Service Oriented Architecture (SOA) Finale
Trends and Directions

April 5, 2007

WebSphere Live! for SOA

AUTONOMY

AUTONOMY

The Value of Re-usable Assets

The Example of Toyota

Baseline	61% Reuse	43% Reuse
		
US $13,870	US $19,295	US $13,845
Corolla CE	Camry LE	Scion xA

The Challenge

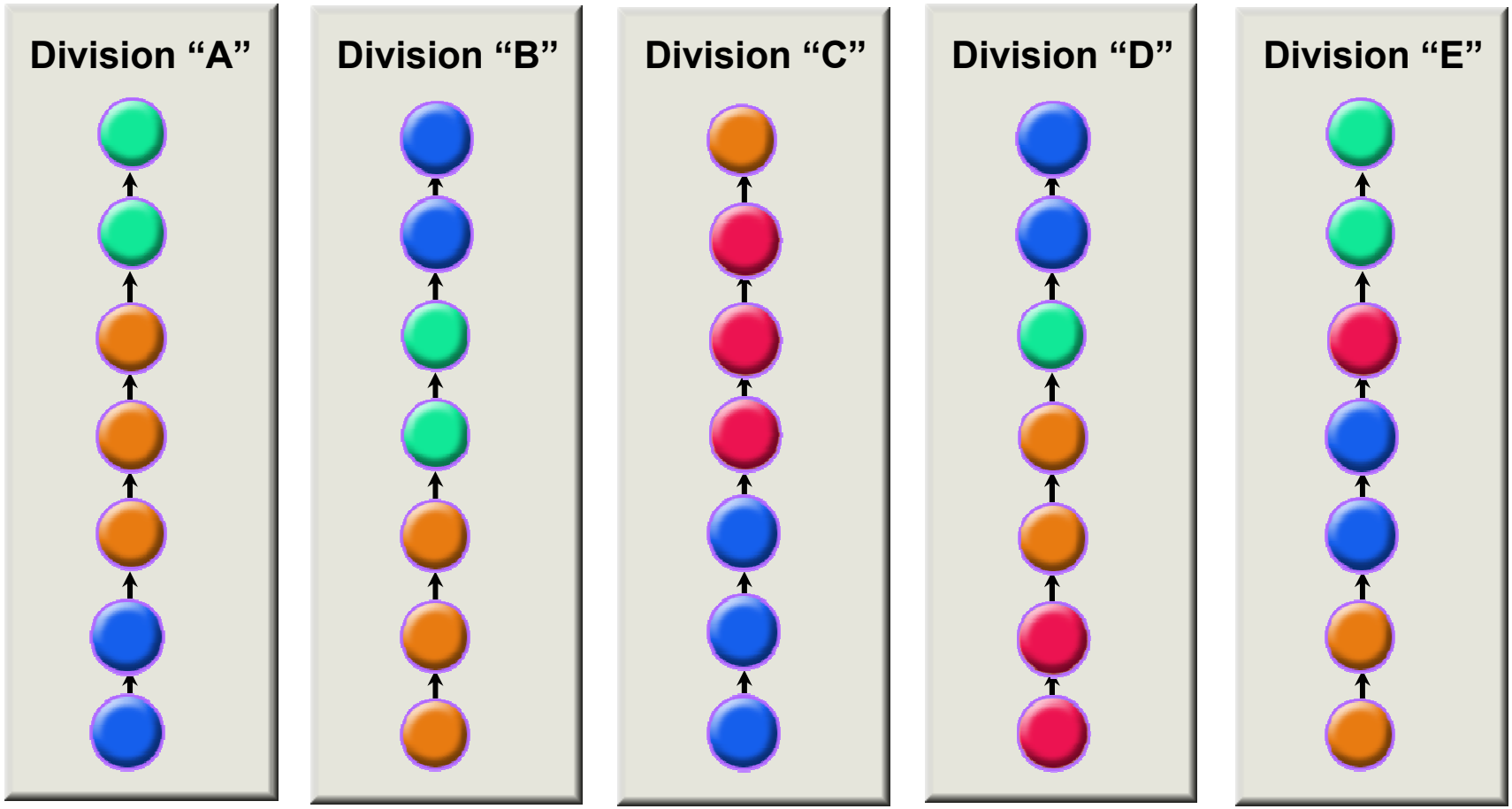
*"In 2005, **76% of I.T budgets where spent on maintenance**, leaving only 24% for new investments."* Forrester Research*

Innovation	Top line growth	Operational Excellence	Reduce costs	Gain market share

- *Complex processes & systems*
- *Complex applications & interfaces*
- *Difficult to adapt quickly*
- *Large portion of IT budget spent on maintenance, not on new value add investments*
- *Duplicate services and difficult to govern*

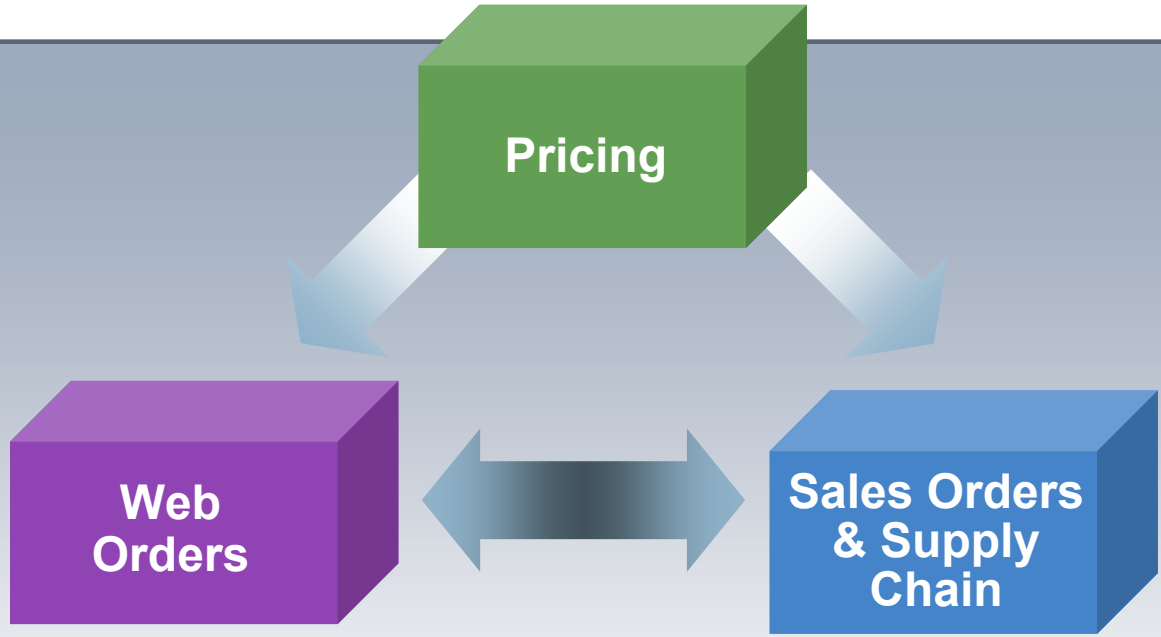
Legacy Claims Database	Auto Claims System	Home Claims System	Life Insurance Claims	Business Partner Claims System	…

The Vertical Silo Problem



Older Architectures Do Not Support Flexibility

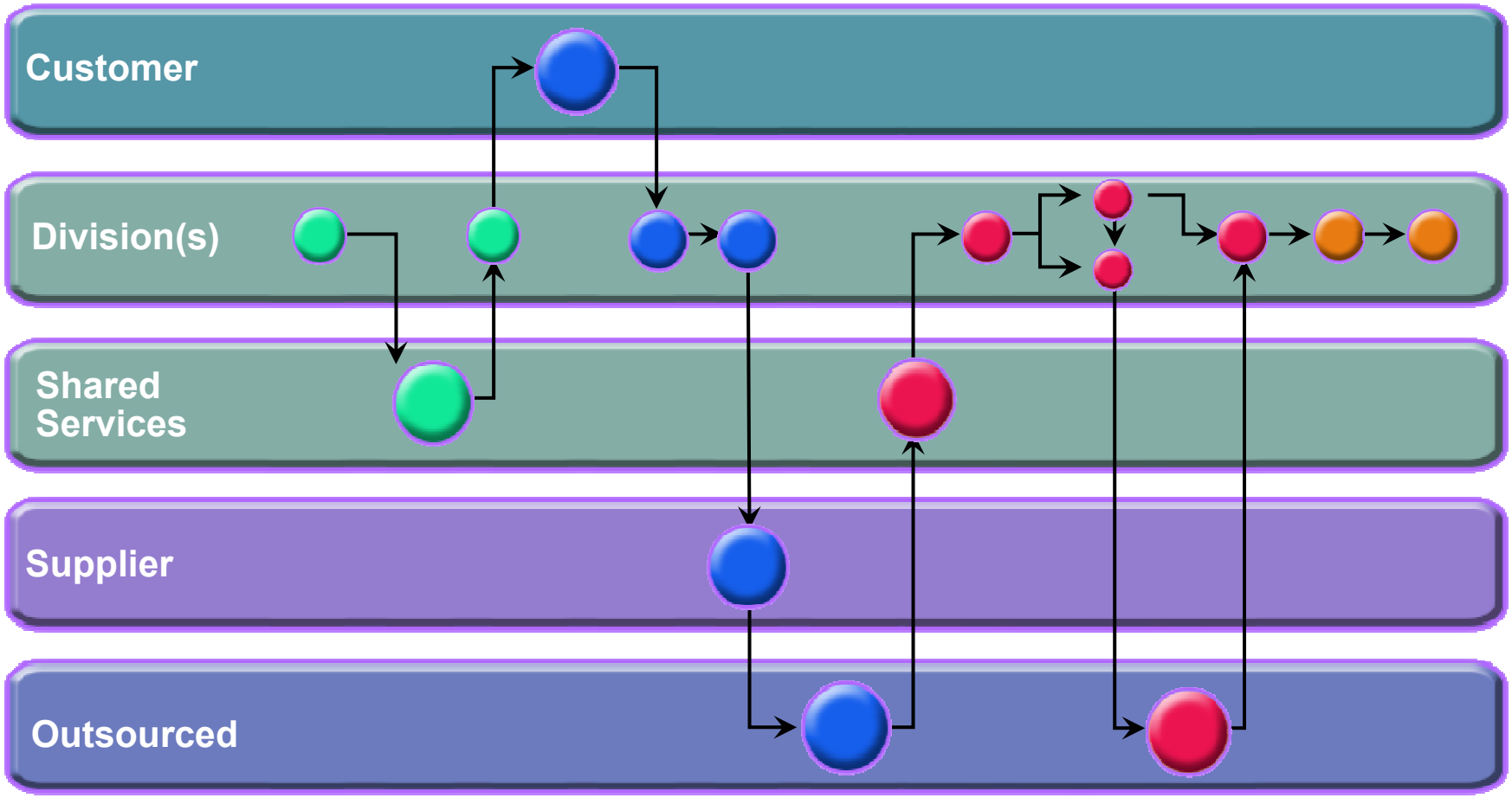
Required by Current Business Environments



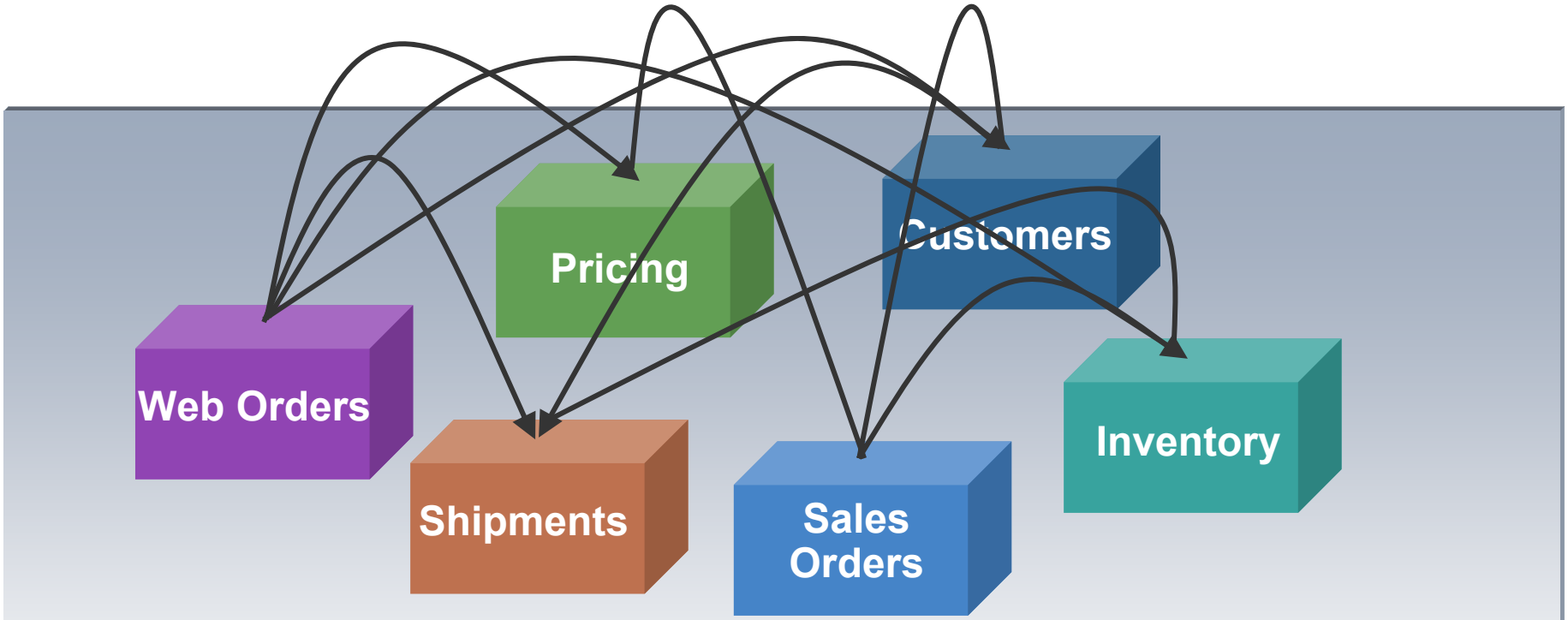
Monolithic Business Applications – built historically

- Must periodically synchronize on inventory information
- Pricing information into each inserted differently based on application structure
- No common customer database, inventory or flexibility in business processes

Where Are We Heading – Service Oriented Architecture



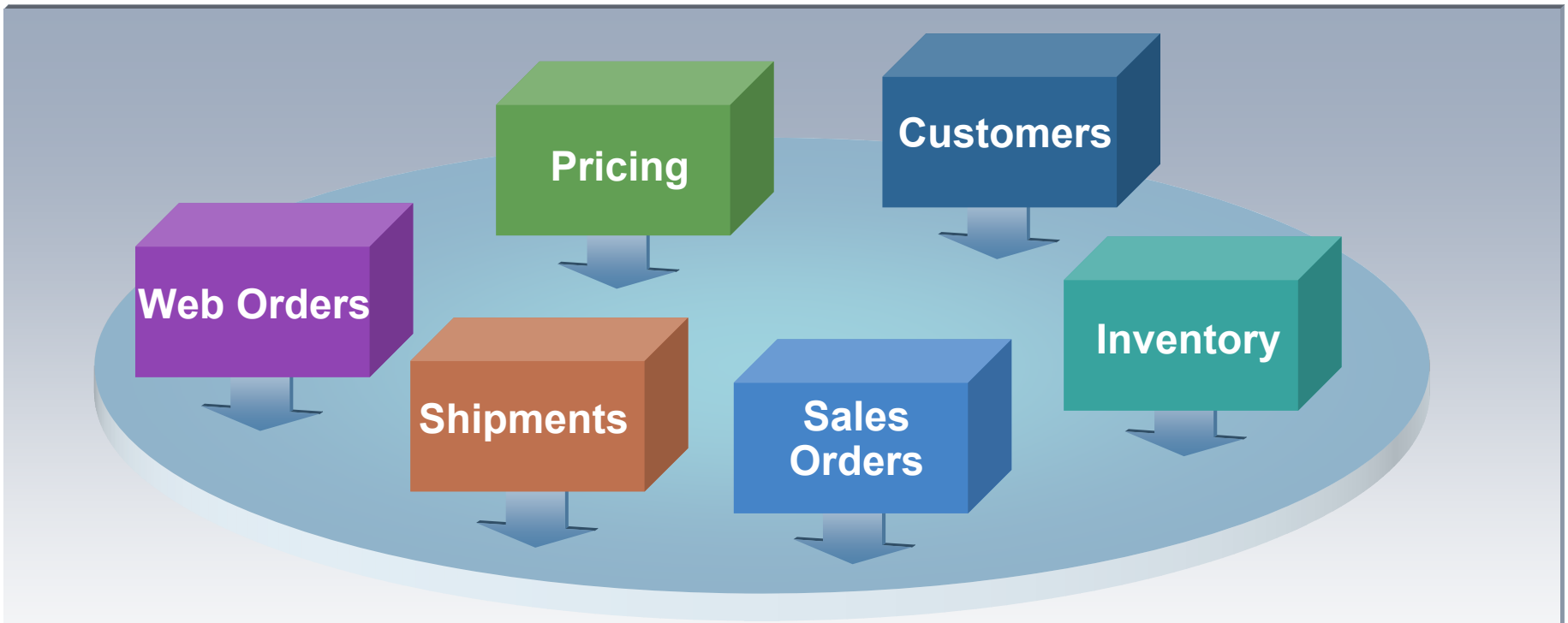
Component-based Architecture is Not Enough



Services defined as units of business logic, but…

- Flow of control – bound into service logic
- Transformation of data formats bound into service logic
- Tight coupling between services makes them fragile

Service Oriented Architecture
Moves IT Logic Out of Services



Services defined as units of business logic separated from…

- Flow of control and routing
- Data transformation and protocol transformation

The basics: What is SOA?

… a service?

A **repeatable business task** – e.g., check customer credit; open new account

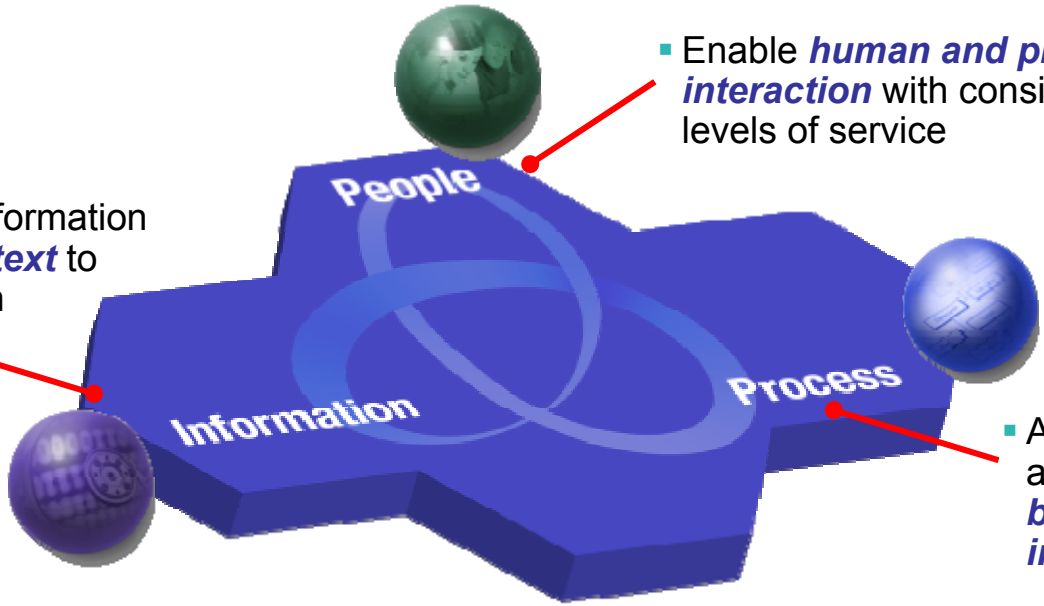
… service oriented architecture (SOA)?

An IT **architectural style** that supports integrating your business as linked services

"SOA impacts every aspect of IT and business."

Gartner

Business Centric SOA Starts with Your Most Critical Business Pain and Enables You to Build for Flexibility



- Enable ***human and process interaction*** with consistent levels of service
- Deliver trusted information in ***business context*** to enable innovation
- Achieve greater efficiency and effectiveness with ***business model innovation***

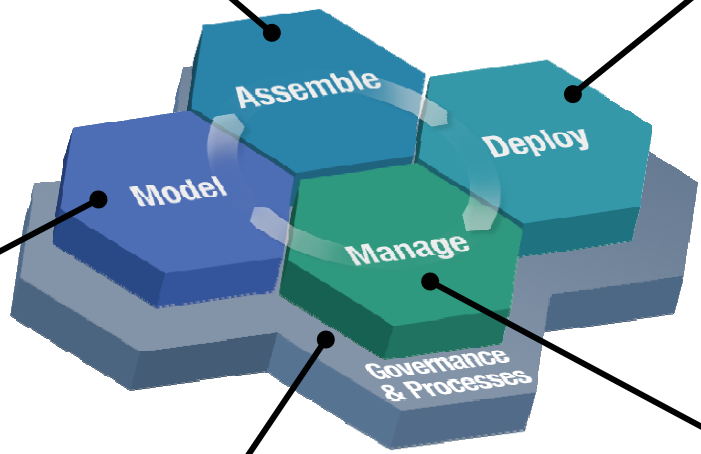
"Pick business processes with pain points that the business clearly recognizes — processes for which the business most clearly needs end-to-end visibility, control, insight, and flexibility"

FORRESTER®

The SOA Lifecycle

Assemble
Assemble existing and new assets to execute and manage business processes

Deploy
Deployment of models, policies and assemblies to realize business intent



Model
Capture, simulate, analyze, and optimize business models to reduce risk and increase flexibility

Governance & Processes
Alignment of strategy and operations across business and IT in support of business objectives

Manage
Real-time visibility and analysis of business information for timely and coordinated action

Why Look at Business Process Management?

Can you visualize how work gets done? Do you know what people do the most (you may be surprised)? Are people working effectively?

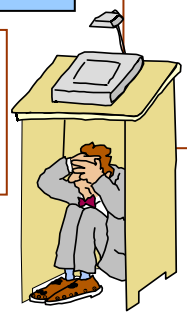
Is it easy to reach into, "to see", and measure the business? In real-time? What can you do with those measurements?

How do you decide what to change? How do you "business case" changes?

Is the process fast enough from start to finish?

Is there too much manual work? too much paper? too many errors?

Is it easy to change how you work? Can you analyze changes before making them? Are changes a programming effort or a business analyst effort?

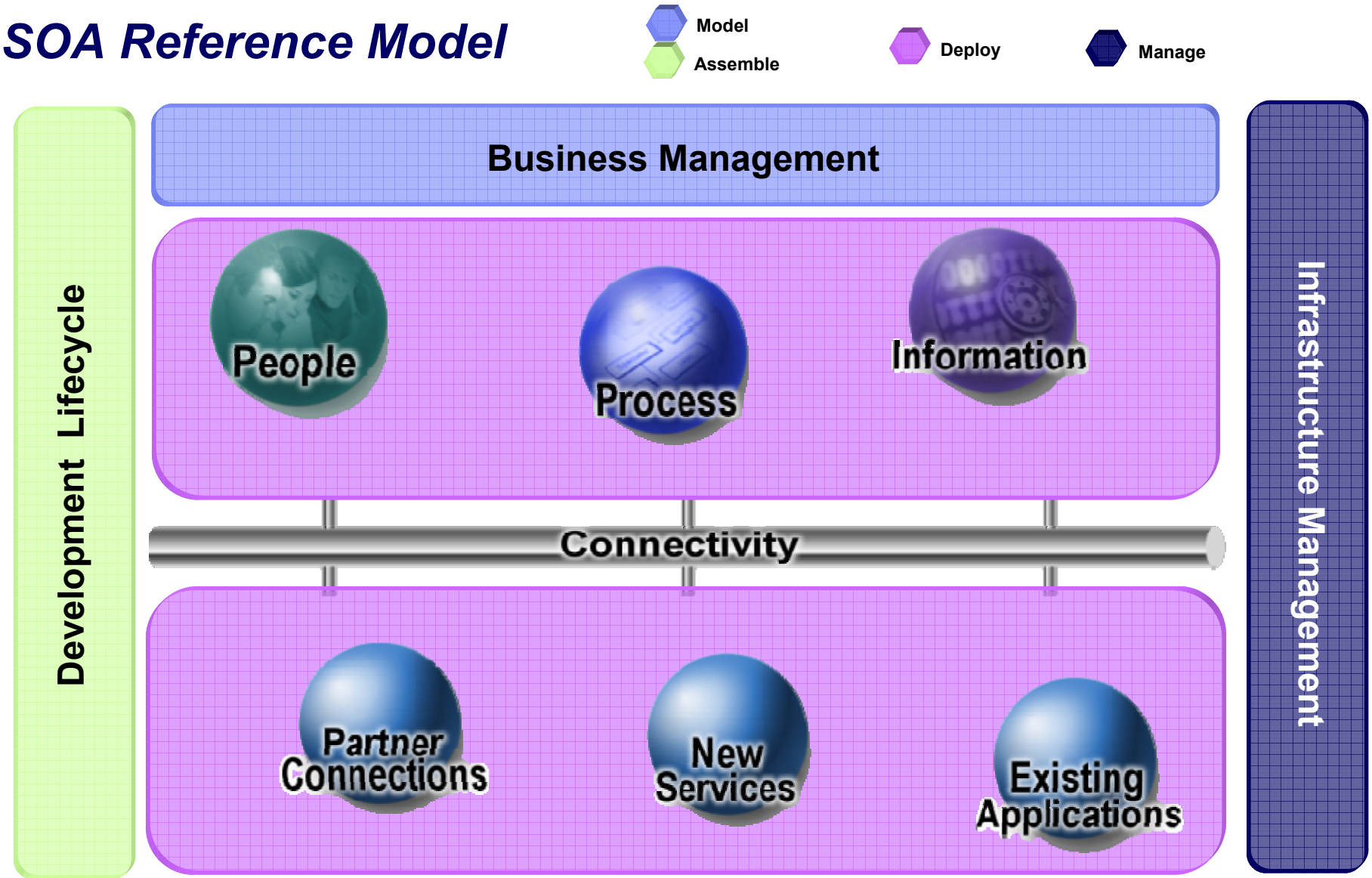


Need to ensure policies and business rules followed?

Is audit a concern?

Is the connectivity infrastructure brittle? Hand-coded?

SOA Reference Model



WebSphere Business Modeler

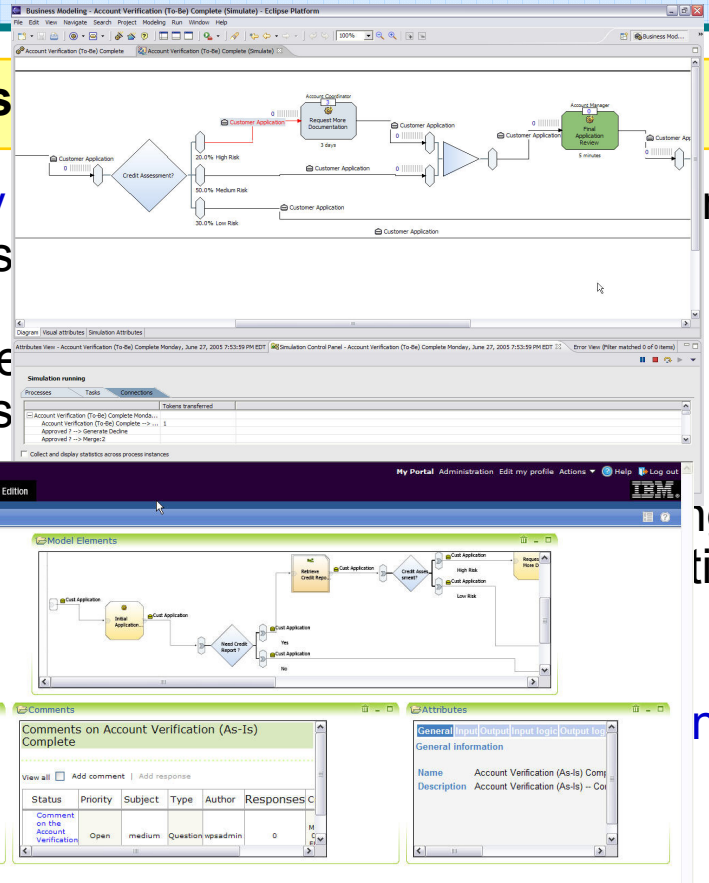
& Business want to understand and change their operational processes quickly…
…but their processes are: misunderstood, inconsistent, hard-wired, or inflexible

Features

- Graphically Model Processes
- Simulate and Analyze
- Collaborate and Web Publish
- Export business and data models for use in IT deployment
- Import existing process pictures done in Visio as a starting point for true business modeling
- Rich edit support:
  Process, Rules, Information, Observation, Resource, Report, Organization…

Benefits

- Quickly
  busines
- Validate
  busines



WebSphere Integration Developer

Business want to understand and change their operational processes quickly…
…but their processes are: misunderstood, inconsistent, hard-wired, or inflexible

Business want to deploy automated processes fast
…but most do not have a way to do this

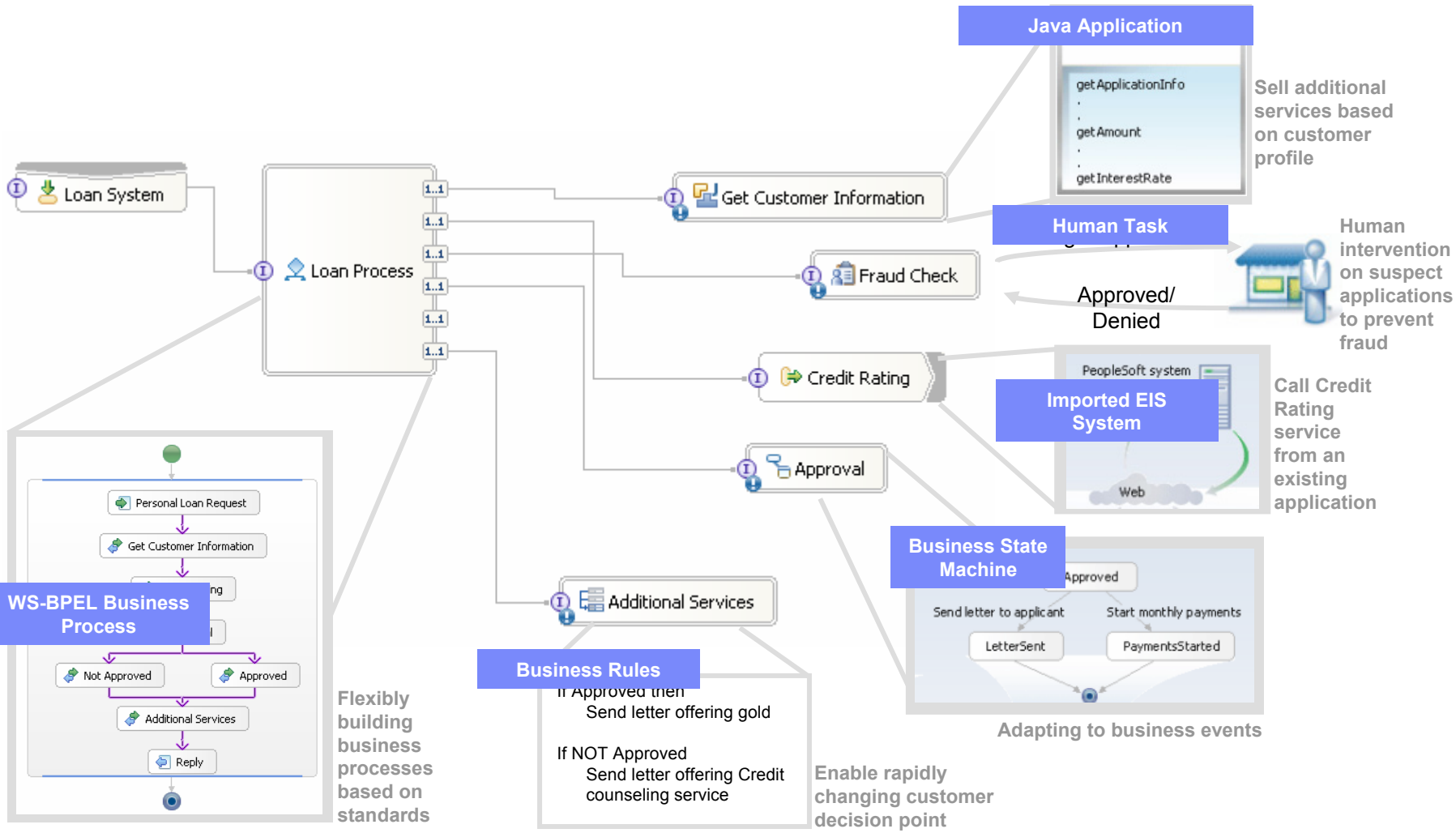
Features

- Development Tool for Process Server and ESB applications
- BPEL Without Coding
- Dynamic processes and assembly
- Business rules to determine the process flow
- Supports native human workflow

Benefits

- Training on a single, multipurpose platform materially improves productivity of staff and reduces education expense
- Reduce application development and maintenance costs by changing, adding or deleting business process rules rather than rewriting applications

Assembling The Components



WebSphere Process Server

Business want to understand and change their operational processes quickly…
…but their processes are: misunderstood, inconsistent, hard-wired, or inflexible

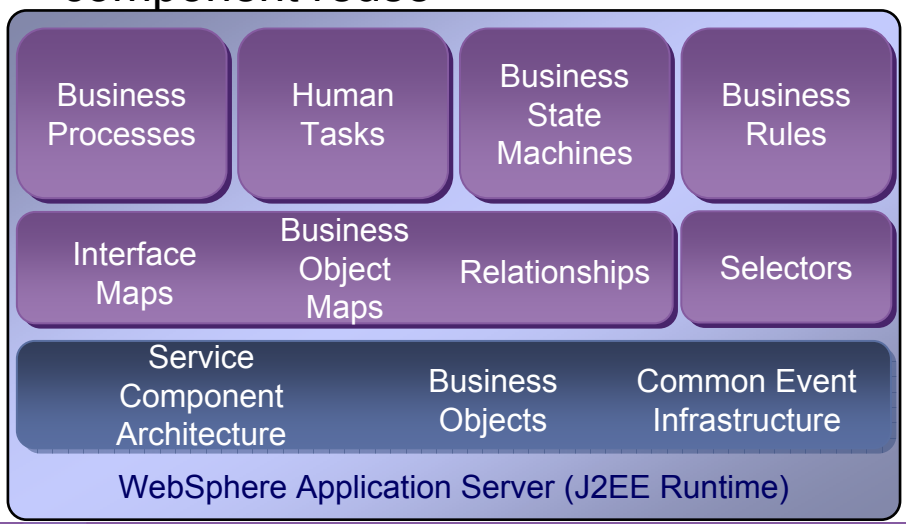
Business want to deploy automated processes fast
…but most do not have a way to do this

Features

- A Single Process Server built upon WebSphere Application Server
  - Integrated runtime for all SOA based process automation
  - Runtime engine for all the components defined in Assemble
  - SCA & CEI support
  - Supports compensation, fault handling, business objects, rich human interaction
- Integrated ESB for Range And Reach

Benefits

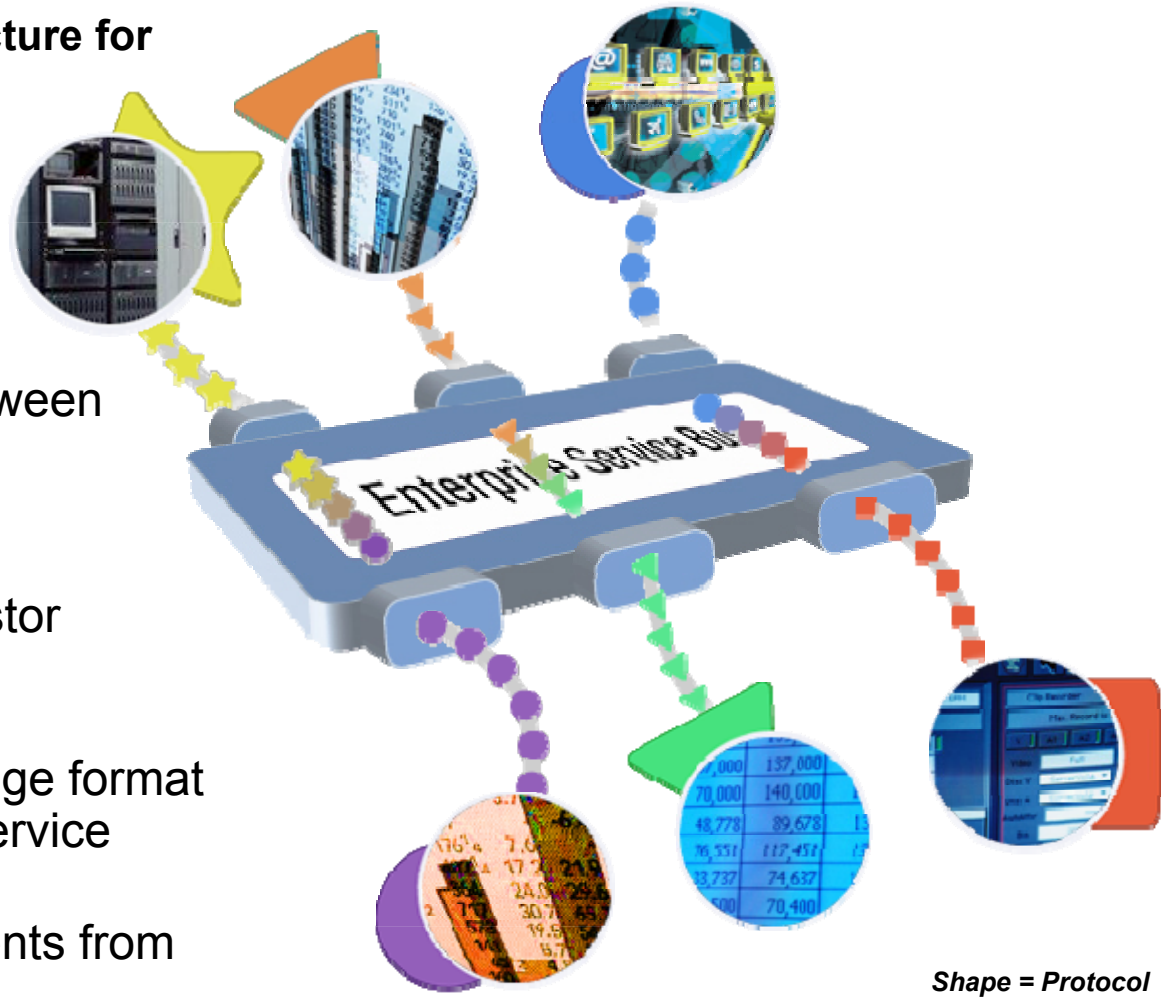
- Reduce cost to deploy function through simplicity, interoperability and component reuse



What is an Enterprise Service Bus (ESB)?

Flexible connectivity infrastructure for integrating applications and services to power your SOA

- Built on **MESSAGING**
- **ROUTING** messages between services
- **CONVERTING** transport protocols between requestor and service
- **TRANSFORMING** message format between requestor and service
- **HANDLING** business events from disparate sources



Shape = Protocol

Color = Data type

Hudson's Bay Company

Vision Automate product information process by moving off paper-based system

Challenge

- ✓ Identified a requirement for a more stringent, policy driven (enforced) product return application.
- ✓ Required access to both current and historical sales and return transactions.
- ✓ Existing process for capturing store transactions could be anywhere from current to 2 ½ hours delayed.
- ✓ Identified that most fraudulent transactions occurred within ½ hour of the original sale transaction.

Solution

- ✓ Each store connects to WBI Message Broker via MQe for TLOG transfers. Data warehouse built with connections to mainframe and fraud detection application which is web service enabled back to the store.
- ✓ WBI Modeler used to model process and define artifacts.

"This is really 'COOL' stuff. IBM as an implementation partner, stepped up and helped us deliver. They co-owned the process."

Rob Armstrong. *Manager Information Resource Management*

Value

- ✓ Documented $1.6M in savings through the first 7 months
- ✓ We know it is more
- ✓ Environment has been further exploited to include debit and credit transactions both internally and externally with 3rd party organizations
- ✓ Process developed for capturing store transactions is being further exploited for enhanced inventory management

Messaging Fundamentals

A single solution, with multi-platform APIs (JMS and MQI)

- Easy to use message centric interface
- Network independent
- Faster application development

Assured message delivery

- Once and Exactly Once, Transactional

Loosely-coupled applications

- Asynchronous messaging
- Pacing, Parallelism, Triggering

Scalable & Robust

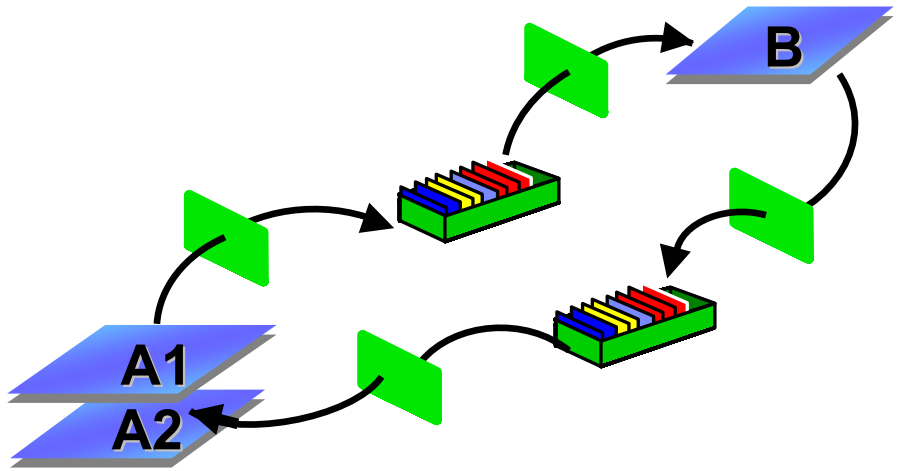
- Publish\Subscribe or Point to Point
- Clustering, Large Messages

Pervasive

- Mobile, PDAs
- Supported on over 80 platforms

PM4Data solution for ftp

- Managed FTP over MQ

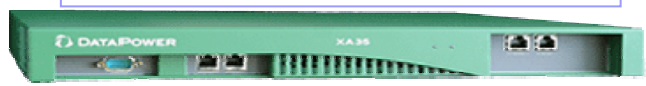


WebSphere ESB Appliances: DataPower

High-Speed XML Processor

- **Functionality -** Centralized wirespeed transformation, parsing, and schema validations
- **Performance -** Speed XML processing by orders of magnitudes, extensive SSL acceleration, XML Compression, XML Caching
- **Compliance -** Full support of XML, XSLT, XPath standards

XA35 XML Accelerator



Centralized XSLT Management
Applies Standards Across Enterprise

Secure Enterprise Gateway

- **Appliance-Based -** "Drop-in" device helps secure multiple applications concurrently
- **Easy Integration -** Interoperates with and augments existing security systems

XS40 XML Security Gateway

Wirespeed Appliance

Purpose-Built for SOA Security

High-Speed XML-to-binary Transformer

- **Easy Integration -** No code changes, APIs, or extra complexity
- **Legacy Support -** Supports multiple wireline protocols, including WebSphere MQ and FTP

XI50 Integration Appliance

Legacy Application Integration

Enhanced Protocol Support

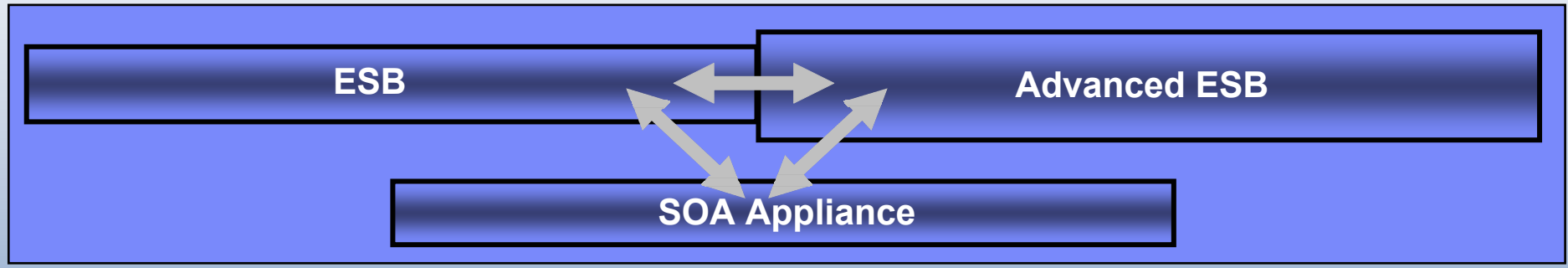
IBM Delivers a World Class ESB Portfolio

ESB:

WebSphere ESB provides Web Services connectivity and data transformation

Advanced ESB:

WebSphere Message Broker provides universal connectivity and data transformation



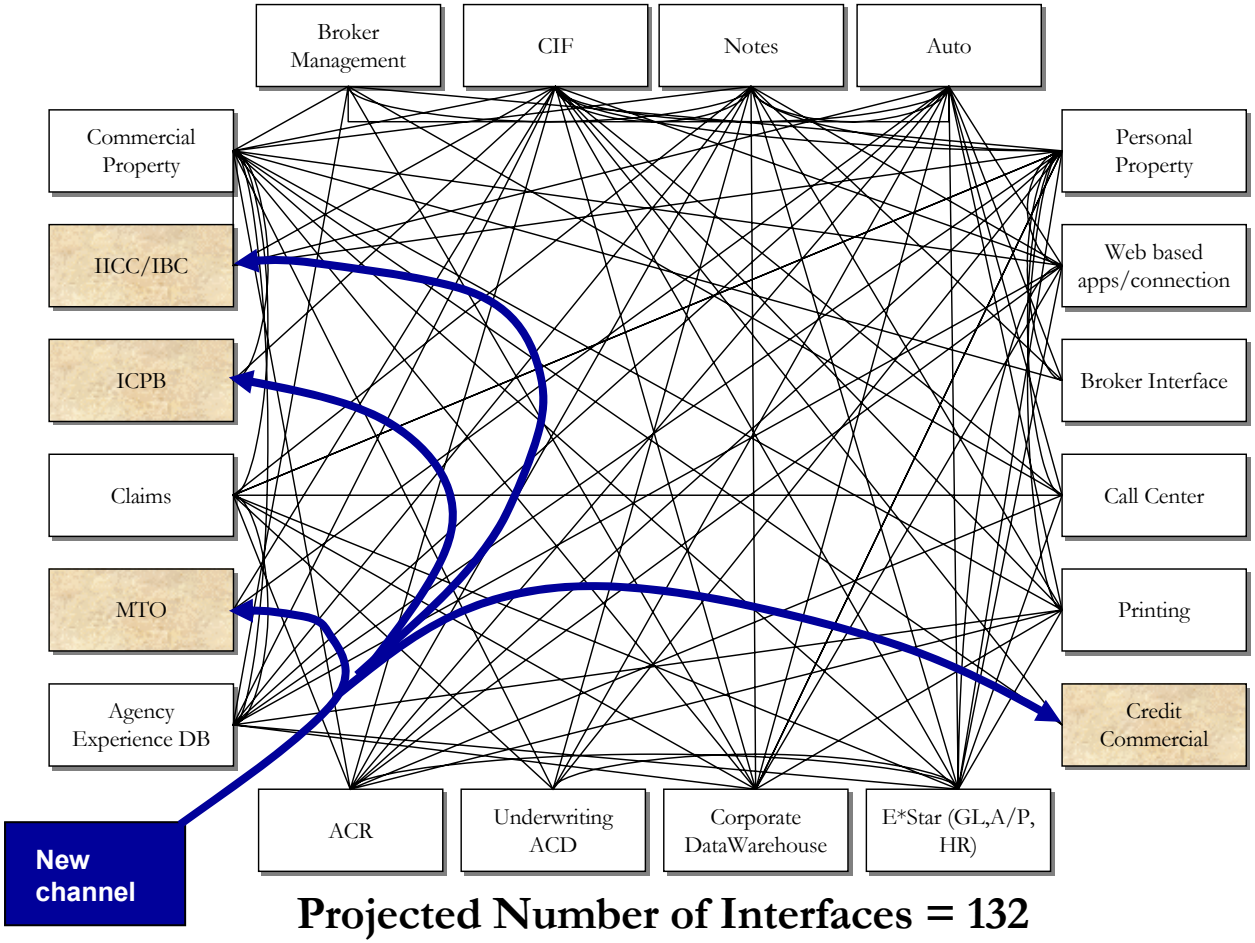
SOA Appliances:

WebSphere DataPower provides simplified connectivity and wirespeed data transformation with enhanced security

SOA: Insurance Example BEFORE

Adding a new channel for Insurance Brokers to access internal systems was too costly and complex to introduce.

"Ripple" changes and unknown impact of changes had stalled project.



Projected Number of Interfaces = 132

Potential Number of Interfaces = n(n-1) = 380

Insurance Example AFTER

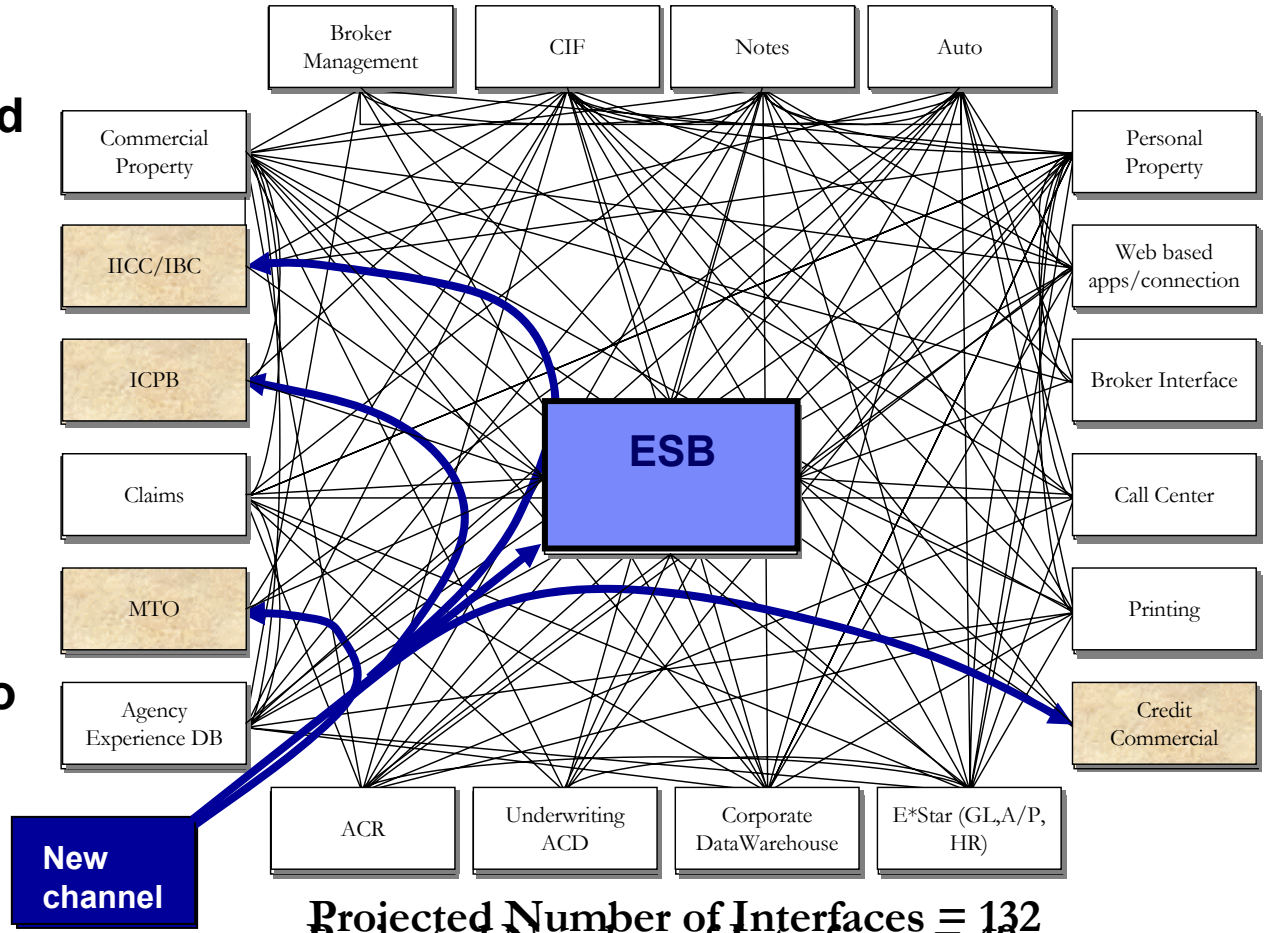
Benefit due to reduced labour: $1.7M USD

Capital costs: $350K USD

ROI after 24 months: 500%

Months to realize 100% ROI: 6

Deploying workflow to integrate processes



Projected Number of Interfaces ≡ 132

Projected Number of Interfaces ≡ 40

Potential Number of Interfaces = n(n-1) = 380

WebSphere Services Registry & Repository

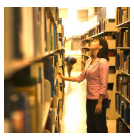
Businesses want a robust connectivity infrastructure…
…to simplify connectivity, support services orientation, reduce costs and risk

Features

- Publish and find services
- Publish and find services capabilities
- Publish and find service lifecycle stage
- Publish and find service interactions
- Publish and find service dependencies and redundancies

Benefits

- Reduce time to market via assembly of services
- Reduce cost via reuse
- Reduce risk by using hardened and understood services
- Improves consistent policy adoption, visibility, reliability

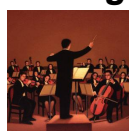
Publish

Describe
Populate
Configure
Classify
Organize

Find

Discover
Search
Retrieve

Agility

Identify
Notify
Secure
Access
Runtime

Manage

Policies
Change
Version
Classify
Analyze
Promote

Govern

Approve
Retire
Validate
Conform

WebSphere Business Monitor

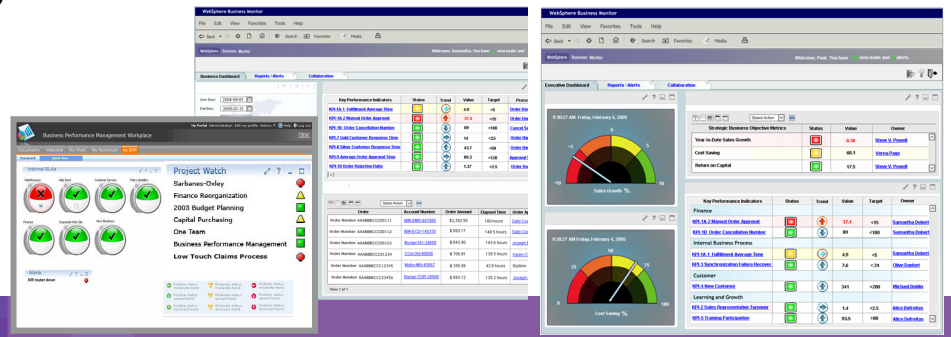
Businesses want a real time view of operations and the ability to intervene…
…but there is typically no way to achieve this without a massive effort, yielding inflexible solutions

Features

- Scorecard view of Key Performance Indicators
- Track cost, time and resources
- Identify bottlenecks, balance workloads, reduce latencies in the *process, monitor trends*
- Set situational triggers and notifications and dynamically respond to these alerts
- Make process modifications based upon real-time data sent back to the Modeler for simulations
- Set programmed responses to events

Benefits

- Line of sight to business information in real time
- Faster reaction to changing business situations
- Optimize your business operations based on actual performance



WebSphere Application Server

Businesses want a robust application integration platform…
…which manages complexity and provides a robust runtime engine

Features

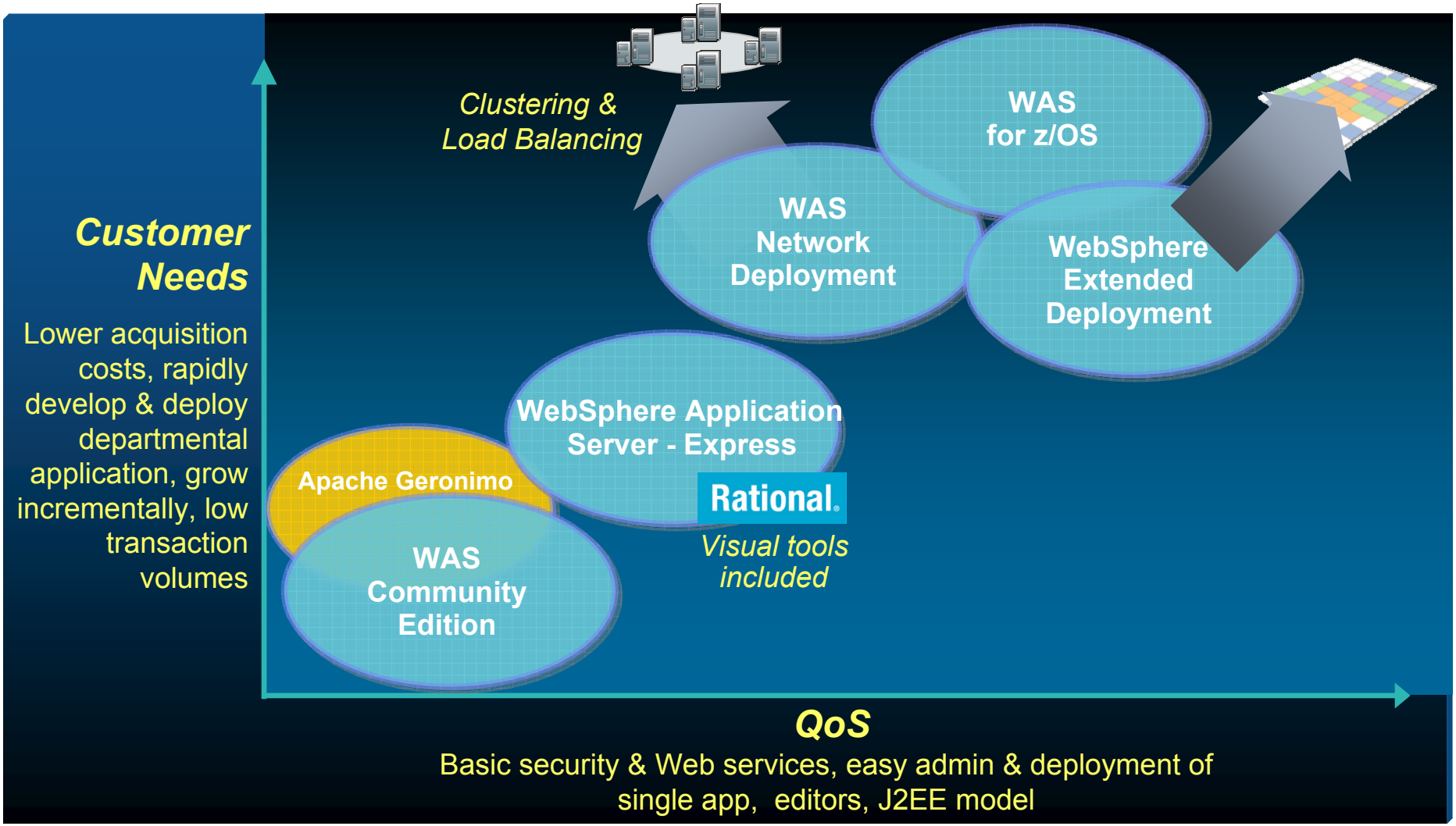
- SOA enablement
- Simple, integrated development
- Secure and scalable deployment
- Flexible management and security infrastructure
- Standards leadership
- Proven experience
- Common and flexible deployment environment
- common tools platform

Benefits

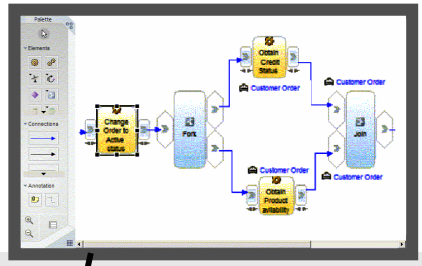
- **Increases the return on your existing investments** while providing **an on ramp to the entire IBM Software Group Portfolio**:
- **Integrate application assets** with the Web services based Services Oriented Architecture
- **Improve resource utilization** with enterprise class quality of service
- **Experience enterprise integration** with the industry's broadest platform support that lets you bridge heterogeneous environments and reuse legacy assets

Application Server QoS

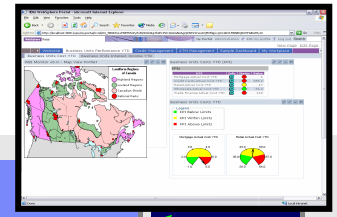
To Meet Your Tactical Application Needs



The Model in Action



Business dashboard



Business Innovation & Optimization Services

Development Services

IT Service Management

Interaction Services

Portal

Process Services

Information Services

Federated Query

Facilitates communication ESB between services

Partner Services

Community Manager

Business App Services

App EJBs

Access Services

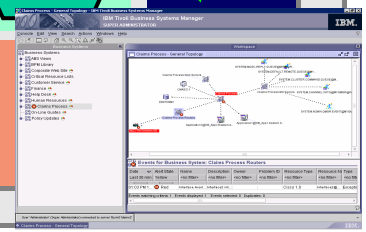
Oracle Adapter

SAP Adapter

DB Access

DB Access

Infrastructure Services



IT impact on processes

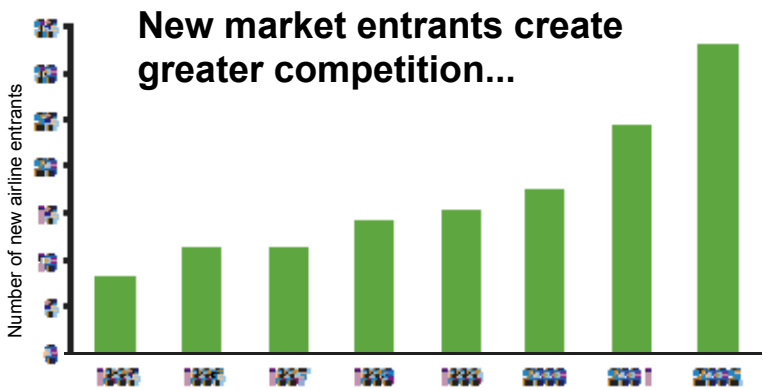
So what's Going on In the world ?

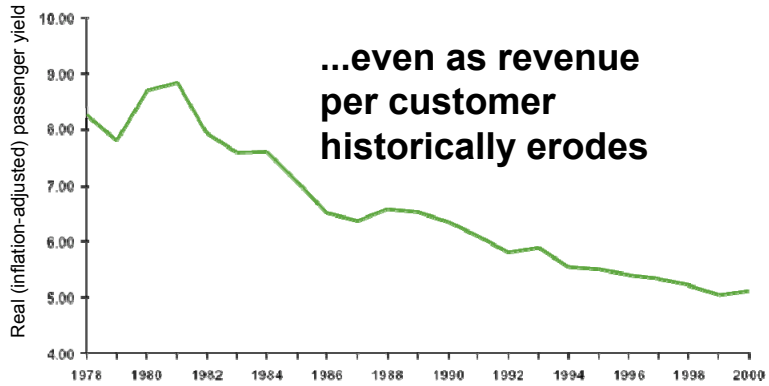
innovation: why?

pressures: commoditization

Examples

- When consumer electronics products stop working, owners are almost as likely to buy replacements (39%) as they are to get them repaired (44%)
- Nearly half (49%) of US and UK consumers have changed service providers in at least one industry during the past year due to poor service
- Airlines:



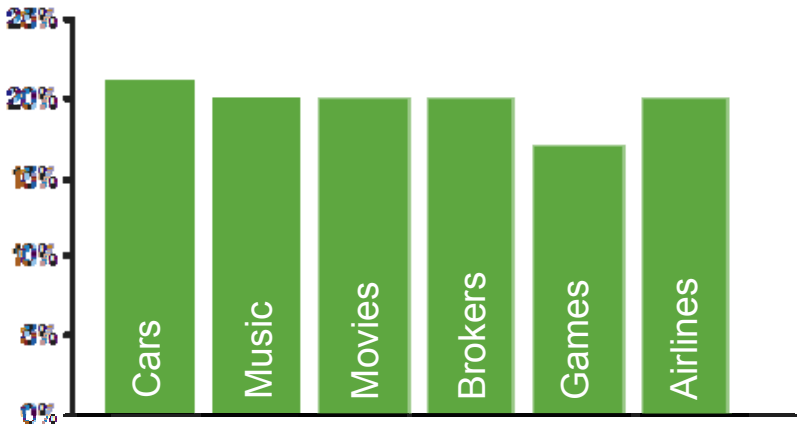


Consumer Electronics Association; Accenture; Airline company Web sites: "Aviation Capacity" ATA; US Bureau of Labor Statistics

innovation: why?

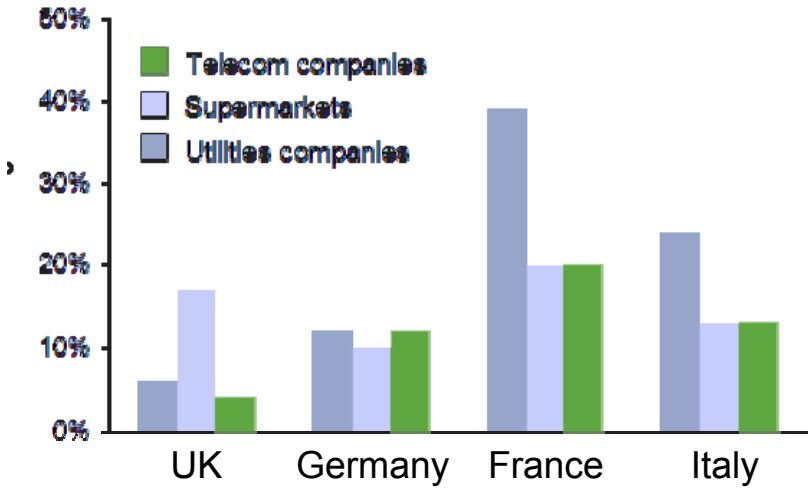
pressures: competition

Access to online information negatively affects brand loyalty as consumers switch brands at purchase...



Percent of consumers switching brands at purchase due to online information

...compounded by their willingness to purchase products from nontraditional providers.



American Interactive Consumer Survey, 2002, Dieringer Research Group. 4,000 survey respondents, all from U.S., combination of online and clicks and mortar shoppers; IBM Institute for Business Value

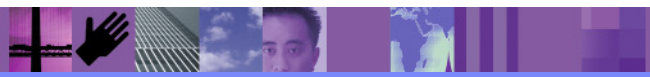
innovation: why?

opportunities: adjacent markets

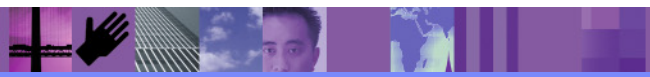
Example: Mobile Phones

- In addition to making and receiving calls, the most popular mobile phone activities among U.S. owners are using the calendar and address book (42%), downloading or playing games (33%), and downloading ringtones (32%).
- In fact, more than half (56%) of mobile phone subscribers rely on their phones' nonphone features, such as camera, clock, calendar, messaging, music...and as substitute flashlights to see in dark places.
- And one in eight mobile phone users (12%) would pay $10 per month for unlimited TV access via their phones.

Macromedia; Strategy Analytics; Sprint

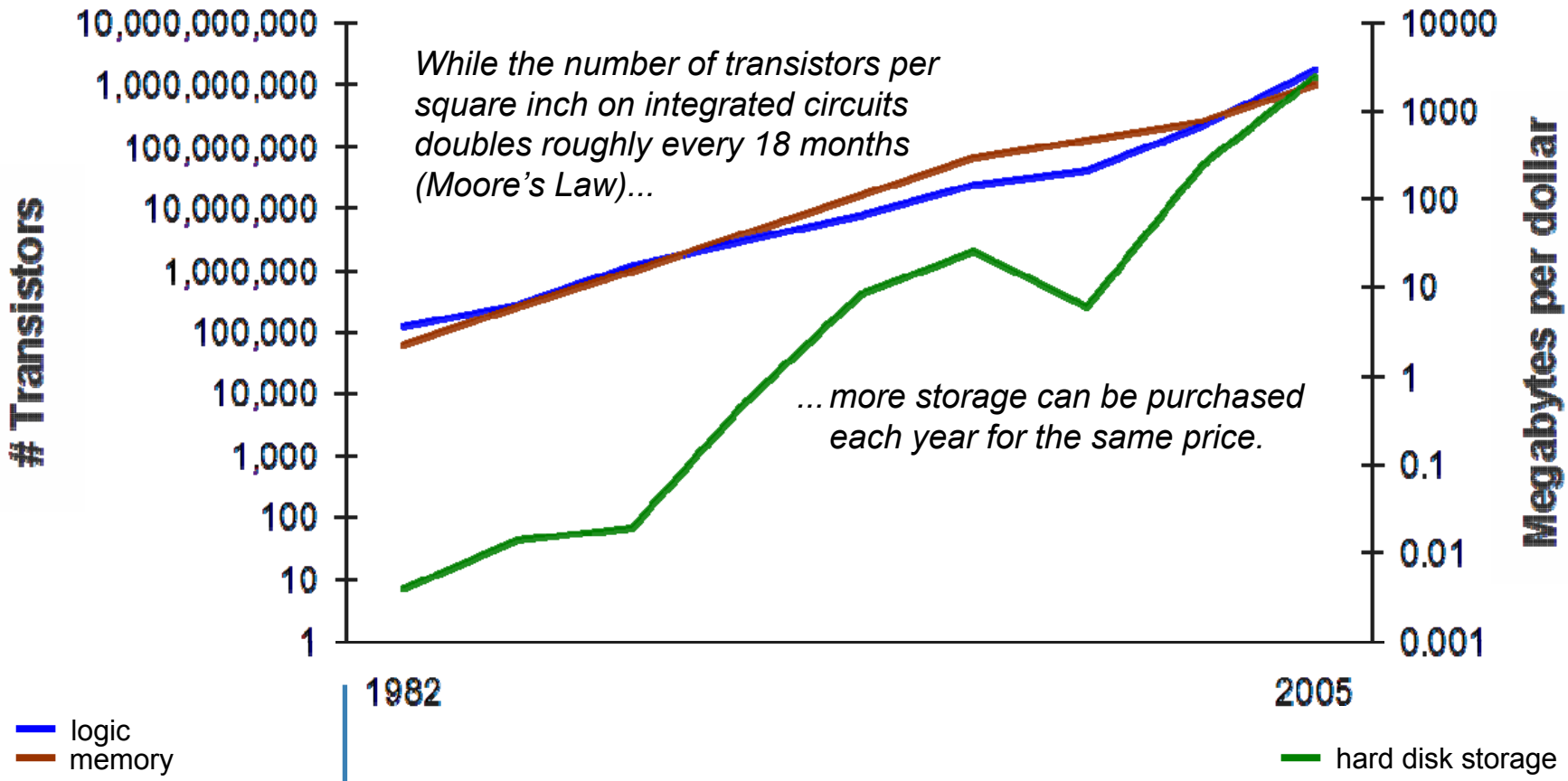


So what's emerging and what should be watched ?



innovation: how?

* embedded intelligence



Semiconductor Industry Assoc.; Seagate (as reported by IBV: "The Specialized Enterprise"); Pricewatch

innovation: how?

Cell processors

Technology Collaboration Solutions

RFID solutions

...and more

embedded intelligence

computing no longer just from computers

- Already more than half of the world's chip supply ends up in consumer-electronic gear.

processing, visualization, simulation power

- The chip in a musical birthday card has more computing power than the computers used on the first flight to the moon.

"pervasive computing" actually becomes pervasive

- In 2001, there were 60 million transistors produced for every man, woman and child on earth. In 2010, the amount of transistors per person will likely be 1 billion.
- RFID costs are dropping as production volumes rise; when they reach 5¢ per tag (down from the current 25¢ per tag), many think they'll become truly pervasive.
- About 1.3 billion RFID tags were produced in 2005. This number is expected to rise to at least 30 billion by 2010.

Semiconductor Industry Assoc./Barron's.; The (Bergen) Record; Semiconductor Industry Assoc. Science & Technology; IDTechEx; Mobile Radio Technology; Investor's Business Daily

innovation: how?

telematics

logistics

real-time inventory management

...and more

interconnected people ... and things

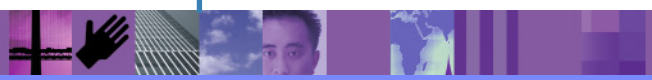
a billion people

- By late 2006, China (currently #2) will surpass the United States (#1) in the *number* of broadband subscribers
- By early 2007, Slovenia (#20) will likely surpass the United States (#19) in the *percentage* of households with broadband connections

a trillion things

- Four leading types of "things" will increasingly account for the number of devices and objects connected to the Internet:
  - tagging things (radio frequency identification)
  - feeling things (sensors)
  - thinking things (smart technologies)
  - shrinking things (nanotechnology)
- 100% annual growth rate of *number* of object-to-object connections
- 49% annual growth rate of *market value* for object-to-object communications
- Estimated worldwide market value of object-to-object communications in 2010: $270 billion

Telecompaper; ITU (UN)/Financial Times; Electronics Weekly; Alexander Resources



innovation: how?

System z

blade servers

grids

storage

...and more

supercomputing for everyone

faster, more powerful

- More than 70% of the world's most powerful supercomputers were installed in 2005
- By 2010, supercomputers will be capable of 10 quadrillion calculations per second

more affordable

- On demand supercomputing today costs approximately 50¢ per hour for CPU time.
- Virtualization can result in an overall IT cost reduction of 15-30 percent, above and beyond what can be achieved through consolidation.

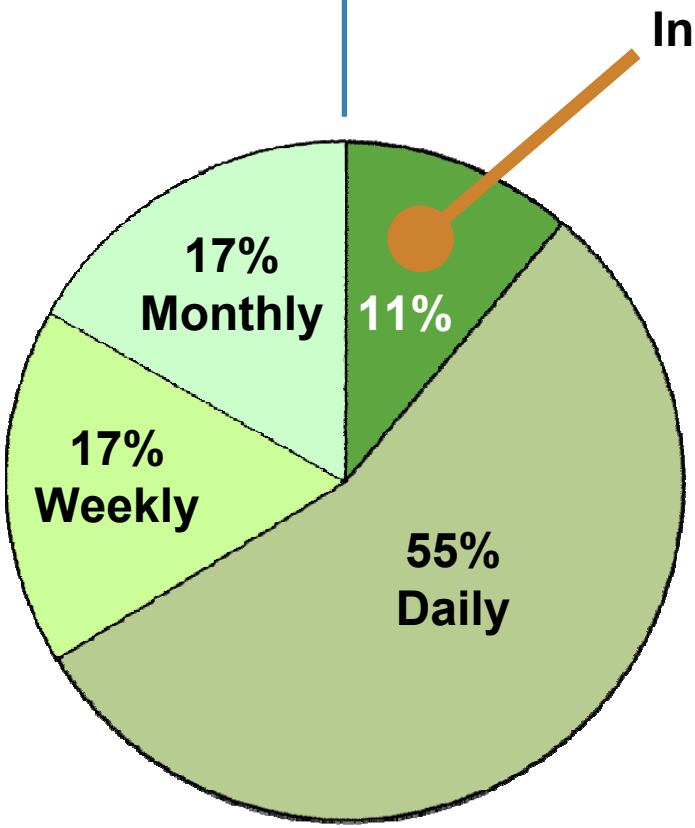
more ways to access

- Mainframes
- Grids
- On demand
- Aggregated servers

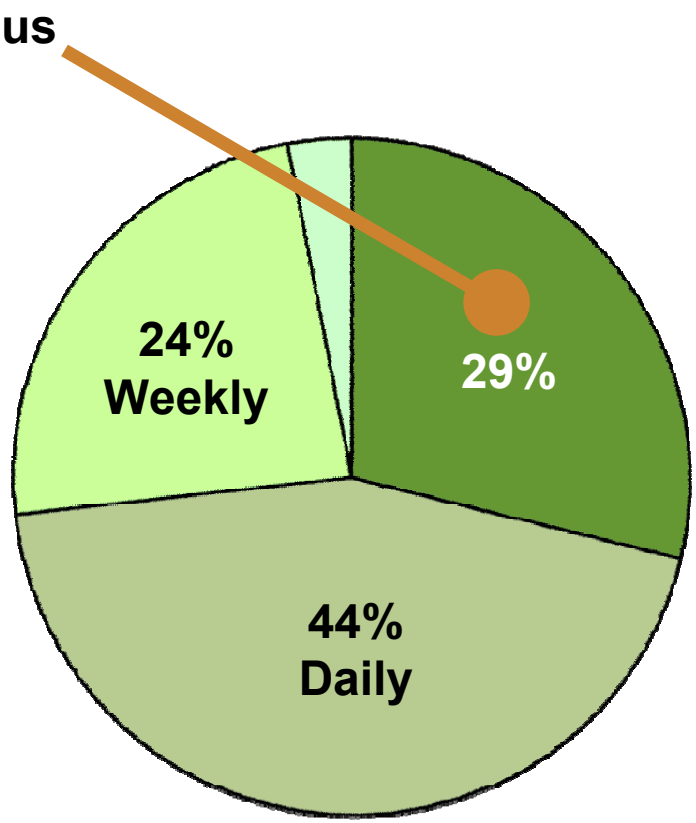
Top500; CIO Today; IDG/IBM; Gartner

innovation: how?

insight through integration



"How current does data need to be for analysis today in **2002**?"



"How current will it need to be in **2006**?"

Gartner

innovation: how?

- storage
- middleware
- autonomic systems
- analytics
- expertise
- ...and more

insight through integration

more information than ever before

- E-mail volume:
  - 2000: 5.1 billion messages a day
  - 2005: 135.6 billion messages a day
- The world's largest commercial databases are now measured in the hundreds of terabytes.

more information integrated more easily

- 90% percent of Fortune 500/Europe 500 companies are planning to or are in the process of implementing an internal "shared services" – or global integration – strategy.

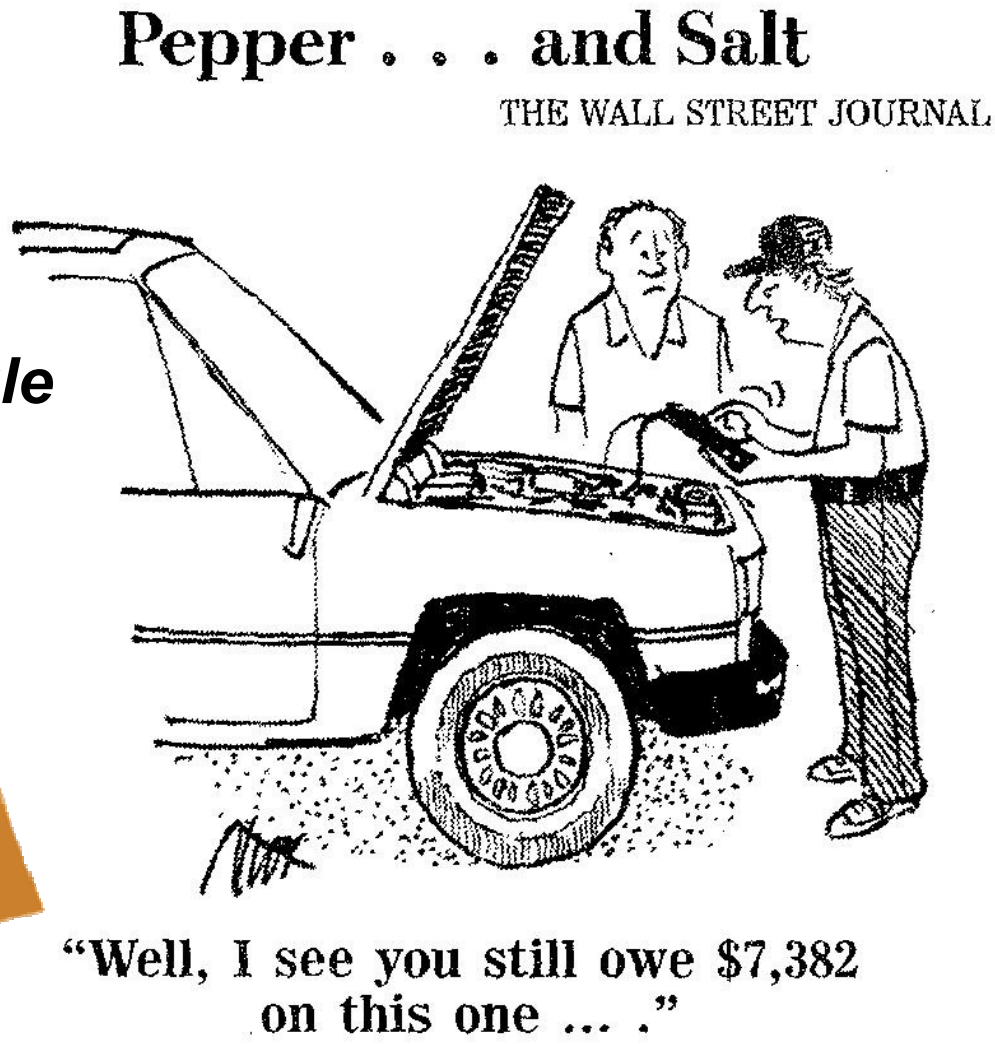
easier to analyze and better results

- The Fire Program Analysis system looks at weather patterns and historical data, such as the location and intensity of forest fires, to predict and prepare five U.S. government agencies for the next season's blazes.

ABC News; InformationWeek; Axon; Fire Program Analysis

The power of data

What if your car could self-diagnose, order parts and schedule a service appointment for you?



Insurance on-demand

Daily Mail, Thursday, March 13, 2003 ... Page 37

Black box in the car

Hi-tech check on where you drive will decide how much insurance you pay

By Sean Poulter
Consumer Affairs Correspondent

WITH insurance charges steadily rising, an aircraft-style 'black box' is being fitted to cars in an experimental pay-as-you-drive scheme.

It means motorists' premiums will be based on where and when they have driven – with the hi-tech device charting the details of journeys and beaming signals to a global positioning satellite orbiting the Earth.

The information is then sent via the mobile phone system to the insurance firm, which calculates a bill. This will be based on the times spent on the road and whether the driver has used accident blackspots, city centres or rural roads.

The system will reward lower premiums to those who use their cars sparingly, avoid rush hours and stick to safer roads.

The scheme is to be tried out this summer by Britain's biggest insurer Norwich Union, with the help of 5,000 volunteers.

Robert Ledger, the firm's Pay As You Drive programme director, said: "We believe this is a much better way to pay for insurance.

"We get a lot of criticism from customers who say they have not had a crash, yet they are being charged more.

"This technology relates personal driving records much more closely to the premium charged."

The technology can also automatically dial out the emergency services in the event of a crash, guide motorists down tracks and provide directions to drivers who get lost.

However the system, which already operates in parts of the U.S., may raise 'Big Brother' fears because it could allow a motorist's movements to be monitored.

In the event of a crash, it could provide key data on timing, or indicate whether a driver has stopped at a pub.

The same sort of technology – if built into all cars – could also be used by the Government at some point as part of a UK-wide congestion charging scheme.

Norwich Union, which is part of Aviva, envisages telling customers for their insurance cover on a monthly basis, and will offer tips on how to reduce the cost.

The insurer has been developing the policy in conjunction with information tech-

nology group IBM, which will provide the computer hardware, and mobile phone operator Orange which will relay information via phone masts.

An IBM spokesman said: "This technology can be used to benefit motorists with more accurate insurance rates based on actual use of their cars." Mr Ledger said: "The box is smaller than a VHS cassette and sits either under the dashboard or in the boot. It is in constant contact with a global positioning satellite, which monitors the vehicle's position.

"Information on journeys in the future, the technology could be mixed into all the electronics of the car.

"It could then tell you the split second that a crash has happened and whether there is a front or rear impact.

"It might tell you the speed and the severity of the impact. That could allow someone at Norwich Union to alert an ambulance or a fire engine which would send help much more quickly than at the moment."

Asked about Big Brother fears, Mr Ledger said: "This is not compulsory – if customers don't like it, they don't have to have it.

"We accept that this will not

HOW THE BLACK BOX WORKS

1 Black box – slightly smaller than a VHS cassette. If sits either under dashboard or in boot. Contains navigator and two transmitters.

2 Computer records details of the trip: Time of day, duration, mileage, roads used. Could provide speed details in the future.

3 Signals from black box bounced off Global Positioning Satellite to provide journey details which are stored in the computer.

4 Details of journeys transmitted at least once a month – possibly daily – to Norwich Union offices in Norwich via Orange mobile phone mast network.

5 Insurance company works out premium to be charged monthly, based on mileage, roads used and time of travel.

POSSIBLE EXTRAS

If you get lost:
Driver contacts Norwich Union call centre who will advise location and provide directions to destination.

In a breakdown:
Company has launched breakdown service and will guide mechanic to the location of the vehicle

In case of accident:
Call centre alerted if car airbags triggered. Will be able to assess severity of impact and send out ambulance or fire engine.

PROGRESSIVE®

innovation: how?

- standards bodies
- open source development
- Power.org
- Open Invention Network
- Technology Collaboration Solutions
- First Of A Kind
- On Demand Innovation Services
- ...and more

new forms of collaboration

between individuals

- The “blogosphere” doubles in size every 5 months, adding 70,000 new blogs per day.
- 50 million Americans -- 30% of U.S. Internet users -- visited blog sites in the first three months of 2005 alone.
- 70% of Internet users use instant messaging, and nearly 4 in 10 send as many or more IMs as e-mails.

between, with and among companies, experts, communities, customers...

- Over half the companies who emphasize collaboration out-perform their closest competitors in terms of operating margin.
- By 2009, wikis are predicted to become mainstream collaboration tools in at least half of all companies.

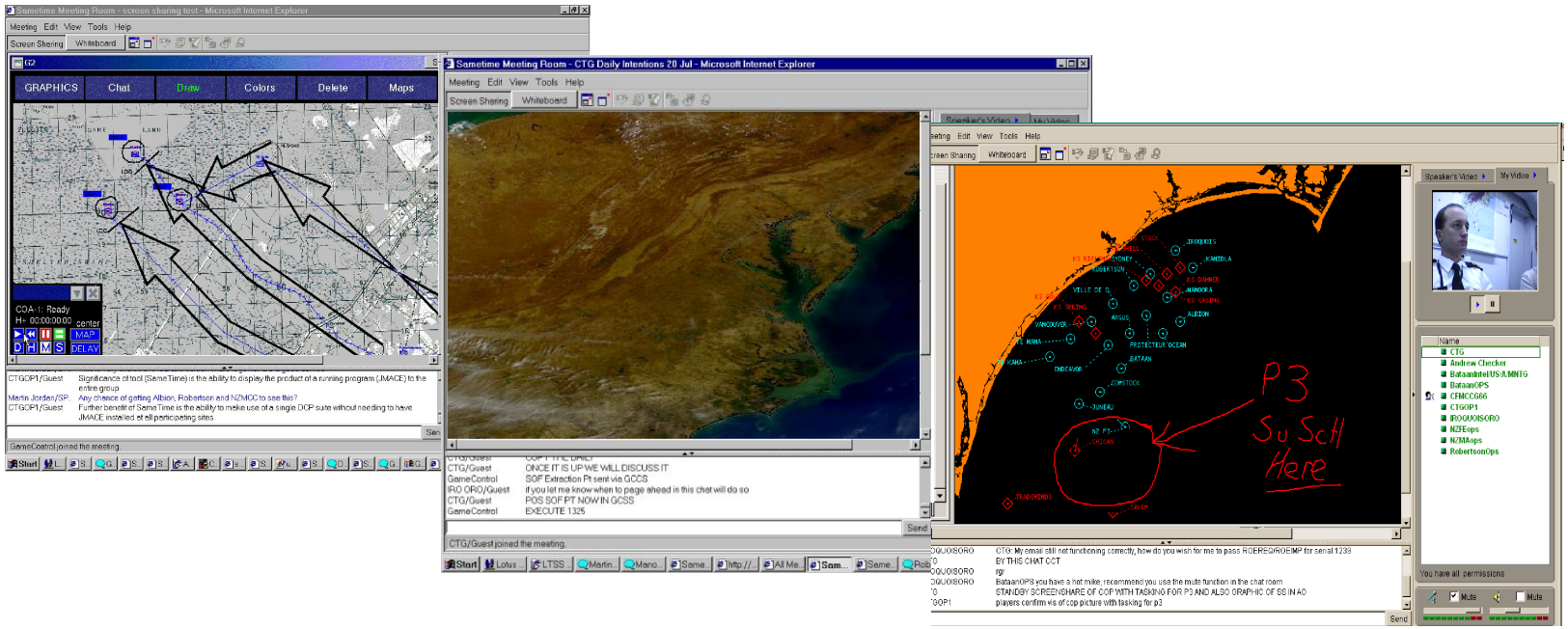
more kinds of things to collaborate on

- Procter & Gamble has set itself a goal of getting half its new product ideas from outside the company by 2010.
- By 2010, 1 of 4 online music sales will be driven by recommendation technology, or “taste-sharing applications.”

Technorati; Comscore; America Online; IBM CEO Study 2006; Gartner/BusinessWeek; BusinessWeek; Gartner & Berkman Center for Internet and Society/Christian Science Monitor

Collaboration at Sea

Collaboration at Sea in the Low Bandwidth Multinational Naval Task Group Environment - Using Collaboration to facilitate tactical and strategic decisions.



innovation: how?

Component Business Model

service-oriented architectures

asset-based services

application hosting

...and more

virtual corporations

once hype, now reality

- Already, 41 percent of Global 2000 firms have deployed SOA (service-oriented architectures) — expected to rise to 62 percent in 2006.
- Worldwide spending on business process outsourcing is projected to grow 11 percent annually through 2008.

business broken into component pieces

- The average bank uses 60 to 90 defined business components every day in the course of business.
- The market for business information management software and expertise is considered to be currently valued at $36 billion, and could be worth $69 billion by 2009.

deeper integration with enterprise

- It's predicted that, by 2008, 80 percent of development projects will be based on SOA.

Forrester; IDC; IBM "Building an Edge," Vol 5, No. 8; Moore & Cabot Capital Markets/Dow Jones; Gartner/Wireless News


Thank you
Goal
Runnings!