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# Rethinking retailing with SOA

New levels of flexibility, agility  
and cost-efficiency

Application Innovation  
Services  
Retail



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# Rethinking retailing with SOA

## New levels of flexibility, agility and cost-efficiency

By Vish Ganapathy, Melody Badgett and Jay DiMare

*Today's retail institutions obtain products from multiple sources across the globe. Getting the right quantity of these items on the right shelves to meet consumer demand involves a complex set of processes and extensive collaboration among retailers, suppliers and manufacturers. Yet in an industry that depends on innovation, many retailers wage constant and costly struggles to keep up with change. It's no wonder that a powerful technology model – service-oriented architecture (SOA) – is capturing the attention of both business and IT executives.*

### Introduction

Retailers have always had to grapple with change – in their customers' needs and preferences, in the product assortments offered from season to season, in their sourcing relationships and supply chain capabilities, and in their strategies for creating differentiation. Today, the pace and complexity of the industry is such that it can be exceedingly difficult to keep up with marketplace dynamics, much less capitalize on them. At the same time, the penalties for those who fail to do so can be severe.

The challenges retailers currently face – a difficult new economic environment, increasing competition, information transparency and heightened expectations from diverse, more informed customers – define the retail playing field. Most major retail segments, such as

apparel and grocery, are mature and slow-growing, and fighting to protect market share as consumer choices expand exponentially. This has created a huge shift: Retailers can no longer afford to focus on the two traditional dimensions of product and store. Competitive differentiation now requires companies to understand who is in the store and why. “Who” takes into account details such as an individual's lifestyle, needs, interests, expectations, shopping behaviors and preferences. “Why” focuses on understanding the shopping occasion and value drivers. By deepening their customer insight, retailers can develop integrated, proactive strategies for addressing everything from cross-channel integration and private-label development, to global sourcing and import logistics, localized assortments and markdown optimization.

Today's retailers source products from all corners of the globe. Typically, a number of manufacturers, suppliers and distributors are involved in the process – creating the need to seamlessly integrate information and applications across internal and external networks. The IT systems a company relies on to support its business must keep pace. While this might seem like a daunting task, it doesn't have to be. Service-oriented architecture (SOA) can help retail organizations simplify complexities and resolve incompatibilities that may inhibit data integrity, information integration and partner collaboration.

#### **What is SOA?**

Service-oriented architecture (SOA) involves breaking an application down into common, reusable “services” that can be used by other applications, both internal and external, in an organization – independent of the applications and computing platforms on which the business and its partners rely. Using this approach, enterprises can assemble and reassemble these open, standards-based services to extend and improve collaboration among existing applications, build new capabilities, and drive innovation at every point in the value chain.

By making IT systems flexible and reusable, SOA can help support critical business capabilities aimed at boosting revenue and improving customer satisfaction. SOA can also aid in increasing the accuracy and accelerating the delivery of realtime information, unifying disparate systems, and exposing services to link vendors, suppliers, shippers, channels and stores. Additionally, SOA permits an organization to reduce disruption and risks to its existing IT systems and improve key performance metrics – including return on investment for IT expenditures and reaping more value from IT solutions.

In the following sections, we will describe three typical retail industry scenarios, and how SOA can help overcome some common challenges. Specifically, we will look at how SOA's remarkable flexibility can help retail organizations:

- *Optimize vendor-managed programs*
- *Tighten cost controls in global sourcing*
- *Improve inventory and order visibility.*

# Rethinking retailing with SOA

*New levels of flexibility, agility and cost-efficiency*

## Optimizing vendor-managed inventory programs

While vendor-managed inventory programs have taken hold throughout the retail world, success demands high levels of integration among suppliers, vendors and their corresponding applications. Without seamless integration, incongruities across partners' IT systems can create information backlogs, which typically translate into longer lead times, larger safety stocks, persistent demand-supply imbalances, and drops in profitability – not to mention less customer satisfaction. Let's look at this problem in the context of a specific scenario.

### ***The business challenge***

Consider the hypothetical case of a retailer that handles its in-store book business through a vendor-managed in-ventory (VMI) program. The retailer's marketing team is elated to hear that one of the most popular authors will soon release a new book soon. The retailer's excitement only increases when the author announces that he will support the release with his first speaking tour in a decade, including stops in 17 of the retailer's biggest market areas.

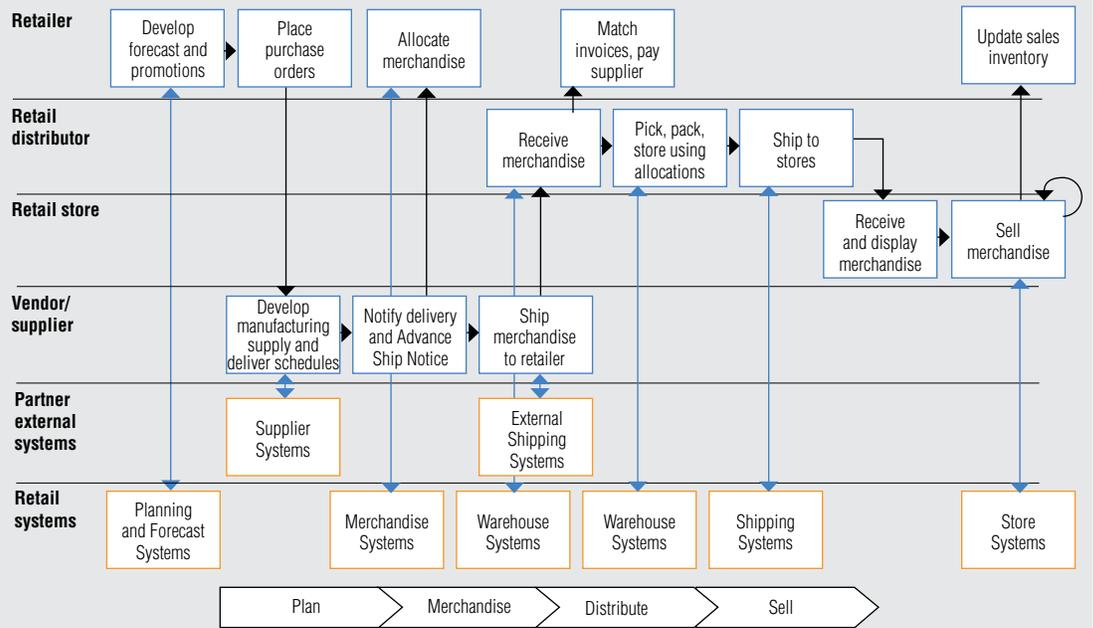
Eager to fully exploit the potential of these events, the marketing group devises a promotion to offer consumers a 50 percent discount on any of the author's older books with every purchase of the new release. To support the promotion, significant investments are made across the country – in marketing, as well as in filling projected inventory re-quirements. Of course, revenue projections are adjusted skyward.

The new book is released, the speaking engagements are held, but the projections remain projections. Despite rave reviews for the book, sell-outs for every speaking engagement and increased sales reported by other competitive retailers, revenues from the promotion never get off the ground. Customers are furious to find no inventory of the author's older books. Stores are overwhelmed with rain check requests. As it enters the January sales doldrums, the company is left with unsold stacks of the new book.

Why did the promotion sputter and die? Quite simply, there was a failure to communicate and coordinate. Even the most careful promotional planning, demand forecasting and program execution will be for naught if a retailer's suppliers can't see deeply enough into the process to support it with the right supply and replenishment strategies and executions. Likewise, if a supplier can't immediately monitor store and warehouse inventory levels, chances are those levels will be either too high or too low – with potentially dire consequences in today's ultra-competitive marketplace.

The problem began with the book supplier having little or no visibility into the retailer's plans and demand forecasts. Consequently, the supplier made no special provision to accelerate replenishment of the author's old books. The existing inventory quickly disappeared from store bins. For the new book, the supplier stuck to its standard replenishment system for major new releases and kept flooding the chain with the new book (see Figure 1).<sup>1</sup>

FIGURE 1.  
**The planning process – from forecasting through sales.**



Source: IBM Institute for Business Value analysis.

This unfortunate situation is one of many that retailers can suffer when partners lack the realtime information they need to efficiently coordinate mission-critical processes such as demand forecasting, allocations and replenishment planning. If the IT systems used by retailers, suppliers, carriers, consolidators and other supply chain partners can't easily communicate and adjust to fast-changing needs and opportunities, profits and customer satisfaction can be exceedingly difficult to sustain and grow. At the same time, there are now options that permit organizations to improve visibility into their partners' systems, and to support any number of retailers and vendors.

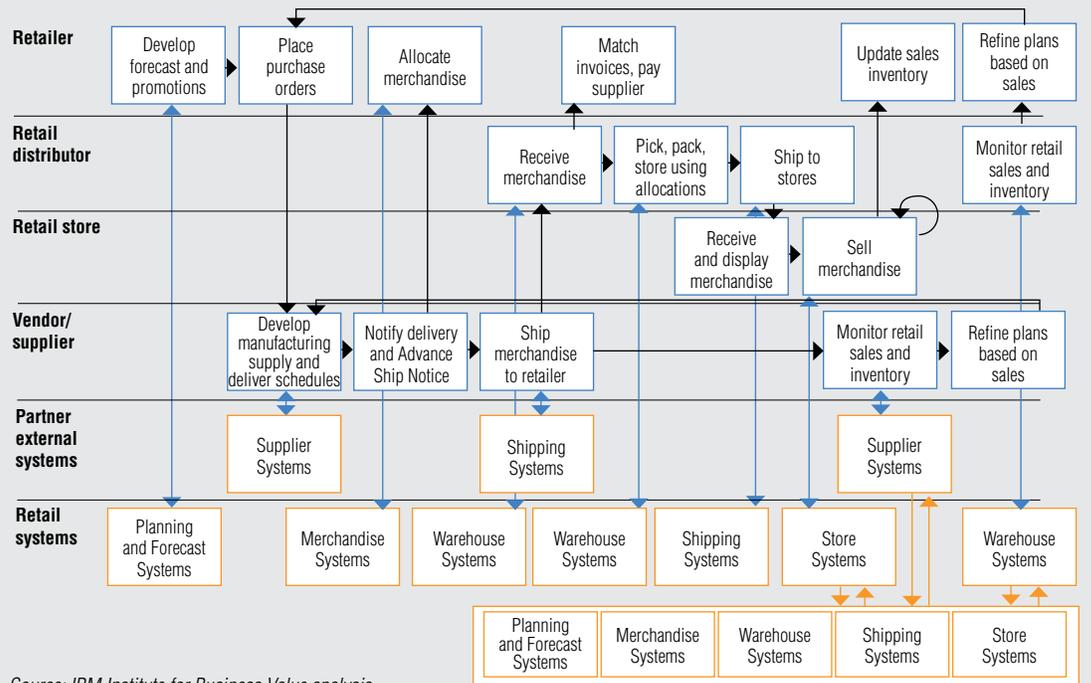
### **Enhancing vendor-managed inventory**

When vendors and suppliers have realtime access to consistent information, they can better plan the production and distribution of products. In order to do this, they need a controlled and secure way to integrate with a retailer's systems, including planning and forecasting, promotion management and inventory. This level of integration must be more flexible, secure and cost effective than current, point-to-point integration solutions to avoid the problems described in our scenario. Figure 2 shows a revised process that employs integrated systems during sales activities.

Having consistent, realtime access to critical information and processes allows retailers, vendors and suppliers to better coordinate the production and distribution of products at every point in the planning stage – from forecasting to sales.

FIGURE 2.

**Revised sales planning with integrated systems support.**



Source: IBM Institute for Business Value analysis.

Although the process did not change, the systems are better positioned to support the process. In this revised approach, the supplier can see in realtime what is happening in the stores. Stores can communicate sales and inventory status to their suppliers. Similarly, store systems and warehouse systems can communicate with other core retail systems. This enhanced connectivity positions the retailer and its suppliers to better respond to changing conditions.

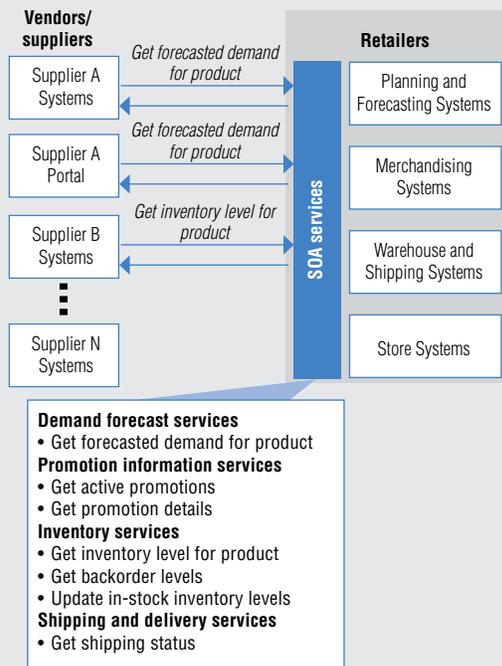
The challenge is how to accomplish this level of integration. Today, point-to-point, direct connections between applications are the prevalent approach. Legacy, “off-the-shelf” and

custom applications can be costly to maintain, and hard to link to other systems. Furthermore, changing business strategies and models often require new applications or more functionality – adding one more application that also requires custom, point-to-point connections. The complexity grows. Figure 2 shows partners accessing a retailer’s core systems using the same approach as the retailer uses internally.

SOA provides a way to build a single, reusable interface for multiple purposes. Partners connecting to the services do not need to acquire additional software. This type of connectivity is illustrated in Figure 3.

Designed to transcend systems, channels and organizational boundaries, SOA can accelerate the speed and effectiveness of information-sharing and process automation

FIGURE 3.  
Retail systems using SOA to improve partner collaboration.



Source: IBM Institute for Business Value.

To build this solution, the retailer would implement the SOA services as shown in Figure 3 – providing controlled access to specific functions within the company’s existing systems. In some cases, there may be more than one core system that leverages a particular service; for example, planning, replenishment and warehouse systems may all be supported by the “Get inventory levels for product” service. In the SOA-enabled scenario, the service would mask the complexity of the back-end systems. The requester of the information need only ask to “Get inventory level for product” and not worry about where the service resides.

In the SOA world, services are designed to support information that is needed the most. A level of security is inherent in the design, and only the approved data is returned by the service. A service can be used to control business partners’ access to information, or employed by intra-company systems as an internal integration solution. For example, a Planning and Forecasting System may use the same “Get backorder levels” service that a Store System uses. To aid retailers in the design of SOA services, organizations like the Association for Retail Technology Standards (ARTS) are creating models specific to retail that can expedite the design and implementation process. ARTS recently released the SOA Blueprint for Retail, a comprehensive, vendor-neutral approach to applying SOA in retail.<sup>2</sup>

### The value to the business

An IT environment built around SOA can help retailers and their partners avoid issues created by a lack of integration and process orchestration. Designed to transcend systems, channels and organizational boundaries, SOA can accelerate the speed and effectiveness of information-sharing and process automation. The Web-based services that are central to SOA can make key performance indicators of the end-to-end supply chain visible to all appropriate parties. Additionally, since SOA permits realtime access to information, conditions, events and metrics can instantly trigger optimal responses – *before* problems have a chance to compound. This type of flexibility has the potential to impact several key performance indicators used by the industry (see Figure 4).

FIGURE 4.  
**The impact of tighter supplier and retailer collaboration.**

Key performance indicator	Measure	Benefits
Store availability	Percentage of time that store inventory for a given SKU is greater than zero.	Store inventory visibility services can improve retailers' and suppliers' ability to manage inventory levels.
Days in inventory	The total amount of time between placement of a replenishment order to a supplier and its arrival at the store.	Promotions and sales services can help reduce this time by providing more realtime inventory levels, thus condensing the reorder cycle.
DC cycle time	Amount of time inventory spends in "buffer" at a distribution center (DC).	
Supplier cycle time	Amount of time between placement of a replenishment order and the carrier pickup of the same order.	Logistics-related services can provide visibility to latency issues in transportation, which can help improve this metric.
Supplier fill rate	The supplier's ability to fulfill the total amount ordered within a given time window.	Earlier visibility to plans, forecasts promotions and inventory can increase the supplier's ability to meet demand, and reduce the PO to ASN variances.
Supplier ASN accuracy	The supplier's ability to generate accurate advance shipping notices (ASNs).	
DC fill rate	The distribution center's (DC's) ability to fulfill the total amount allocated to an individual store within a given time window.	Reducing the PO to ASN variances can help improve the distribution center fill rate, since "pre-allocations" will likely be more accurate.

Source: IBM Institute for Business Value.

Consider the book promotion scenario discussed earlier, and how SOA could benefit the retailer. From the start, the open standards used to build SOA services would allow the supplier to see the retailer's plans and respond with a special replenishment program for the old book titles. This would help assure that the right amount of inventory of the old and the new books was in the stores – without requiring major, resource-consuming application development on the part of either the retailer or the supplier. Shipments of merchandise to the retailer's distribution warehouse and stores would be synchronized with sales. Unanticipated shortfalls, overages or delays could be quickly detected and corrected before creating their own set of problems.

This level of integration, coordination and collaboration can have dramatic and positive effects across the value chain – from inventory and logistics, to sales, service and overall business performance.

Think about how the retailer might have reduced operational and implementation costs. By better aligning the timing of inventory delivery to in-store sales, the company's expenditures for advertising, in-store displays and other promotional items could have been better coordinated and more effective. As the promotion progressed, realtime feedback on sales would have enabled the supplier to refine its replenishment strategies accordingly. Likewise, these forecasts would support management decisions to optimize scheduling of merchan-

**SOA can support the global sourcing process by permitting companies to have “one version of the truth” for calculating both actual and landed costs.**

dise receiving and stocking while reducing staff over-time. Had the author suddenly changed his plans – by adding a city to the tour or canceling a scheduled speaking engagement, for example – the supplier would have had the lead time and tools to easily adjust the replenishment for the affected stores. As the tour wound to a close and publicity for the new release declined, inventory replenishment could have been scaled back – reducing the amount of unsold goods.

### **Tightening cost controls in global sourcing**

Creating differentiation with private-label products sourced from around the world has become a key strategy for retailers, especially as global trade barriers fall. Yet a McKinsey study concludes that while companies are realizing revenue lift with a unique product set, they may be missing out on operational savings. For organizations purchasing from China alone, only 25 percent of the potential savings have been achieved.<sup>3</sup> To help optimize profit margins in this lucrative opportunity, retailers are increasingly bypassing intermediaries to handle sourcing and import logistics on their own. But it's a complex process involving many different entities and innumerable data transactions – often among different information systems and parties.

### ***The business challenge***

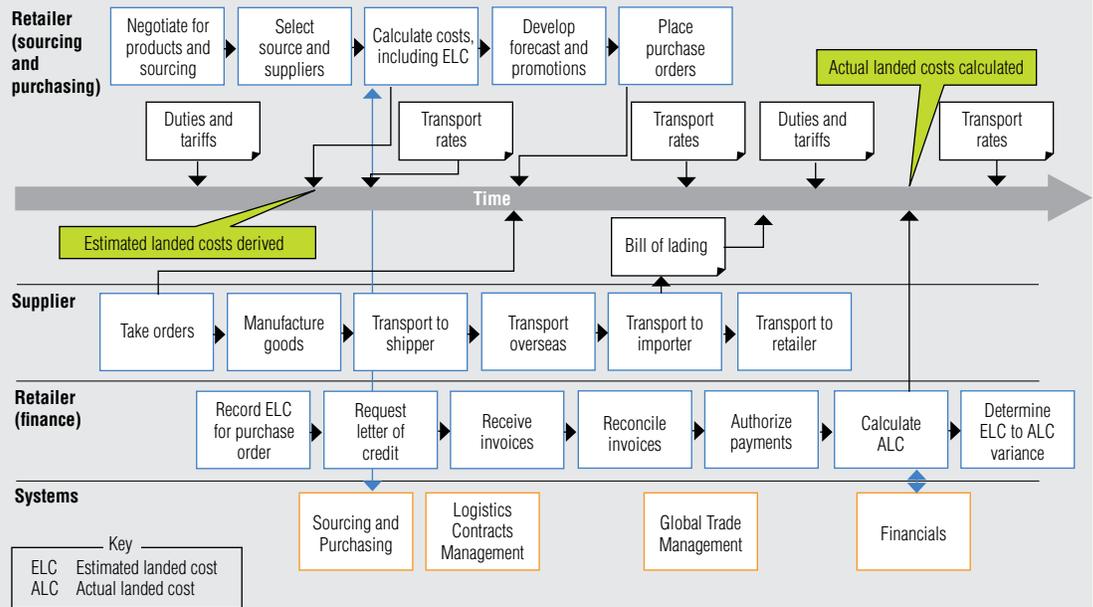
One of the biggest challenges retailers face is estimating landed costs. Estimate too high and pricing may turn customers away. Estimate too low and margins can erode. Meanwhile, key opportunities for cost reductions might go unnoticed, and valuable time slips away because critical information is not available to support sound decision making.

For example, a large retailer might contract with a Chinese company to manufacture the chain's own brand of lawn mowers. The retailer's finance teams recognize that by the time a container of mowers reaches its domestic warehouse, their cost will often be significantly higher than what it was at the manufacturer's loading docks. The question is, by how much and why?

To estimate the actual landed cost (ALC), the retailer figures in all the expenditures incurred on both the export and import side of the equation – through banks, forwarders, agents, customs agencies, port authorities, stevedores, transport firms and other parties. But gauging that cost, then calculating the *actual* cost, can be a very complicated process given all the steps and entities involved.

Figure 5 shows the parties involved and the number of independent processes that must be orchestrated to support the estimating process.

FIGURE 5.  
**Snapshot of global sourcing processes showing landed cost calculations.**



Source: IBM Institute for Business Value analysis.

In the case of the lawn mowers, the retailer's transportation team relies on special software to optimize carrier bids. But the estimating tools use a different source to look up carrier rates – and these figures depend on manual updates that often lag behind the latest rates. Because of this, the estimates usually fail to match the actual costs. Similarly, the customs compliance group uses a global trade-management tool to calculate duties and tariffs. Every day, these numbers change, but no one ever seems to have the time to incorporate all of them all into the tool. Consequently, it's usually impossible for anyone to accurately estimate the duty and

tariff costs. In the finance department, invoices arrive in numerous formats from vendors, customs brokers, carriers and other parties. There is a 90-day backlog in calculating and comparing actual versus estimated landed costs.

With so many departments using various processes and applications (and producing data that serves different purposes), merchants often make pricing decisions based on inaccurate and inconsistent information. Profit margins can suffer for months before estimating variances are even noticed. More time may go by before the cause is identified and corrected.

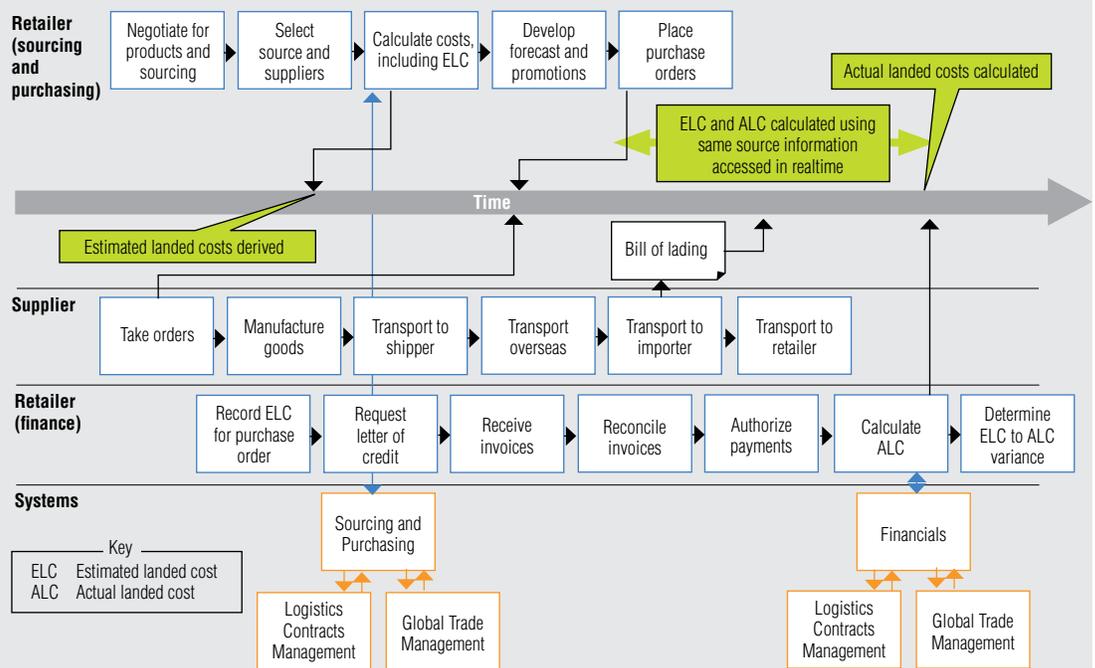
### Standardizing access to realtime information

There are multiple ways to address this problem. One solution is to standardize and centralize the calculation and distribution of rates, tariffs and other information. Going one step further, making such information available in realtime to all systems involved in calculating landed costs could create a single “version of the truth” to be used for figuring both estimated and actual landed costs. If the systems involved in the calculations could access the same source in realtime, most of the problems would go away (see Figure 6).

When Sourcing and Purchasing personnel calculate estimated landed costs, they have software supporting them. If that software had direct access to the systems that support duties, tariffs and transport costs, the application could present and include these costs in the calculation. Realtime access would verify that the correct rates are used. The Sourcing and Purchasing department would continue to execute its business processes – with accurate and current information.

At the other end of the process, the Finance department would use its financial management software to support the calculation of the

FIGURE 6. Global sourcing process support by SOA systems.



Source: IBM Institute for Business Value analysis.

actual landed costs. This software is also able to directly access duties, tariffs and transport costs in realtime. The business processes are not changed, but the information sources now provide a single version of the truth.

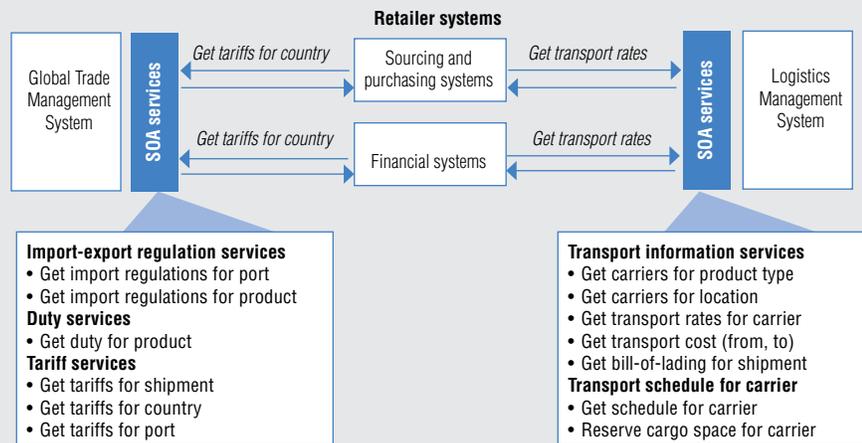
There are multiple ways to build this solution; many are in use today. However, most are point-to-point, custom solutions that are costly to maintain and hard to change. For example, many large retailers have multiple, best-of-breed applications supporting logistics management. With multiple sourcing and purchasing systems connected to multiple logistics management systems, the number of custom integration scenarios increases exponentially, and reduces an organization's ability to accommodate change. SOA presents an appealing alternative that uses a single interface to access key functionality. In our example, SOA services can be used to access

crucial information needed to calculate landed costs. Figure 7 shows how SOA services can be used to support access to duties, tariffs and transport costs from the source systems that control them.

To create the solution in Figure 7, a retailer would build a layer of services that connects its Logistics Management Systems and the Global Trade Management System. This layer of services would be used by any application that needs to get to the functionality and data controlled by these systems. The SOA services could allow a more secure and controlled access to needed information in realtime – helping to enable continuous access to current and accurate data.

The same SOA services could be used by other applications, and even exposed externally to the retailer's business partners.

FIGURE 7.  
**SOA services supporting transportation and tariff information.**



Source: IBM Institute for Business Value.

Typically, third party logistics organizations have their own applications to run the transportation business. While not covered in this scenario, the same SOA services and SOA infrastructure could be used to allow these transportation and logistics partners' systems to access the retailer's systems.

### ***The value to the business***

The key issue in the global sourcing scenario is that the numerous information systems operating across a typical retail organization can't communicate information to each other in a timely and consistent manner. As a result, those who depend on accurate, timely and efficient cost estimates and analyses can find them all but impossible to obtain.

However, if the retailer takes an SOA approach to its IT architecture, all the domains and systems can have rapid access and respond to key information changes. Interactions between sourcing, IT, financial, regulatory, logistics and other areas can flow more smoothly and without surprises, as orchestrated. With our example, benefits to the retailer from the SOA solution can include:

- Up-to-date information accessed in realtime, which can improve the accuracy of estimated landed costs.
- Faster, better visibility of landed costs can yield greater control, which can improve operating costs and positively affect the cost of goods sold (COGS), as well as margins. The financial control process itself becomes more cost-efficient.
- With accurate costs known to all appropriate parties earlier in the process, retailers have the opportunity to reduce variances between estimated and actual landed costs that historically lead to margin erosion.

- Early visibility of landed cost variances and taking appropriate action to reduce landed costs can help positively affect the gross margin.

With SOA, information developed in one department or by one application becomes instantly available, wherever it is needed. For example, carrier and tariff rates maintained in one system can be automatically updated and instantly accessible to trade management, purchase order management and other applications.

For our hypothetical retailer, SOA simplifies and streamlines the task of estimating landed costs. As costs are actually incurred in each step of the sourcing process – sourcing, purchasing, logistics, customs compliance and finance processes, for example – the totals can be tallied and analyzed much faster. The retailer is then able to use realtime information to support vendor selection, transportation planning, pricing strategies and other key decisions.

SOA as an IT systems integration approach can bring benefits to the retailer because the components of SOA are based on open standards; individual services such as “Look up the latest tariff” are interoperable across applications. A “write once, deploy repeatedly” strategy can save the retailer money, since one service can be exposed to many different applications across the enterprise and to supply chain partners. This type of reuse may lead to other benefits, such as reduced systems integration time and lower maintenance costs.

As the need for new services inevitably arises, SOA permits the retailer to target precise requirements. It helps eliminate the delays, redundancies and expenditures that are traditionally associated with complete application replacement – particularly those systems that are not built on open standards. With time and money deterrents substantially reduced, the retailer can begin to automate more cost-estimating and cost-tracking functions – helping to improve both the accuracy and cost-efficiency of the processes involved.

### Improving inventory and order visibility

Today's customers demand (and expect) a seamless, coherent experience between "click," "brick" and any other channel they elect to use. Visibility of inventory and customer orders across the retail chain and at the store level is therefore critical to consumer satisfaction and multichannel selling opportunities. This in turn increases the need for interoperability and integration among store systems, e-commerce systems and the retailer's back-office merchandising and inventory systems. Key foundational capabilities need to be in place, the most important being:

- *Cross-channel inventory visibility* – secure, reliable access to inventory levels at the channel/style/size/color levels to support new services (online, product availability lookup and "buy online, pick-up in store," for example).
- *Cross-channel order visibility* – realtime, multichannel order management capabilities to optimize available-to-promise decisions, inventory utilization and customer service.

### **The business challenge**

For most retailers, in virtually every case, online and catalog channels are managed separately from the physical stores. It is not uncommon for the IT infrastructure for each channel to utilize separate applications. Data that is shared by the channels, such as inventory levels, is most often handled by nightly batch updates. Consider the example of a shopper visiting his favorite Web shop with the intent to purchase a new jacket for outdoor adventures, along with a hiking backpack. The buyer selects a jacket in a specific size and color (it happens to be on sale), and indicates that both items will be picked up at the local store (#1234). At checkout time, the Web site confirms that the items are in stock and available for pickup at the specified location.

The online commerce application generates a customer order and transmits the details to the store location indicated by our shopper. (While communication approaches vary, and are definitely in transition, e-mail remains the common communication for such cross-channel transactions). At the store, a sales associate prints the order, pulls the backpack from the store's inventory but does not find the jacket in the correct size. After calling one of the company's other locations, the associate is ultimately successful in convincing another store to transfer a jacket in the right size. The associate then sets aside the backpack and holds the customer order until the jacket is delivered.

Unfortunately, when the customer arrives at store #1234, the order is nowhere to be found. Store associates cannot view customer orders from the point-of-sale system. Working from the customer's printed confirmation, the

**To effectively share physical inventory with stores, online commerce systems need realtime data exchange with store and inventory systems.**

associate and store manager pull a second backpack from inventory, process a new sales transaction and credit the online order. This distorts several metrics, including inventory (remember the backpack that was already pulled from the sales floor), demand by color/size and credit for sale (the consumer actually bought the backpack online but the store got the revenue).

***Collaborative systems enable better consumer experiences***

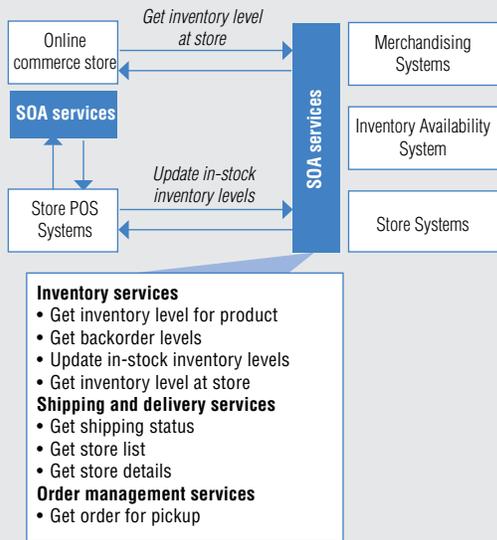
Clearly, there are improvements our retailer can make to improve the outcomes and effectiveness of the cross-channel processes described in our scenario. First, the online commerce application does not have real-time access to inventory levels across the enterprise. The desired jacket may have been available at the start of the day, but without realtime inventory updates, the online system incorrectly promises the size medium jacket to our shopper. Ideally, the online commerce application should have inventory visibility at the channel/style/size/color levels. For direct-to-consumer fulfillment, the challenge is to aggregate inventory information from all store and warehouse locations. In our buy-online, pickup-in-store scenario, the commerce systems should have reliable, up-to-date visibility, down to a single store. In the above scenario, the store associate took the initiative to transfer the jacket from another store; however, the lack of inventory visibility required this additional step, which increases operating costs and skews actual demand.

The second opportunity to enhance the process involves the communication of the customer order from the online system to the fulfilling store. Our retailer used e-mail. In this case, the order was not accessible from store systems. Nor was it available to the store associate and store manager who had the challenge of piecing together the customer's order history and saving the sale. Hardware, software and networks alike were working in isolation. In order to change the processes and improve results, the IT systems supporting those processes must also change.

There are a number of ways to address these challenges. Many e-commerce initiatives support a variety of integration approaches, and many involve ETL (extract-transform-load) software for moving data and files. In our example, however, file transfer is a solution for creating realtime visibility. With the jackets flying out of the store, the online commerce application needs constant, realtime access to chain-wide inventory levels to support store pickup. SOA provides a standards-based approach to achieving this level of realtime connectivity (see Figure 8).

Figure 8 shows an environment where the retailer has built a set of SOA services that act as the access path to the different systems involved. There would be a single service to "Get inventory level for product" that would hide the complexity of collecting the inventory levels for a jacket, for example, at all of the retailer's stores and warehouse locations. Likewise, a single service would be developed

FIGURE 8.  
**SOA services supporting realtime inventory and order visibility.**



Source: IBM Institute for Business Value.

to collect the inventory level at a particular store. These same services can be used by the online commerce application, as well as store systems (or any application in the retailer's domain).

This layer of services could be extended to provide access to information created by or managed in the online commerce application. Many commerce applications already support application programming interfaces, including Web services. This approach to extending the application would allow other applications to access customer order history that may have been generated online. Store systems could

“see” and update inventory levels outside the store, as well as view and manipulate online orders. In our example, the store could easily have annotated the order to note that the customer had picked up the backpack, and that the jacket was coming from another store. These two SOA services implementations could share the same supporting infrastructure – setting the base for additional SOA implementations in the future.

### ***The value to the business***

This type of solution can deliver numerous benefits to the retailer. First and foremost, programmatic and realtime access to inventory levels at the store level and across the enterprise can help improve the order process in every channel – with wide-ranging advantages that can extend to replenishment, sourcing and purchasing systems, as well as to logistics management.

While our scenario focused on “buy online, pick up at store,” cross-channel integration offers many other benefits. For example, retailers can create personalized dialogues with consumers. Offers and promotions can be utilized to move customer traffic from one channel (the store) to another (the Web) to help increase wallet share. Similarly, customer returns (such as buy online, return in store), while not a direct revenue generator, can have a huge positive impact on customer perceptions and a halo effect on total sales.

Increasingly, retailers are also bundling value-added services with the products they sell. These services are often fulfilled through the store by tapping into a network of local suppliers and contractors. For example, retailers that offer home delivery, installations, service warranties and at-home repairs essentially use the store as a hub, or as an extension of the fulfillment supply chain. Cross-channel integration is vital to this type of seamless experience.

As an implementation approach, SOA brings a standards-based method to systems integration that doesn't require the purchase of new applications. In our example, higher-quality information is available – without changing the inventory-management, commerce or store systems. Functionality in the existing online commerce system was simply exposed for other application software to use.

SOA services can be used to mask the complexity of multiple applications or data sources. In our example, there are various systems managing inventory levels. In the case of some retailers, there may be many formats – each operating their own set of commerce and supply-chain applications. A single SOA service can be used to shield this complexity – resulting in a potentially lower cost for systems integration, as well as shorter development times.

## Conclusion

In many ways, retailing might be one of the most fertile grounds for reaping the benefits of SOA. At the same time:

- Fast and easy process integration is a must – internally, as well as externally, to support changing business models, global expansion, mergers and acquisitions.
- The industry often involves extensive, dynamic sets of suppliers, shippers and other entities serving functions that must be closely matched with a retailer's strategies and needs.
- Business processes require heavy IT support and control a wide variety of software applications and interfaces that must respond to fast-breaking demands – either on their own or in concert.
- There is no room for changes that might hinder or disrupt the flow of business.

Not surprisingly, major retailers are rapidly structuring their IT plans around SOA. For them, SOA is a practical path to transforming their operations to become more responsive to the demands of a highly dynamic marketplace.

By exploiting SOA capabilities internally, as well as with external entities, retailers can forge new connections and support new levels of collaboration and innovation. There is virtually no limit to the number of connections and configurations. In this way, IBM believes, SOA is potentially as transformative as the Internet.

Rarely will retailers find that all applications are services-enabled. Custom and legacy code, inflexible vendor packages and varying integration methods often impose major constraints. Changing the architecture and redesigning all applications for SOA costs time and money. Fortunately, SOA doesn't require an "all-or-nothing" commitment from day one. Retailers can begin by carefully identifying and prioritizing those services that are most appropriate to enable and hold the greatest potential benefit.

SOA can be a little daunting to the organization that has yet to use it. Like anything else of this scale, it should be employed responsibly and intelligently – with a sense of vision, purpose and strategy. Through our own use of SOA and in thousands of SOA engagements across the world, IBM has gained a very good sense of how to proceed with SOA:

- Focus on a business problem, and use SOA to help solve it. SOA is a means to an end – not an end in itself.
  - If possible, start with revenue-generating capabilities. The idea is to look for a kick-off project that offers real tactical value. In this way, the SOA pilot becomes more than just an exercise. SOA really shines when implemented to provide multiple users with instant, up-to-date access to information. Excellent candidates for your first SOA project could include:
    - Information integration (product, price, promotions, inventory, customer)
    - Supply-chain visibility (purchase orders, advance shipping notices, receipts, shipments, logistics)
    - Cross-channel capabilities (store inventory visibility via the Web, buy-online/store-pickup, single view of customer across channels).
- Start small. Use your first SOA project to "learn the ropes." If it is successful, show it to other parts of the business to demonstrate what can be done with SOA.
  - Begin to build new staff capabilities. SOA requires some specialized skills that entail a learning curve. It is best to instill these skills now.
  - Think long-term. The hardest, most prolonged and most expensive part of SOA is building the initial architecture. Once that's in place, additions or changes – new channels, back-office functions or business lines – can be made much faster, and at less cost. Over time, the return on this initial investment can be dramatic.

Whether you build, buy or evolve to an SOA infrastructure, the time to start is *now*. Optimum results usually come from starting with a small project aimed at solving a real business problem, and progressing from there. This will establish a working SOA infrastructure and reusable services that subsequent projects can build upon – first within one part of your organization, then others, and externally to suppliers and partners.

Once you've established a foundation for SOA and created your first reusable services, you'll be ready to start building on that foundation and adding new services to the portfolio. You might focus on areas where you could profit from instantaneous information about an aspect of your business, or make information available to multiple users – even beyond your firewall. The experiences and services you can gain there can then prepare you to roll out the SOA approach – and its benefits – to your entire enterprise.

## About the authors

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### Related publications

- Butner, Karen, "Blueprint for supply chain visibility: Service-oriented architecture can help drive agility, supplier collaboration and demand-driven replenishment." IBM Institute for Business Value. August 2007.
- DiMare, Jay. "Service-oriented architecture: A practical guide to measuring return on that investment." IBM Institute for Business Value. October 2006.
- DiMare, Jay. "Changing the way industries work: The impacts of service-oriented architecture." IBM Institute for Business Value. October 2006.

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- <sup>3</sup> From "The challenges in Chinese procurement," 2006, originally published in *The McKinsey Quarterly*, [www.mckinseyquarterly.com](http://www.mckinseyquarterly.com)





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