# Preparing a "Web-Savvy" Future Workforce

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# Outline

- Premise

- Evolving Society

- Major Technological Advancements

- Preparing a "Web-Savvy" Future Workforce

- Issues

- Applications

- Summary

- Acknowledgements

# Premise

Ongoing advances in the Web, hardware, middleware and networking continue to drive new demands and expectations for solutions to complex applications by a variety of user communities. Computing no longer remains the sole domain of the applied sciences and engineering communities. It has now become critical in non-traditional applied fields such as journalism, humanities and in resources as cool as Xbox and PlayStation, and by movie studios as diverse as Dreamworks SKG, MGM, WB and Disney. As a result, the caretakers of the necessary technologies will also require a broad range of advanced skills (e.g., security, systems integration, middleware, communication and networking) on the new Global stage. Resource management is critical to achieving a number of necessary goals, but also brings some unique and complex challenges in this new era of globalization.

In this presentation, we look at some of the qualifications, expectations, obstacles and opportunities facing the Next Generation Workforce in solving global problems with global resources.

# Quote

" **To benefit from globalization…there are two things that you must do:**

    — **First, you have to accept and embrace change (easy to say, hard to do)…**

    — **Second, you have to innovate. To innovate means literally to renew…or make new again.** "

**Excerpt from Distinguished Lecture Series in International Business at St. Louis University, Presentation entitled "Innovation and the Global Economy", May 16, 2006**

**— Boeing CEO, President, Chairman**

# Quality of Life

# Major Technological Advancements

Energy

# Major Technological Advancements

Energy

Health & Medicine

- Genomics and Proteomics
- Pharmaceuticals
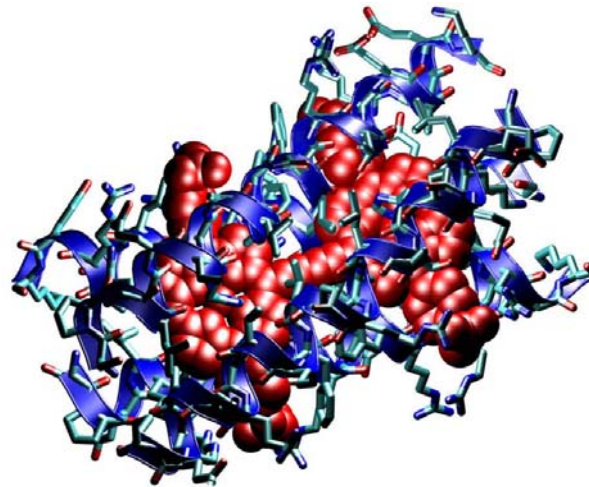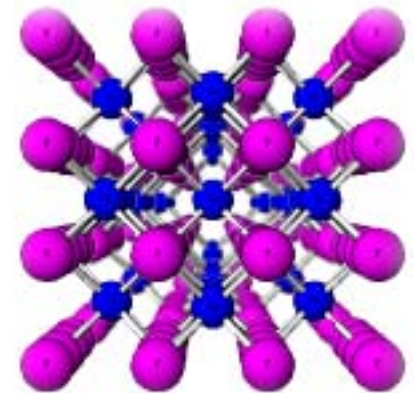
# Major Technological Advancements

Energy

Health & Medicine

Manufacturing
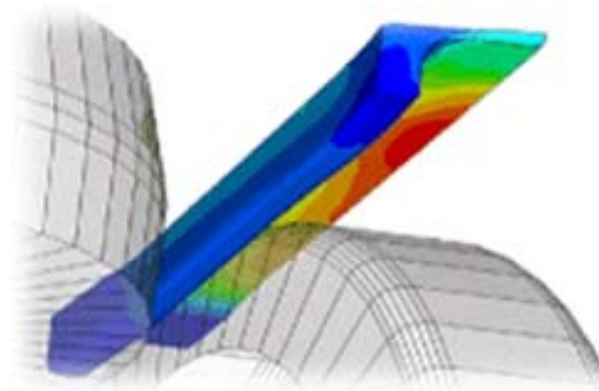
- Materials
- Processes

# Major Technological Advancements

Energy

Health & Medicine

Manufacturing

Security

- Sensors

# Major Technological Advancements

Energy

Health & Medicine

Manufacturing

Security

Transportation

- Hybrids

# Major Technological Advancements

Energy

Health & Medicine

Manufacturing

Security

Transportation

Web
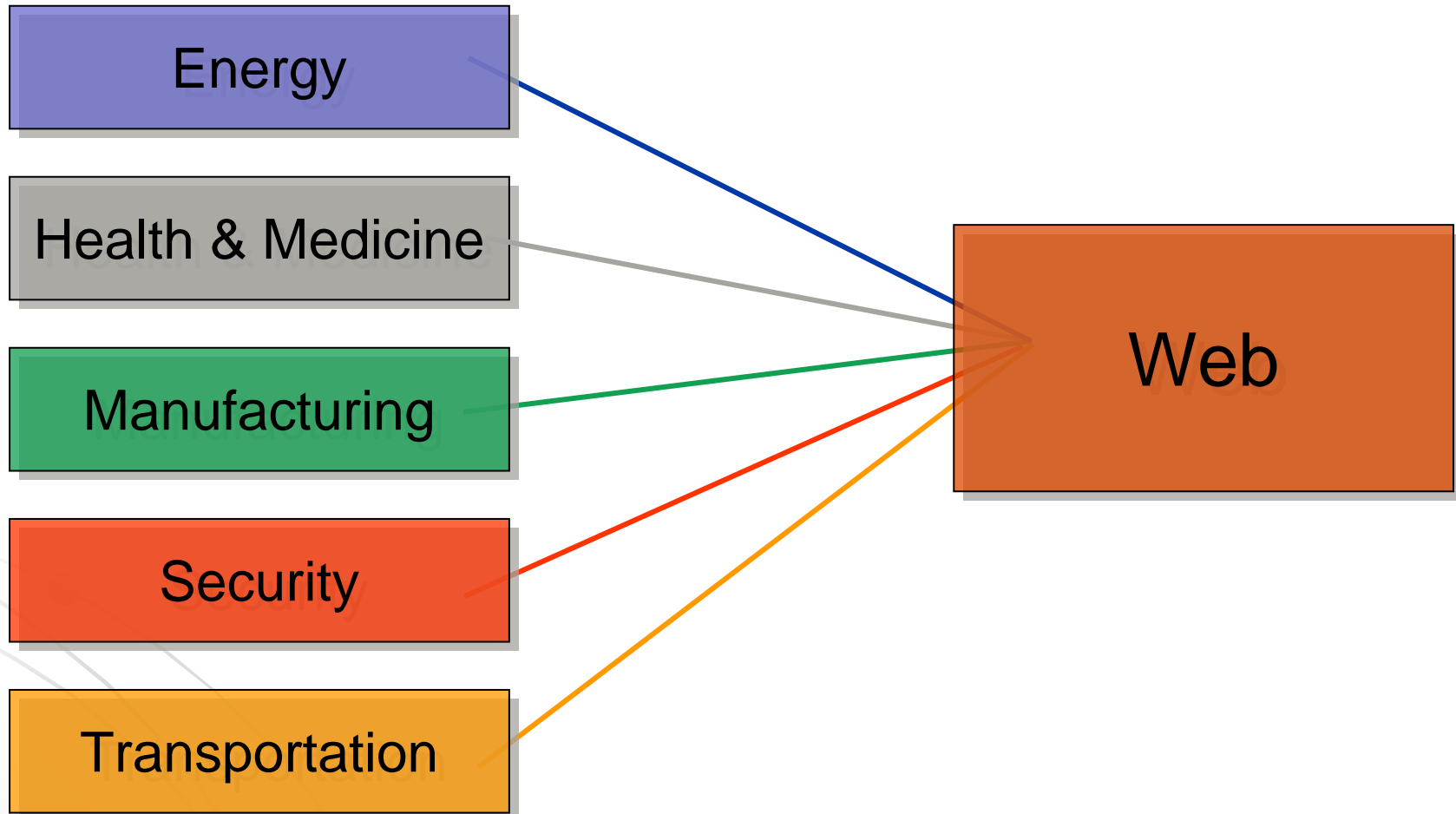
qualifications
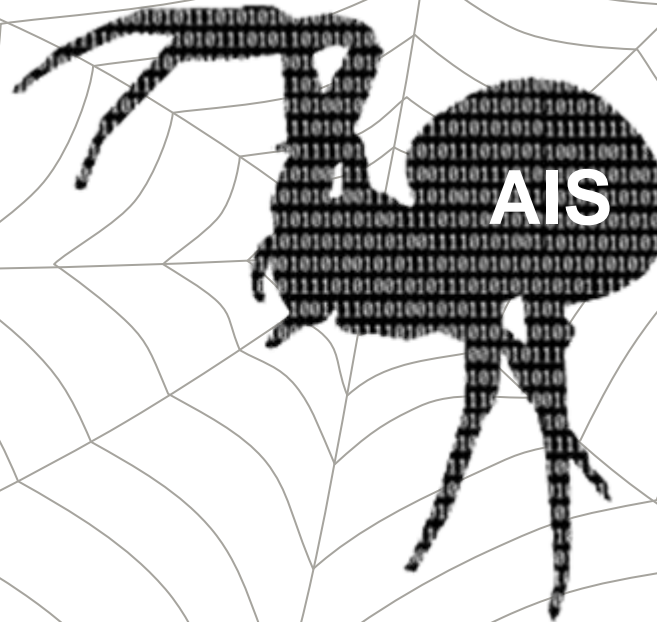- multi-disciplined
- broad tech base
- multi-cultured

obstacles
- qualifications
- expectations
- cultural

AIS

expectations
- problem solvers
- adaptive
- expedient

opportunities
- global
- impact
- adventurous

# Industry Perspective

- Improve performance and Cut costs
  - Sharing and Managing Resources
    - Resources
      - Middleware
      - Systems
      - Networking
      - Data, Information and Knowledge
      - People
- Enterprise
  - No longer a local entity — "Global" environment
    - Other sites, collaborators, geographies and cultures
  - Solutions must now be:
    - Policy and Role-based
    - Service-oriented
    - Evolvable/Adaptive
    - Secure
    - "Real- or Near Real-Time (RT)"

# Issues

- Technical

- Business

# Business

- Competition

- Efficiency

- Customer-centric

- Value
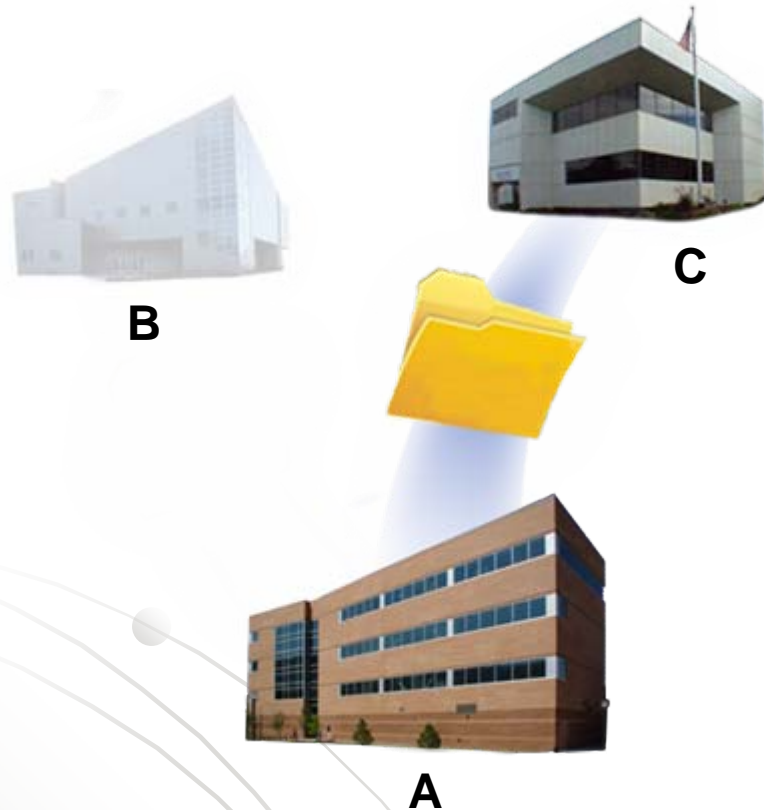
- Markets

# Customer-Centric

- Focus on customer's needs and comforts

- Look beyond customer's expectations

- Competition aware

  - "If they won't, we will!"

- Total experience

  - Memorable

    (in a <u>positive</u> sense)

# Collaborative Engineering in Virtual Enterprise

**B**

**C**

**A**

Organizations **A**, **B**, and **C** are collaborating to build a product (say, an airplane) where there is a business contract between **A** and **B** for landing gear.

Another separate contract exists between **A** and **C** for electrical wiring.

**A** is the lead contractor.

There is some data that is open to **A** and **B**, but not **C**.

Similarly, there is also some data that is open to **A** and **C**, but not **B**.
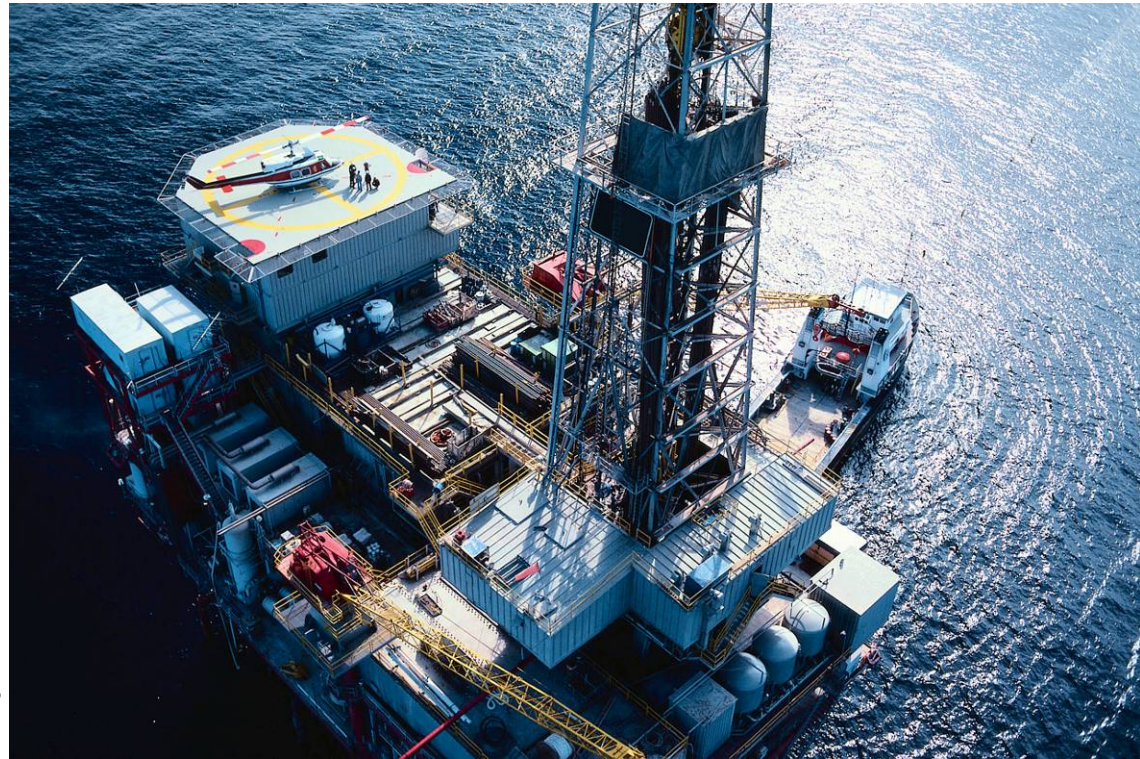
# International and Emerging Markets

- Sharing
  - Content
  - Data
  - Information
  - Knowledge
  - People

- Connecting
  - People-to-Content
  - People-to-People
  - Through flexible and adaptive environments
  - Shared Matter Experts

- Need
  - People with specific skills (technical, social, business)
  - Knowledge of the emerging markets and opportunities
  - Understanding of the Risk

# Technical

- Risk Management

- Heterogeneous Enterprises

- Service-oriented

- Adaptive/Evolvable

- Timely

- COTS-based

- Monitoring and Maintenance

- Modular

- Integrable

- Secure

- Standards-based

- User-friendly

# Applications

- Complex Systems

- Structures and Processes

- Collaborative Engineering

- Virtualization

- Data and Text Mining

- Enterprise Security

- Information and Data Management

- "Smart" Environments

- Optimization

- Protocol and Event Processing

- Signal and Image Processing

# Enterprise Security

- Most computing environments require multi-level security engagement

- Present Data Encryption technologies can provide unwanted entry into systems

- The "global" enterprise significantly complicates security concerns and access

  - IT vs. Technology growth is a no-win situation

# R&D to Production

- Research and Development $\Rightarrow$ Production
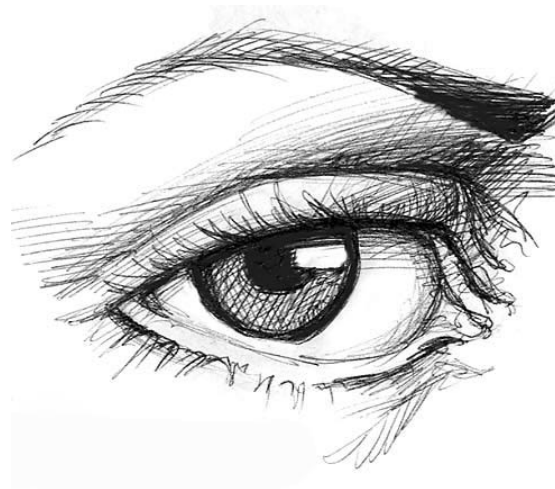
# Summary

- *Tremendous opportunities and incredible time to engage*

- *With advancements and progress come higher expectations and demands— never only about the technology*

- *Must embrace but not be limited by cultural perceptions*

# Acknowledgements

- *W3C conference organizers, staff and sponsors*

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