

# Retail Solutions: Technology Innovation That Matters

Optimizing retail solutions with IBM  
systems and technologies

Using IBM technology to maximize  
retail business performance

Tuning IT infrastructure for  
On Demand Business



Lynn Behnke  
LindaMay Patterson





International Technical Support Organization

**Retail Solutions: Technology Innovation That Matters**

March 2006

Archived

**Note:** Before using this information and the product it supports, read the information in “Notices” on page v.

Archived

**First Edition (March 2006)**

This edition applies to IBM eServer and TotalStorage families of products and related software and services.

© Copyright International Business Machines Corporation 2006. All rights reserved.

Note to U.S. Government Users Restricted Rights -- Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

# Contents

<b>Notices</b> .....	v
Trademarks .....	v
<b>Preface</b> .....	vii
The team who created this Redpaper .....	vii
Become a published author .....	viii
Comments welcome .....	viii
<b>Executive summary</b> .....	ix
<b>Chapter 1. Retail industry landscape</b> .....	1
1.1 Marketplace dynamics .....	2
1.1.1 Industry fundamentals .....	2
1.1.2 Emerging challenges .....	3
1.2 The role of IT .....	4
1.2.1 IBM retail solutions .....	5
1.2.2 Solution infrastructure .....	6
1.3 Technology innovation that matters .....	8
<b>Chapter 2. Technology innovation that matters: IBM retail solutions</b> .....	11
2.1 Solutions architecture: putting the pieces together .....	12
2.1.1 Solutions overview .....	13
2.1.2 Guide to examples of customer retail solutions .....	13
2.2 Merchandising/Supply Chain solution .....	14
2.2.1 Merchandising/Supply Chain customer success story: Fossil .....	16
2.2.2 Value-adding technology: Fossil Merchandising/Supply Chain solution .....	17
2.2.3 Merchandising/Supply Chain customer success story: Globex .....	19
2.2.4 Value-adding technology: Globex Merchandising/Supply Chain solution .....	20
2.3 Integrated Multi-channel Retailing solution .....	22
2.3.1 Integrated Multi-channel Retailing customer success story: REI .....	25
2.3.2 Value-adding technology for Integrated Multi-channel Retailing solutions .....	26
2.4 Store solution .....	28
2.4.1 Store solution customer success story: Pep Boys .....	30
2.4.2 Value-adding middleware for Store solutions .....	32
2.4.3 Value-adding technology for Store solutions .....	34
<b>Chapter 3. Technology enablers for retail solutions</b> .....	37
3.1 Technology innovation that matters .....	38
3.1.1 IBM Systems agenda .....	39
3.1.2 Technology and product family overview .....	39
3.2 Technologies .....	40
3.2.1 Virtualization solutions .....	40
3.2.2 Deep computing .....	42
3.2.3 Enterprise X-Architecture .....	44
3.2.4 IBM Linux support .....	45
3.2.5 IBM Power Architecture .....	45
3.3 IBM System families .....	46
<b>Related publications</b> .....	55

IBM Redbooks .....	55
Online resources .....	55
How to get IBM Redbooks .....	55
Help from IBM .....	56

Archived

# Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

*IBM Director of Licensing, IBM Corporation, North Castle Drive Armonk, NY 10504-1785 U.S.A.*

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:** INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

## COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrates programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. You may copy, modify, and distribute these sample programs in any form without payment to IBM for the purposes of developing, using, marketing, or distributing application programs conforming to IBM's application programming interfaces.

## Trademarks

The following terms are trademarks of the International Business Machines Corporation in the United States, other countries, or both:

@server®  
eServer®  
Redbooks (logo) ™  
eServer™  
iSeries™  
i5/OS®  
pSeries®  
xSeries®  
zSeries®  
z9™  
AIX 5L™  
AIX®  
AS/400®  
BladeCenter®

Blue Gene®  
Chipkill™  
Domino®  
DB2®  
Express Portfolio™  
HACMP™  
IBM®  
Power Architecture™  
PowerPC®  
Predictive Failure Analysis®  
POWER™  
POWER4™  
POWER5™  
POWER5+™

ServerProven®  
SurePOS™  
System p™  
System p5™  
System z™  
System z9™  
System Storage™  
Tivoli®  
TotalStorage®  
Virtualization Engine™  
WebSphere®  
Workplace™  
X-Architecture™  
Xtended Design Architecture™

The following terms are trademarks of other companies:

Java, Solaris, Sun, and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Intel, Xeon, Intel logo, Intel Inside logo, and Intel Centrino logo are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Linux is a trademark of Linus Torvalds in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.



# Preface

The retail industry is evolving into a marketplace of extremes. Customers seek low cost for basic goods at the low end of the competitive spectrum, yet at the high end, they pay premium prices for goods that offer high personal value. Undifferentiated competitors in the middle are fading away. The challenges that this marketplace raises for retailers include:

- ▶ How to avoid being squeezed out of the middle
- ▶ How to sustain a competitive advantage
- ▶ How to respond quickly to changes in the industry

Retailers are meeting these and other challenges by striving to differentiate brand propositions, create distinctive shopping experiences, and optimize business processes throughout every element of their value chain. Retailers are achieving these goals with the help of IBM® retail solutions running on an IBM infrastructure.

Using examples based on real customer experiences, this Redpaper describes IBM retail solutions that are available to help retailers shape operations to overcome the challenges—and capture the opportunities—emerging in the industry landscape. Customer examples also illustrate how infrastructure from IBM can help retailers maximize the value of their business solutions.

This Redpaper opens with an executive summary that is followed by:

- ▶ *Chapter 1, Retail industry landscape*, which describes challenges raised by trends in the retail industry and the role that IBM solutions and IBM infrastructure can play in helping retailers meet those challenges
- ▶ *Chapter 2, Technology innovation that matters: IBM retail solutions*, which describes IBM retail solutions and presents customer success stories to illustrate the value that IBM infrastructure contributes to solutions
- ▶ *Chapter 3, Technology enablers for retail solutions*, which briefly describes IBM technologies and products especially beneficial as components of infrastructure for retail solutions

This Redpaper is intended for:

- ▶ CIOs, IT managers, and others who are responsible for evaluating retail business solutions and IT infrastructure for supporting them
- ▶ IBM teams who sell, implement, and support retail solutions

## The team who created this Redpaper

This Redpaper was produced by a team of specialists working at the International Technical Support Organization, Rochester Center.

**Lynn Behnke** is a retired Senior Program Manager, who joined the ITSO, Rochester Center, to develop a class on competitive selling, IBM Redbooks™, and various technical marketing materials.

**LindaMay Patterson** is an Advisory Software Engineer in the ITSO, Rochester Center. She leads teams that produce IBM iSeries™ and IBM software related presentations, Web

content and redbooks. Before joining the ITSO, she worked on various redbooks on Pervasive (Mobile) Computing and has published numerous articles.

Special thanks to **June Eikel**, Global Marketing Manager, IBM Systems and Technology Group, for her sponsorship and hands-on contributions, and Forsyth Alexander, Editor, ITSO, Raleigh.

## Become a published author

Join us for a two- to six-week residency program! Help write an IBM Redbook dealing with specific products or solutions, while getting hands-on experience with leading-edge technologies. You'll team with IBM technical professionals, Business Partners and/or customers.

Your efforts will help increase product acceptance and customer satisfaction. As a bonus, you'll develop a network of contacts in IBM development labs, and increase your productivity and marketability.

Find out more about the residency program, browse the residency index, and apply online at:

[ibm.com/redbooks/residencies.html](http://ibm.com/redbooks/residencies.html)

## Comments welcome

Your comments are important to us!

We want our papers to be as helpful as possible. Send us your comments about this Redpaper or other Redbooks in one of the following ways:

- ▶ Use the online **Contact us** review redbook form found at:

[ibm.com/redbooks](http://ibm.com/redbooks)

- ▶ Send your comments in an email to:

[redbook@us.ibm.com](mailto:redbook@us.ibm.com)

- ▶ Mail your comments to:

IBM Corporation, International Technical Support Organization  
Dept. JLU Building 107-2  
3605 Highway 52N  
Rochester, Minnesota 55901-7829

# Executive summary

Trends in the retail industry are creating a marketplace of extremes. Consumers at one end of the competitive spectrum seek low prices for basic goods. At the other end, customers pay a premium for goods and services they perceive to offer high personal value. Consumers at both ends are becoming “super shoppers,” empowered with technology as they navigate the marketplace for distinctive shopping experiences and value. Retailers are also employing technology to meet challenges in this marketplace populated by super shoppers. By effectively integrating their information assets and business processes with innovative technology, retailers are able to “give customers what they want, when they want it.”

## Industry landscape

Retailers are focusing on growth. In an IBM survey of over 450 companies across the globe and across all major industries, four out of five CEOs identified revenue growth as a top priority. A similar number stated that the key to growth is the ability to anticipate and quickly respond to changes in the industry.

One of the changes reshaping the industry is polarization of the consumer marketplace. The IBM Institute for Business Value projects that, by 2010, unprecedented social diversity and competitive intensity will precipitate a marketplace of even greater extremes than we are seeing today. The “bell curve” that characterized homogeneous mass markets of the twentieth century will be replaced by “well curves.” “Well curves” will reflect a marketplace in which growth and perceived customer value migrate to opposite ends of the competitive spectrum.

Several trends are moving the consumer marketplace towards polarization.

- ▶ **Customer value drivers are fragmenting.** Profound shifts in age, wealth, ethnicity, living patterns, and value systems are making customers harder to define, categorize, and reach.
- ▶ **Gatekeepers are becoming more guarded.** Enabled by technology and regulation, time-strapped consumers are blocking out communications that are not demonstrably relevant to their particular interests.
- ▶ **Information is revealing alternatives.** Customers are now super shoppers. Using hand-held devices to access Internet-based “infomediary” services, customers standing in the aisle of one store can easily comparison shop online at another store across the mall, down the street, or on the other side of the globe.
- ▶ **Mega-retailers are breaking boundaries.** Mega-retailers are rapidly expanding across geographic and industry boundaries.
- ▶ **Partnering is pervasive.** Competition is no longer a solo game. Many retailers are transforming their traditional, vertically integrated value chains into more agile and responsive “value networks,” where participants collaborate using technology such as the Internet, wireless networking, and Web services.

These trends and the polarizing consumer marketplace raise strategic challenges for retailers:

- ▶ **How to avoid being squeezed out of a polarized marketplace.** Retailers stuck in the undifferentiated middle risk being squeezed out.
- ▶ **How to sustain a competitive advantage.** Competitive advantage in a world of extremes will erode faster than ever.

- ▶ **How to anticipate and quickly respond to shifting customer needs.** Volatility in the marketplace combined with intense, global competition requires retailers to respond to market demand more quickly than ever.

### **The role of information technology**

Retailers are implementing IBM retail solutions to help them meet these challenges and revolutionize the customer experience. Such retail solutions include:

- ▶ *IBM Retail Merchandising/Supply Chain solutions* help retailers focus supply chain and logistics operations on meeting fluctuations in consumer demand quickly, thereby ensuring the availability of popular items while reducing costs of maintaining low-demand inventory.
- ▶ *Store solutions* integrate systems and applications to streamline store operations, improve in-store execution, and personalize customer shopping experiences.
- ▶ *Integrated Multi-Channel Retailing (IMCR) solutions* integrate multiple channels into complementary marketing, merchandising, and transaction operations that maximize profit across channels.

Retailers are maximizing the value of their solutions by deploying them on IBM infrastructure. Although infrastructure is often overlooked during the evaluation of business solutions, infrastructure can add value to a solution. IBM systems and storage products are designed to work synergistically and with associated middleware to form the best possible platforms for business applications. They are built on open standards so that they can be integrated non-disruptively into existing and new IT infrastructures. IBM systems and storage products incorporate proven technologies, such as autonomic computing to provide resilience, virtualization technologies to simplify management and increase resource utilization, and Linux® support to preserve solution openness. Experiences of customers such as Fossil, Globex, REI, and Pep Boys illustrate the incremental value that solutions can derive from an IBM infrastructure.

### **Technology innovation that matters to retail**

Investing about \$5 000 000 000 annually in research and development, IBM continues to bring new technologies to market. In 2005, IBM earned 2941 patents, more U.S. patents than any other company for the thirteenth consecutive year, and over 1100 more than the number 2 patent recipient. The year 2005 was also the eighth consecutive year IBM received more than 2000 U.S. patents.

Technology innovation matters because it provides businesses a continuous stream of innovative solutions to real business problems, solutions that help businesses improve agility and responsiveness, tighten integration to facilitate collaboration across the enterprise, develop deeper marketplace insight, and improve business resilience, security, and compliance.

The customer stories in this paper document the differentiating value that retail solutions can gain from IBM technology innovation. Look them over and discuss this paper with your technical staff. Then contact your IBM account team to learn how IBM technology matters to your retail business.



## Retail industry landscape

This chapter summarizes current market trends in the retail industry and describes how businesses are responding. It introduces the role of information technology (IT) in helping retailers shape operations to the current environment and introduces IBM retail solutions.

## 1.1 Marketplace dynamics

Retailers and companies in other industries are focusing on growth. In an IBM survey of over 450 companies across the globe and across all major industries, four out of five CEOs identified revenue growth as a top priority. A similar number stated that the key to growth will be the ability to anticipate and quickly respond to changes in the industry.

One of the changes reshaping the retail industry is polarization of the consumer marketplace. The IBM Institute for Business Value, a worldwide partnership between IBM, leading industry consultants, and leading-edge clients that examines marketplace challenges and potential solutions, projects that by 2010, unprecedented social diversity and competitive intensity will precipitate a marketplace of extremes. The “bell curve” that characterized homogeneous mass markets of the twentieth century will be replaced by “well curves.” “Well curves” will reflect a marketplace in which growth and perceived customer value migrate to opposite ends of the competitive spectrum, as illustrated in Figure 1-1.

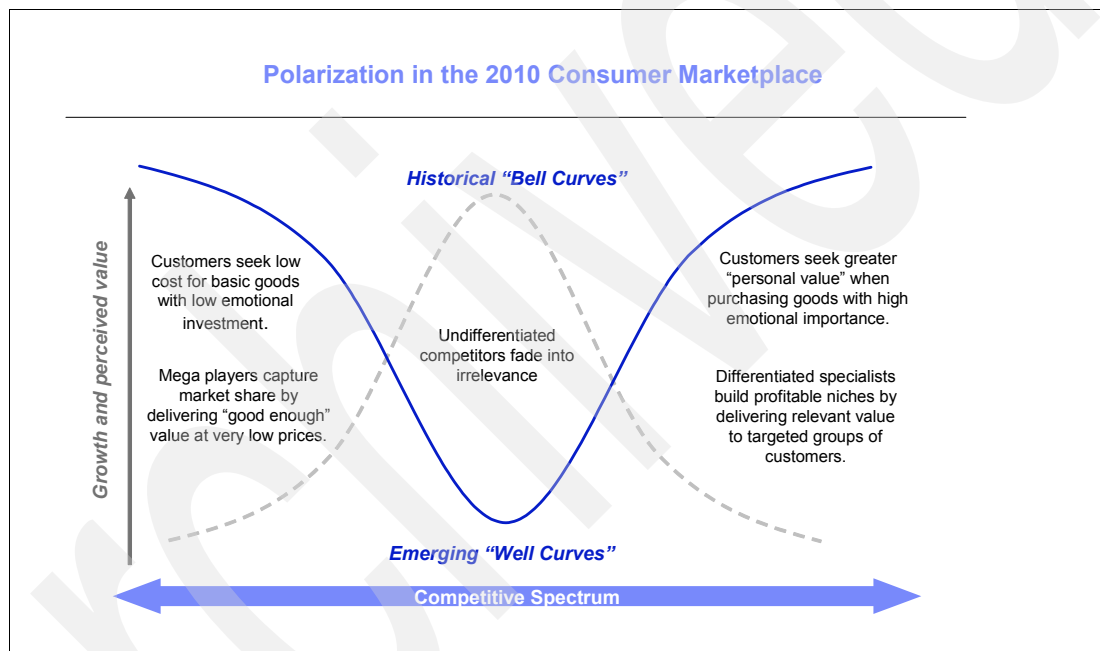


Figure 1-1 The consumer marketplace is becoming polarized

### 1.1.1 Industry fundamentals

Five trends are moving the consumer marketplace towards polarization.

#### **Customer value drivers are fragmenting**

Profound shifts in age, wealth, ethnicity, living patterns, and value systems are making customers harder to define, categorize, and reach. For example, aging baby boomers and their children are driving population growth to the boundaries of traditional age groups. Distribution of wealth is becoming increasingly polarized. Customer value systems are becoming more complex and individualized, driven by demographics, social awareness, education, and focus on personal identify.

## Gatekeepers are becoming more guarded

Enabled by technology and regulation, time-strapped consumers are blocking out communications that are not demonstrably relevant to their particular interests. For example, among users of TiVo (a rapidly growing digital video recording service), as many as 77% of people watching recorded primetime TV programs skip past the advertisements.

## Information is revealing alternatives

Because the Internet is fast becoming a standard part of the global shopping experience, customers are now super shoppers. Using hand-held devices that provide access to Internet-based “infomediary” services, customers standing in the aisle of one store can easily comparison shop online at another store across the mall, down the street, or on the other side of the globe.

## Mega-retailers are breaking boundaries

Mega-retailers are rapidly expanding across both geographic and industry boundaries. The growth of mass merchants like Wal-Mart and Carrefour, and “category killer” specialists like Staples and Home Depot, is driving rapid consolidation of the retail industry, and forcing all participants to establish highly differentiated value propositions.

## Partnering is pervasive

Competition is no longer a solo game. Many retailers are transforming their traditional, vertically integrated value chains into more agile and responsive “value networks.” Participants in value networks collaborate in common ventures using technology and services such as:

- ▶ *Universal connectivity.* Increased bandwidth, Internet access, wireless networking, and RFID adoption create an environment where almost everyone and everything are connected.
- ▶ *Data and systems integration.* Middleware, Web services, application integration software, workflow management software, portals, and user “workbenches” facilitate continuous, often real-time, information sharing and interaction.
- ▶ *Open industry standards.* Global data standards such as global trade item number (GTIN), global location number (GLN), and electronic product code (EPC), with software platforms such as extensible markup language (XML) and Linux, create a common parlance and basis for integration across the industry ecosystem. In the future, new standards are likely to be developed in areas such as price and promotions synchronization, security and privacy, and product safety and health content.
- ▶ *Process outsourcing to business specialists.* Process specialists are proliferating in both horizontal (HR, indirect procurement) and vertical (product manufacturing, customer data analytics) competency areas. As these providers mature, retailers can obtain more efficient and effective external capabilities in a growing range of business areas.

### 1.1.2 Emerging challenges

The fragmentation of customer value drivers, the ability of consumers to control dissemination of marketing messages while exercising nearly unlimited access to product information, the extending reach of mega-retailers, and the trend to pervasive partnering all combine to present strategic challenges to the industry. Key among them are:

- ▶ *How to avoid being squeezed out of a polarized marketplace.* In the emerging marketplace of extremes illustrated by the “well curve,” customers trade both up and down. They seek “good enough” quality at low prices where they perceive no differentiated value. At the

same time, they pay a premium for new “luxury” brands where they perceive differentiated value. Retailers stuck in the undifferentiated middle risk being squeezed out.

- ▶ *How to sustain a competitive advantage.* Competitive advantage in a world of extremes will erode faster than ever. Consumer access to real-time, industry-wide product and pricing information can quickly erase a pricing advantage. Universal access to best-in-class specialists can quickly dilute the competitiveness of a featured function or service.
- ▶ *How to anticipate and quickly respond to shifting customer needs.* Volatility in the marketplace combined with intense, global competition requires retailers to respond to market demand more quickly than ever.

Retailers are finding ways to respond to these challenges. For example, they are:

- ▶ *Creating distinctive brand propositions.* To avoid being squeezed out by mega-retailers on one side and focused specialists on the other, retailers are differentiating themselves through distinctive brand propositions. They are tailoring offerings to address the areas most important to preferred customers and then fine tuning implementation by continuously monitoring customer and competitor response.
- ▶ *Introducing customer-valued innovation.* With sources of competitive advantage in retail eroding faster than ever, continuous innovation in products, services and business concepts is becoming essential to growth. But innovation must provide what targeted customers value. To achieve insight into the value drivers of customers, retailers are acquiring as much intelligence as possible from sources ranging from widely available syndicated services to systematic analysis of all in-store and online customer transactions.
- ▶ *Optimizing operations.* Retailers are improving performance and cost-effectiveness of core functions such as supply chain management, customer relationship management, merchandising, and store operations. Optimization reduces cost, resulting in a potential competitive advantage and growth of the bottom line. Optimization can also grow top-line revenues because retailers can reach more diverse customer segments, raise customer satisfaction, and strengthen customer loyalty—all without additional capital investment.

## 1.2 The role of IT

IT is helping retailers respond to challenges emerging in the industry. Retailers employ IT to expedite face-to-face interaction with the customer, such as using bar-code scanners to help in-store staff check prices for customers. Retailers also use IT to streamline core operations. For example, a retailer might deploy a supply chain management solution on high-performance IBM systems powered by POWER5™ microprocessors, the latest implementation of IBM Power Architecture™. Using the virtualization capabilities of IBM TotalStorage® products, the solution might also provide real-time inventory data to all who need it. Such a solution could help the business:

- ▶ Reinforce the brand proposition by ensuring on-shelf availability of popular products.
- ▶ Sustain competitiveness by integrating market intelligence with product planning.
- ▶ Optimize operations by linking strategic suppliers and partners to respond in real-time to variations in customer demand.

Figure 1-2 on page 5 gives examples of IT that can help retailers address the challenges raised by trends in the industry.



Employing IT to Address Challenges in the Retail Industry			
	Industry Challenge	Contributing Trends	Technology-Enabled Response
Business Solutions	<ul style="list-style-type: none"> <li>Differentiate brand proposition</li> </ul>	<ul style="list-style-type: none"> <li>Fragmented value drivers</li> <li>Gatekeepers</li> <li>Universal access to information</li> </ul>	<ul style="list-style-type: none"> <li>Merchandising solution based on systematic market intelligence—acquired in part through universal connectivity—to identify, reach, and manage targeted customer segments.</li> </ul>
	<ul style="list-style-type: none"> <li>Sustain competitive advantage</li> </ul> <p>Anticipate and respond to change quickly</p>	<ul style="list-style-type: none"> <li>Growth of mega retailers</li> <li>Pervasive partnering</li> </ul>	<ul style="list-style-type: none"> <li>Optimized supply chain to support integrated multi-channel operations that differentiate customer experience.</li> <li>Implement standards-based IT infrastructure to facilitate collaboration across evolving value networks.</li> </ul>
Infrastructure	<ul style="list-style-type: none"> <li>Systems</li> <li>Storage</li> <li>Networks</li> <li>IT management and operations</li> </ul>		

Figure 1-2 Examples of IT that can help retailers respond to industry challenges

As the column at the very left in Figure 1-2 indicates, businesses use IT primarily in two forms: solutions and solution infrastructure.

### 1.2.1 IBM retail solutions

IBM retail solutions can help retailers streamline operations, maximize asset utilization, and develop marketplace insights to help create distinctive customer experiences. Some solutions focus on specific operations, such as merchandising and in-store transactions. Others, such as the Retail Business Intelligence Solution, can enhance the effectiveness of all operations. Each solution can be customized to meet unique business requirements. Figure 1-3 identifies the categories of retail solutions available from IBM.



Figure 1-3 IBM retail solutions

#### Merchandising/Supply Chain

Merchandising/Supply Chain solutions help retailers build a supply chain that can respond in real time to changes in consumer demand. These solutions:

- Provide real-time inventory status across the entire supply chain to help ensure availability of high-demand items while reducing carrying costs and shelf-space for low-demand items.

- ▶ Heighten the responsiveness of the supply chain to consumer demand by increasing collaboration with suppliers, distributors, consumers, and other links in the chain.
- ▶ Enhance accuracy and reliability of product information by maintaining a central repository of information that is integrated with ERP and supply chain applications.

### **Integrated Multi-Channel Retailing**

Integrated Multi-Channel Retail solutions help retailers integrate multiple, discrete channels into a coherent fabric of customer contact points. The portfolio can help retailers implement a multi-channel retailing strategy that might include, for example, multi-channel gift registry, guided selling across channels, cross-channel product management, in-store online shopping, and multi-channel customer management.

### **Store**

Store solutions help retailers integrate systems and applications to streamline store operations and improve in-store execution. The solution also facilitates employee access to the information and tools that they need to serve customers effectively. By helping retailers provide customers convenient, consistent access to products and in-store services, and by improving execution of services, Store solutions help retailers differentiate in-store customer experiences.

Store solutions are supported by an architecture developed specifically for the retail industry. Called the Store Integration Framework (SIF), this architecture helps retailers respond to the ever-evolving nature of consumer demand by providing a scalable, adaptive framework for quickly integrating new applications and innovative devices, such as electronic shopping carts, mobile communications devices, and in-store kiosks.

### **Retail Business Intelligence solution**

The Retail Business Intelligence solution (RBIS) allows retailers to develop a timely, accurate, and integrated view of consumer, employee, and value chain data. RBIS helps retailers distill consumer data into marketplace insight. Such insight can help retailers anticipate and respond to changes in the marketplace.

## **1.2.2 Solution infrastructure**

IBM offerings include infrastructure to support retail solutions. Just as solutions can help optimize operations, the right infrastructure optimizes the value of solutions that run on it. For example, the better the performance of systems that are supporting a Store solution, the faster the response to customer queries at an in-store kiosk, the faster the completion of sales, and the quicker the ROI on the kiosk.

The kiosk example illustrates two key points about infrastructure. First, infrastructure itself often goes unnoticed. Computer manufacturers have succeeded in making systems and other infrastructure less and less visible by designing more and more reliability, ease of use and ease of management into their systems.

Second, although relatively unnoticed, infrastructure matters. The performance of solution infrastructure, such as the performance and scalability of systems that support in-store kiosks, directly affects the effectiveness of—and customer response to—the solution. In light of emerging trends in the industry, retailers are finding that infrastructure matters even more.

For example, a common requirement of all retail solutions is to integrate real-time operations and marketplace data into business processes throughout the enterprise. Merchandising solutions must reconcile promotions with supply chain forecasts. Store solutions must integrate customer data from all points of sale and provide the results to supply chain

solutions. Supply chain solutions must reflect demand that is confirmed by store solutions. The integration of information and processes in real time throughout a business helps the business quickly sense and respond to changes in the marketplace. It helps a business operate as an On Demand Business.

An On Demand Business responds dynamically to customer demands, market opportunities and external threats based on the real-time exchange of information, ideas, insights and experience. The rapid interchange of information and ideas depends on integrating people, information, and business processes. IBM infrastructure can help. IBM systems and technologies can provide secure and dynamic sharing of information on demand, reduce the complexity of managing different types of servers and storage, and improve the interoperability of the systems, business processes, and applications that support the business. They can provide retailers with infrastructure that quickly adjusts to new demands without interrupting existing operations.

IBM infrastructure can help retailers operate on demand because IBM infrastructure employs innovative, continuously evolving technologies such as autonomic computing, virtualization, Linux support, and POWER5 processor technology.

### **Autonomic computing**

For a retail business to be available to consumers on demand, the infrastructure for running its processes must be available on demand. Autonomic computing features help keep infrastructure available. Autonomic computing is a computing environment that can manage itself and dynamically adapt to business changes. A self managing environment can observe and sense situations in the IT environment without direction from IT professionals. IBM delivers autonomic computing solutions in its systems and storage families to help users build solution infrastructure that can be:

- ▶ **Self-configuring:** Components dynamically adapt to changes in the environment, using policies provided by the IT professionals.
- ▶ **Self-healing:** Systems discover, diagnose, react to and prevent disruptions to the IT environment.
- ▶ **Self-optimizing:** Systems monitor and balance workloads to optimize resource utilization.
- ▶ **Self-protecting:** Infrastructure anticipates, identifies, and protects against threats to the IT environment. This allows businesses to consistently enforce security and privacy policies.

Infrastructure that is reinforced with autonomic computing adds value to retail solutions. By minimizing system downtime, for example, autonomic computing helps retailers keep the supply chain and other operations running smoothly around the clock to give customers access to products and services at the hour of their convenience.

### **Virtualization**

IBM virtualization technology can help retailers allocate IT resources dynamically to respond to customer requirements in real time. IBM pioneered virtualization technology more than 40 years ago to simplify management of, and optimize utilization of, IT resources. Using this technology, IT administrators represent applications, information, and computing resources as logical, or “virtual,” pools of assets. Because resources that are virtualized in a pool need not be treated as physically bound to a particular application, system, or storage device, users can allocate them simply and quickly to where they are needed most. With swift, dynamic allocation of resources, virtualization increases both the responsiveness and the utilization of infrastructure.

Virtualization technology can also help retailers protect their investment in existing assets. For example, in recent years many retailers have grown through multiple acquisitions and, as a

result, have inherited heterogeneous and complex infrastructures that they are trying to manage effectively. Virtualization technology can help such companies manage heterogeneous assets as pools of resources to share across the enterprise, and to integrate multiple channels into a smooth, cross-channel experience for customers.

The IBM Virtualization Engine™, a suite of virtualization products, can help retailers:

- ▶ **Virtualize resources:** Allows IBM server and storage systems and select server and storage systems from other vendors such as HP, Sun™, and EMC to integrate into a single holistic virtual environment
- ▶ **Virtualize management:** Provides numerous workload, performance and resource managers as well as mapping, dependency, and modeling capabilities
- ▶ **Virtualize access:** Provides a single portal that presents administrators with a single view of all virtual resources and a programmatic interface for accessing resources through the service oriented architecture (SOA) program model

## Linux

IBM has a strategic commitment to open, standards-based computing, including a commitment to Linux, one of the world's fastest growing operating systems. Linux environments give businesses access to ongoing innovation in the open computing marketplace at competitive prices. With infrastructure that supports Linux environments, retailers can adapt solutions by incorporating innovative standards-based applications as they appear. Infrastructure that supports Linux also facilitates the sharing of resources and processes among systems that comply with open standards. A value of such sharing is the ability for retailers to integrate processes with partners in a supply chain, which can help retailers respond rapidly to volatile consumer demand.

IBM supports Linux computing in the entire line of IBM servers and systems.

## Power Architecture

Power Architecture refers to the design and technology of the IBM POWER™ family of microprocessors. POWER processors range from embedded PowerPC® microprocessor cores and microprocessors to POWER5 systems processors. POWER enhances the value of other technologies. For example, the record-breaking price/performance of POWER helps make advanced analytics cost-effective in the Retail Business Intelligence solution. The micro-partitioning capabilities of POWER5 processors support extensive virtualization of resources, which in turn tightens the integration that can be achieved with IBM Merchandising/Supply Chain and Multi-Channel Retail solutions.

## 1.3 Technology innovation that matters

IBM is committed to continuously deliver innovative technology that matters to business. New generations of IBM systems, storage devices and other technology evolve with marketplace requirements and opportunities. Building on the best current technologies and bringing new capabilities into the mix, IBM solutions and infrastructure can help retailers:

- ▶ **Improve business agility and responsiveness.** IBM technologies such as Virtualization Engine and Linux support can help retailers integrate systems and applications to support a dynamic, real-time response to changes in the marketplace.
- ▶ **Tighten integration of information and processes across the enterprise.** IBM systems work together to create an integrated infrastructure that allows effective sharing of information and encourages collaboration. The openness of IBM systems and technology can help retailers include partners and customers in a collaborative network.

- ▶ **Optimize IT.** IBM systems and virtualization technologies can help retailers consolidate IT assets and simplify management to improve resource utilization, accelerate ROI on IT, and reduce operating costs.
- ▶ **Develop deeper marketplace insight.** IBM business intelligence solutions, driven by POWER5 and deep computing technologies, help retailers sharpen marketplace insight by acquiring, integrating, and analyzing consumer information.
- ▶ **Enhance business resilience, security, and compliance.** IBM autonomic computing and security technologies help businesses maintain highly available services to customers while protecting business and customer assets.

Table 1-1 on page 10 illustrates links between the IBM commitment to innovation, IBM technology, and value to the retail industry.

Table 1-1 Links between the IBM commitment to innovation, technology, and business value

IBM strategic commitment	Resulting technology	Business value
<b>Technology Innovation That Matters</b>	<ul style="list-style-type: none"> <li>▶ <b>IBM POWER Technology</b></li> <li>▶ Fifth generation of POWER implemented in POWER5 processor-based systems</li> <li>▶ Stable, documented POWER Technology roadmap</li> <li>▶ IBM TotalStorage disk family includes POWER5 to partition large disk systems</li> </ul>	<b>Industry-leading infrastructure</b>
	<ul style="list-style-type: none"> <li>▶ <b>Advanced 64-bit and co-existing 32-bit processing capabilities</b></li> <li>▶ <b>Commitment and leadership in Linux development and deployment.</b></li> <li>▶ Innovative products using industry-standard technologies</li> <li>▶ Enterprise X-Architecture™, Xtended Design Architecture™, and X3 Architecture</li> </ul>	<b>Adaptable, standards-based solution environment</b>
	<ul style="list-style-type: none"> <li>▶ <b>Broad portfolio, flexible upgrades, migration support and stable product roadmaps</b></li> <li>▶ IBM BladeCenter®</li> <li>▶ Flexible IBM consolidation process</li> <li>▶ Integrated IBM hardware, software and services solutions</li> <li>▶ Open framework for applications and middleware and ongoing support of Linux</li> <li>▶ Integrated Industry, Business Partner, and ISV solutions</li> </ul>	<b>Business agility</b>
	<ul style="list-style-type: none"> <li>▶ <b>Virtualization capabilities for IBM systems and storage</b></li> <li>▶ IBM Virtualization Engine (VE)</li> <li>▶ Infrastructure simplification solutions</li> <li>▶ Built-in systems and workload management</li> <li>▶ Flexible IBM delivery offerings such as Deep Computing Capacity on Demand</li> </ul>	<b>IT integration and optimization</b>
	<ul style="list-style-type: none"> <li>▶ <b>Information Lifecycle Management</b></li> <li>▶ IBM TotalStorage and Tivoli® products provide a full range of capabilities for information lifecycle management</li> <li>▶ Cross-enterprise/value network sharing and management of data with IBM range of products and virtualization capabilities</li> <li>▶ Improved decision-making based on access to data secured by security and autonomic computing features of IBM systems, storage, and networks</li> </ul>	<b>Marketplace insight</b>
	<ul style="list-style-type: none"> <li>▶ <b>Systems protected and managed with mainframe-inspired availability and security features</b></li> <li>▶ Embedded self-healing and self-protecting technologies, including real-time diagnostics, system partitioning, intrusion detection, and dedicated cryptographic processors</li> <li>▶ Autonomic computing innovations such as smart systems management with IBM Director and Rapid Deployment Manager.</li> <li>▶ Active Memory Technology to propel Intel®-based servers toward continuous availability, with technologies such as Chipkill™, Redundant Bit Steering, Memory Mirroring, and Hot lug Memory</li> <li>▶ IBM technical support personnel and IBM Business Partners.</li> </ul>	<b>Enhanced business resiliency, security, and compliance</b>

Chapter 2, “Technology innovation that matters: IBM retail solutions” on page 11, presents case studies based on real customer experiences. The studies show how retailers are implementing IBM solutions to meet challenges unique to the retail industry. The studies also show how IBM infrastructure helps retailers optimize the value of their solutions. They illustrate that IBM technology matters in helping retailers thrive in the emerging on demand marketplace.



## **Technology innovation that matters: IBM retail solutions**

This chapter begins with an overview of IBM retail solutions and solution architectures, then presents customer case studies to illustrate the benefits of IBM retail solutions and the value that they derive from running on an IBM infrastructure.

## 2.1 Solutions architecture: putting the pieces together

Each IBM retail solution is composed of various offerings. Each offering is enabled by services, products and technologies. To meld offerings and associated components into customized solutions, IBM develops retail solutions within the IBM On Demand Operating Environment (ODOE).

ODOE is an open standards-based architecture for integrating applications, infrastructure, and other computing resources. ODOE is based on the concepts of service-oriented architecture (SOA). That is, ODOE treats every application and resource as a service. Service interfaces are defined according to industry standards. Services use their standards-based interfaces to exchange structured information. Services also allow solution architects to mix and match services, including underlying applications, infrastructure, and business processes, at will. The services in turn request and combine with other services to generate an end-to-end solution. As illustrated in Figure 2-1, services such as *Applications Services* and *Infrastructure Services* are requested, scheduled, and delivered over an *Enterprise Service Bus*.

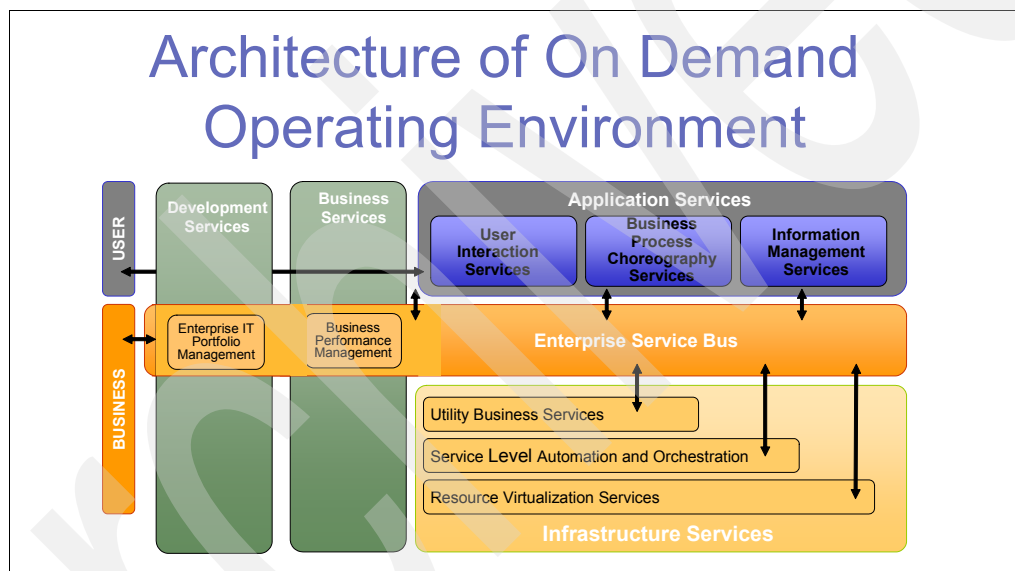


Figure 2-1 ODOE is a blueprint for integrating components into customized retail solutions

For more information about ODOE, see:

<http://www.redbooks.ibm.com/abstracts/SG246248.html?open>

Because ODOE can combine and recombine new and existing services such as applications, businesses can quickly adapt solutions to new requirements and opportunities. In other words, ODOE is ideal for implementing solutions, including IBM retail solutions, for operating an On Demand Business.

For example, many retailers continually introduce new in-store and online channels, such as in-store kiosks, wireless shopping carts, and Web stores, to provide consumers with a personalized shopping experience. By managing these channels with the infrastructure services of ODOE, retailers can quickly introduce or withdraw a channel or device according to customer preferences. Such easy modification eliminates the need to reconfigure or disrupt a merchandising solution to add or delete a single channel.



## 2.1.1 Solutions overview

IBM retail solutions are designed to help streamline operations, maximize utilization of IT assets, and develop marketplace insights so that retailers can deliver a distinctive shopping experience to their customers. IBM retail solutions are also designed to help retailers create and sustain a competitive advantage by anticipating and responding to change in the marketplace. Figure 2-2 identifies the components of Merchandising/Supply Chain, Multi-Channel Retail, and Store solutions.

Component Offerings of IBM Retail Solutions		
Merchandising/Supply Chain Solution	Integrated Multi-channel Retailing Solution	Store Solution
<ul style="list-style-type: none"> <li>▪ Enterprise Data Management</li> <li>▪ Forecasting and Replenishment</li> <li>▪ Global Sourcing &amp; Procurement</li> <li>▪ Logistics</li> <li>▪ Merchandise Planning</li> <li>▪ Optimization (Price &amp; Promotion)</li> <li>▪ Portal</li> <li>▪ RFID Wireless</li> <li>▪ Supply Chain Planning</li> </ul>	<ul style="list-style-type: none"> <li>▪ Consolidated Order and Inventory Management</li> <li>▪ Guided Selling</li> <li>▪ In-store Online Shopping</li> <li>▪ Multi-channel Customer Management</li> <li>▪ Multi-channel Gift Registry</li> <li>▪ Next Generation e-Commerce</li> <li>▪ Unified Product &amp; Content Management</li> </ul>	<ul style="list-style-type: none"> <li>▪ Digital Video Security</li> <li>▪ Dynamic Digital Merchandising</li> <li>▪ Open POS</li> <li>▪ Shopper-Driven Kiosk</li> <li>▪ Shopper Self Checkout</li> <li>▪ Smart Shelf</li> <li>▪ Store Integration Framework (SIF)</li> <li>▪ Store Networking</li> </ul>
<b>Retail Business Intelligence Solution</b>		
<b>Infrastructure Offerings</b>		

Figure 2-2 Components of IBM Retail solutions

The sections that follow present case studies that are based on real customer experiences. The case studies illustrate how IBM retail solutions are helping retailers succeed in today's challenging marketplace. The studies also show the incremental value that IBM retail solutions can derive from an IBM infrastructure, value that helps improve business flexibility, achieve deeper marketplace insights, optimize IT resources, and enhance business resilience while providing customers a distinctive shopping experience.

## 2.1.2 Guide to examples of customer retail solutions

Figure 2-3 on page 14 itemizes the IBM technologies featured in the customer examples.

Customer examples of IBM technology adding value to retail solutions				
Retail Solution → IBM Technology ↓	Merchandising/ Supply Chain	Merchandising/ Supply Chain	Integrated Multi- channel Retailing	Store
IBM Systems	IBM @server pSeries	IBM @server zSeries	IBM @server iSeries	IBM @server xSeries
IBM TotalStorage	X	X		
IBM POWER	X			
Linux support		X	X	X
Virtualization technology	X	X		
Autonomic computing			X	X
X-Architecture				X
Z-Architecture		X		
Store Integration Framework (SIF)				X
<b>Customer</b>	<b>Fossil</b>	<b>Globex</b>	<b>REI</b>	<b>Pep Boys</b>

Figure 2-3 Guide to examples of customers using IBM infrastructure to add value to Retail solutions

Although each customer story highlights only one retail solution and just a few of the offerings in the IBM portfolio, each customer might be running more than one solution, and each solution might consist of many more offerings than those that are described.

For additional information about the IBM solutions in this chapter, visit:

<http://www.ibm.com/industries/retail/index.jsp>

## 2.2 Merchandising/Supply Chain solution

Today's retailers can have hundreds of millions of dollars tied up in excess inventory, but still might not have the right product assortment on store shelves to meet consumer demand. Meanwhile, the cost of maintaining overstocked inventory in warehouses cuts relentlessly into profit margins. To generate revenue and keep inventory levels and associated costs down, retailers must move products from the warehouse to store shelves and into the hands of customers continuously. To do so, market managers need to know, in real time, which products are selling best and be able to communicate in real time with store managers and supply chain directors to respond quickly to shifts in consumer demand.

Today, retailers need a merchandising and supply chain solution that:

- ▶ Establishes a single, secure repository of current, accurate data to increase visibility of events across the supply chain
- ▶ Feeds planning cycles with real-time data so that managers can anticipate changes in consumer demand
- ▶ Facilitates collaboration along the supply chain by integrating business processes and data in the enterprise and among trading partners

IBM Retail Merchandising/Supply Chain solutions are designed to help you focus all supply chain operations on meeting fluctuations in consumer demand quickly. Table 2-1 on page 15 summarizes the features of Retail Merchandising/Supply Chain solutions.

Table 2-1 Merchandising/Supply Chain solution description

<b>Solution description</b>	<p>IBM Retail Merchandising/ Supply Chain solutions are designed to help retailers focus all supply chain and logistics operations to meet fluctuations in consumer demand quickly. Offerings include: Supply Chain Strategy and Design; Sourcing and Procurement; Inventory Demand Planning and Replenishment; Warehouse Management, Transportation and Logistics; Trading Partner® Integration, and Enterprise Data Management. In developing Merchandising/Supply Chain solutions, IBM teams with industry ISVs who are providing leadership in supply chain optimization solutions.</p>		
<b>Client value</b>	<b>Challenge for retail</b>	<b>Solution</b>	<b>Benefit</b>
	<p>Optimize the supply chain to ensure on-shelf product availability, improve customer satisfaction, and strengthen relationships with key trading partners</p>	<p>Increase productivity and collaboration to quicken responsiveness of operations. Enable solution with integrated and optimized IBM Systems, TotalStorage, operating systems, and middleware.</p>	<ul style="list-style-type: none"> <li>▶ Integrated supply chain that can adapt quickly and coherently to fluctuations in demand</li> <li>▶ Infrastructure that can integrate existing and new standards-based systems and solutions quickly to provide flexible growth paths by which to scale with the business</li> </ul>
	<p>Improve business agility with an adaptable, integrated supply chain</p>	<p>Facilitate sharing of data throughout the supply chain to raise visibility of supply chain events in real time; align infrastructure costs with the value of information stored. Enable solutions with virtualization and management capabilities of IBM Systems and Storage.</p>	<ul style="list-style-type: none"> <li>▶ Retailers and trading partners of all sizes have real-time, highly secure access to data across the enterprise on which to base sound marketing and operations decisions</li> <li>▶ Comprehensive and cost effective Information Lifecycle Management strategy</li> </ul>
<p>Lower IT operating costs while improving business efficiency and resilience</p>	<p>Simplify infrastructure and IT management by integrating systems, storage, and networking on IBM Systems compliant with open standards.</p>	<ul style="list-style-type: none"> <li>▶ Reduced complexity of IT and IT management</li> <li>▶ Reduced cost of IT operations</li> <li>▶ Increased utilization of IT assets</li> <li>▶ Increased ROI for IT</li> </ul>	

<b>Technology-enabled differentiators</b>	<ol style="list-style-type: none"> <li>1. Broad range of IBM systems, architectures, and operating systems for building an infrastructure that meets current application, performance, and skills requirements and that is scalable to meet future requirements as they emerge</li> <li>2. IBM Systems that support multiple operating systems and application environments simultaneously on one system to provide access to the industry's largest and fastest growing pools of innovative applications and to provide consolidation platforms for simplifying infrastructure</li> <li>3. IBM Virtualization Engine, which allows simplification and sharing of IT resources and adapts resources "on the fly" to address unique business demands on demand</li> <li>4. IBM POWER technology that provides industry-leading performance while helping control total cost of ownership.</li> <li>5. Flexible IBM delivery options for acquiring computing resources as needed and paying for just what is needed when it is needed</li> </ol>
<b>For more information about IBM Merchandising/Supply Chain solutions</b>	<a href="http://www.ibm.com/industries/retail/doc/jsp/solutionarea/focus/index.jsp">http://www.ibm.com/industries/retail/doc/jsp/solutionarea/focus/index.jsp</a>

### 2.2.1 Merchandising/Supply Chain customer success story: Fossil

“SAP and IBM technologies give us the ability to provide better, more consistent service at lower costs.”

— Ed Jurica, Chief Information Officer, Fossil

Fossil, Inc. is one of the world’s leading fashion brands. Primarily known for watches sold under the FOSSIL, RELIC, and ZODIAC brands, the company has added eyewear, leathers, apparel, and jewelry to its product lines and has licensed brands from some of the most prestigious companies in the world, such as Burberry, Calloway, Columbia, Diesel, Disney, DKNY, and Emporio Armani, to name but a few.

Founded in 1984, the company has grown dramatically, consistently achieving sales increases of up to 20% per year. Growth has been achieved by a combination of acquisition and brand extension into fashion accessories and apparel.

Ed Jurica, Chief Information Officer, comments: “Fossil is a young, creative company, diversified by brand name, geography, and by product set. We sell branded watches, handbags, belts, wallets, key fobs, eyewear, jeans, jewelry and other apparel. As a distributor we have multiple channels, from boutiques to the generic large-format stores, as well as ‘outlet’ stores for end-of line products.”

To learn more about Fossil, see:  
<http://www.fossil.com>

**Challenge**

Fossil sells goods in Fossil stores, department stores, and specialty retail stores in more than 90 countries and on the Web. Logistics and distribution facilities on four continents supply own-brand and licensed products to subsidiaries, retailers, distributors, and Fossil stores worldwide.

To be able to respond more quickly to opportunities in the global, changeable fashion marketplace, Fossil needed to:

- ▶ Bring more consistency to these diverse global operations
- ▶ Manage its complex supply chain more efficiently for fast-moving fashion goods
- ▶ Integrate processes across different geographies and customer groups.

To achieve consistency, efficiency, and integration of operations, Fossil needed access to consolidated views of global operations in real-time.

### **Solution**

Fossil deployed an SAP R/3 and Apparel & Footwear Solution 3.0 on an IBM infrastructure that included IBM System p™ systems, a spectrum of IBM TotalStorage products, IBM Tivoli Storage Manager, and IBM DB2® information management. IBM Global Finance helped Fossil finance the solution.

### **Benefits**

Along with low cost of management, flexibility and scalability, its Retail Merchandising/Supply Chain solution gives Fossil:

- ▶ Fast access to a consolidated view of global sales across a complex organizational and channel structure
- ▶ A clear view of total inventory throughout its extended supply chain.

Jurica sees another key benefit: the ability to shrink time-to-market for new products. “If we can increase the speed at which we bring new concepts to market in line with changes in the fashion business,” Jurica says. “We can introduce products faster, and bring products to end-of-life faster...bringing Fossil even closer to the tastes of the market, and hence selling more.”

## **2.2.2 Value-adding technology: Fossil Merchandising/Supply Chain solution**

The Fossil story illustrates the incremental value that retail solutions can derive from IBM systems and storage technology.

### **IBM systems technology: IBM System p and pSeries**

The “p” stands for “performance.” IBM System p and pSeries® products are designed for users of UNIX® and Linux operating systems who demand powerful, reliable, and secure computing solutions that meet today’s and tomorrow’s business needs. Systems from the IBM System p family:

- ▶ Provide unparalleled UNIX performance and an attractive price/performance ratio with POWER technology
- ▶ Are designed for agility to enable quick response to changes in UNIX/Linux processing requirements
- ▶ Are “migration friendly” for users of competitive systems and “upgrade friendly” for customers who want to be assured of a stable growth path to next-generation UNIX technologies
- ▶ Provide the ability to dramatically increase system utilization
- ▶ Provide highly secure UNIX processing platforms that safeguard data

IBM continuously enhances System p products with innovative technology. One of those is POWER5 processor technology, the latest implementation of IBM Power Architecture.

When IBM introduced POWER5 into the pSeries family, pSeries systems achieved more than three times the performance of the closest competitor, according to disclosed TPC-C results

(<http://www.tpc.org>), and p5 systems took the lead in over 70 key computing performance benchmarks. The performance provided by System p helps ensure that even during seasonal peaks that might strain Fossil's extended supply chain, Fossil executives and product managers can quickly generate consolidated views of global sales operations and adjust the supply chain in anticipation of emerging trends. System p provides the performance to help companies such as Fossil stay close to the marketplace. As CIO Ed Jurica says, "Fossil is a fashion company, not a systems integrator."

POWER5 also enables logical partitioning (LPAR) on System p systems. With the LPAR feature, companies such as Fossil can run different application environments in different partitions of the same system, allowing the company to satisfy processing requirements with fewer physical servers, saving cost and footprint.

For more about System p and pSeries systems, see "System p" on page 49. For more on IBM POWER technology, see "IBM Power Architecture" on page 45.

### **IBM TotalStorage**

Fossil stores data on a variety of TotalStorage products that are managed by Tivoli Storage Manager. TotalStorage is a broad family of physical storage products, networking products, and storage management software. They are designed to meet a variety of capacity, availability, and processing requirements for small, medium and large businesses. Features of the TotalStorage family include:

- ▶ POWER5 processors and enhanced controller software to improve storage price and performance
- ▶ Wide ranging Linux support: IBM TotalStorage solutions are tested and enabled to support Linux deployments
- ▶ The IBM TotalStorage SAN Volume Controller, which supports most major vendors, including IBM, EMC, HP, and Hitachi
- ▶ Virtualization capabilities that permit the pooling of storage resources to improve utilization, simplify provisioning, eliminate backup windows, and isolate applications from changes to storage infrastructure
- ▶ Storage management software that performs predictive analysis to help prevent storage outages

Fossil chose TotalStorage for the distinctive values that the family adds to the Fossil solution. One is storage virtualization. IBM storage virtualization software and Tivoli storage management software helps simplify the management of SAN-based storage and supports shared access to stored data. Shared access to data is especially relevant to companies such as Fossil that want to consolidate data quickly to gain insight into global operations and the status of an extended supply chain.

Summarizing the unique values of TotalStorage, Jurica says: "The storage servers give Fossil the ability to 'move' disk around within the SAN environment and allocate it where it is needed. Tivoli Storage Manager offered great synergy with our existing proposition at a competitive price. The IBM technology stack enables better use of IT resources and keeps the total cost of both administration and management low."

For more details about TotalStorage, see "Storage" on page 52.

## 2.2.3 Merchandising/Supply Chain customer success story: Globex

Brazil's second-largest retailer grows revenues, increases customer satisfaction, and improves decision making by gaining real-time access to current inventory information, all while reducing cost of operations.

Founded in 1975, with a single location in Rio de Janeiro, Globex Utilidades is now the second-largest retailer in Brazil. The company's merchandise includes:

- ▶ Household products
- ▶ Electronics, such as telephones, computers, audio and video equipment
- ▶ Home appliances
- ▶ Furniture.

Operating more than 350 stores in 10 Brazilian states with a workforce of more than 7000 employees, Globex provides shoppers access to its merchandise in regional and community shopping centers.

To learn more about Globex, see:

<http://www.pontofrio.com.br>

### Challenge

Globex Utilidades had adopted a business plan to double revenues and its number of stores in Brazil in three years. The company realized that to meet its objectives, it needed to update many of its business processes and the technology that supported them.

Most important, Globex Utilidades needed to update its inventory control system. The company had no access to real-time inventory numbers because inventory management processes ran in batch mode overnight. There was no communication of consolidated data between the distribution center and the stores. Its supply chain management system was causing Globex to miss sales and lose opportunities. The system was clearly inadequate to support the aggressive growth plans of Globex.

### Solution

Globex implemented an integrated IBM Merchandising/Supply Chain solution on an IBM infrastructure. IBM Business Consulting Services designed, developed, and implemented a real-time inventory system that deployed on more than 100 systems and servers, including IBM zSeries® systems and p5 systems running Linux. Inventory data is stored on IBM TotalStorage products. IBM middleware, such as IBM WebSphere® Business Integration Message Broker, connects all systems in a network and to TotalStorage to ensure that authorized users have access to real-time inventory data as they need it.

### Benefits

The integrated IBM Merchandising/Supply Chain solution expedites operations in the entire Globex supply chain. The biggest benefit, says Globex, is the ability for market managers, resource planners, and store managers to view inventory information in real time. Access to current information helps Globex prevent stock-outs, present customers a greater choice of products, and customize merchandising and marketing to reflect regional preferences. Globex expects the solution to provide a total return on investment in just six months, a good indication that the integrated IBM solution will help Globex achieve its planned growth.



## 2.2.4 Value-adding technology: Globex Merchandising/Supply Chain solution

The Globex Utilidades story illustrates the value of IBM systems technology and architecture, Linux support, storage technology, and virtualization capabilities. These technologies all provide differentiating value to implementations of IBM retail solutions.

### **IBM Systems technology: IBM zSeries**

The Globex Merchandising/Supply Chain solution is built on servers, System p and System z™. The System p systems function as logical nodes in the Globex IT network. Globex chose a System z system to anchor its solution. Globex requires the security and reliability that System z provides. Globex also needs systems that support open standards (such as Linux) so that Globex can quickly integrate new systems and applications into its solution as needed. System z systems meet both of these critical requirements.

While supporting today's open standards, System z systems also reflect the 40 years of world-class hardware innovation, software innovation, and core competencies such as business resiliency and application availability that is part of the history of the IBM mainframe. Such resiliency helps retailers like Globex ensure the availability of merchandise to customers in hundreds of stores spread across wide geographic regions. The mainframe security features of System z also help prevent accidental or intentional damage to critical inventory data and other business and customer information. For example, z9™ systems have earned Common Criteria EAL5 certification for the security of LPARs. Additionally, z9 encryption has earned Federal Information Processing Standard (FIPS) 140-1 Level 4 certification required by US government agencies.

For more details about the zSeries, see “System z9 and zSeries” on page 51.

### **Z-Architecture**

IBM Z-Architecture provides System z systems a complete 64-bit execution model, which increases the storage capacity for constrained systems, improves scalability, and provides migration transparency for applications built for the 64-bit world. Z-Architecture enables System z systems with advanced virtualization technology to provide companies like Globex who want “mainframe” security with an ideal platform on which to integrate applications and data and on which to consolidate selected UNIX, Windows®, and Linux workloads. For more information about Z-Architecture, see:

<http://www.ibm.com/servers/eServer/zseries/>

### **IBM Linux Support**

Many companies claim openness. IBM backs up its claim by making significant investments in industry-wide development communities and by delivering a broad portfolio of systems that incorporate and support open standards. An example of the IBM commitment to openness is the comprehensive support of Linux provided in the IBM product line, as indicated in Figure 2-4 on page 21.



## IBM leadership for Linux

- Linux hardware**
  - Linux runs on all IBM eServer systems
- Linux software**
  - IBM middleware—300+ IBM middleware products are enabled on Linux
  - IBM Business Partner offerings—5,000+ applications
- Linux development**
  - Power.org, an open community launched by IBM to promote open standards on Power Architecture
  - Open Source Development Lab
  - Linux Integration Center - pre-sales technical support
  - Linux Technology Centers: 600+ engineers, 40+ locations WW, 150+ open source projects
- Linux services**
  - IBM Linux Centers of Competency
  - Migration services
  - Linux Solution for e-business

**No other single company has more Linux-related hardware, software, and service solutions than IBM. Thousands of IBM customers have already embraced Linux technology.**

*Figure 2-4 Highlights of the comprehensive Linux support provided by IBM*

Designed to support open standards, IBM systems can interoperate with one another. You can select a variety of IBM systems as building blocks for creating a flexible infrastructure, infrastructure that you can:

- ▶ Customize to the particular needs of your business
- ▶ Adapt and enhance as needs change
- ▶ Grow with your business without disrupting your business.

By running its supply chain solution in a Linux environment on standards-based IBM systems, Globex can refine its solution non-disruptively to achieve the best solution possible for Globex. By incorporating or replacing standards-based applications and components, Globex can continuously shape its solution to the continuously evolving retail environment.

The IBM commitment to openness also ensures that Globex will have an ever growing portfolio of standards-based applications and enhancements to choose from. IBM actively and openly shares much of its technology with the IT industry. IBM also works with industry organizations that champion open standards to help communities of hardware and software developers create innovative products that meet the evolving needs of retailers such as Globex.

### **IBM TotalStorage**

Because the TotalStorage family includes systems that range from low-cost entry systems to high-end high performance systems, Globex can scale storage as requirements change. Because TotalStorage systems support Linux, Globex can quickly integrate new storage systems into its solutions. And because management software for TotalStorage performs predictive analysis to help prevent outages, IBM storage technology helps Globex keep its supply chain serving customers without disruption.

Like the Fossil solution, the Globex solution benefits from another significant feature of TotalStorage: virtualization capabilities. IBM virtualization technologies allow Globex to create a single storage pool that authorized applications and employees in the enterprise can access. Virtualization of the repository for inventory data helps Globex give store managers and product directors access to the data in real-time so that they can swiftly adjust the supply chain to ongoing changes in demand.

Storage virtualization also simplifies managements of storage to meet peak demands. Applications can access pooled storage quickly without regard to the physical location of the storage. By helping Globex respond to peaks in demand quickly, storage virtualization helps Globex maintain the service levels and customer satisfaction requires for continued growth.

For more details about TotalStorage, see “Storage” on page 52.

## Virtualization

IBM virtualization capabilities extend beyond storage. IBM pioneered virtualization technology and continues to share it throughout IBM product families as a tool to help businesses manage infrastructure cost effectively. Virtualization represents data and computing resources to users, including applications, as elements in a logical pool. In the view presented to users, virtualization separates resources from their physical location. Resources exist independent of any particular system or storage device. By removing consideration of their location, virtualization permits resources to be accessed more simply. Simplified access to resources helps raise user productivity, increase resource utilization, and reduce cost of operations. It also helps sustain high levels of customer service, as in the case of Globex.

IBM technologies enable businesses to virtualize practically all IT resources, including storage, systems, and IT management:

- ▶ **Virtualized storage:** IBM storage virtualization software and Tivoli storage management software helps simplify the management of SAN-based storage and facilitates shared access to stored data.
- ▶ **Virtualized systems:** IBM systems include various virtualization capabilities to dynamically allocate resources to meet business requirements and optimize system utilization.
- ▶ **Virtualized management:** IBM virtualization technologies allow systems administrators to create a comprehensive, logical view of all IT resources, helping businesses to manage, delegate, and provision IT resources in a way that supports business goals.

A key virtualization offering from IBM is the IBM Virtualization Engine. Various virtualization technologies are also integrated and delivered with IBM systems and storage products. The technologies include:

- ▶ **Common Hypervisor:** Supports partitioning and dynamic resource movement across multiple operating system environments
- ▶ **Virtual LAN:** Helps virtualize networks for prioritizing traffic on shared networks
- ▶ **Virtual I/O:** Can be used to dedicate I/O adapters and devices to a virtual server, allowing allocation and management of I/O devices on demand

As Globex grows, the IBM Virtualization Engine and other virtualization technologies are available to help Globex continue to simplify IT infrastructure, control IT operations costs, and facilitate real-time sharing of critical data throughout the supply chain.

For additional information about virtualization, see 3.2.1, “Virtualization solutions” on page 40.

## 2.3 Integrated Multi-channel Retailing solution

Today’s consumers have become “super shoppers.” They want detailed product information and pricing before they make significant purchases. Many, if not most, consumers research products online before making a significant purchase offline. Sometimes these consumers arrive at a store with more information about products than the sales associates have.

Today's consumers also prize convenience, wanting to shop when, where, and how they want. As they pursue information and convenience, "super shoppers" increasingly cross multiple channels during a single buying process. For example, a consumer might notice a plasma TV in a catalog that was delivered to his or her home. He or she might then go to the Web to learn more about plasma TVs and do some comparison shopping before visiting a store to check on product availability. To save time in the store, the shopper might use an in-store kiosk rather than visit with a sales associate. Finally, after a little more research, the shopper might return to the store and purchase a plasma TV.

IBM Integrated Multi-Channel Retailing (IMCR) solutions help retailers integrate multiple channels into complementary marketing, merchandising, and transaction operations that maximize profit across channels. IMCR solutions help retailers:

- ▶ Deliver information and services consistently across multiple channels, such as the Web, call centers, stores, kiosks, and catalogs
- ▶ Maintain ongoing interaction with each customer across his or her preferred channels
- ▶ Develop a faceted, insightful profile of each customer based on information integrated from multiple channels
- ▶ Align core operations and assets to maximize business performance across the spectrum of channels

Table 2-2 summarizes the features of IBM Integrated Multi-channel Retailing solutions.

*Table 2-2 Integrated Multi-channel Retailing solution description*

<p><b>Solution description</b></p>	<p>With IBM Integrated Multi-channel Retailing (IMCR) solutions, retailers can integrate multiple, isolated channels and touchpoints into consistent, personalized customer experiences across all channels. The portfolio of IMCR solutions includes IBM consulting services to help retailers define a multi-channel retailing strategy and to prioritize and implement offerings such as Consolidated Order and Inventory Management, Guided Selling, In-store Online Shopping, Multi-channel Customer Management, Multi-channel Gift Registry, Next Generation e-Commerce, and Unified Product and Content Management.</p>
------------------------------------	--

Client value	Challenge for retail	Solution	Benefit
	Distinguish the customer shopping experience.	Enable multiple online and offline channels and customer touchpoints to allow “super shoppers” to shop when, where, and how they want. Develop a single profile for each customer based on data that is collected from customer interaction throughout all channels, then personalize channels and touchpoints to reflect the profile. Enable the solution with selective IMCR offerings deployed on a scalable, standards-based infrastructure of IBM systems, storage, and middleware.	<ul style="list-style-type: none"> <li>▶ Personalized shopping experiences attract and retain “super shoppers.”</li> <li>▶ Customer profiles based on customer interactions across multiple channels strengthen customer management, leading to increased customer satisfaction and loyalty.</li> <li>▶ Deepened marketplace insight increases the effectiveness of marketing programs.</li> </ul>
	Maximize profit by optimizing cross-channel collaboration.	With help of IBM consulting services, evaluate existing channel strategy based on marketplace insight, targeted segments, and market position. Prioritize channel operations based on internal capabilities and the variable costs of alternate channels. Implement operations on a scalable, adaptable infrastructure of IBM systems, storage, and middleware.	<ul style="list-style-type: none"> <li>▶ Strengths of each channel, such as marketing capabilities of direct channels, are employed to drive traffic in all channels.</li> <li>▶ Analysis of customer feedback from all channels deepens marketplace insight, raising effectiveness of cross-channel merchandising and marketing programs.</li> <li>▶ High-cost channels, such as direct channels, are subsidized by increased traffic in other channels.</li> <li>▶ Cross-channel substitution optimizes inventory management and customer service.</li> <li>▶ Cross-channel content management reinforces brand propositions.</li> </ul>
	Lower IT operating costs while improving business efficiency and resilience.	Deploy solutions on scalable, standards-based IBM systems and storage that can be virtualized and that is reinforced with autonomic computing features.	<ul style="list-style-type: none"> <li>▶ Reduced complexity of IT and IT management</li> <li>▶ Reduced cost of IT operations</li> <li>▶ Increased utilization of IT assets</li> <li>▶ Increased ROI for IT</li> </ul>

<b>Technology-enabled differentiators</b>	<ol style="list-style-type: none"> <li>1. Broad range of open systems and storage products for building an infrastructure that meets current application, performance, and skills requirements and that is scalable to meet future requirements as they emerge</li> <li>2. IBM virtualization technologies that reduce IT complexity, increase utilization of assets across channels, and help increase cross-channel responsiveness to new requirements</li> <li>3. IBM POWER Technology to provide industry-leading performance while helping control total cost of ownership</li> <li>4. Comprehensive Linux support to simplify implementation of innovative, cross-channel solutions as they emerge in the industry</li> <li>5. IBM WebSphere, Tivoli systems management, Workplace™ and other IBM middleware designed for On Demand Business through multiple channels</li> <li>6. Flexible IBM delivery options for acquiring computing resources as needed, and paying for just what is needed when it is needed.\</li> </ol>
<b>For more information about IBM Integrated Multi-channel Retailing solutions</b>	<a href="http://www.ibm.com/industries/retail/doc/content/resource/thought/1364699101.html?g_type=pspot">http://www.ibm.com/industries/retail/doc/content/resource/thought/1364699101.html?g_type=pspot</a>

### 2.3.1 Integrated Multi-channel Retailing customer success story: REI

“The success of our current e-commerce transformation is aided by the open standards based, flexible and extensible e-commerce and multi-channel platform we implemented.”

— Joan Broughton, Vice President of Multi-channel Programs, Recreational Equipment, Inc.

Millions of hiking, climbing, camping, and paddling enthusiasts make Recreational Equipment, Inc. (REI) their first stop whenever they head for the great outdoors. Such loyalty has played a large role in making the Kent, Washington-based cooperative the leading retailer of quality outdoor gear.

An equally important factor behind the success of REI has been its efforts to make itself as accessible as possible to its customers through multiple shopping channels. Staffed by 7000 employees, the company has 70 retail stores in 24 states, an online store at [www.REI.com](http://www.REI.com), a Web-based discount outlet at [www.REI-OUTLET.com](http://www.REI-OUTLET.com), a call center, and catalog sales.

To learn more about REI, see:

<http://www.REI.com>

#### Challenge

Since the late 1990s, REI brick-and-mortar stores have been equipped with Web-based kiosks where customers can access REI Web sites to order any of 40 000 unique products, which is far more than can be stocked at the stores. With its online business achieving double-digit growth year-to-year, REI wanted to ensure that it was maximizing revenue over all its retail channels by synchronizing them rather than pitting them against each other. REI also wanted to provide customers a consistent, rewarding, multi-channel shopping experience.

## Solution

REI worked with IBM Business Consulting Services to develop a coherent, multi-channel strategy based on REI business goals, targeted segments, and brand proposition. REI then implemented its strategy by deploying an IMCR solution. The solution meshes, for example, online purchasing with in-store services by providing an in-store pickup service for items ordered on the Web. The solution also provides a multi-channel gift registry to engage customers in online channels and brick-and-mortar stores.

Key components of the solution include:

- ▶ Services
  - IBM Business Consulting Services
  - IBM Software Services for WebSphere
- ▶ Software
  - IBM WebSphere Commerce Professional Edition
  - IBM WebSphere Application Server
  - IBM WebSphere MQ
  - IBM WebSphere Studio Application Developer
- ▶ Systems
  - IBM System p
  - IBM System

## Benefits

The multi-channel strategy is paying off for REI. By synchronizing its sales channels and seeing to it that customers enjoy a seamless, cross-channel shopping experience, REI found that dual-channel shoppers spend 14% more per customer than single-channel shoppers, and tri-channel customers spend 48% more than dual-channel customers.

“The response to the REI Store Pickup service has surpassed all projections and has contributed to increased sales at the e-commerce sites as well as at REI’s 70 locations,” says Joan Broughton, REI Vice President of Multi-channel Programs. “The multi-channel gift registry service is another solid win. Registries created online bring customers into REI stores to shop. Store-created registries generate demand online. And, as REI customers create registries, they can notify friends and family via e-mail, in many cases introducing new customers to REI.”

In summarizing benefits of its IMCR solutions, REI reports:

- ▶ 1% increase in store sales, totaling more than \$8 million in the first year
- ▶ 100% payback in six months for store pickup services
- ▶ Improved customer satisfaction and loyalty
- ▶ Increased share of wallet and customer lifetime value

### 2.3.2 Value-adding technology for Integrated Multi-channel Retailing solutions

IBM infrastructure adds flexibility, resilience, and integration to IMCR solutions.

#### Flexibility

IBM systems are designed to comply with open standards. For example, IBM supports the Linux operating system in the entire line of IBM systems, from entry level to mainframe. Because IBM systems are built on open standards, they interoperate with each other and with many third-party products. They give you the flexibility to select from a wide range of

products, both from IBM and others, to create infrastructure and solutions customized to satisfy unique requirements of your business, not a hypothetical “average” business.

The flexibility that results from the IBM commitment to open standards and documented IBM roadmaps for product development also means that, as your business requirements change because of growth and emerging opportunities, you can adapt your solutions without disrupting your business, and without having to replace infrastructure that still serves its purpose.

As REI Vice President Joan Broughton said, “The success of our current e-commerce transformation is aided by the open standards based, flexible and extensible e-commerce and multi-channel platform we implemented.” That transforming platform achieves flexibility in part from an infrastructure composed of open standards-based IBM systems.

## **Resilience**

The REI multi-channel strategy requires that Web sites, like in-store operations, be integrated with fulfillment and other back-end operations, and that those operations be available and secure. REI chose to deploy its back-end operations on an System i system.

System i systems combine IBM autonomic computing features with security features unique to System i to deliver proven security and resilience. Virus lists such as those at <http://www.sarc.com>, and <http://viruslist.com> confirm that the industry has identified fewer threats to i5/OS®, than to Windows or UNIX operating systems. High availability options such as clustering, cross-site mirroring, and hot plug memory make System i systems among the most resilient in the industry. Enhancements continually reinforce the legendary capability of System i systems to safeguard data, shield assets from hackers, and keep business running on demand.

## **Integration**

System i systems provide another benefit to retailers who want to implement a multi-channel strategy: the systems can help simplify infrastructure.

The “i” in System i has always meant integration. A System i system integrates the components that are necessary to support robust business computing, such as the operating system, middleware, database management, application servers, security and more. Now businesses are using System i systems, to integrate multiple computing environments and simplify their entire IT infrastructure. With System i systems, you can create infrastructure for supporting multiple channels without creating a complex environment that is difficult to operate and costly to manage.

For example, i5, a recent addition to the System i family, can simultaneously support four different operating systems on a single platform: i5/OS, Linux, AIX® 5L™, and Windows (by means of IXA or IXS). By consolidating several operating environments onto one platform, an i5 system can help minimize the number of systems required to support a multi-channel strategy, with corresponding savings in the cost of operations and maintenance, savings that flow directly to your bottom line.

Finally, integrated infrastructure is responsive infrastructure. IT staff can refocus integrated resources on new customer requirements or on optimizing variable channel performance far more quickly than they can realign a complex of diverse, loosely connected components. Integrated infrastructure can help you respond to your customers on demand.

“i” is also for “innovation.” Over the last two years IBM invested more than \$1 000 000 000 in innovations for System i systems and solutions development. These innovations help System i systems maintain industry leadership as complete, integrated systems that run thousands of



the world's most popular business applications in a reliable, secure, environment, and that help businesses simplify IT infrastructure, reduce total cost of computing, and accelerate ROI.

Figure 2-5 illustrates the concept of integrating multiple computing environments on a single i5 system.

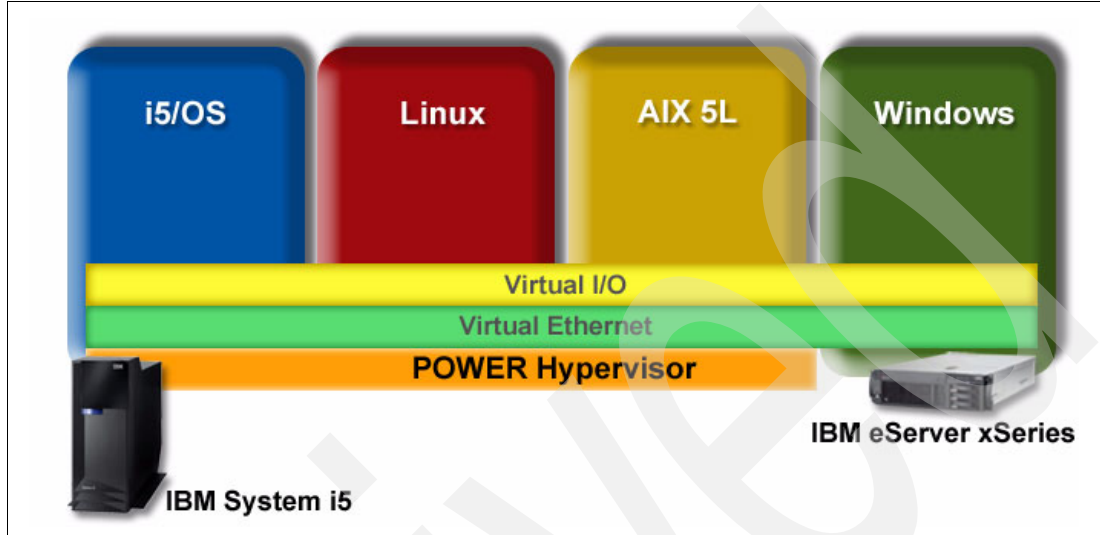


Figure 2-5 Integration of multiple computing environments on System i systems

For more details about System i systems, see “System i systems” on page 48.

## 2.4 Store solution

IBM Store solutions help retailers distinguish brand propositions and the shopping experience they provide to customers. IBM Store solutions can help retailers:

- ▶ Increase same-store sales while reducing the cost of goods sold
- ▶ Increase customer loyalty by providing each customer a personalized shopping experience
- ▶ Aggregate customer insight to improve product planning and purchasing
- ▶ Sustain a competitive advantage by developing a scalable, adaptive infrastructure to support ongoing innovation and growth

Table 2-3 summarizes features of IBM Store solutions.

Table 2-3 Store solution description

<p><b>Solution description</b></p>	<p>IBM Store solutions are designed to help retailers stand out in a crowded marketplace by providing customers with a personalized shopping experience. Store solutions are also designed to help increase same-store sales and control costs by linking existing and new in-store systems in an environment that provides customers personalized access to services and tools. Offerings include Business Performance Management, Interaction Services, Process Services, Information Services, Infrastructure Services, and others.</p>
------------------------------------	--



Client value	Challenge for retail	Solution	Benefit
	Distinguish the customer shopping experience.	Enable store operations with a variety of devices and methods for customers to initiate and complete transactions. Provide a consistent, intuitive interface for all store operations. Use the Store Integration Framework (SIF), an architecture designed specifically for retail, to integrate operations. Deploy the solution on a scalable, standards-based, reliable infrastructure of IBM systems, storage, and middleware.	<ul style="list-style-type: none"> <li>▶ Personalized shopping experience for customers</li> <li>▶ A solution infrastructure that can be adapted quickly to new technologies and new customer preferences</li> <li>▶ Increased customer satisfaction and loyalty</li> </ul>
	Improve same-store sales.	Implement a workplace environment that provides employees and managers real-time access to productivity tools and current, accurate product information. Enable the solution with IBM Workplace and SIF on an infrastructure of IBM systems, storage, and middleware.	<ul style="list-style-type: none"> <li>▶ Increased employee productivity</li> <li>▶ Reduced training costs</li> <li>▶ Increased customer service, resulting in higher customer satisfaction and loyalty</li> </ul>
	Lower IT operating costs while improving business efficiency and resilience.	Simplify infrastructure and IT management by integrating systems within SIF on a simplified infrastructure of IBM standards-based systems and storage.	<ul style="list-style-type: none"> <li>▶ Reduced complexity of IT and IT management</li> <li>▶ Reduced cost of IT operations</li> <li>▶ Increased utilization of IT assets</li> <li>▶ Increased ROI for IT</li> </ul>
<b>Technology-enabled differentiators</b>	<ol style="list-style-type: none"> <li>1. Broad range of open systems and storage products for building an infrastructure that meets current application, performance, and skills requirements and that is scalable to meet future requirements as they emerge.</li> <li>2. SIF, an adaptable solution architecture designed specifically for retail store operations.</li> <li>3. IBM WebSphere, Tivoli systems management, Workplace and other IBM middleware optimized for on demand business.</li> <li>4. IBM POWER Technology to provide industry-leading performance while helping control total cost of ownership.</li> <li>5. Flexible IBM delivery options for acquiring computing resources as needed, and paying for just what is needed when it is needed.</li> </ol>		
<b>For more information about IBM Store solutions</b>	<a href="http://www.ibm.com/industries/retail/doc/jsp/solutionarea/transform/index.jsp">http://www.ibm.com/industries/retail/doc/jsp/solutionarea/transform/index.jsp</a>		

## 2.4.1 Store solution customer success story: Pep Boys

“Pep Boys was ahead of its competitors in terms of recognizing the importance of service to the customer, and the need to be able to respond with systems that provided the right information in real-time. Collaborating with IBM Business Partner 360 Commerce, we integrated Pep Boys’ service center and retail store environments so the company could service customers from a single interface.”

— Jan Jackman, general manager, Retail on Demand

In 1921, four young neighborhood entrepreneurs in Philadelphia, Pennsylvania, pooled \$200 each to start what has become the largest automotive aftermarket retailer in the United States. Today, Pep Boys Auto employs more than 22 000 people at its 593 stores in 36 states and Puerto Rico, and reported over \$2 200 000 000 in sales in 2004. Pep Boys differentiates itself from competitors by being the value alternative to car dealerships, providing exceptional customer service, and it is the only retailer that serves all four segments of the automotive aftermarket—do-it-yourself, do-it-for-me, buy-for-resale, and replacement tires.

To learn more about Pep Boys, see:

<http://www.pepboys.com/>

### Challenge

To boost employee productivity and efficiency, and to raise customer satisfaction and loyalty, Pep Boys needed to create an integrated retail environment that connected its disparate systems and provided a single view of the customer and available inventory. The company also sought a proven, low-risk solution that could be implemented within 12 months, was easy to learn, and could provide rapid time to value. Finally, Pep Boys required a flexible and scalable infrastructure that would allow them to enhance IT as the business evolved.

“Pep Boys needed to change its store systems, which were outdated and beginning to break down,” says Bob Berckman, Senior Director of Store Solutions, Pep Boys. “Sometimes, store checkout systems would fail, which was a major disruption to our business.”

Based on aging technology, the Pep Boys previous infrastructure was a homegrown, check-out only point-of-sale (POS) solution made up of various independent systems that were no longer supported by the vendor, causing Pep Boys to hunt for qualified support staff. The solution required time-consuming and costly integration efforts, and it could not scale to support the company’s growth plans. Nor could the solution accept debit cards or coupons, but competitors of Pep Boys did. Customers who wanted to purchase auto parts inside the store and have their vehicles serviced had to wait in two separate lines: one at the cash register and another at the service desk. To process a return, an employee had to search various systems to match a customer’s receipt with the sale transaction, reducing worker productivity and efficiency.

### Solution

Pep Boys started its IT transformation by replacing its outdated POS environment with an IBM Open POS solution, a POS configuration built on Java™ technology-based 360Commerce software running within the SIF. The solution included hardware, an operating system, and services from IBM.

SIF is an open-standards, Web-based platform that connects the Pep Boys POS system and 360Commerce applications. “SIF enables the integration of people, processes, and data throughout the store and at various customer touch points,” says Jackman. “It is a service oriented architecture that leverages open and industry standards to allow Pep Boys to reuse components and applications, helping to reduce the time it takes to deploy new service touch points as well as reduce total cost of ownership.”

Within one year, IBM had all of the company’s 593 stores up and running with new servers, workstations, registers, printers, scanning devices, and applications, accelerating ROI. The Pep Boys solution was composed of:

- ▶ Software
  - IBM Retail Environment for SUSE Linux (operating system)
  - IBM DB2 Express
  - IBM WebSphere Business Integration Server Foundation
  - IBM WebSphere MQ
- ▶ Servers
  - IBM eServer™ xSeries®
- ▶ Hardware
  - IBM SurePOS™ 300 (running IBM Retail Environment for SUSE Linux operating system)
- ▶ 360Commerce applications
  - 360 Point-of-Sale
  - 360Store Back Office
  - 360Store Inventory Management

## Benefits

Jackman says, “By connecting all of the solution components, SIF enables Pep Boys to become a true On Demand Business. The solution facilitates the seamless integration of information and data, allowing Pep Boys to speed its operations and improve the customer experience by providing the right information at the right time, in real-time.”

SIF also gives Pep Boys a platform on which it can easily enhance its solution infrastructure by incorporating additional functionality, such as digital media and radio frequency identification (RFID) technology.

Pep Boys realized immediate benefits from its solution, including:

- ▶ Rapid ROI
- ▶ Reduced solutions cost of ownership
- ▶ Faster checkout
- ▶ Increased responsiveness to customer needs, enabled by solution ease-of-use
- ▶ Improved employee productivity
- ▶ Reduced employee training costs
- ▶ Flexibility to incorporate additional technology as business goals evolve

“With the added stability and efficiency of this new solution from IBM and 360Commerce, we have improved our daily operations and our customer service, as well as our ability to develop systems and grow our company,” says Mike Elmore, CIO, Pep Boys.

## 2.4.2 Value-adding middleware for Store solutions

The Pep Boys story demonstrates the potential benefits provided by the Store solution implemented on the SIF.

### SIF

The SIF is a conceptual framework based on SOA. Using IBM middleware that is deployed in retail environments, SIF can extend existing POS environments to:

- ▶ Heighten customer centricity
- ▶ Increase the efficiency of retail processes
- ▶ Raise employee productivity by creating an adaptive infrastructure capable of supporting a changing retail environment

SIF provides the architecture and technology to link existing point-of-sale (POS) systems with innovative technologies as they gain acceptance and feasibility. Such devices could include, for example, wireless in-store kiosks, handheld Web tablets, smart shopping carts and personal digital assistants (PDAs). The devices can be linked to systems across the store, up to the enterprise and out into the supply chain to create dynamic real time business processes.

Figure 2-6 illustrates the concept of SIF.

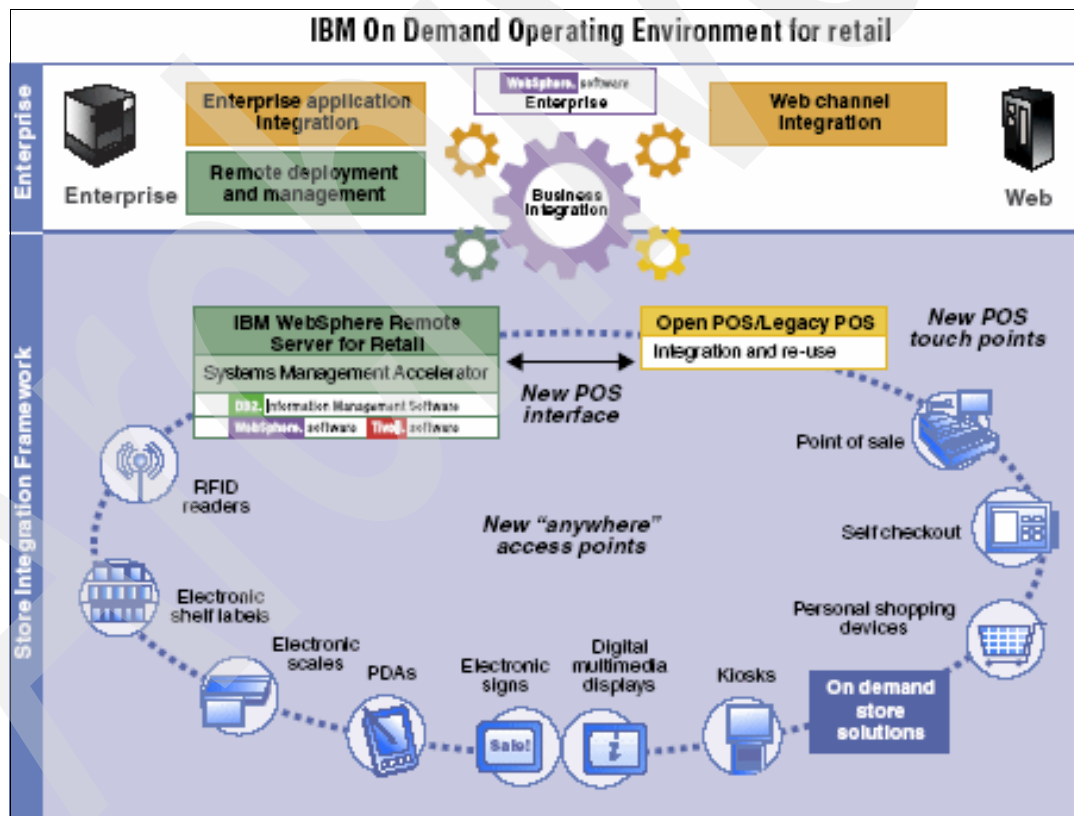


Figure 2-6 Store Integration Framework

SIF is compatible with most major retail operating systems, including Microsoft® Windows, the IBM Retail Environment for SUSE Linux, Solaris™, HP-UX, AIX and the IBM 4690 Operating System. The IBM WebSphere Remote Server for Retail provides the core components for SIF, including WebSphere Application Server, WebSphere MQ, DB2 and

Tivoli middleware. These components are integrated, packaged, and configured for the store environment to speed the deployment process.

To increase its maintainability, the IBM Middleware for Remote Retail Server Systems Management Accelerator technology (available on Microsoft Windows and Linux) provides remote installation support and systems management components. This helps you offload IT management responsibilities from store personnel to the enterprise, freeing in-store staff to concentrate on sales and service. Offloading also helps you reduce operations costs by consolidating IT management at the enterprise level.

Additional capabilities provided by SIF include:

- ▶ The ability to quickly implement solutions
- ▶ The ability to provide product and services that are directly and immediately available to customers, helping them to increase basket size
- ▶ The ability for consumers to control their own shopping experiences with self-service technologies
- ▶ The ability to capture consumer and inventory information to improve store flow and merchandise mix, so that you can deliver products and services that reflect customer preferences in a specific store
- ▶ The ability to deploy of tools for helping employees serve customers and complete their work faster
- ▶ The ability to implement new technologies, such as RFID technology-enabled solutions, to streamline merchandise delivery and inventory management processes within the store
- ▶ The ability to automatically sense out-of-stock merchandise and products that are selling faster than anticipated

By streamlining in-store processes and supplying employees with tools to enhance customer service, Store solutions on SIF can help you differentiate the shopping experience that you provide your customers.

### ***IBM WebSphere Remote Server for Retail***

The IBM WebSphere Remote Server for Retail, a key component of SIF, delivers a fully integrated platform to help manage retail stores and other remote environments. WebSphere Remote Server for Retail provides an on demand operating environment, including WebSphere Application Server, DB2 information management, WebSphere MQ advanced messaging, and Tivoli management and monitoring software.

With WebSphere Remote Server for Retail, you can manage your business more cost effectively. WRS for Retail can also expedite employee access to customer, product, and sales information to help them increase productivity and provide better customer service.

### ***IBM WebSphere Systems Management Accelerators for Retail***

The IBM WebSphere System Management Accelerators for Retail consists of these components:

- ▶ WebSphere Systems Management Accelerators
- ▶ WebSphere Remote Management Agents

The WebSphere Systems Management Accelerators can provide remote installation support and centralized systems management for virtually any device and software solution in individual stores.

The IBM WebSphere Remote Management Agents provide administrators with a consolidated view of hardware and software status by monitoring store infrastructure from the

central (enterprise) location. These agents deliver updates remotely from the enterprise to the stores, which can install them on a variety of devices such as kiosks and Web pads.

These components allow delivery of new and enhanced applications and services on an as-needed basis to remote systems and devices and consolidation of IT management responsibilities at the enterprise level, thereby reducing IT operations costs.

### 2.4.3 Value-adding technology for Store solutions

The Pep Boys example illustrates the value that Store solutions can derive from IBM xSeries systems, Enterprise X-Architecture, and features of autonomic computing.

#### **IBM eServer xSeries**

The Pep Boys Store solution benefits from the power and capabilities of IBM eServer xSeries systems. While the IBM POS hardware and the 360Commerce solutions provide Pep Boys employees and customers the tools and services to streamline and personalize transactions, xSeries systems provide the robust IT environment that is necessary to sustain supply chain, merchandising, and personnel operations between stores and company offices.

By choosing xSeries, Pep Boys deployed their Store solution on Intel processor-based systems that deliver exceptional availability, simplified manageability, outstanding performance, and scalability. xSeries also supports Linux. By choosing to deploy on xSeries, Pep Boys ensured that their Store solution, which runs in a Linux environment, will continue to have access to ongoing innovations that are based on open standards.

For more details about the xSeries, see “xSeries” on page 50.

#### **Enterprise X-Architecture**

IBM Enterprise X-Architecture technology enhances the availability and manageability of the Pep Boys solution. This architecture extends mainframe-like capabilities to the Intel-based server platform, especially benefits in the areas of availability, scalability, systems management, service, and support. X-Architecture combines industry-standard technologies, with advances in I/O, memory, performance, and scalability, to deliver the best of the mainframe capabilities in a building-block design.

Created in 1997, the X-Architecture blueprint brought mainframe-inspired technologies to the IBM industry-standard environment, resulting in enhanced server performance, availability, scalability, and systems management and in reduced cost-of-computing achievable through industry-standard hardware and software.

Building on the X-Architecture blueprint, Enterprise X-Architecture technologies have delivered revolutionary advances in I/O, memory, and processor performance, creating a leadership server architecture with a flexible, pay-as-you-grow approach to building high-end, scale-up xSeries servers. These technologies offer XpandOnDemand scalability to enable long-term “expandability” and reduce any concerns about limits in computing capacity. XpandOnDemand lets you make the most of your current IT budget and staff while providing a flexible growth path to the future. Each scalable enterprise node consists of a 4-way processor complex that can easily be extended to an 8, 12, or 16-way system just by adding 4-way expansion modules. The modules are connected by high-speed scalability ports, making the investment in adapters and switches a thing of the past.

Enterprise X-Architecture technology delivers high system availability through technologies such as:

- ▶ **Active memory:** Delivers hot-swap and hot-add capability to memory, which means that, if any memory needs replacing, you do not need to take the system down to add or replace it.
- ▶ **Chipkill memory:** Integrated into the Enterprise X-Architecture chipset, allows multiple errors to be corrected using low-cost industry standard error correcting code (ECC) memory
- ▶ **Memory ProteXion:** In combination with Chipkill memory, corrects virtually all the errors that a system is likely to encounter.
- ▶ **Memory mirroring:** Mirroring similar to RAID-1 disk mirroring, simultaneously writes data to two independent memory cards, but only reads from the active memory card.

For more information about Enterprise X-Architecture, see:

<http://www.ibm.com/servers/eServer/xseries/xarchitecture/enterprise/index.html>

## Autonomic Computing

xSeries systems provide smart management tools for autonomic computing. Autonomic computing is a computing environment that can manage itself and dynamically adapt to business changes. A self managing environment can observe and sense situations in the IT environment without direction from IT professionals. Autonomic computing environments are:

- ▶ **Self-configuring:** Components dynamically adapt to changes in the environment, using policies provided by the IT professionals.
- ▶ **Self-healing:** Systems discover, diagnose, react to, and prevent disruptions to the IT environment.
- ▶ **Self-optimizing:** Systems monitor and balance workloads to optimize resource utilization.
- ▶ **Self-protecting:** Infrastructure anticipates, identifies and protects against threats to the IT environment. This allows businesses to consistently enforce security and privacy policies.

xSeries smart management tools for autonomic computing include:

- ▶ Dynamic partitioning that facilitates efficient resource utilization
- ▶ Remote Deployment Manager, which provides self installation and configuration of multiple, replicated, distributed systems and unattended remote image deployment
- ▶ Predictive Failure Analysis® with automated corrective action
- ▶ Digital certificates and encryption to provide identity authentication and to prevent unauthorized use of data, respectively
- ▶ IBM Director, which provides:
  - Automated system health management
  - Software rejuvenation to predict and avoid software failures
  - Capacity Manager resource bottleneck identification
  - Automated corrective action
  - Automated Event Action Plans

For more details about autonomic computing, see

<http://www.ibm.com/servers/autonomic/>

Archived





## Technology enablers for retail solutions

This chapter summarizes the features of IBM systems, IBM TotalStorage offerings, and selected technologies that can help maximize the value of IBM retail solutions. IBM technologies described here include IBM Systems Agenda, virtualization, deep computing, Enterprise X-Architecture, IBM Linux support, and IBM Power Architecture.

## 3.1 Technology innovation that matters

Investing about \$5 000 000 000 annually in research and development, IBM continues to bring new technologies to market. In 2005 IBM earned 2941 patents, more U.S. patents than any other company for the thirteenth consecutive year and over 1100 more than the number 2 patent recipient. The year 2005 was the eighth consecutive year that IBM received more than 2000 U.S patents. For the ranking of the top 10 patent recipients in 2005, see,

<http://www.uspto.gov/>

To help foster innovation of technology that matters, IBM is providing access to a portion of its intellectual property. For example, IBM is giving individuals and groups that are working on open source software access to key innovations covered by 500 IBM software patents. “Unlike the preceding Industrial Economy,” says Dr. John E. Kelly III, IBM Senior Vice President, Technology and Intellectual Property, “The Innovation Economy requires that intellectual property be deployed for more than just providing the owner with freedom of action and income generation.” In addition to helping foster innovation, IBM believes that the patents that it is opening up can contribute to open standards and broader interoperability between applications by providing open source developers with a solid base of innovation that they can use and share.

IBM also announced an initiative that it is undertaking with the United States Patent and Trademark Office (USPTO), Open Source Development Labs (OSDL), members of the open source software community, and academia that is focused on improving U.S. patent quality. The unprecedented partnership between these parties to improve patent quality will help accelerate innovation in the United States.

“IBM believes that patents should be granted only for ideas that embody genuine scientific progress and technological innovation,” says Kelly. “Raising the quality of patents will encourage continued investment in research and development by individual inventors, small businesses, corporations and academic institutions while helping to prevent over-protection that works against innovation and the public interest.”

Technology innovation matters because it provides businesses with a continuous stream of innovative solutions to real business problems. IBM innovations appear in broad categories of IT that today help businesses operate around the globe. Examples include:

- ▶ **Processing innovations:** Technologies such as 64-bit computing, Power Architecture processors, BladeCenter, Cell Processors, and Enterprise X-Architecture are some of the processor innovations that IBM has introduced to the marketplace.
- ▶ **Operating system innovations:** IBM operating systems support a portfolio of systems that address needs of businesses ranging from small neighborhood shops to global enterprises. IBM operating systems continue to set records for security, performance, and resilience. IBM operating systems have also led the industry in supporting open standards, in integrating heterogeneous environments on a single platform, and in simplifying IT infrastructure.
- ▶ **Optimization innovations:** Technologies such as virtualization, grid computing, and autonomic computing are helping businesses optimize use of their IT resources.
- ▶ **Storage innovations:** IBM System Storage™ and IBM TotalStorage products effectively use systems technology to enhance availability, openness, and virtualization of storage.

Innovations such as these reflect the IBM heritage of broad business experience and world-class research. They demonstrate that IBM can deliver technologies and products that companies can use to drive their own innovation, technologies, and products to capture business opportunities that were nearly impossible to pursue before. IBM innovations also reflect the IBM Systems agenda.

### 3.1.1 IBM Systems agenda

IBM Systems are being designed around the core principles of collaborative innovation, openness, and virtualization. Infrastructure that supports these principles can help move a business to the next generation of computing: collaborative processing. Collaborative processing is what happens when an organization transcends its standard organizational boundaries to change the way people interact with each other and with their IT environment.

Technology that facilitates collaboration such as virtualization, which enhances access to data and IT assets, can help create a critical mass of people who share information, processes, and ideas to collaborate. When collaboration becomes a principle of operation in a business, the business can achieve the integration of business goals, information, and processes that is the foundation of an On Demand Business. An On Demand Business is a business whose processes are integrated from end to end both inside the company and with key partners, suppliers, and customers. This collaboration helps an On Demand Business respond quickly to customer demand, marketplace opportunities, and external threats.

Figure 3-1 illustrates the concept of the IBM Systems agenda.



Figure 3-1 IBM Systems agenda

### 3.1.2 Technology and product family overview

Figure 3-2 on page 40 indicates the range of IBM systems, storage offerings, and technologies that are available to help a business achieve the integration and collaboration that is required to capture opportunities and maintain a competitive advantage in today's on demand marketplace.

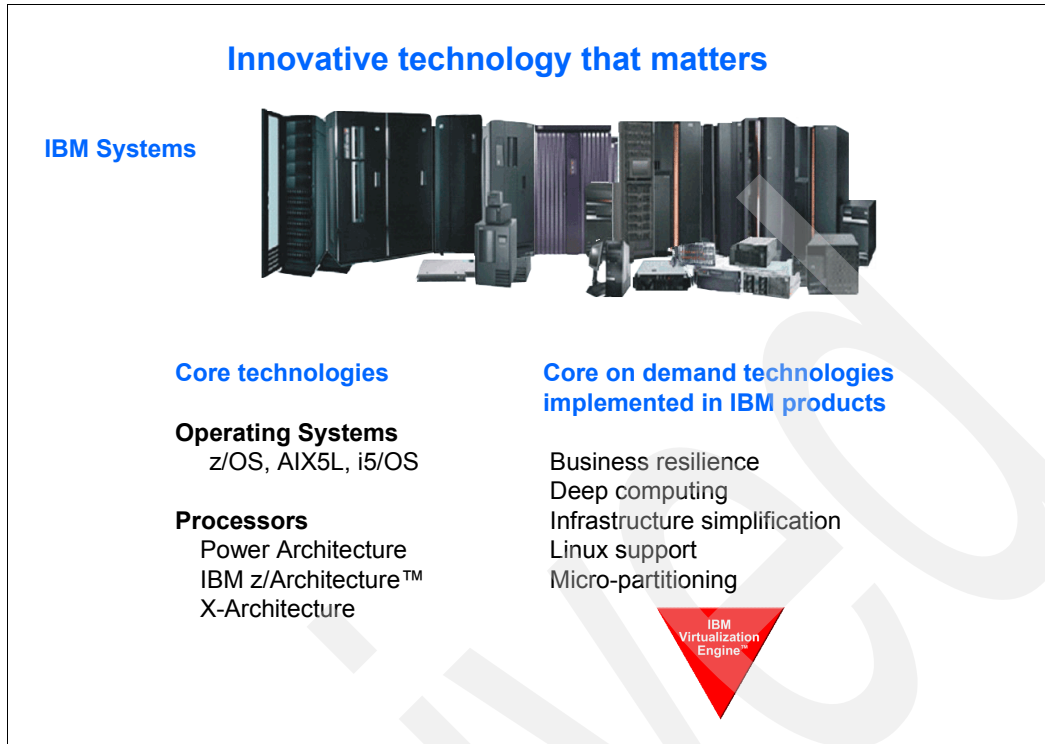


Figure 3-2 IBM Systems, products, and technologies

## 3.2 Technologies

The key technologies that IBM is advancing to meet the requirements of the retail industry include:

- ▶ Virtualization
- ▶ Deep computing
- ▶ Enterprise X-Architecture
- ▶ IBM Linux support
- ▶ IBM Power Architecture

### 3.2.1 Virtualization solutions

IBM pioneered virtualization technology and continues to share it in IBM product families as a tool to help businesses manage infrastructure cost effectively. Virtualization represents data and computing resources to users, including applications, as elements in a logical pool. In the view presented to users, virtualization separates resources from their physical location. Resources exist independent of any particular system or storage device. By removing consideration of their location, virtualization helps simplify shared access to resources and allocation of resources on demand. Simplified access to resources helps raise user productivity, increase resource utilization, and reduce cost of operations. It also helps IT departments sustain high levels of customer service.

Table 3-1 on page 41 correlates virtualization solutions with types of resources and specific management needs.

Table 3-1 Virtualization solutions to optimize management of IT resources]

Resource	Management challenge	Virtualization solution
People	Reduce the effort required to manage the IT environment, and thereby reduce the cost of IT.	Centralize the management of IT resources to simplify management tasks and eliminate duplicate effort.
IT processes	Enhance IT responsiveness to changing business requirements.	Replace out-dated processes that are used to manage IT by employing technology to automate adding, removing, reallocating, and otherwise managing resources in response to changing business demands.
Technology	Improve the efficiency of an increasingly diverse IT environment that includes a variety of devices, heterogeneous systems, and disparate networks.	Simplify access, raise utilization rates, improve ROI, and enhance responsiveness of infrastructure by virtualizing resources in centrally managed, easily accessible, enterprise-wide pools.

### Key virtualization technologies

The IBM Virtualization Engine provides technologies for virtualizing systems and storage. They help you integrate IBM resources and select server and storage systems from other vendors such as HP, Sun, and EMC into a single, holistic, virtual environment. Other tools and services can help you virtualize management of and access to IT resources. The IBM Virtualization Engine uses various IBM technologies. These technologies are integrated and delivered with certain IBM systems and virtualization products. These technologies include:

- ▶ **Common Hypervisor:** Supports partitioning and dynamic resource movement in multiple operating system environments
- ▶ **Virtual LAN:** Helps provide network virtualization capabilities that allow you to prioritize traffic on shared networks
- ▶ **Virtual I/O:** Helps provide the ability to dedicate I/O adapters and devices to a virtual server, allowing the on demand allocation and management of I/O devices

For additional information about the IBM Virtualization Engine and other virtualization technologies, see:

<http://www.ibm.com/servers/eServer/about/virtualization>

### System virtualization

IBM Systems include various virtualization capabilities for optimizing system utilization and allocating resources dynamically to meet fluctuating requirements. IBM virtualization technologies can integrate the resources of IBM products and select products from other vendors into a single, holistic, virtual environment. The IBM Virtualization Engine Suite for Systems includes:

- ▶ **Enterprise Workload Manager:** Automates workload distribution according to business policies
- ▶ **Director Multiplatform:** Platform management for all IBM platforms and non-IBM Intel platforms.
- ▶ **IBM Tivoli Provisioning Manager:** Dynamically adds and removes resources as needed by the business. It is available on IBM and non IBM systems.
- ▶ **IBM Grid Toolbox:** Helps provide network virtualization capabilities that allow you to prioritize traffic on shared networks

- ▶ **Virtualization Engine Console:** Can simplify existing system management through its integration console technology and addresses the need to virtualize system management in a distributed heterogeneous environment.

### ***Storage virtualization***

IBM storage virtualization software and Tivoli storage management software improves management of SAN-based storage and data. IBM Virtualization Engine Suite for Storage provides:

- ▶ **IBM TotalStorage SAN Volume Controller (SVC):** SVC simplifies your storage infrastructure by allowing changes to the physical storage with minimal or no disruption to applications. SVC also combines the capacity of multiple disk storage systems into a single storage pool that can be managed from a central point.
- ▶ **IBM TotalStorage SAN File System (SFS):** SFS simplifies file and data management in an SAN by consolidating the file systems of UNIX, Windows, and Linux servers. SFS centralizes files and file systems into a single IT resource with a single point of administrative control. SFS can support secure, heterogeneous data sharing and centralized policy-based storage management in an open environment.
- ▶ **IBM TotalStorage Productivity Center:** TotalStorage Productivity Center is a suite of infrastructure management software that can centralize, automate, and simplify the management of complex and heterogeneous storage environments. It helps reduce the effort of managing complex storage infrastructures, improves storage capacity utilization, and improves administration efficiency. TotalStorage Productivity Center helps you respond quickly to on demand storage needs by centralizing and simplifying the management of storage devices and data.
- ▶ **Virtualization Engine TS7510:** TS7510 combines hardware and software into an integrated solution that is designed to provide tape virtualization for open systems connected with Fibre Channel.

### ***Virtual management***

IBM tools and application help administrators manage resources as virtual environments:

- ▶ The **IBM Virtualization Engine Console** helps you manage your IT environment by allowing your administrators to view systems beyond operating system boundaries. It also helps increase utilization rates by facilitating the sharing of resources. The console provides two powerful cross-platform applications:
  - **Health center:** Provides a single view point to perform key system and storage monitoring and management.
  - **Launch-pad:** Provides a single view for launching key Virtualization Engine related systems and storage management consoles.
- ▶ **Virtual access** tools provide a single portal (a virtual view) for administering virtualized resources. These tools also provide a programmatic interface to system resources as services in an SOA program model.

## **3.2.2 Deep computing**

IBM and IBM Business Partners implement deep computing solutions in an infrastructure of IBM hardware, software, tools, and services. Figure 3-3 on page 43 shows the IBM commitment to deep computing.

## Deep Computing at IBM

- Embraces the breadth of IBM's hardware, software, and services technologies
- Includes industry expertise gained from IBM partnerships with other industry leaders
- Fuels breakthrough initiatives for innovators (scientist, engineers and knowledge workers) in organizations of all sizes whose business or research demands intense computation, visualization or manipulation and management of massive amounts of data
- Solves business problems to
  - ✓ Build solutions that transcend the enterprise
  - ✓ Generate strategic value
  - ✓ Help clients transform their business

*Figure 3-3 IBM commitment to deep computing*

For more information about deep computing, see:

<http://www.ibm.com/servers/deepcomputing>

### **IBM Blue Gene supercomputer**

As of June 2005, IBM continues by all measures to be the leading provider of supercomputing systems as ranked in the TOP500 List of Supercomputers, which tracks the performance of supercomputers worldwide. The 64-rack IBM Blue Gene/L solution at the U.S. Department of Energy Lawrence Livermore National Laboratory (LLNL) retains the number one position by almost doubling its performance and achieving 136.8 Teraflops. IBM has a prestigious record with six systems in the TOP10; 10 systems in TOP20; 58 systems in TOP100 systems.

For more information about Blue Gene®, see:

<http://www.ibm.com/servers/deepcomputing/bluegene.html>

### **Deep Computing Capacity on Demand**

Deep Computing Capacity on Demand is an IBM service offering that allows its clients to access additional capacity over the network to deal with workload spikes. Clients can reserve deep computing capacity on an as-needed basis to execute computing and data-intensive applications. Clients access the resources through a highly secure, dedicated virtual private network (VPN), and pay only for the amount of capacity reserved.

Deep Computing Capacity on Demand services are based on advanced IBM systems technologies and advanced cluster management capabilities. Services are delivered in a highly secure, resilient infrastructure that is located in several centers around the globe.

For more information about Deep Computing Capacity on Demand, see:

<http://www.ibm.com/servers/deepcomputing/cod.html>



## Deep Computing Institute

The Deep Computing Institute is an IBM Research organization. IBM founded the Institute to promote ongoing advancement of deep computing solutions. The Institute is charged with developing solutions to business and scientific problems by exploiting IBM strengths in high-end computing, data storage and management, algorithms, modeling and simulation, visualization, and graphics.

For more information about deep computing, see:

<http://www.research.ibm.com/dci/>

### 3.2.3 Enterprise X-Architecture

Created in 1997, the IBM X-Architecture blueprint brought mainframe-inspired technologies to the industry-standard environment. It provided standards-based, lower cost servers with enhanced performance, availability, scalability, and systems management.

Building on the X-Architecture blueprint, Enterprise X-Architecture technologies have delivered revolutionary advances in I/O, memory, and processor performance, creating a leadership server architecture with a flexible, pay-as-you-grow approach to building high-end, scale-up xSeries servers.

This approach has yielded the following key differentiators.

#### ***IBM eServer X3 Architecture (x260, x366, and x460)***

Using IBM eServer X3 Architecture, the third-generation of Enterprise X-Architecture, standards-based, high-end xSeries systems are designed to provide breakthrough 64-bit performance and business-critical reliability. Improved scalability and investment protection are possible with 4- to 32-way dual-core processing capability and Xtended Design Architecture technology (x206, x226, x236, x306, x336, x346).

#### ***Xtended Design***

Through advanced system design, Xtended Design Architecture uses industry standards to bring outstanding performance, availability and manageability to one- and 2-way servers, giving customers mission-critical confidence and investment protection while helping to control costs.

#### ***Benefits***

X3 and Xtended Design architectures both:

- ▶ Give you the confidence that all parts of your solution (hardware, software and middleware) install quickly, start up easily, and run reliably with the IBM ServerProven® program. When you see the ServerProven emblem, you know that operating system or software application you are looking for is part of a complete business solution that has been identified, validated, optimized, and documented to run reliably on IBM servers.
- ▶ Give you the flexibility to choose from the wide variety of applications that exist for industry-standard hardware with Intel processors.

They also deliver high system availability through technologies such as:

- ▶ **Active memory:** Delivers hot-swap and hot-add capability to memory, meaning if any memory needs replacing you do not need to take the system down to replace it
- ▶ **Chipkill memory:** Integrated into the Enterprise X-Architecture chipset, allows multiple errors to be corrected with low-cost industry standard error correcting code (ECC) memory



- ▶ **Memory ProteXion:** In combination with Chipkill memory, corrects virtually all the errors that a system is likely to encounter.
- ▶ **Memory mirroring:** Mirroring similar to RAID-1 disk mirroring, simultaneously writes data to two independent memory cards but only reads from the active memory card.

For more information about Enterprise X-Architecture, see:

<http://www.ibm.com/servers/eServer/xseries/xarchitecture/enterprise/index.html>

### 3.2.4 IBM Linux support

IBM systems are built on open standards, making them interoperable with each other and with many third-party systems. As a result, these systems become building blocks that connect together in standard ways that help protect existing investments while providing the flexibility for IT systems to grow in an evolutionary, nondisruptive way. They also provide you the flexibility to choose from a broad portfolio of infrastructure to build the solution that matches your business needs.

An example of the IBM commitment to open standards is the comprehensive support of Linux across IBM product lines. Linux, an open-standards technology, is one of the world's fastest-growing operating systems. The growth of Linux provides users of IBM systems access to an ever-growing pool of business solutions developed for Linux environments.

Linux is available all across IBM product lines, including:

- ▶ **Systems:**
  - IBM BladeCenter JS20
  - IBM System i systems
  - IBM System p systems
  - IBM System z systems
- ▶ Linux on Intel processor-based servers that support core business applications:
  - IBM eServer Cluster 1350
  - IBM eServer xSeries
- ▶ Linux on AMD processor-based servers to support 32-bit and 64-bit applications, for example, IBM eServer 326
- ▶ TotalStorage Products that support Red Hat distributions

IBM has a large Linux development team and maintains Linux Technology Centers around the globe, all charged with the mission to support and promote ongoing evolution of Linux as a platform for business computing. IBM also provides financial and technical support to the Linux community and various open standards organizations.

For more information about IBM Linux support, see:

<http://www.ibm.com/linux>

### 3.2.5 IBM Power Architecture

Power Architecture refers to the design and technology of the IBM POWER family of microprocessors. The Power Architecture family of processors ranges from embedded PowerPC microprocessor cores and microprocessors to POWER5 system processors. IBM product lines feature the latest IBM implementation of Power Architecture, POWER5 processors.

POWER is a collaborative technology, meaning that business partners and other vendors can participate with IBM in designing and testing POWER processors. Such collaboration has accelerated POWER innovations and marketplace acceptance, resulting in more solutions being available on AIX and Linux for clients to choose from. Power.org, a standards group to promote Power Architecture as the preferred open standard hardware development platform for electronic systems, opens a whole new dimension of innovative POWER technology-based solution options. For more information, see *About: Power.org - An interview with Bill Dykas and Mark Ireland*, on the Web at:

<http://www.ibm.com/developerworks/library/pa-powerint/>

IBM systems built with POWER microprocessors bring you performance, reliability, high availability, and computing power at an economical price. IBM System p5™ Express, a UNIX system with POWER5+™ microprocessor technology, provides high performance computing capabilities for small to medium sized businesses, and for branch locations that are running business critical database applications in retail, wholesale, distribution, and financial services.

Power Architecture provides you with investment protection by design. IBM continues to invest in this technology, so that your investment in POWER systems is viable for the long term.

For additional information about Power Architecture, see:

<http://www.ibm.com/power>

For additional information about Power processor-based systems, see:

<http://www.ibm.com/servers/power>

### 3.3 IBM System families

To serve businesses of various sizes and requirements, IBM offers several families of systems and a comprehensive line of storage products. IBM Systems are designed to work together synergistically and with associated middleware to form the best possible platforms for business applications. They are built on open standards and designed to be easily integrated into existing and new IT infrastructures. IBM products incorporate proven technologies, such as those described in 3.2, “Technologies” on page 40, to provide IT infrastructure that helps you and your business:

- ▶ Pursue new opportunities created by the on demand marketplace while protecting current investments in IT
- ▶ Improve responsiveness to changing business requirements
- ▶ Control operations costs
- ▶ Protect business and customer data in a highly secure IT environment
- ▶ Achieve the resilience required to compete in a 24x7 global marketplace.

Figure 3-4 on page 47 shows the breadth of the IBM server and storage product lines.

## Infrastructure for maximizing solution value



### ▪ Shared technology through all IBM systems

### ▪ Common design principles

- ✓ Build on IBM mainframe innovation, cascaded throughout
- ✓ View from a holistic, system-level perspective
- ✓ Leadership in industry-standard environments
- ✓ Make the most of the world of open standards
- ✓ Integrated to better enable complete business solutions

Figure 3-4 IBM Systems

## BladeCenter

With its standards-based and scalable design, BladeCenter integrates servers, storage, and networking to help you reduce complexity, simplify IT management, and reduce IT costs. BladeCenter supports Intel, POWER, and AMD processor-based 1-to-4-way blades, which collectively can support Linux, Microsoft Windows, AIX, and UNIX operating systems in a single chassis. A maximum of 14 hot swappable 2-way blades, or seven 4-way blades, can be configured in a single chassis, similar to books stacked in a bookshelf. Each blade server is an independent server with its own processors, memory, storage, network controllers, operating system, and applications. A blade server simply slides into a bay in the chassis and plugs into a mid-plane or back plane. Each blade shares power, fans, floppy drives, switches, and ports with other blade servers to save floor space and reduce cabling. BladeCenter eliminates the tedious tracking of cables just to add or remove a server and can reduce cabling by up to 83%.

BladeCenter provides the following:

- ▶ A managed infrastructure that helps maximize resource productivity and minimize IT and network administration costs
- ▶ Efficient use of data center floor space with up to 84 2-way blades or up to 42 4-way blades in a 42-unit rack
- ▶ Simplification of scale-out infrastructure
- ▶ Integration of enterprise-class servers, networks, switching, storage, and applications
- ▶ Autonomic computing innovations such as smart systems management to support intelligent systems that can deliver near-zero downtime
- ▶ IBM Director, an integrated suite of tools that provides a single point of management and automation. IBM Director can integrate with and complement higher-level systems management offerings, can manage non-IBM hardware, and can help you simplify the management of heterogeneous hardware environments.



For more information about BladeCenter, see:

<http://www-03.ibm.com/systems/bladecenter/>

## IBM eServer Clusters

IBM eServer Clusters provide leading-edge Linux cluster solutions that combine the best of IBM, open standards, and third-party technology. Clusters are available with a broad range of server, storage, and interconnection choices. For example, IBM introduced Cluster 1350 support for the enhanced IBM eServer 326 based on AMD processor technology and for BladeCenter JS20 PowerPC processor-based servers. In addition, support for xSeries 336 and 346 and BladeCenter HS20 servers has been extended to include models with Intel Xeon® processors running at speeds up to 3.60 GHz. Storage and cluster interconnection offerings give users outstanding flexibility to configure Cluster 1350 systems to meet their specific requirements.

IBM eServer Cluster 1600 systems consist of IBM POWER5 and POWER4™ symmetric multiprocessing (SMP) servers that run AIX 5L or Linux. Cluster 1600 is a highly scalable cluster solution for:

- ▶ Large-scale computational modeling and analysis
- ▶ Large databases and business intelligence applications
- ▶ Cost-effective datacenter, server, and workload consolidation

Cluster 1600 systems are deployed on Ethernet networks or with the IBM High-Performance Switch. They are frequently managed with Cluster Systems Management software, a tool that is designed to streamline initial deployment and ongoing management of cluster systems.

## System i systems

The “i” in System i is for “integrated.” The design of System i systems integrates hardware, operating systems, middleware, database, security, systems management, and storage into one easy-to-manage system that can be deployed and updated quickly.

The “i” is also for “innovation.” Over the last two years, IBM invested more than \$1 000 000 000 in innovations for iSeries hardware, operating systems, and solutions development. These innovations help System i systems maintain industry leadership as complete, integrated systems that are designed to run thousands of the world’s most popular business applications in a reliable, secure environment. At the same time, innovative System i systems help businesses simplify IT infrastructure, reduce total cost of computing, and accelerate ROI. For example:

- ▶ System i systems can support four operating systems simultaneously: i5/OS, Linux, AIX 5L, and Microsoft Windows (with IXA or IXS). System i systems integrate solutions from multiple application environments (WebSphere, Java and Domino®) in a single system.
- ▶ With advanced virtualization features and the ability to support up to 10 dynamic LPARs per processor, POWER5 technology-based System i systems can consolidate workloads on a single, resilient server to help simplify your IT infrastructure.
- ▶ The new i5 I/O processor (IOP) for a SAN load source eliminates the requirement for an internal load source, helping improve system availability and optimize use of floor space.
- ▶ i5/OS eases system security management by providing five levels of security. The five levels of security range from minimal to an enhanced level. This means that System i systems can operate at the C2 level of trust that is required by the U.S. government. A



security foundation that is offered with i5/OS includes system integrity with digital signature and object signing, a Digital Certificate Manager, and password protection.

- ▶ i5/OS implements multiple safeguards to secure network connections and transactions. These safeguards include:
  - Secure Sockets Layer (SSL): The industry standard for enabling applications for secure communication sessions over an unprotected network
  - Digital Certificate Management: Used to enhance network security
  - Enterprise Identity Mapping (EIM): Helps manage multiple user registries throughout an enterprise.
  - Network Authentication Service: Allows use of Kerberos protocol to provide authentication in a unsecure network.
  - Virtual private network: Allows a company to extend its private intranet security over a public network, such as the Internet
  - IP filtering and Network Address Translation: These capabilities act as a firewall to protect the internal network from intruders.
- ▶ System i systems have proven ROI. In 2005, IDC studied 12 companies in the United States, Europe, and Asia that had deployed iSeries to consolidate IBM i5/OS, Linux, AIX 5L, and Windows environments. Key findings included:
  - Three-year ROI of 258% on average across sites
  - Payback period of just over five months.<sup>1</sup>
- ▶ System i systems that have more than a decade of documented achievement in helping to lower total cost of ownership
- ▶ Clients continue to choose System i systems: Over 400 000 iSeries and AS/400® servers are in use in more than 100 countries.
- ▶ Value-added resellers continue to choose System i systems: For the seventh consecutive year, the System i won the VARBusiness Midrange Server Award, August 2005. For more information, see the VARBusiness Web site at:

<http://www.varbusiness.com>

For more information about the System i systems, see:

<http://www.ibm.com/series>

## System p

The “p” stands for “performance.” IBM System p5 systems with IBM POWER5 processors offer jaw-dropping performance. When introduced by IBM, for example, System p5 model 595 systems achieved more than three times the performance of the closest competitor, according to disclosed TPC-C results. For more information, see

<http://www.tpc.org>

Also, p5 systems took the lead in more than 70 key computing performance benchmarks. For more information, see

<http://www.ibm.com/systems/p/benchmarks/>

The introduction of new System p5 servers with POWER5 processors marks the continued commitment of IBM to extend its leading 64-bit technology to organizations of all sizes and leads the industry into a new era of UNIX computing. Differentiating characteristics of the System p5 and pSeries systems include:

<sup>1</sup> An IDC White Paper, sponsored by IBM, Infrastructure Simplification and the ROI of Consolidating Windows, Linux, and AIX 5L Applications on IBM eServer iSeries Systems, September 2005



- ▶ System p5 systems architecture provides a foundation for a virtualized computing infrastructure.
- ▶ System p5 systems maintain the reputation of mainframe security. Every p5 and pSeries system includes IBM mainframe-inspired self-healing capabilities that contribute to system ease-of-use, reliability, availability, and serviceability.
- ▶ System p5 systems support binary compatibility of software applications through multiple generations of hardware by continuing the evolution of AIX, the award-winning, standards-based UNIX operating system for System p5 systems.
- ▶ AIX has the capability to manage enterprise-class servers and the flexibility to work well with Linux. AIX 5L, the newest version of AIX, supports open and emerging standards such as Linux and Java 2 Version 1.3. It supports 64-bit POWER processors while retaining compatibility with 32-bit applications.
- ▶ Advanced authentication, accountability, administration, and encryption capabilities of System p5 systems under AIX 5L allow you to implement system-wide security policies along with controls that are configurable on a user-by-user basis. AIX 5L provides security for an open environment, with C2 and B1 secure systems, native Kerberos V5 network authentication, and more on top of IPsec security protocols for VPN and SSL for Web serving.
- ▶ IBM High Availability Cluster Multiprocessing (HACMP™) for AIX 5L V5.3 (HACMP V5.3) helps achieve business continuity that reliable hardware alone cannot provide. HACMP monitors the entire system, quickly and automatically restarting an application on designated backup hardware when a failure or service degradation occurs. The System p5 systems and HACMP provide the highest level of protection and availability for business critical applications.



For more information about the System p5 family, see:

<http://www.ibm.com/pseries>

## xSeries

The xSeries product line can help improve the economics of your IT environment by combining technology innovation with industry-standard components. xSeries employs an Intel-based architecture enhanced with innovative technology. The combination enables pay-as-you-grow solutions that deliver availability, simplified manageability, outstanding performance, and scalability to help you build a cost-effective, flexible IT infrastructure for competitive advantage. xSeries servers are available in up to 16-way configurations. In the xSeries family, IBM technology enhances industry-standard processors to provide:

- ▶ Choice of 32- or 64-bit performance, allowing clients to run 32-bit operating system applications today while having the flexibility to upgrade over time.
- ▶ Higher levels of memory expendability and greater choice of I/O.
- ▶ Intelligent system and workload management tools.
- ▶ Memory technologies, such as Chipkill, redundant bit steering, memory mirroring, and hot-plug memory, that continue to advance Intel-based servers toward continuous operation.
- ▶ Recent xSeries servers are now using the second generation of IBM Xtended Design Architecture (XDA) to provide even greater performance, availability, manageability, and flexibility. These servers join the IBM Express Portfolio™, which is designed to meet the needs of start-up, small, and mid-sized businesses.



For more information about xSeries servers, see:

<http://www-03.ibm.com/servers/eserver/xseries/>

## System z9 and zSeries

The System z9™ and zSeries product line offers a “mainframe” that incorporates open standards and the latest technologies. IBM mainframes have a 40-year history of world-class hardware innovation, software innovation, and core competencies such as business resiliency and application availability. System z9 and zSeries systems provide businesses with an industry leading combination of availability, reliability, security, and resilience. This combination is especially suited to businesses, such as retailers, that require high levels of availability, high processing capacity, and the ability to reallocate resources to match changing business priorities. Characteristics of System z9 and zSeries systems include:

- ▶ Hardware, operating systems, and middleware elements interoperate to provide world-class security, data, and application availability, and disaster recovery capabilities.
- ▶ Highest levels of security certification. zSeries z800, z900, and z990 systems have earned Common Criteria EAL5 certification for the security of LPARs. Additionally, zSeries encryption has earned Federal Information Processing Standard (FIPS) 140-1 Level 4 certification required by government agencies.
- ▶ A highly optimized operating environment achieves system utilization levels of 80% and often higher, helping to increase ROI, lower total cost of ownership (TCO), and improve business productivity.
- ▶ Ability to scale up and out concurrently: System z9 and zSeries systems scale up to handle massive transaction and data serving requirements and scale out to provide virtual servers to support infrastructure consolidation and simplification.
- ▶ The coexistence of 64-bit and 32-bit processing is supported, with full upward compatibility Virtualization Capabilities.
- ▶ Highly responsive, Autonomic and Intelligent Workload Management.
- ▶ A platform for the transformation and integration of existing applications and data that is unmatched.
- ▶ Specialty engines that integrate well with existing assets
- ▶ Linux support on System z9 and zSeries systems opens infrastructure and provides access to a broad range of innovative solutions that can help lower TCO while meeting business needs.
- ▶ System z9 systems support extensions to Z-Architecture that increase performance, extend expansion options, and integrate z9 systems into complete hardware and software environments.



Z-Architecture provides System z9 systems with a complete 64-bit execution model, which increases the storage capacity for constrained systems, improves scalability, and provides migration transparency for applications built for the 64-bit world. Z-Architecture provides System z9 systems with advanced virtualization technology so that companies who want “mainframe” security have an ideal platform on which to integrate applications and data and on which to consolidate selected UNIX, Windows, and Linux workloads.

For more information about System z9 and zSeries, see:

<http://www.ibm.com/servers/eserver/zseries/>

For more information about z-Architecture, see:

## Storage

IBM System Storage and TotalStorage families provide a comprehensive array of storage products, including physical storage, networking products, resiliency solutions, and storage management software. IBM storage products are designed to help businesses, regardless of their size, gain better business insight through improved access to information. IBM storage products can also help transform the economics of enterprise storage by enabling users to simplify their infrastructure, protect their data and efficiently manage information throughout its life cycle.

IBM Figure 3-5 identifies the various IBM storage families.

**IBM System Storage and TotalStorage Portfolio –  
A solid foundation for On Demand Business**

- **IBM TotalStorage DS family**  
The industry's broadest range of disk storage systems
- **IBM System Storage and TotalStorage Tape family**  
Solutions for data archiving, backup, and disaster recovery
- **IBM TotalStorage SAN family**  
Complete storage area networking solutions
- **IBM TotalStorage Open Software family**  
Comprehensive, flexible software to help address storage management challenges
- **IBM TotalStorage Resiliency family**  
Hardware and software infrastructure to keep the business running
- **IBM System Storage N Series**  
Complete network-attached storage solutions

*Figure 3-5 IBM storage families*

IBM storage families feature:

- ▶ POWER5 processors and enhanced controller software to improve storage price and performance for high performance, mid-range, and low-cost entry level storage systems
- ▶ Flexible storage management software that supports storage infrastructure management, hierarchical storage management, archive management, and storage virtualization
- ▶ Linux support
- ▶ The IBM TotalStorage SAN Volume Controller, which supports IBM and most other major vendors, including EMC, HP, and Hitachi
- ▶ The TotalStorage Productivity Center with Advanced Provisioning, which is an integrated storage provisioning solution that was designed to simplify and automate complex provisioning and thereby enable provisioning on demand



- ▶ Virtualization capabilities that can pool storage resources to help improve utilization, simplify provisioning, eliminate backup windows, and isolate applications from changes to storage infrastructure
- ▶ Storage management software that performs predictive analysis to help prevent outages
- ▶ A range of information management capabilities from simple archive management to archive and protect key information and hierarchical storage management to manage and align data with value.
- ▶ Shared technology with IBM systems and storage products to enable greater integration of information and processes

For more information about IBM System Storage and TotalStorage, see:

<http://www.ibm.com/servers/storage/index.html>

Archived

# Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this Redpaper.

## IBM Redbooks

For information about ordering these publications, see “How to get IBM Redbooks.” Note that some of the documents referenced here may be available in softcopy only.

### **Linux**

*Linux Handbook A Guide to IBM Linux Solutions and Resources*, SG24-7000

### **On demand operating environment**

*Enable the On Demand Store with IBM Store Integration Framework*, SG24-6698

*On demand Operating Environment: Creating Business Flexibility*, SG24-6633

*On Demand Operating Environment: Managing the Infrastructure (Virtualization Engine Update)*, SG24-6634

### **Virtualization**

*Virtualization and the On Demand Business*, REDP-9115

## Online resources

These Web sites and URLs are also relevant as further information sources:

- ▶ IBM Institute for Business Value  
[http://www.ibm.com/services/us/bcs/html/bcs\\_whatwethink.html](http://www.ibm.com/services/us/bcs/html/bcs_whatwethink.html)
- ▶ Retail On Demand  
[http://www.ibm.com/businesscenter/venturedevelopment/us/en/featurearticle/gcl\\_xmlid/18459/nav\\_id/mergeopp](http://www.ibm.com/businesscenter/venturedevelopment/us/en/featurearticle/gcl_xmlid/18459/nav_id/mergeopp)
- ▶ Retail Solutions from IBM  
<http://www.ibm.com/industries/retail/index.jsp>
- ▶ Why IBM Systems  
<http://www.ibm.com/systems/why/>

## How to get IBM Redbooks

You can search for, view, or download Redbooks, Redpapers, Hints and Tips, draft publications and Additional materials, as well as order hardcopy Redbooks or CD-ROMs, at this Web site:

[ibm.com/redbooks](http://ibm.com/redbooks)

## Help from IBM

IBM Support and downloads

[ibm.com/support](https://ibm.com/support)

IBM Global Services

[ibm.com/services](https://ibm.com/services)

Archived





# Retail Solutions: Technology Innovation That Matters



## **Optimizing retail solutions with IBM systems and technologies**

The retail industry is evolving into a marketplace of extremes. Customers seek low cost for basic goods at the low end of the competitive spectrum, yet at the high end pay premium prices for goods that offer high personal value. Undifferentiated competitors in the middle are fading away.

## **Using IBM technology to maximize retail business performance**

Retailers are meeting these and other challenges by striving to differentiate brand propositions, fashion distinctive shopping experiences, and optimize business processes throughout every element of their value chain. Retailers are achieving these goals with the help of IBM retail solutions and IBM infrastructure to run them on.

## **Tuning IT infrastructure for On Demand Business**

Using examples based on real customer experiences, this Redpaper describes IBM retail solutions available to help retailers shape operations to meet the challenges and opportunities emerging in the industry landscape. Customer examples also illustrate how infrastructure from IBM can help retailers maximize the value of their business solutions.

This Redpaper is intended for CIOs and others that are responsible for evaluating retail business solutions, and for IBM teams who sell, implement, and support them.

## **INTERNATIONAL TECHNICAL SUPPORT ORGANIZATION**

## **BUILDING TECHNICAL INFORMATION BASED ON PRACTICAL EXPERIENCE**

IBM Redbooks are developed by the IBM International Technical Support Organization. Experts from IBM, Customers and Partners from around the world create timely technical information based on realistic scenarios. Specific recommendations are provided to help you implement IT solutions more effectively in your environment.

**For more information:**  
[ibm.com/redbooks](http://ibm.com/redbooks)