



Noble Group's RawMart: An e-Marketplace Powered by Linux and IBM Technology

An IDC e-business Case Study

THE SUBJECT

RawMart is an e-marketplace designed to facilitate B2B transactions in a wide range of industrial and agricultural materials. A unit of Hong Kong-based Noble Group, RawMart was launched in September 2000 and now supports over 5,000 customers.

THE GOAL

To build a scalable, reliable platform for delivering information and transactional services to customers in the industrial raw materials marketplace. The system needed to handle high volumes of transactions, and to link seamlessly to backend databases and external data sources.

THE SOLUTION

Designed and developed by IBM Global Services, the RawMart solution is an online classified posting system that pairs buyers and sellers of raw materials. Supplementing this is a rich flow of realtime information—delivered to users through a customized portal. The system's Linux-based applications run on an infrastructure of IBM WebSphere Application Server, IBM DB2 Universal Database and IBM RS/6000 servers.

WHY IBM

"We saw the transaction processing capabilities and rock-solid uptime performance of the IBM solution as the ideal combination for a high-volume e-marketplace solution like ours. What's more, the superior scalability of the platform means we'll never outgrow it, and we'll preserve our infrastructure investment."



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Executive Summary

Innovation Spotlight

One of the key values of the RawMart solution is the ability to keep traders, buyers, and producers up-to-date on key market developments. To this end, the solution can be customized to deliver critical data—like pricing—automatically to a wireless device such as a pager.

In early 2000, Hong Kong-based Noble Group (a worldwide provider of raw materials and supply chain services) extended its trading expertise to the Web by launching RawMart. A standalone unit within Noble, RawMart is a B2B “e-marketplace”—an integrated supply chain management outsourcing system for consumers of industrial raw materials. The company’s services are designed to bring together buyers (i.e., consumers of industrial raw materials) and sellers (i.e., raw materials producers), as well as commodity traders. For users of the RawMart system, key benefits include a shorter, more streamlined transaction cycle.

RawMart’s decision makers viewed the selection of a technology platform and solutions provider as being vitally important to its success in the market. The company selected IBM Global Services to design and build an integrated, Linux-based platform powered by WebSphere Application Server and DB2 Universal Database, running on RS/6000 servers. In addition to bringing together buyers and sellers of raw materials, the solution gathers and disseminates customized pricing data and news from third-party information service providers.

RawMart’s Solution at a Glance

- ▶ **e-business State** Internal Integration
- ▶ **Core Functionality** RawMart’s online classified posting system enables registered users to conduct business in over 600 basic commodities. Adjunct services available through the solution include shipping, insurance, inspection, finance and credit services. The solution also delivers realtime commodity news and commodity pricing data from Dow Jones Newswires and other high-profile sources.
- ▶ **Software** IBM WebSphere Application Server, IBM DB2 Universal Database
- ▶ **Servers** IBM RS/6000 Model B50, IBM RS/6000 Model H70
- ▶ **Storage** IBM “Shark” Enterprise Storage Server
- ▶ **Services** IBM Global Services
- ▶ **Key Benefits**
 - ▶ The high degree of integration within the IBM technology platform enabled the RawMart solution to be deployed in just four months, which in turn shortened the company’s time to market.
 - ▶ The RawMart platform processes an average of 500,000 database transactions per week.
 - ▶ The RawMart platform supports an average of 1,000 concurrent users.
 - ▶ Since going live in September 2000, the RawMart system has achieved 99.99 percent availability.

Situation Analysis

Based in Hong Kong, the Noble Group Limited is a worldwide supplier of raw materials and related services, ranging from materials sourcing to marketing, processing, and transportation. A classic “middleman” in the global supply chain, Noble Group links producers and consumers of a wide range of industrial and agricultural materials, including iron, aluminium, cocoa, fertilizers, coal and refined oil products. Through a worldwide network of over 30 offices, the US\$2 billion company operates 16 product-specific business lines.

As Noble Group has aggressively diversified its core business, it has also embraced Internet technology as a key enabler of this strategy. Examples of this are seen in the rich, sophisticated Web sites Noble Group maintains for its Fleet Management and Noble Investment subsidiaries (which offer ship management and financial services, respectively). But the most complete expression of Noble Group’s integration of Web technology with its core business—a strategy it calls “bricks, ships and clicks”—was the formation of RawMart, its B2B e-marketplace. RawMart was conceived by Noble Group’s newly minted Internet Services division in late 1999 as an integrated supply chain management outsourcing system for consumers of industrial raw materials, delivered over a robust, Web-based platform.

While its basic mission is similar to other B2B e-marketplaces—bringing together buyers and sellers (i.e., raw materials producers)—RawMart’s business model is designed to pick up where more traditional e-marketplaces have left off.

At its most basic, RawMart’s mission—like other providers of B2B e-marketplace services—is to bring together buyers and commodity producers. However, as Chief Operating Officer Michael Mudd points out, the company’s business model is designed to pick up where more traditional e-marketplaces leave off. “After examining the market, we saw the prevailing e-marketplace model falling short because it didn’t provide a true e-commerce solution,” says Mudd. “Instead, these marketplaces were really just discovery platforms—like a directory service—that made users do most of the work, while they take the commissions.”

As Mudd and his colleagues worked to establish the core of RawMart’s business model in early 2000, they were guided by three basic goals. First, they sought to build a system that mirrored the actual trading process, thus allowing the participation of raw materials producers and consumers, as well as traders. In addition to broadening the target audience, RawMart also sought to deliver a substantially broader degree of information and functionality to users of the system. Finally, the service would be configured to meet the specific needs of companies in the developing countries. On this latter point, says Mudd, the sheer size of the market opportunity in emerging countries was the key driver. “In the field of industrial raw materials, 65 percent of the materials are consumed by developing countries, although e-commerce and Web adoption lag far behind developed nations,” explains Mudd. “We sought to develop a service that would provide companies in these countries with access to an affordable and simple—yet rich—e-commerce platform.”

The business model that emerged was a “mutual trading platform,” whose core

functionality was an online classified posting system designed to facilitate the pairing of buyers and sellers. At the root of this platform is a database of electronic catalogs, each of which contains “offers” from participating companies. Around this core offering is a rich flow of realtime information—delivered to users through a customized portal—designed to keep participants up-to-date on market developments and trading opportunities. In addition to core services, the RawMart model also differs from traditional e-marketplaces in its fee structure, which replaces the site’s “cut” of transactions with a low, fixed fee.

Having articulated the basic elements of the RawMart business model, Mudd and his team faced the challenge of transforming their vision into a fully functional service. In 1Q2000, just months after the idea for RawMart was on the drawing board, Mudd and his team launched their search for the technology that would power the business, and the solutions provider that would bring it all together.

Action Plan and Decision Process

► Wanted: Performance, Reliability...and Accountability

RawMart approached its infrastructure buildout with a well-defined roster of technology requirements, with performance and reliability at the top of the list. The company’s most fundamental requirement was the ability of the system to support large numbers of simultaneous users accessing its vast electronic catalog database with no degradation in performance. On the hardware side, RawMart demanded both robust server performance and a high degree of scalability to accommodate a rapid growth in the number of users. The company was equally cognizant of the importance of infrastructure software—specifically application server and database technology—in managing and delivering the large volumes of data that underpinned the company’s business.

RawMart’s need for an integrated platform was driven by not only the complexity of the various data flows in its solution, but also the need to build this integrated solution within a tight timeframe.

Another critical requirement for RawMart was the ability to establish tight integration between front-end applications, backend databases, and external data sources. Indeed, the most defining characteristic of the planned RawMart platform was its ability to gather and present huge amounts of information from a wide variety of sources. According to Mudd, RawMart’s need for an integrated platform was driven by not only the complexity of the various data flows in its solution, but also the need to build this integrated solution within a tight timeframe. “Speed to market was naturally an important strategic concern for us,” says Mudd. “The desire to bring a solution to market as rapidly as possible was central to our technology selection process.”

In selecting a service provider to develop and deploy its platform, RawMart’s key criteria was the ability to provide an end-to-end solution—from core technology to post-implementation support. According to Mudd, RawMart’s single-source strategy was rooted in the desire to have a single point of contact

for problem resolution. “We wanted to avoid the finger-pointing that can occur with multi-vendor solutions,” says Mudd. “A single-source strategy allows us to concentrate on our core competencies, and on the information content at the heart of our business—not the underlying technology infrastructure.”

► IBM Chosen on Integration, Performance and Track Record

RawMart began its evaluation process in early 1Q2000. On the hardware side, the company’s initial list of candidates included Dell, Compaq, Hewlett-Packard, IBM and Sun Microsystems. The two main software vendors under consideration were IBM (WebSphere Application Server and DB2 Universal Database) and Oracle (Oracle 8i). Ultimately, the choice came down to an IBM solution—WebSphere and DB2 running on RS/6000 servers—and a Sun Microsystems/Oracle solution. In late 2Q2000, the company selected the IBM solution, citing its superior integration characteristics, as well as IBM Global Services’ track record as a provider of robust B2B solutions. As Mudd explains, seamless integration—coupled with best-of-breed performance—made the IBM solution an obvious choice in light of RawMart’s challenging performance requirements. “We saw the transaction processing capabilities and rock-solid uptime performance of the IBM solution as the ideal combination for a high-volume e-marketplace solution like ours,” says Mudd. “What’s more, the superior scalability of platform means we’ll never outgrow it, and we’ll preserve our infrastructure investment.”

“Our vendor’s commitment to standard, open technology is critical for us because of our need to interact with the broader trading community, such as banks. The future viability of our business model is a function of our ability to share data with our partners. Working with IBM puts us squarely on the right path.”

— Michael Mudd, Chief Operating Officer, RawMart

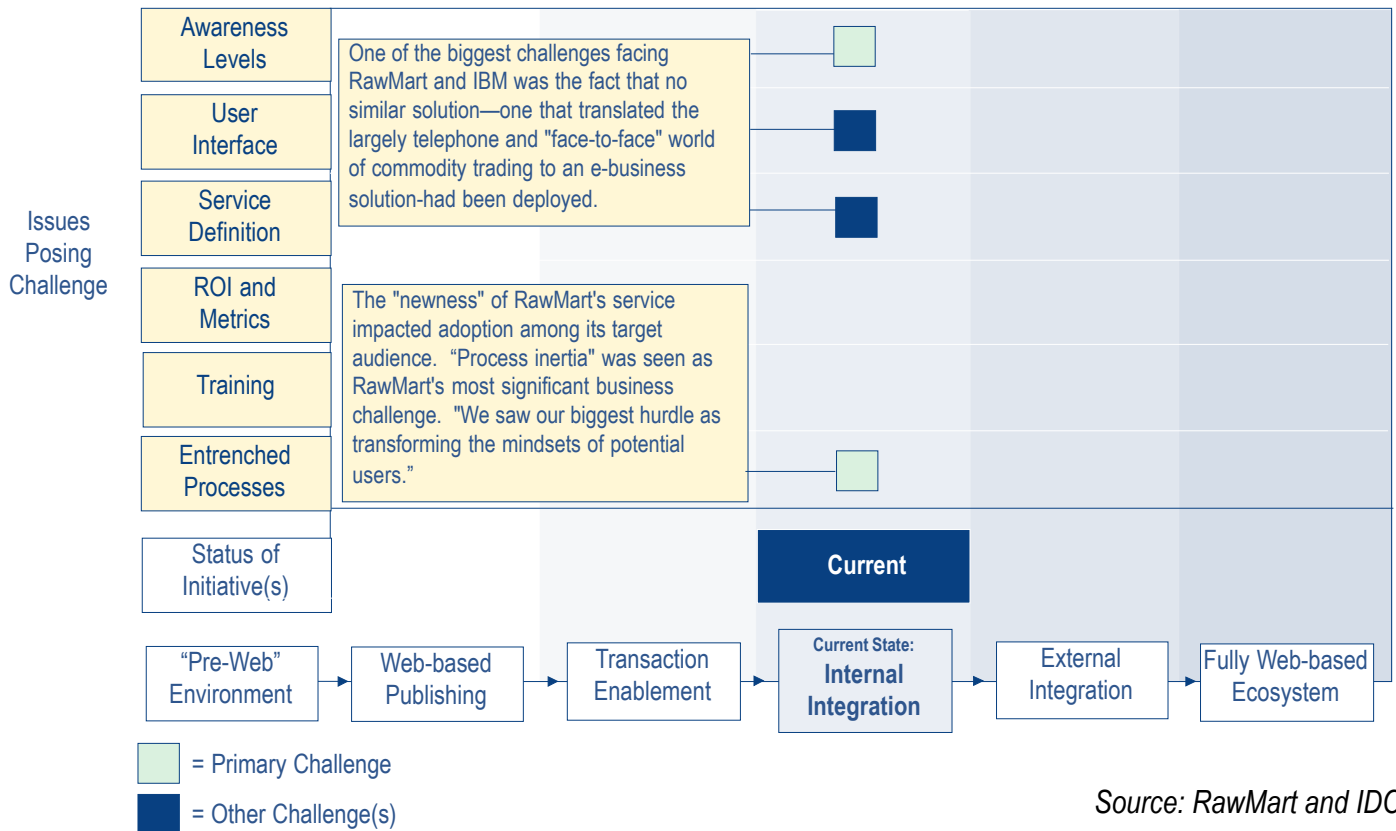
While the solution’s attributes were the major driver of RawMart’s decision, the company also took a number of more general, strategic issues into consideration. For example, RawMart looked favorably on IBM’s strong support for standards (such as XML) and open-source software (such as Linux, the company’s operating system of choice). “Our vendor’s commitment to standard, open technology is critical for us because of our need to interact with the broader trading community, such as banks,” adds Mudd. “The future viability of our business model is a function of our ability to share data with our partners. Working with IBM puts us squarely on the right path.” Above and beyond the performance-related parameters of its selection process, RawMart also saw its choice as an opportunity to distinguish itself by associating with a reliable and trusted vendor. As Mudd points out, RawMart’s association with IBM has clear benefits. “I see our decision to build an industrial-grade infrastructure using all-IBM components as setting us apart as a company,” notes Mudd. “Being powered by IBM conveys a credibility that resonates with our customers.”

► Challenges

One of the biggest challenges facing RawMart and IBM was the fact that no similar solution—one that translated the largely telephone and “face-to-face” world of commodity trading to an e-business solution—had been deployed. Because RawMart was entering essentially uncharted territory, developers had few reference points as they designed the solution. This was especially pertinent for issues such as:

- the type, depth and breadth of data to provide users;

Challenges Encountered in RawMart's e-business Evolution



- the ancillary services that should be offered along with the core information-based offering; and
- the nature and sophistication of the user interface.

Mudd also saw the “newness” of RawMart’s service as impacting adoption among its target audience. According to Mudd, “process inertia” was seen as RawMart’s most significant business challenge. “We saw our biggest hurdle as transforming the mindsets of potential users,” notes Mudd. “We needed to convey the message that RawMart will save producers, buyers and traders time—thus allowing them to spend more of their time making deals.” Thus far, RawMart has focused the majority of its promotional efforts on highly targeted commodity-related trade shows (e.g., metals, chemicals, energy, plastics, etc.). However, its most visible promotional channel is perhaps the world’s largest floating billboard. In 2000, RawMart affixed its URL (www.rawmart.com) to the side of the e-Trader, a Panamax class, 75,000-ton bulk carrier of raw materials owned by Noble Shipping.

Solution Profile and Implementation Strategy

► Solution Overview

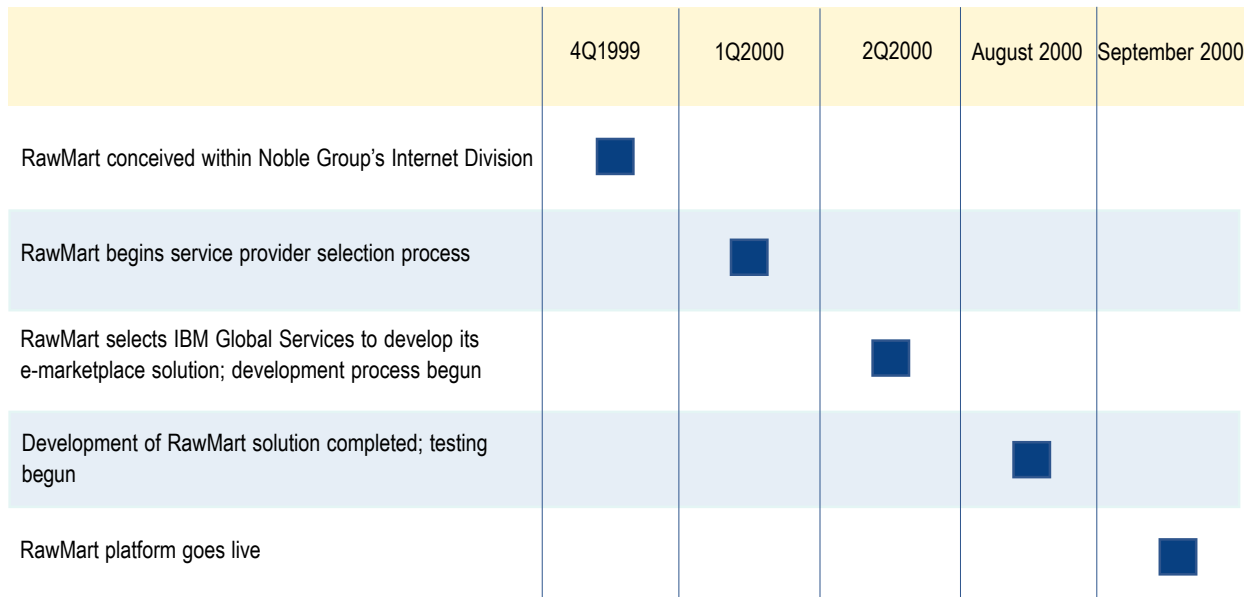
RawMart’s core platform is an online classified posting system delivered in multiple languages (English, Chinese, Russian, Japanese, Spanish, Portuguese and Korean) that enables users to conduct business in over 600 basic com-

modities. Adjunct services that can be procured online through the solution include shipping, insurance, inspection, finance and credit services. In addition to its core trading capability, RawMart offers realtime commodity news and commodity pricing data from such reputable sources as Dow Jones Newswires and Moneyline. This market-specific news is complemented by specialist reports on weather, trade issues, banking and insurance.

Consistent with RawMart’s aim of replicating the day-to-day operations of traders, the platform allows users to communicate rumors through an electronic bulletin board. This allows users of the RawMart platform to not only track price movements, but to explore the news and events that may be driving these price movements. One of the system’s most innovative features is its ability to proactively notify users of important price-related developments or new deal opportunities within certain commodity areas (e.g., coal). Users receive these messages—known as “trigger alerts” or “deal alerts” —after registering within a given commodity area as part of their user profile (see below). In addition to standard e-mail, the RawMart system is capable of delivering these alerts through such novel channels as short message systems, voicemail messages or pagers.

The RawMart solution presents users with their own customizable portal, whereby users can select sectors they wish to track and receive up to 190 market prices, industry indices and reports. Customers place ads (which are stored in a backend DB2 database) via a template-driven platform. [At any one time, RawMart lists an average of 17 million tons of products for purchase or sale on its site.] At present, the RawMart system does not—by design—support the execution of trades online due to the size of average trade deals, which often run into the hundreds of thousands or millions of dollars (US). To

Development Timetable for RawMart’s e-business Solutions



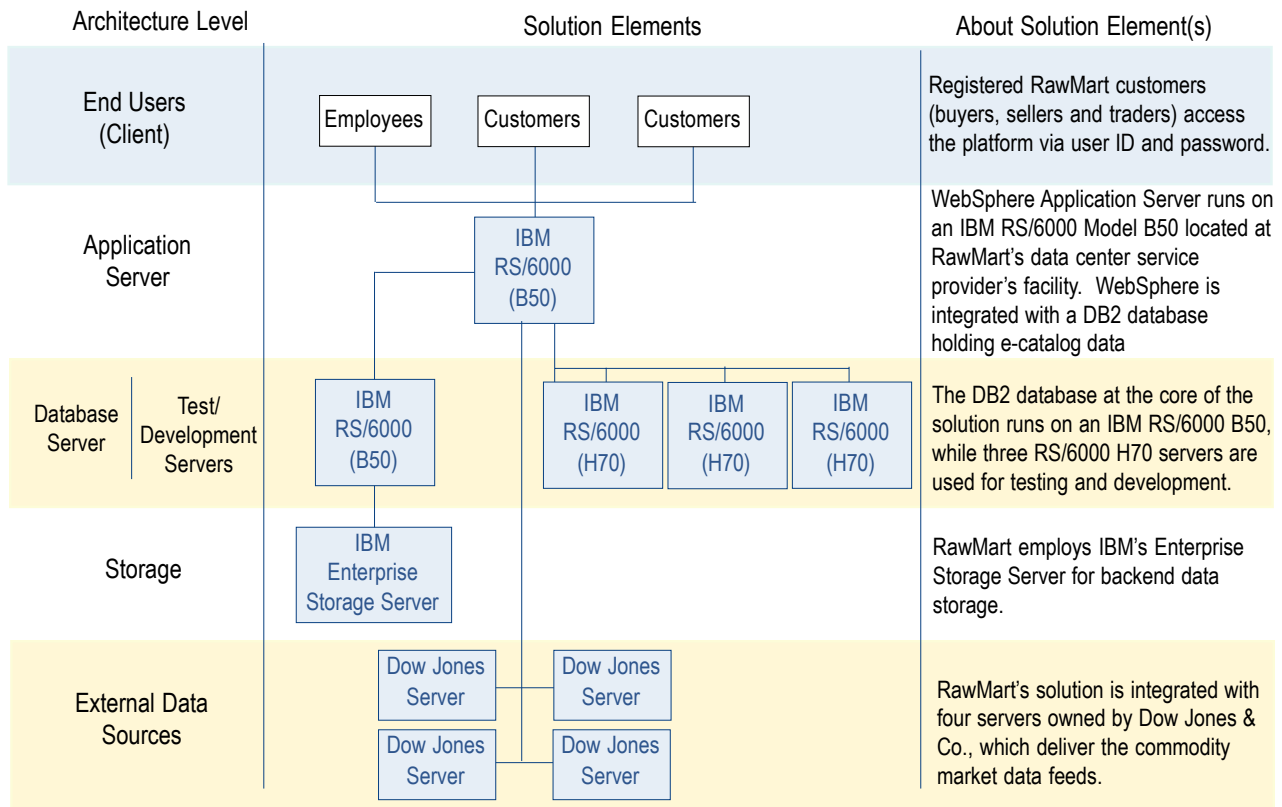
Source: RawMart and IDC

make these large commodity deals feasible in an online setting, e-marketplaces such as RawMart will require banks to produce an electronic or “virtual” letter of credit from a bank. RawMart expects to incorporate this functionality in the near-to-intermediate term.

► Solution Development and Architecture

The development of the RawMart platform—began in June 2000—was a cooperative effort involving IBM Global Services and RawMart’s technical personnel. Prior to the commencement of development work, RawMart personnel conducted an extensive study among Noble Group commodity traders to understand the processes by which they obtained and employed information. Findings were assimilated into the overall solution design process, which was led by IBM Global Services personnel. Integration, an important part of the implementation effort, occurred in two separate parts of the solution. In addition to the development of Linux-based applications, a significant amount of effort was focused on integrating WebSphere Application Server with the backend DB2 database. Another key area of integration, also performed by IBM Global Services, was between the core platform and servers owned by Dow Jones & Co., which delivered the commodity market data feeds. The solution was completed in late August 2000 after 60 days of development work. After another 30 days of pilot testing, the solution went live on September 25, 2000.

Basic Architecture of the RawMart Solution



Source: RawMart and IDC

The RawMart solution runs on two (2) IBM RS/6000 Model B50 servers, one of which runs IBM WebSphere Application Server Advanced Edition, the other IBM DB2 Universal Database. The system also employs three (3) RS/6000 Model H70 servers for development and testing. For backup, the RawMart solution employs IBM's "Shark" Enterprise Storage Server, which is deployed as a storage area network (SAN) and linked to the database servers.

Business Results

Since the solution went live in September, 2000, the number of users has grown dramatically. Of the 5,000 currently subscribed to the service, more than one-third use the system on a daily basis. On an average day, the platform supports approximately 1,000 simultaneous users. But Mudd believes that RawMart has just begun to get traction, and that even faster growth lies ahead. "Despite our rapid growth, we've just begun to scratch the surface of the overall opportunity," says Mudd, who pegs the universe of potential worldwide users at some 350,000 producers, traders, and raw material consumers. "A big part of our success has been the flawless performance of our IBM solution." Thus far, the numbers tell a story of success. These include a half-million calls per week to RawMart's back-end database with undiminished performance, and an uptime rate of better than 99.99 percent.

Users of RawMart's solution have also begun to rack up an impressive array of benefits. The strongest value proposition of the RawMart solution has been its time-compressing, efficiency-stretching impact on the deal cycle—from discovery to settlement. Indeed, by slashing the time required to match buyers and sellers of industrial raw materials, RawMart's service has effectively lowered users' transaction costs and sped up cash flows. One such user of the RawMart solution, cited by Mudd, was able to shorten what would have been a six-week search for a customer in China to less than 10 days.

Overview of RawMart's Business Results Achieved

Business Process/Issue	Nature of Benefit	Description or Metric
Application Development	Shorter Development Cycle	The high degree of integration within the IBM technology platform enabled the RawMart solution to be deployed in just four months, which in turn shortened the company's time to market.
Transactions Processing Performance	Large Transaction Volume	The RawMart platform processes an average of 500,000 database transactions per week.
Transactions Processing Performance	Undiminished Performance	The RawMart platform supports an average of 1,000 concurrent users.
Reliability	Cost Avoidance	Since going live in September 2000, the RawMart system has achieved 99.99 percent availability.

Source: RawMart and IDC

Case Epilogue

RawMart plans to build on its unique position in the global raw materials supply chain by enriching its service offerings and forging closer links to customers and partners. For instance, the company plans to expand its third-party relationships from information service providers to banks to enable more fully integrated transactional capability. In Mudd's vision, customers using the RawMart site will be able to not only find a trading partner, but also link with their preferred bank to secure the "virtual letter of credit" required to settle commodity transactions. "In the future, we will provide a richer array of services, more information, and deeper integration with third parties," explains Mudd. "Our aim is to provide a secure, reliable, and high-performance infrastructure for delivering end-to-end supply chain management services for our customers."

"Our use of IBM infrastructure technology is an unambiguous statement to our customers that we're committed to providing bulletproof performance. Likewise, our association with IBM is a truly leveragable asset."

— Michael Mudd

Looking back on the IBM Global Services engagement, Mudd expresses strong satisfaction with the completed solution—and with the IBM team's ability to bring the solution from concept to reality. "In conjunction with RawMart staffers and Noble Group traders, the IBM team was able to quickly and efficiently construct the process framework from which to design the solution," says Mudd. "The fact that we were able to go to market with a 'no-compromises' solution in such a short time speaks volumes about the focus and efficiency of the IBM Global Services team." Of course, RawMart faces challenges as it seeks to win over the hearts and minds of producers, buyers and traders in the global raw materials market. The key hurdle will be to convince this community of the value of shifting their activities from familiar channels to more convenient and efficient Web-based processes. By using IBM technology, relates Mudd, RawMart has already gone a long way towards meeting another key challenge—bridging the credibility gap. "Our use of IBM infrastructure technology is an unambiguous statement to our customers that we're committed to providing bulletproof performance," says Mudd. "Likewise, our association with IBM is a truly leveragable asset."

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G325-1909-00