Socio-economic trends
Challenges & opportunities

The multi-generational economic phenomenon

- Aging Baby Boomers: Retiring workforce
- Declining birth rates in Generation X & Y
- Less people entering the workforce than those departing
Labor arbitrage in India and China coming to an end

- Increasing labor rates in India & China
- Retention and skills gap are key issues
- Importing skills to address skills shortage
- But …
- Educating young people in sciences & engineering at much higher rates
Supply & Demand of key commodities

- Demand outpacing supply
- Increases need for solutions that make effective & efficient use of natural resources
- Sustainability of resources becomes key design point

Global Oil Production & Consumption

Global Steel Production

John Soyring — Keynote: Web 2.0 — The Next Generation
Disruptive socio-economic events
Challenges & opportunities

The global reach of terrorism
Delivery constraints in the supply chain

- Flattening world and globalization have strained the supply chain
- Global container traffic fuelled by eastern Asia growth
- Port congestion causing delays in delivery to vendors

Vancouver choked by trade with China
Shippers divert cargo to Halifax, despite longer voyage and 35% cost increase  Vancouver Sun

Asia trade strains port
San Francisco Chronicle, Oct 18, 2006
The internet continues to grow in importance

- 80% of U.S. adults use the internet, 44% everyday
- The influential youth log on more often – social networking
- The wired Gen X/Boomer use the internet for major decisions
- Privacy and security are key issues
- Emerging trends can positively impact peoples lives, e.g. Electronic personal health records
The business knows what it needs to do to achieve its goals... but there are inhibitors to progress

**Businesses Need:**
- A way to **change** their operational processes quickly...
- To **deploy** automated processes fast...
- A real time view of operations and be able to **intervene**...
- To see results and **value** fast...

**But they can’t because:**
- Poor documentation of processes
- Cannot pin-point differentiating process
- Hard to find a place to start
**CEO’s cite Innovation as top priority for business**

*Business Model Innovation delivers the greatest returns*

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**Results of 765 CEO interviews worldwide:**

- Out-Performers place 2X emphasis on **Business Model innovation** than under-performers
  - CEOs under intense pressure to innovate
  - Corporate culture is critical to sustained innovation
  - Business model innovation is the new strategic differentiator
- 65% will make fundamental changes to their business over next 2 years
- Over half have found it difficult to manage change in the past

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**Innovation Type for Out & Under Performers (Operating Margin CAGR)**

- **Under-Performers**
  - Products / Markets / Services: 40%
  - Operations: 20%
  - Business Model: 10%
- **Out-Performers**
  - Products / Markets / Services: 60%
  - Operations: 30%
  - Business Model: 10%

Source: *IBM 2006 Global CEO Study*

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"**The business model we choose will determine the success or failure of our strategy.**"

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John Soyring — Keynote: Web 2.0 – The Next Generation
Entry points to business model innovation occur in different areas, depending upon specific industry market pressures and individual organizational needs

- **Front Office Innovation**
  - New collaborative solutions across partners, customers and suppliers

- **Core Business Process Innovation and Transformation**
  - Better customer service and more efficient use of resources through new and innovative approaches to internal business processes

- **Back Office Innovation**
  - New levels of cost efficiency and best-of-breed solution delivery through global services assembly lines
Business Process Management

Services are the “building blocks” for business processes

SOA improves how you design, manage, and optimize your business processes by enabling:

- Solution Building Efficiency
- Reuse of existing assets
- Flexibility in change

SOA at the core of BPM:
Today’s payment operations are fragmented, complex, inflexible and costly

- Duplication of:
  - Customer facing applications
  - Processes and functions
  - Data warehouses
  - OFAC, credit, fraud, other checks and control points
  - Settlements, statements, advices, customer inquiries, history, adjustments

- Many-to-many connections
- Proliferation of support requirements
- Manual bridges
- Existing embedded systems

- Innovation is road-blocked
- Incremental changes are difficult
- Maintenance is costly

“Banks with a clearly focused payments organization can increase revenue by up to 10%”

The Boston Consulting Group

John Soyring — Keynote: Web 2.0 – The Next Generation
SOA components are choreographed among various ‘value chain’ participants

- Investment/Trust Client
- Payment Systems
- Account Management
- Anti-Money Laundering Services
- Outsourced
By exposing standard service definitions based on ISO20022 partners can extend a payments platform.
Customer Challenges:

- How do I optimize service interactions to be better aligned with business process?
- How do I help services interact efficiently and dynamically with each other?
- How do I increase service reuse?
- How do I govern services as part of my SOA?
- How do I eliminate “rogue services” and ensure control of my SOA?

Solution: services registry & repository

- **Encourage Reuse**
  - Find and reuse services for building blocks for new composite applications.
- **Enhance Connectivity**
  - Enable dynamic and efficient interactions between services at runtime
- **Help optimize service performance**
  - Enable enforcement of policies. Impact analysis
- **Enable Governance**
  - Govern services throughout the service lifecycle
# Why SOA Governance matters

<table>
<thead>
<tr>
<th>Realize business benefits of SOA</th>
<th>&quot;Firms with above average IT governance... had more than 20 percent higher profits than firms with poor governance following the same strategy&quot;</th>
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<tbody>
<tr>
<td>• Improved time to market</td>
<td></td>
</tr>
<tr>
<td>Mitigate business risk and regain control</td>
<td>&quot;Effective IT Governance is the single most important predictor of value an organization generates from IT.&quot;</td>
</tr>
<tr>
<td>• Maintaining quality of service</td>
<td>Source: Peter Weill, MIT Sloan School of Management’s Center for Information Systems Research</td>
</tr>
<tr>
<td>• Ensuring consistency of service</td>
<td></td>
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<tr>
<td>Improved team effectiveness</td>
<td>Professional investors are willing to pay premiums of 18-26% for stock in firms with high corporate governance.</td>
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<tr>
<td>• Measuring the right things</td>
<td>Source: McKinsey Quarterly</td>
</tr>
<tr>
<td>• Communicating clearly between business and IT</td>
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</tbody>
</table>
Evolving Infrastructure and Management in Support of SOA

“Access, Integrity and Compliance”
- Federate identity and access control across services
- Secure services and applications
- Consistently enforce security policy for services

“Insight, Visibility and Control”
- Automate and simplify IT processes
- Manage service and application service levels
- Predict and manage change across linked services

“Right Place, at the Right Time”
- Automatic scaling to support services demand
- Intelligently respond to business priorities
- Accelerate application and services performance
What is Virtualization?

Many examples and levels of virtualization across the IT infrastructure

- Workload / Service Virtualization
  - Coordinate, schedule and manage services / apps across a grid

- Server Virtualization
  - Partitioning / Hypervisors

- Virtual Memory

- Network Virtualization
  - Virtual LANs (VLANs)
  - Virtual Private Networks (VPNs)

- Microprocessor Virtualization
  - Multi / Hyper Threading
  - Hardware assisted virtualization (Intel, AMD)

- Information Virtualization
  - Content / Format Virt.
  - Location Virtualization

- File Virtualization
  - Distributed File Systems

- Storage Virtualization
Growing adoption of Sensor & Actuator Solutions enabling Business Process optimization from new operational insights

**Business Challenges:**
- Compliance with regulations: *e.g.*, FDA mandates for safe & secure drug supply chain
- Supply Chain: end-to-end inventory visibility
- Asset Tracking: High cost of lost assets
- Asset Monitoring: state & utilization of assets

Networked Devices deliver new data & act upon insights

**Sensors**
- Power meters
- SCADA, pressure, volume, RFID readers
- Motion detectors...

**Actuators**
- Tag printers, status lights
- Load generation, HVAC & lighting, valves, switches, pumps...

**Controllers**
- HVAC & Lighting controllers, PoS Controllers, SCADA INGs...

Insights enable Business Process optimization and new business capabilities
The evolving Web platform

**Web 1.0** was about **connecting computers** and making technology more efficient for computers.

**Web 2.0** is about **connecting people**, and making technology efficient for people.

Web 2.0 changes the way in which businesses interact with its customers.

**Web 2.0:**
- Is about communities and social networks
- Builds contextual relationships and facilitates knowledge sharing
- Is about people and the way they collaborate
- It is not a technology, not an industry, not a standard
Many entities have been labeled as WEB 2.0, all with different functionality, utility, and business impact.
To extract the full value from Web 2.0, organizations must support a paradigm shift of key business principles.

<table>
<thead>
<tr>
<th>Web 1.0</th>
<th>Web 2.0</th>
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</thead>
<tbody>
<tr>
<td>Servicing the Masses</td>
<td>Servicing the Long Tail</td>
</tr>
<tr>
<td>Focus on Software</td>
<td>Focus on Data and Web Services</td>
</tr>
<tr>
<td>Control Web sites</td>
<td>Allow Users to Contribute</td>
</tr>
<tr>
<td>Rights Reserved</td>
<td>Cooperate, don’t control</td>
</tr>
<tr>
<td>Connecting Computers</td>
<td>Connecting People</td>
</tr>
</tbody>
</table>

Web 2.0 is both the result of and cause of cultural change
Web 2.0 brings *new business considerations* which effect both *front-end* functionality and *backend* architecture.

1. **Embrace the Long Tail**  
   - Leverage customer self service to reach the entire web not just the head

2. **Data is your Competitive Advantage**  
   - Seek to own a unique, hard to recreate source of data  
   - Data is the new “INTEL INSIDE”

3. **Allow your users to “Add Value”**  
   - Key competitive advantage is the extent in which users add their own data to your platform. Don’t restrict your “architecture” of participation. Involve users implicitly and explicitly in adding value to your applications.

4. **Network Effects by default**  
   - Set inclusive defaults for aggregating user data as a side effect of their use of the application

5. **Some Rights Reserved**  
   - Limiting re-use prevents experimentation. Benefits from Web 2.0 come from collective adoption, not private restriction. Design for Reliability and “hack-ability”

6. **The Perpetual Beta**  
   - Internet applications are no longer software artifacts, they are ongoing services. Engage users as real-time testers and user their feedback as an instrument in designing the service.

7. **Cooperate, Don’t Control**  
   - Web 2.0 is a network of cooperating data services. Offer web services interfaces and syndication through lightweight programming models

8. **Software Above the Level of a Single Device**  
   - Integrate service across handheld device, PC’s and internet servers

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Web2.0 - Tim O’Reilly, 2005
Web 2.0 has given rise to a wave of New Tools and Techniques

New paradigms for individuals and businesses to interact and do business on the web

**RSS**
Really Simple Syndication: a family of XML file formats for web syndication, which provides a way to distribute information

**Wiki**
A group of web pages that facilitates community authoring

**AdSense**
A mechanism that helps creators of web sites serve up advertisements relevant to a site’s content

**Blog**
A web-based publication of periodic articles (a.k.a. weblog)

**AJAX**
Asynchronous JavaScript and XML: a mechanism to update parts of a web-page without refreshing the entire page

**Mash-up**
A mash-up is a composite application derived by aggregating components or services

**Tagging**
Bookmarks providing a way to attach keywords to pages or images on the web helping categorize and making it easier to find (i.e., metadata)

**REST**
Representative State Transfer: an architectural style for distributed hypermedia systems like the world wide web
Development, deployment, and management of situational (Web 2.0) applications is very different from traditional application development.

### Traditional (Transactional)
- Structured design and programming
- Code Review
- Function test
- Quality test
- Performance test
- Handful of large applications on 100s of machines
- Often dedicated – several machines per application
- Careful, formal change management
- Slowly evolving applications
- Changes are major

### Situational (Web 2.0)
- Unstructured programming
- Little discipline
- No formal test process – using the application is test
- Thousands of small applications on handful of machines
- Each machine has hundreds of applications
- Change management is a huge challenge
- Rapidly changing applications
- Changes generally minor
Ajax - What is the industry doing?

Open Ajax Alliance (http://openAjaxAlliance.org)

Industry group will support the development of open Ajax technologies &
tooling

- Initiated in April - over 53 members on board
- IBM contributing tooling framework & Eclipse plug-in for Ajax toolkits (Ajax Toolkit Framework)
  - “…toolkits can be supported in less than 30 minutes…”
- Dojo - an open source JavaScript/Ajax toolkit that enables users to create rich, lightweight
  UIs; (Eclipse Ajax Toolkit Framework support included)
- Mozilla™ - IBM contributing code to Mozilla™ to enable Eclipse developers to use Mozilla's
  debugging capabilities within Eclipse
Application Wikis are environments for collaborative, situational (ad hoc) dynamic content development

- Facilitate web solutions for non-programmers who are domain experts - i.e. Mash-ups, dashboards, etc.
- Further mark-up based client development strategy - plug-in model for easy extensibility
- Weave together “good enough” solutions by scripters
- Combined runtime & light weight assembly capabilities
What is Web 2.0 All About?

Web 2.0 business examples

EXAMPLE: MASHUPS — Integration of disparate data source through simple scripting tools enables users to innovate by combining existing web services into entirely new applications.

- Web Service which uses content from more than one source to create a completely new service
- Typically sourced from a third party via a public interface or API
- Simple methods of sourcing content for mashups include Web feeds (e.g. RSS or Atom) and JavaScript

EXAMPLE: MASHUPS
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JOBS RECOVERY
You requested jobs in Louisiana
- Accounting Clerk
  - Accounting Clerk is looking for an accounting clerk to handle general accounts payable and accounts receivable and possible payroll functions. This is a long term...
- IT Staff Accountant
  - Staff Accountant is looking for an entry level staff accountant multi-company consolidations and special projects. Pay for this position is up to $35k and must have...
- Database Administrator
  - Database Administrator is looking for a database administrator with experience in Oracle releases 8i-10g. The University of Arkansas at Little Rock is a top-50, highly ranked research university...
- 30-40K General Ledger Accountant at Firm Downtown
  - Robert Smith is looking for a General Ledger Accountant for a client located in downtown New Orleans on a temporary to full time basis. The position is to...
Reshaping of Enterprise Software

Web 2.0 requires & enables an architecture of open services that empowers users to *CREATE, COMBINE & COLLABORATE* around content within a rich user *EXPERIENCE*...

...that will require additional resiliency to existing enterprise infrastructure through a robust *Services Oriented Architecture*
Glimpse into the future?

...a web of data sources, services for exploring & manipulating data, and ways that (end) users can connect them together

Instantly
Colorado Software Summit

Keynote:  Web 2.0 – The Next Generation

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October 23, 2006