avoidance—namely, Household's ability to absorb significantly higher loan application volume without a proportional increase in staffing and administrative costs.

As Sinyak explains, EBridge enables Household to deliver perhaps the most important service attribute to dealers: the ability to shorten the approval process. “The dealer wants to sell automobiles—and the faster we can process a loan application, the more likely the dealer is to sell the car,” says Sinyak. “The speed with which Household is able to turn around a lending decision is

Overview of Household’s Business Results Achieved

Business Process Area/Issue	Nature of Benefit	Description or Metric
Customer Service/ Administrative Processing	Cost Avoidance	Household was able to grow its loan volume without a proportional increase in staffing and administrative costs—further strengthening its industry-leading efficiency ratio.
Transaction Processing	Shorter Cycle Time	The EBridge and HAFC Superhighway platforms have enabled Household to cut its loan application review process from days to minutes.
Operational Efficiency	No Additional Costs to Dealers	Increases in efficiency related to the EBridge and HAFC Superhighway platforms enable dealers to utilize these services with no additional spending.
Market Development	Increased Penetration of New Segments	The EBridge infrastructure has made it much easier for Household to capitalize on emerging market opportunities such as the loan aggregator market.

Source: Household and IDC

by far the number one reason why we’ve been able to increase our market share. And we see it as a key strategy for gaining share in the future.”

Compared to dealer partners, the dynamics of penetrating the aggregator market are complicated by their typically more stringent requirements in the area of data standards. That is, aggregators typically require a lender to be able to exchange messages in a particular format (such as XML) as a precondition for doing business with that aggregator. Given the increasing share of lending volume emanating from the aggregator market, it was important for Household to develop a platform flexible enough to accommodate these requirements easily and at low cost. “Through EBridge, the aggregator market can be tapped much more easily,” says Sinyak.

Case Epilogue

While Household plans to expand the reach of EBridge to a broader base of dealers and aggregators, the company also plans to leverage the EBridge infrastructure to embrace a range of new partnership opportunities across other business units. A good example, says Sinyak, is Household’s mortgage lending unit, which would benefit by providing independent mortgage brokers with the same kind of functionality as auto dealers: sending mortgage applications for

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— Eli Sinyak

review. “Like auto dealers, we see the biggest benefits in the area of efficiency, productivity and turnaround,” explains Sinyak. “The common thread is that it Web-enables relationships that have a strong ‘manual’ component and rely on proprietary networks. The common thread from a technology standpoint is the use of open standards like XML, and the leveraging of applications and infrastructure—which is a key theme in our overall IT strategy.”

Looking back on the engagement, Sinyak lauds the strong relationship between Household and IBM Business Partner Kanbay. “Over the ten years we’ve had a relationship, Kanbay has become a close and trusted partner whose methodologies and processes mesh closely with our own,” says Sinyak. “We see e-business becoming more and more pervasive across Household, and we expect Kanbay and IBM technology to play an important role in getting us there.”

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