



## Sterling Fluid Systems: Collaborating with Partners through XML and e-commerce

An On Demand Business Case Study sponsored by IBM



### **on demand Business Driver**

Sterling Fluid Systems needed to be more responsive to the demands of its customers, distributors and employees by providing a faster, more convenient way to interact with—and within—the company.

### **Business Process Adaptations**

The solution enables realtime transactions capability and information access between Sterling Fluid Systems and its customers and distributors, as well as internally between the company's business units.

### **Key Solution Elements**

The solution employs both customer-facing and employee-facing portals that are linked through an XML-based integration hub to each of the company's ERP systems.

### **Why IBM**

"We saw the direction that IBM was taking the WebSphere platform in as very favorable, and we saw IBM Global Services as being best equipped to help us extract the most benefit from the technology."

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## THE STERLING FLUID SYSTEMS SOLUTION at a Glance

### BUSINESS DRIVERS

#### Customer Business Challenge

Sterling Fluid Systems' demand side processes—such as customer service and order-entry—were labor-intensive and inefficient, making it more costly for the company and less convenient for customers and distributors. The second key challenge was internal. Specifically, because its ERP systems were highly heterogeneous (due to a number of acquisitions), the company was limited in its ability to conduct electronic transactions internally between business units, making the flow of intra-company transactions slower and more expensive. This heterogeneity across business units also posed strategic barriers by making it harder for partners and potential new channels to integrate with Sterling Fluid Systems.

#### on demand Business Rationale

Sterling Fluid Systems needed to be more responsive to the demands of its customers and distributors by providing a faster, more convenient way to interact with the company—both in terms of transactions and information retrieval. Similarly, the company needed to be more responsive to the needs of internal employees who purchased products (e.g., spare parts) from other business units for an efficient, cost-effective transaction process that would improve their overall productivity. The company also needed to be more responsive to strategic opportunities by making it easier to integrate with new and existing partners.

### BECOMING ON DEMAND

#### Business Process Adaptations

The Sterling Fluid Systems solution enables customers and distributors to obtain key account information and conduct transactions in realtime, providing them with faster turnaround for their transactional and informational requirements. The system also allows internal business units to transact electronically in realtime via a hub. In the near future, internal business units will be able to purchase from each other through the company's various desktop procurement systems through an XML-based integration hub that links their respective ERP systems. This hub will also enable Sterling Fluid Systems to more quickly and cost-effectively integrate with new channels (i.e., e-marketplaces) and strategic partners (e.g., suppliers).

#### on demand Operating Environment

The solution, designed by IBM Global Services and implemented by IBM Business Partner Digital Union, employs IBM WebSphere Business Integration software, IBM WebSphere Application Server, IBM WebSphere Commerce, IBM DB2 Universal Database, IBM HTTP Server and IBM Lotus QuickPlace

### ON DEMAND BENEFITS

- Sterling Fluid Systems expects the solution to increase gross margins by 2 percent by reducing pre- and post-sales support costs.
- By lowering the incidence of order errors, the company's solution will cut related costs and increase customer satisfaction.
- The solution enables Sterling Fluid Systems to more easily pursue e-marketplaces as a revenue opportunity.
- By virtue of its hub-based XML-based architecture, Sterling Fluid Systems will gain the flexibility to integrate with current and future strategic partners.

## SITUATION ANALYSIS

### Background

Sterling Fluid Systems is a global provider of highly engineered fluid and gas handling products and services. The company serves a diverse range of market segments through a series of highly decentralized business divisions, defined as:

- *Liquid Pumps*—Sterling SIHI provides side channel and centrifugal pumps and systems for the chemical, pharmaceutical and process industry. Sterling Halberg also provides a range of centrifugal pumps and mixers to many sectors of industry.
- *Vacuum Process Pumps*—Sterling SIHI also provides dry and liquid ring vacuum pumps and systems for the process-based industries and all other sectors of industry.
- *Filling & Testing Systems*—Sterling SAT provides filling and testing systems for the automotive industry, as well as engineered systems for process-based industries. Sterling PCU supplies filling & testing systems for the automotive and appliance industries.
- *Engineered Valves*—Sterling Mokveld provides engineered valves for the control of natural gas, oil, LPG and other fluids and gases.

Comprised of some 50 fully-owned operations, these business divisions are supported by a worldwide network of 20 major manufacturing centres. While its operations are global in scope, Sterling provides its customers with strong local support through its 200 Sterling Service support centres and a broad network of third-party distributors and agents. With revenues of approximately EUR 500 million (\$500 million), Sterling employs 2500 people worldwide.

Sterling Fluid Systems has sought to encourage and control the flow of information across its business units at all levels of its value chain. Its goal: competitive advantage through increased collaboration and process integration.

An established leader in the fluid systems market, Sterling Fluid Systems has followed a competitive strategy based on creating and exploiting synergy. The main thrust of this strategy has been to bring together the complementary skills, products and resources of the company's various business units to produce both demand-side and operational benefits. On the customer side, a synergistic product line enables Sterling Fluid Systems to offer comprehensive solutions to a wide range of industry segments. On the operational side, the company has sought to leverage the complementary nature of its business units in such areas as product development, supply chain management and customer service. Not unlike its pump products, Sterling Fluid Systems has sought to encourage and control the flow of information across its business units at all levels of its value chain. Its goal: competitive advantage through increased collaboration and process integration.

### Business Drivers: Business Unit Integration

A key factor impeding the flow of information within Sterling Fluid Systems was the highly heterogeneous backend application environment that existed both between and within its business divisions—the product of the company's strategy of growth through acquisition. Evidence of this heterogeneity: in the wake of its acquisitions, the company has operated some 10 ERP platforms across the Group,

including implementations of SAP, Baan, MK, MM and MFG Pro and others . This patchwork of ERP solutions across the company made it extremely complex to conduct electronic transactions or share data between business units, with the most common example being one Sterling Fluid Systems business unit needing to purchase spare parts from another. In 2000, the company began investigating the feasibility of establishing a single, common ERP system to serve all of its divisions. Despite the clear benefits of such a system, the expected cost of its implementation—and the sheer magnitude of Sterling Fluid Systems’ existing investments in both IT and platform-specific expertise—did not provide a compelling business case. The company’s planners concluded that more cost-effective ways to link its disparate systems could be found.

At about the same time, another team of planners was looking at ways to improve interaction on the demand side—specifically, how to provide customers and distributors with a more efficient way to conduct transactions and share information with Sterling Fluid Systems. At the root of the company’s plan were two strategic goals, the first of which was to improve operational efficiency by streamlining its costly, labour-intensive customer service and order-entry procedures. The common example of a customer seeking spare parts (for pumps, valves or other engineered products) vividly illustrates how processes were ripe for improvement. Under a typical scenario, a customer contacted either a local Sterling Fluid Systems sales office or a distributor by phone and—with the aid of a serial number—worked with a representative to identify the specific product that was needed. After receiving a price quote and negotiating delivery terms with the sales engineer, the customer would then place the order by fax, e-mail or postal mail. Upon receiving the order, a representative would then manually (and sometimes incorrectly) input it into the ERP system. With half a million transactions conducted annually—each costing an estimated \$75, not including the cost of transcription errors—the potential savings were huge.

In addition to cost savings, Sterling Fluid Systems saw technology-driven process improvements as a means of cementing existing customer relationships and opening the door to new ones.

In addition to cost savings, Sterling Fluid Systems saw technology-driven process improvements as a means of cementing existing customer relationships and opening the door to new ones (its second strategic goal). While the degree to which the company is a “partner” to customers varies across business units and product lines, one common thread runs through all relationships: the need to make it easy to do business with Sterling Fluid Systems. Providing sophisticated Web-based B2B self-service capabilities was seen as the most effective way to meet this mandate.

In early 2001, the company’s planners had begun to articulate an e-business vision that incorporated its customer-centric B2B self-service goals while at the same time provided B2B integration across its various business units. Under this emerging vision, the company would create a flexible framework under which all key stakeholders in its value chain—customers, internal business units, partners and suppliers—could easily and tightly integrate with any of Sterling Fluid Systems’ business units. According to Graham Terry, Director of System Strategies and leader of the team that developed the plan, its key strength was a highly efficient approach to addressing both current and future integration. Graham explained “We saw our customer-facing initiative as an excellent opportunity to also integrate our business units at the umbrella level. It also provides us with a ready-made platform for integrating with any of Sterling Fluid Systems’ future

The company's plan centered on the creation of an XML-based integration framework that would make it easier to establish e-business relationships between itself and its external trading partners—as well as between its business units.

acquisitions. Given the growth of the company's organization, this flexibility and leveragability was seen as very valuable."

At a high level, the company's plan centered on the creation of an XML-based integration framework that would make it easier to establish e-business relationships between itself and its external trading partners—as well as between its business units. Under Sterling Fluid Systems' vision, the key goal is the integration of the purchasing function (i.e., buying spare parts) with backend ERP systems. As the chart on page 7 shows, one element of this solution would be the use of dedicated purchasing portals that link to backend ERP systems via an XML integration layer. Ultimately, however, Sterling Fluid Systems' infrastructure would establish direct B2B—or "system-to-system"—linkages between existing procurement systems and ERP systems via the integration layer. Equally important, the infrastructure lays the groundwork for a wider range of e-business relationships in the future, including e-marketplaces, thereby opening up a substantial untapped market opportunity.

## ACTION PLAN AND DECISION PROCESS

### First Steps

To spearhead the initial planning of its e-business solution, Sterling Fluid Systems assembled a cross-functional project team comprised of IT and business unit staff. Strong input was also provided by Remko Vleesch Dubois, the company's e-commerce development manager from the Marketing organization and Ian Massey, head of North American operations. The project team's central mission was to establish a master strategic plan that would serve as the kernel of the company's e-business efforts. One of the first steps in this process was to identify those specific business functions likely to yield the most significant payoffs through e-business enablement, as well as the likely cost of enabling these functions. The team's aim was to establish a hierarchy of projects based on their expected ROI, and to use the resulting ordering scheme as a means of prioritizing individual initiatives. But as Graham Terry points out, these preliminary ROI assessments—while creating signposts for the future—were not intended to give "red light/green light" validation for Sterling's e-business plans. "We knew intuitively that for competitive reasons we had to both integrate our business units and establish a Web-based service for our customers. It was a strategic necessity."

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—Graham Terry,  
Director of System  
Strategies, Sterling  
Fluid Systems

By the spring of 2001, the project team had completed its master e-business strategy and had compiled its preliminary findings on targeting specific processes. Surprising few, the team's findings underscored the high cost of providing information to customers in general, and—as a subset of this—responding to a narrow range of routine "pre-sales" inquiries. Just how costly? "Our analysis found that a huge part of our sales costs represented non-value added activities. Our initial assessment was that we could increase our gross margin by approximately two percent." With the magnitude of Sterling Fluid Systems' potential benefits now clear, the next stage of planning for the initiative took on a higher sense of urgency.

As the planning process became more granular, so too did the degree of involvement from across the Sterling Fluid Systems organization. In assembling a broader decision-making framework, the company was determined to maximize the level of input from its various lines of business and to keep the primary focus on business-level benefits. Toward this end, Sterling Fluid Systems created a steering committee comprised of divisional presidents whose role was to lead the decision-making while at the same time championing the initiative within their business units. Business unit interests were further represented through a series of workshops held in early summer designed to flesh out specific functional needs. In recruiting for these workshops, the project team sought representation from all business units as well as from key functional areas (e.g., sales and marketing, supply chain management, etc.).

In addition to producing feedback on functionality needs, the workshops were useful because they helped to establish fundamental principles that would ultimately govern the way e-business was established in the company—and how it would be grown over time. The first principle was that the company should use e-business not to change its core business model but to augment and extend existing business processes. Second, any e-business initiatives the company took would leverage existing IT infrastructures across all divisions—thereby minimizing additional investments. Third, the company would formulate its e-business strategy at a company-wide (not division) level, which would lead to a more open, flexible architecture and make it easier to share costs across all divisions.

### Decision Process

Sterling Fluid Systems' key decisions related to the software infrastructure needed to run the e-business solution and a solutions provider to help design and implement it. The company conducted its technology selection process with eye toward both its current and future needs—and was very conscious of avoiding any platform that could limit its future options. “We were looking for a platform that was versatile enough to handle our e-commerce needs while at the same time provide a way to integrate both inside and outside the company,” says Graham Terry. “We also were extremely concerned about scalability, since the solution will ultimately be deployed more widely [across more business units] and more deeply [providing more services] over time. Put simply, we wanted to think big.”

And for Sterling Fluid Systems, thinking big also extended to the realm of integration. With process-level integration—both internal and external to the enterprise—a central part of its e-business strategy, the company was also looking for a B2B platform with strong support for standards, most notably XML. Such a platform was seen as essential to the rapid formation of dynamic business relationships with customers, suppliers, distributors and partners. With these needs in mind, Sterling Fluid Systems was determined to go with a technology leader because, the stakes were too high not to. “Throughout the process we had received strong support at the business level and expectations were high,” says Terry. “We were very conscious that we didn’t want to be let down by the technology.”

While the technology itself was critical, the company also sought a provider with the experience and expertise needed to configure a solution that fully leveraged this technology. In the middle of 2001, Sterling Fluid Systems evaluated

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—Graham Terry, Sterling Fluid Systems



approximately 10 providers, focusing on traditional ERP vendors and providers of Web-based B2B solutions. By July 2001, the company selected an IBM solution comprised of WebSphere Application Server, WebSphere Commerce and WebSphere Business Integration software. On the solutions provider side, the company contracted with IBM Global Services to scope and architect a solution, and UK-based IBM Business Partner Digital Union to work with the company's development staff to develop and implement the solution. "We saw the direction that IBM was taking the WebSphere platform in as very favorable, and we saw IBM Global Services as being best equipped to help us extract the most benefit from the technology and point us in the right direction."

## SOLUTION PROFILE AND IMPLEMENTATION STRATEGY

### Key Components

#### Software

- IBM WebSphere Business Integration software
- IBM WebSphere Application Server
- IBM WebSphere Commerce
- IBM HTTP Server
- IBM DB2 Universal Database
- IBM Lotus QuickPlace

#### Business Partner

- Digital Union

#### Services

- IBM Global Services

### The Solution: Core Functionality and Architecture

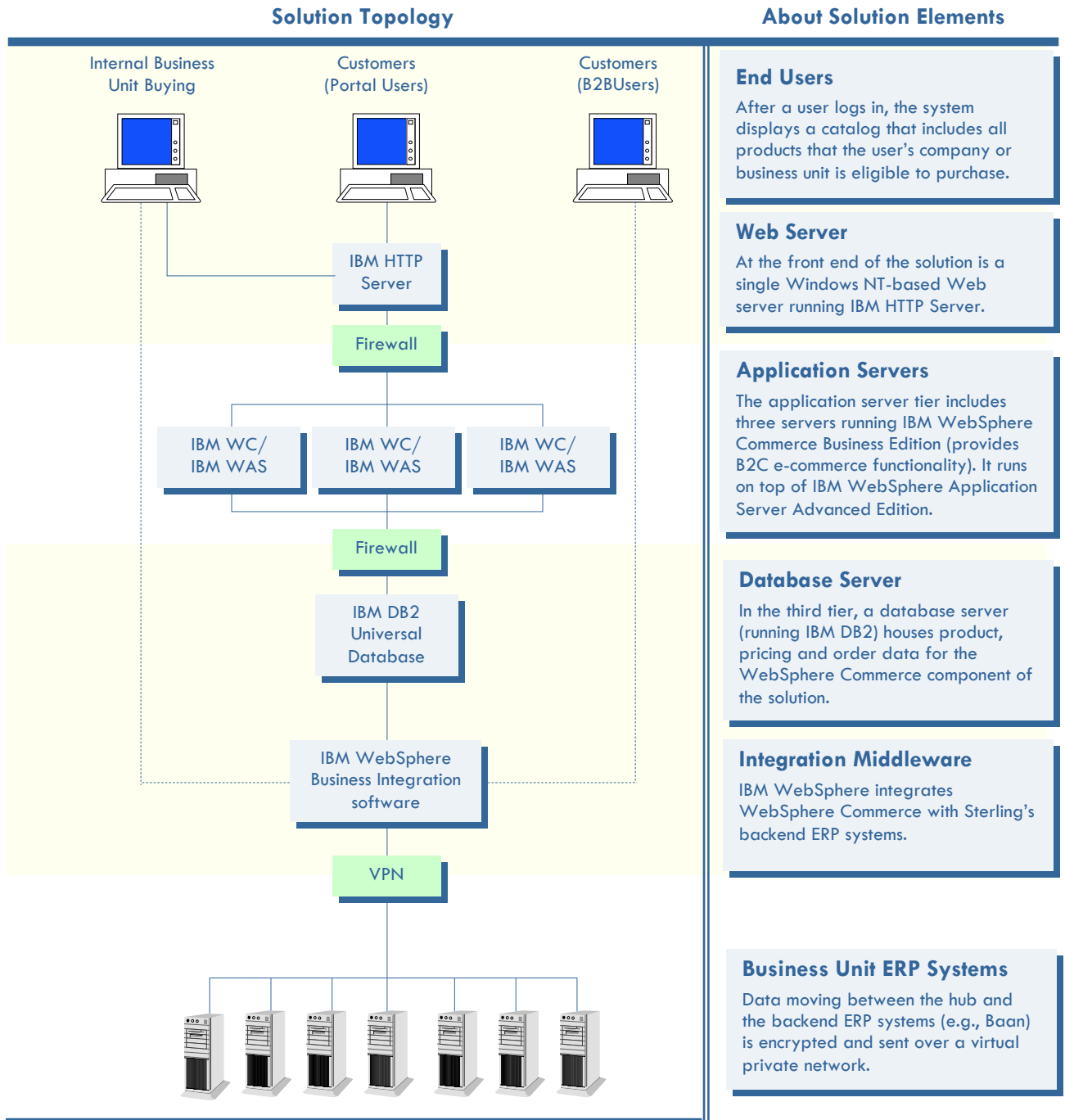
Sterling Fluid Systems' core solution is comprised of a B2B platform (targeted at customers and distributors) and their business units. The solution's core transactional capabilities include the ability to order online from a customised catalogue. Product information displayed in a customer or business unit's catalogue is driven by a complex set of business rules related to a customer's profile, which includes ordering history. The solution's most significant information delivery feature is an ability to tell customers what spare parts they need for a specific Sterling Fluid Systems' product (such as a pump or a valve). The solution also allows customers to access information on pricing, product availability and order status. The solution is currently running as a pilot in three of its business units: the Vacuum Process Pumps division (US operations), the Engineered Valves division (Netherlands) and the Filling & Testing Systems division (US operations).

Housed in Sterling Fluid Systems' data center in Amsterdam, the solution employs an n-tiered architecture. At the front end of the solution is a single Windows NT-based Web server (running IBM HTTP Server). Below this, separated from the first tier by a firewall, is the application server tier. It includes three Windows NT servers, each of which runs an instance of IBM WebSphere Commerce Business Edition (which provides the solution's core B2B e-commerce functionality) and IBM WebSphere Application Server, Advanced Edition V4.0 (on which WebSphere Commerce runs). The third tier, also separated by a firewall, is comprised of a single database server running IBM DB2 Universal Database. It serves as the database for the WebSphere Commerce application, storing product, pricing and order data. Scalability and performance were seen as the key criteria in the selection of DB2.

Below and connected to the database server is a Windows NT server running IBM WebSphere Business Integration software—which integrates in a hub fashion with the various backend ERP systems running within the company's business units (three now, all eventually). Data moving between the hub and the ERP systems is encrypted and sent over a virtual private network. Sterling Fluid Systems' ERP systems run on a variety of vendor platforms, including an IBM system running OS/400.



# EXHIBIT 1: BASIC ARCHITECTURE: THE STERLING FLUID SYSTEMS SOLUTION



**Standards and Integration**  
Sterling Fluid Systems sought to create an XML-based integration framework that would make it easier to establish e-business relationships between itself and its external trading partners—as well as between its business units.

Key: ..... = Future Integration

As discussed above, Sterling Fluid Systems' solution employs a standard network security architecture within its n-tiered architecture, with firewalls between the Web server and application servers as well as between the application servers and the database server. The primary security challenge for the Sterling Fluid Systems' solution was in the area of user authentication—both for customer and intra-company transactions. Specifically, the development team needed to design an authentication mechanism that mirrored the company's extremely hierarchical purchase authorization policies. These policies, which define purchasing authority at the division or department level, were used to control who had access to business unit-specific catalogue information. To achieve this, the team employed WebSphere Commerce's standard authentication functionality.

### The Sterling Fluid Systems Solution in Action

Users of the Sterling Fluid Systems' solution include their customers and distributors as well as internal business unit staff. In the case of a typical transaction, an approved employee within a customer's company—ranging from a service person or engineer to a power plant manager—logs into the system using the B2B, or portal, interface. Using the login information, the system authenticates the user and—upon successful authentication—displays a catalog that includes all products that the user's company is eligible to purchase. When the user selects a product from the catalog, the system displays his company's contract price (driven by backend business rules).

WebSphere provides an integration layer between WebSphere Commerce and Sterling Fluid Systems' multiple ERP systems.

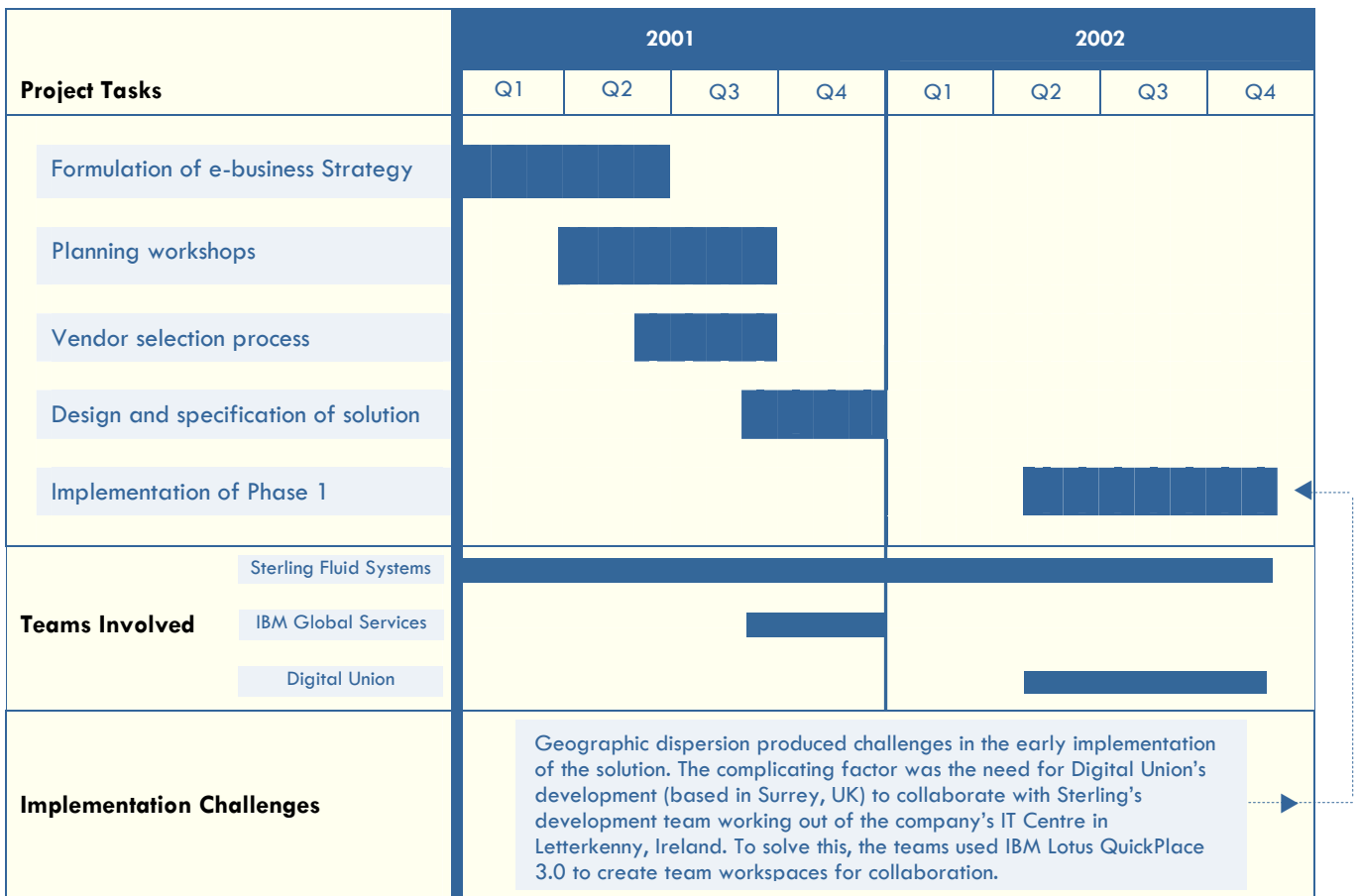
A user who wishes to purchase products has the option of either purchasing the product at that time or creating a purchase requisition. A user choosing to purchase then can do so either through a purchase order (PO) with credit card payment planned. In the case of a PO purchase, WebSphere Commerce sends out a "Create PO" message through the hub, which in turn sends it as an XML message (i.e., request) to the appropriate ERP system. Once the request has been processed, the ERP system sends an order status message through the hub to the DB2 database where it can be accessed by WebSphere Commerce. In the case of a credit card purchase, WebSphere Commerce sends the customer's credit information to a third party for authorization. Upon credit card approval, WebSphere Commerce then sends the order information through the hub, which sends it as an XML message to the ERP system, triggering the processing of the order. The solution also allows users requiring approval for a purchase to create a requisition and—via a workflow process—send it to a superior for authorisation. Upon approval, the requisition is automatically turned into a standard order and follows the sequence outlined above.

As the above example shows, WebSphere provides an integration layer between WebSphere Commerce and Sterling Fluid Systems' multiple ERP systems, sending order-related information back and forth across the system after the user initiates a transaction. Another critical function of the hub is to automatically populate the WebSphere Commerce database with catalogue information on an "event-driven" basis. Specifically, any change to catalogue content (product information, pricing, etc.) residing in the backend ERP system automatically triggers replication of the new content out to the WebSphere Commerce catalogue. In the future, Sterling Fluid Systems plans to link its customers' (internal and external) purchasing systems directly to the solution, using WebSphere Business Integration's connect capability as the gateway between the systems.

### The Project: Development Approach and Timetable

The whole project is led from a business point of view by a Steering Team comprising the chief executives of each of the operating divisions with a project team responsible for realisation. IBM Global Services was engaged to scope and architect the solution and establish its technical specifications; it completed the process in December 2001 after a four-month effort. The development of Sterling Fluid Systems' solution, began in mid 2002, and has been performed conjointly by Digital Union and Sterling Fluid Systems' small internal development team working in the company's IT Centre in Letterkenny, Ireland, with both groups reporting back to Sterling Fluid Systems' e-business project team. At a high level, Digital Union's role was that of lead developer, responsible for implementation, project management and support of Sterling Fluid Systems' development team and with a strong emphasis on skill transfer between the teams. Within the overall implementation effort, Digital Union focused on setting up the WebSphere Application Server and WebSphere Commerce part of the solution, while the Sterling Fluid Systems' team focused on the implementation of location-specific functionality and look and feel, as well as related business process integration

### EXHIBIT 2: KEY MILESTONES FOR THE STERLING FLUID SYSTEMS SOLUTION



Source: Sterling Fluid Systems and IDC

with WebSphere. The first phase of the implementation process—the setting up of the software and hardware infrastructure and development environment—ran from March to May 2002. After this, the actual application development, interface development and encoding of business rules proceeded in a fairly parallel fashion. The teams’ basic approach was to break the project into some 25 deliverable areas, each of which would be separately defined and tested. Examples of these modules ran the gamut from business logic to JSP (Java Server Pages) page changes to legacy integration.

## BUSINESS RESULTS

Going into its e-business initiative, Sterling Fluid Systems expected to achieve substantial improvements to a whole range of customer-facing activities—related to both transactions processing and information delivery. With their pilot implementations under way, the e-business project team has confirmed the earlier predictions of savings and are encouraged by the fact that operational managers not only endorse the goals but have identified further potential not originally anticipated. The development process itself has highlighted many areas of improvement in electronic coding practices. These have created a platform in

### EXHIBIT 3: BUSINESS RESULTS: THE STERLING FLUID SYSTEMS SOLUTION

Business-Level Benefits	Enabling Process Changes	Linkage to Solution
Improved Margins	The company expects the solution to increase gross margins by 2 percent by reducing pre- and post-sales support costs as well as customer communications costs.	The solution provides customers with realtime access to product, catalog and support-related information.
Improved Operational Efficiency	By lowering the incidence of order errors, the company’s solution will cut related costs and increase customer satisfaction. This aspect of the solution makes it much easier to do business with Sterling Fluid Systems as the supplier.	Because the solution is integrated in realtime with Sterling Fluid Systems’ ERP system, representatives no longer have to manually input orders.
Access to New Markets	The solution enables Sterling Fluid Systems to more easily pursue e-marketplaces as a revenue opportunity.	The solution’s use of XML facilitates rapid integration with new channels such as e-marketplaces.
Technology Benefits	Underlying Product/Attribute	Benefit in Action
IT Strategy Flexibility/Increased Ease of Integration	WebSphere Business Integration software/Strong Support for XML	The company’s e-business infrastructure investment will provide several long-term strategic advantages, the most important of which is the "integration flexibility" afforded by its hub-based XML-based architecture.

Source: Sterling Fluid Systems and IDC

which the company's future business strategy depends on its ability to cumulatively serve its customers.

"By making it easier and faster to obtain products and information, the solution strengthens our ability to become more integral partners with our customers," says Terry. "Given this, we expect the solution to emerge as a key competitive weapon in the future." While addressing a clear and present customer need, Sterling Fluid Systems' e-business infrastructure investment is also expected to provide several long-term strategic advantages to the company. Perhaps the most important of these advantages is the "integration flexibility" afforded by its hub-based XML-based architecture—a product of its use of IBM WebSphere Business Integration's connect capability. Graham Terry expects, "This newfound flexibility to transform integration from a strategic impediment to a source of opportunity. Internally, our XML-based architecture is making it possible to not only integrate our existing backend ERP systems, but also to build a simple and cost-effective framework for integrating any businesses we acquire in the future. On the demand side, the solution gives us the flexibility to work with e-marketplaces that we didn't have before."

## CASE EPILOGUE

Sterling Fluid Systems' near-term strategy for expanding the scope of the solution is both simple and ambitious. For the business units where the solution has been deployed, functionality will be enhanced by adding new self-service features (on the information delivery side) and product configuration capability (on the transactional side). From there, Sterling Fluid Systems plans to roll the platform out to all its business units on a worldwide basis.

Looking back on the engagement, Sterling Fluid Systems affirms its three most critical decisions—to use IBM technology, IBM Global Services for design and Digital Union for implementation. Says Graham Terry: "Overall, we're extremely happy with the way the WebSphere platform is architected. IBM and Digital Union have met our expectations and have immense depth of technical and business expertise. The success of this project is substantially a result of the performance of our selected partners."

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