



| IBM Overview

Services Science and Service Innovation

OTS2008

Maribor, June 12, 2008

Paul Van Droogenbroeck
IBM Belgium
Governmental Programs



IBM
Services
Service Science

21st century
Challenges
and opportunities

Services
Service Science
SSME
Services Systems

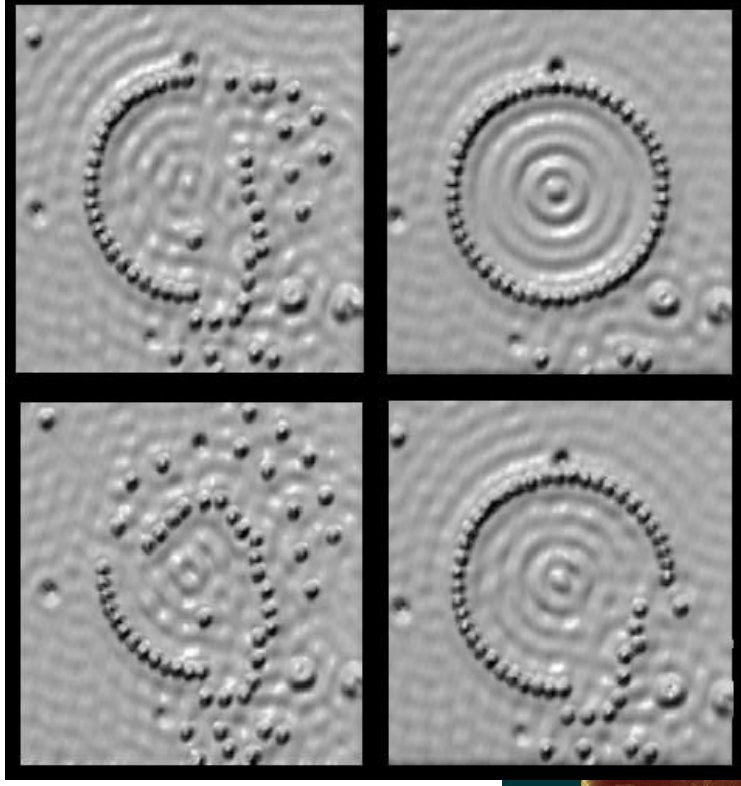
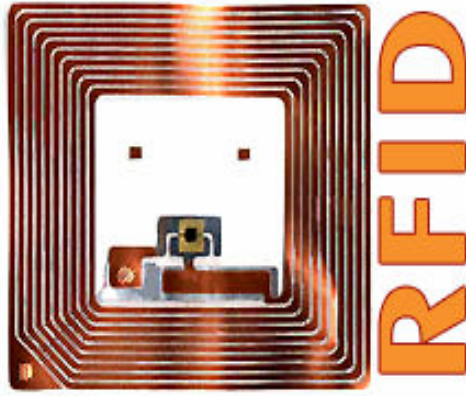
Agenda
OTS 2008
June 12 2008
“Service Science and
Service Innovation”

Innovation
and research

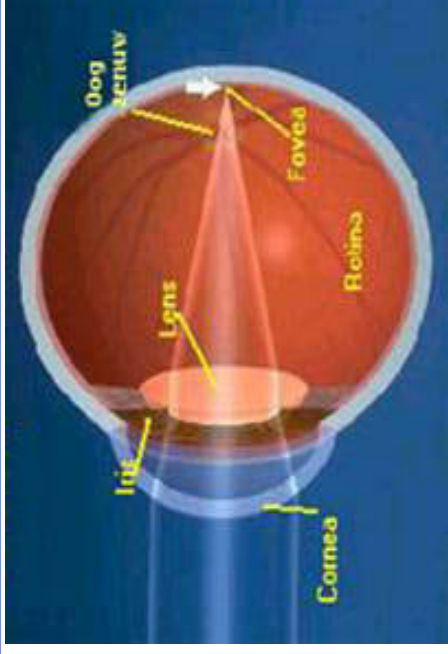
SSME and
- Industry
- Academia
- Government

Recommendations

IBM, a technological company...



Dee Breger, microgra



1983

1986

1987

IBM® SYSTEM BLUE GENE®/P SOLUTION
Expanding the limits of breakthrough science



ON DEMAND BUSINESS™

...operating in a global economy

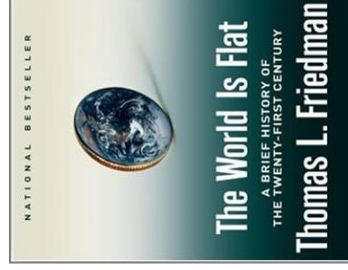


Everything = commodity



New technologies

‘a flat world’



Fierce competition



New business models



Some facts and figures

2007 year-end from continuing operations

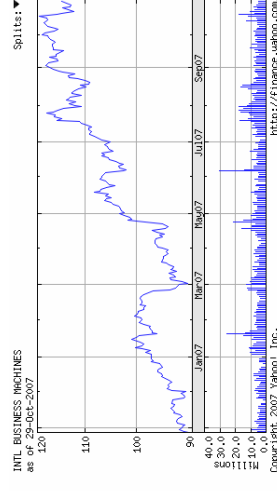
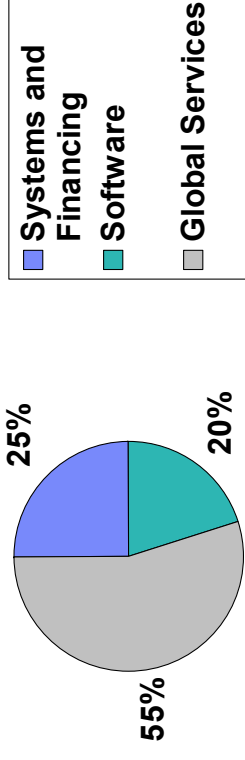
- Revenue: \$98.8 billion
- Cash balance: \$16 billion
- Number of IBM employees (31/12/07):
 - Worldwide: 355,766



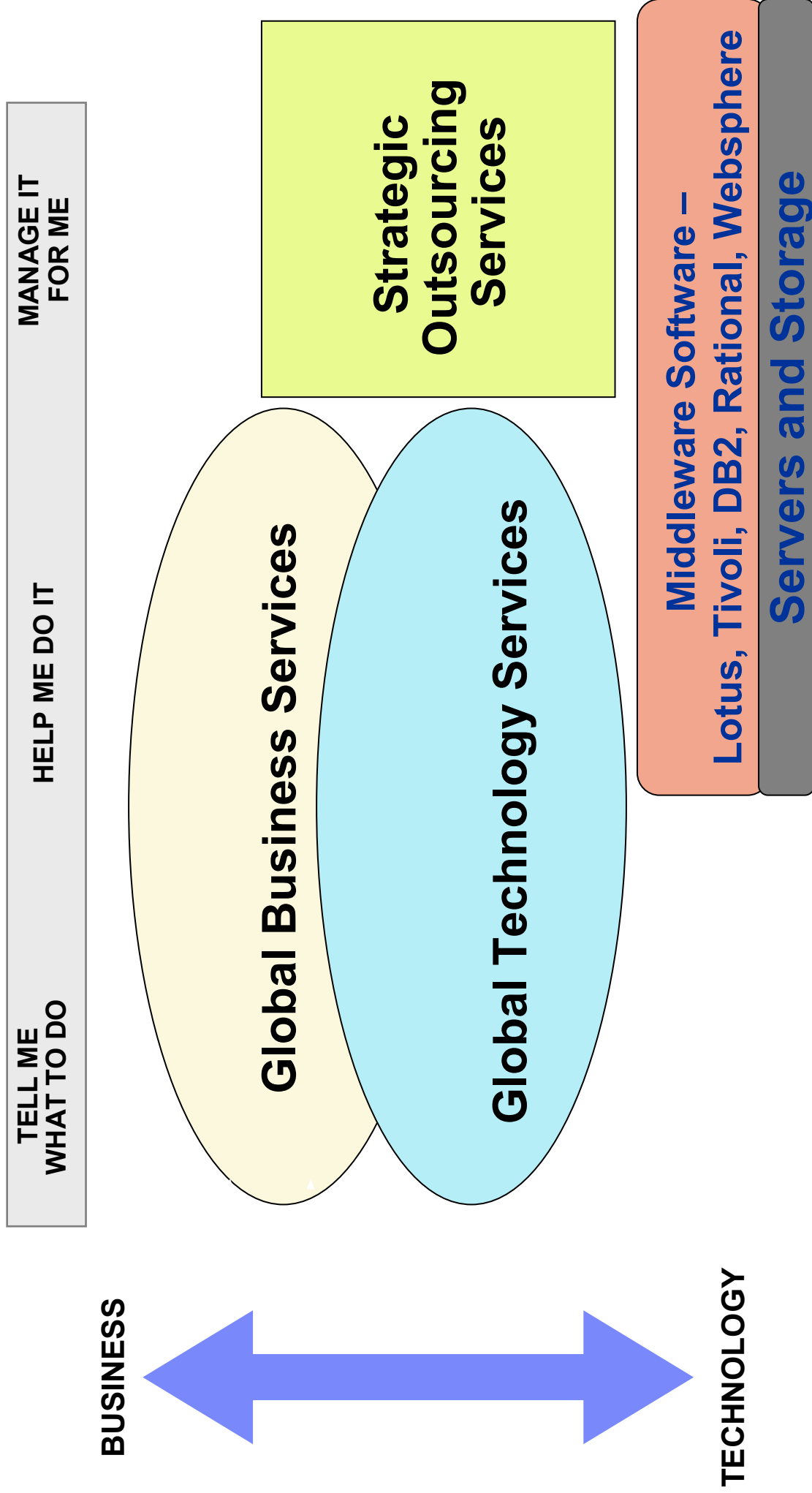
Computing
Tabulating
Recording
Company 1911-
1924



2007 IBM Corporate Revenue by segment

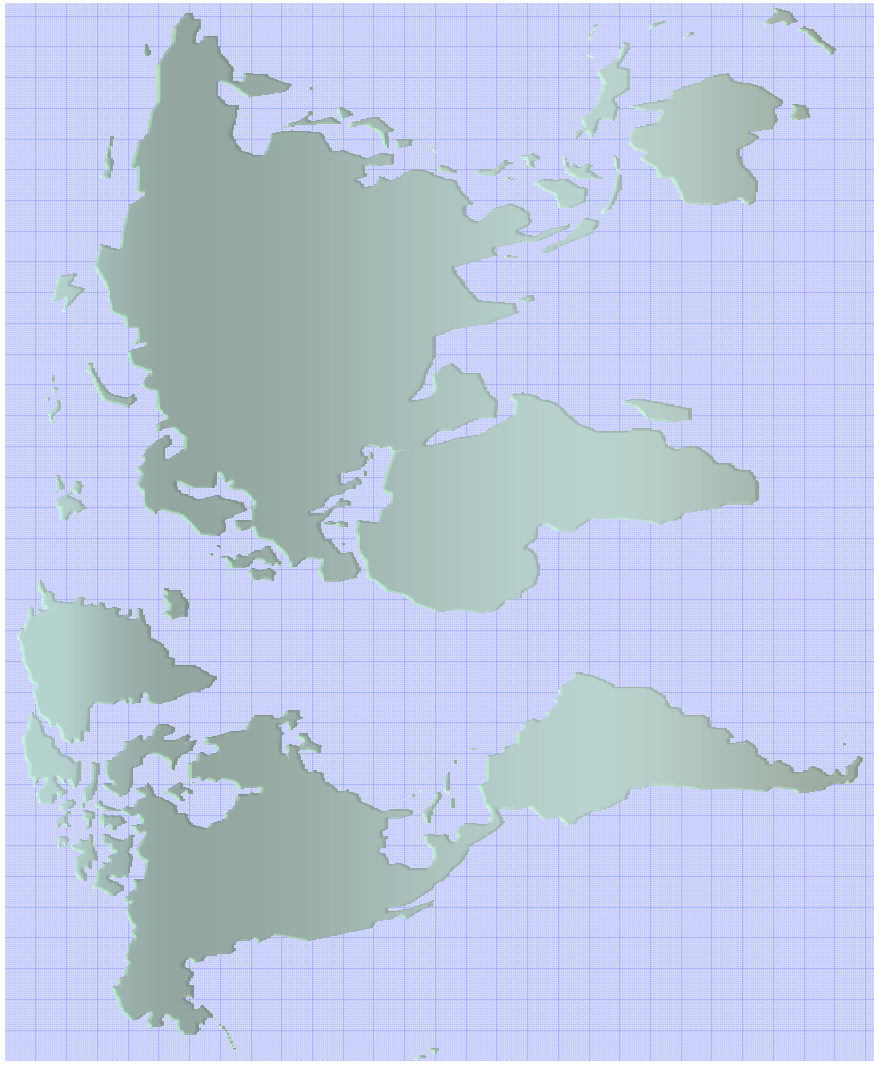


IBM's End-to-end solutions with products and services



The economy has reached a new era – an innovation era

21st-Century Drivers of Change



Network Ubiquity

- More than a billion Internet users today
- Trillions of connected devices

Open Standards

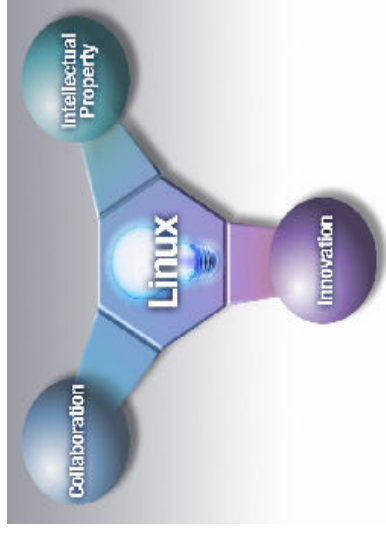
- Widely-adopted technical and transaction specifications

New Business Designs in a global economy

- Horizontally-integrated operations

Nature of innovation itself is changing

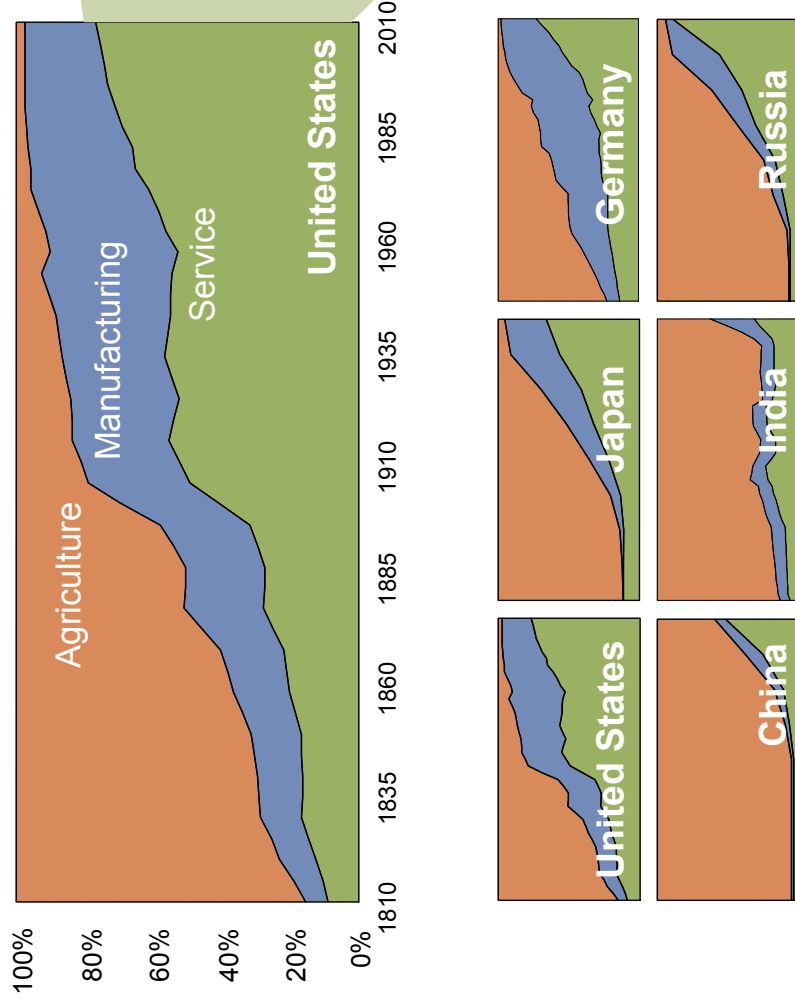
- **It's occurring more rapidly**
- **It's more open, global and requires wider collaboration across multiple disciplines, specialties and borders often involving diversity in culture and language**
- **Concepts of intellectual property ownership are giving way to a more enlightened emphasis on intellectual capital, sharing and collaboration.**



Services as share of Gross Domestic product

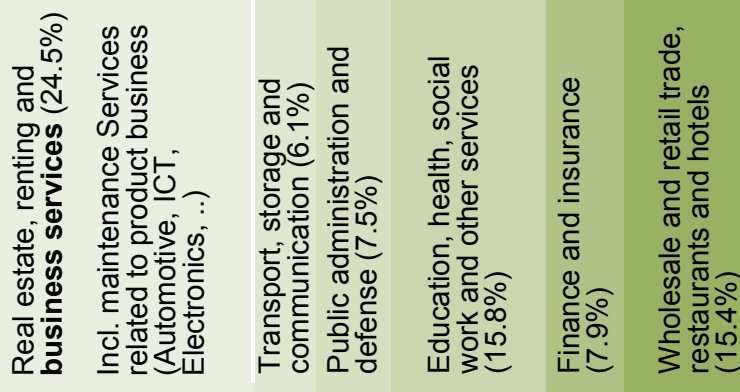
Economies have become services dominated

Historical Development of GDP contribution of industrial sectors in some example countries



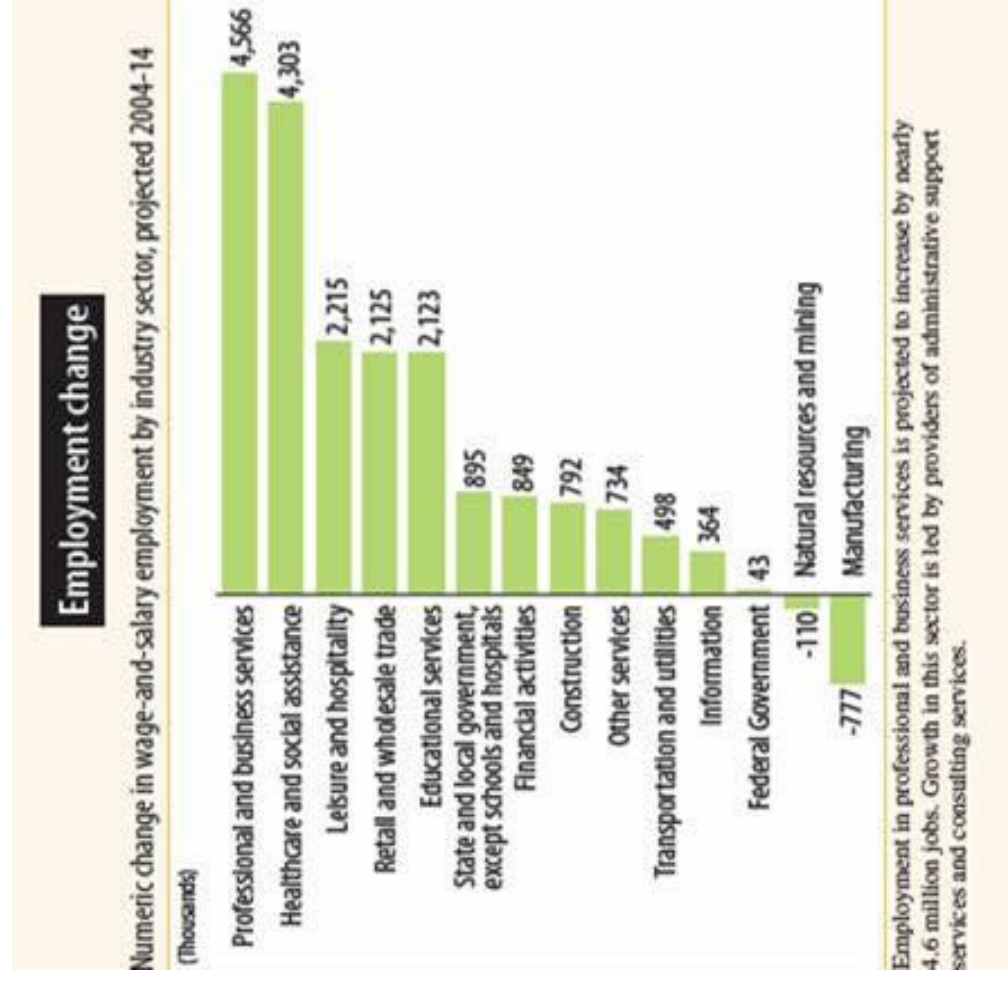
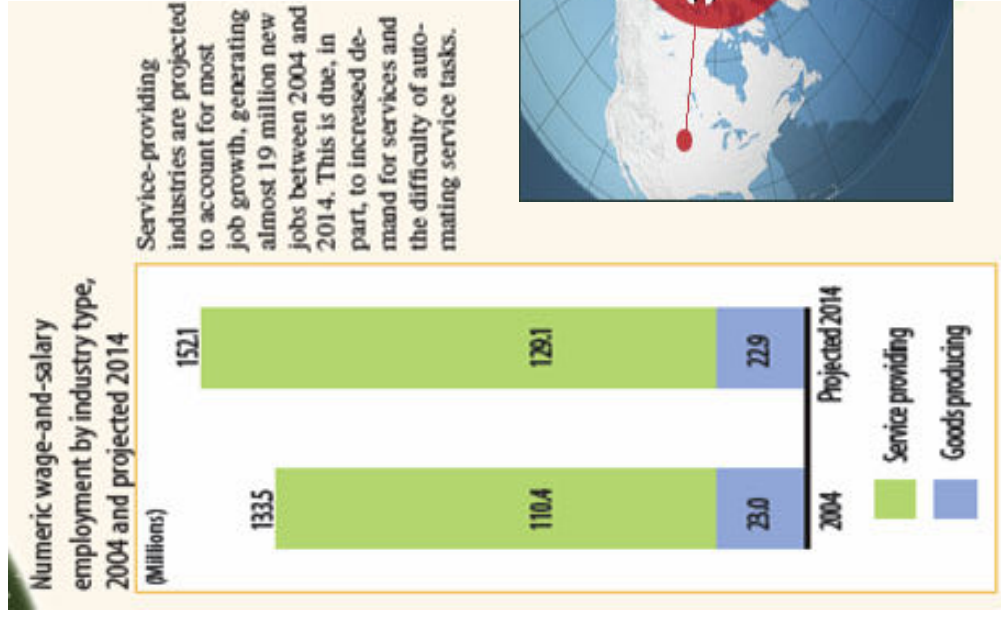
Business and related services provide a growing part of overall services

Breakdown of services for U.S. 2004



Source: OECD in Figures 2006-2007

Projected US service employment growth, 2004 - 2014



US Bureau of Labor Statistics.

<http://www.bls.gov/pub/ooq/2005/winter/art03.pdf>

Conclusions

- **Growth is in services business**
- **Global competition in product business; hard to escape the commodity/price battle**
- **Need to evolve from delivering the best technology to providing the best solution**
- **Know your customer's business environment**
 - = Industry specifics + Customer specifics + Technology + Client needs + Governmental rules & regulations + ...**

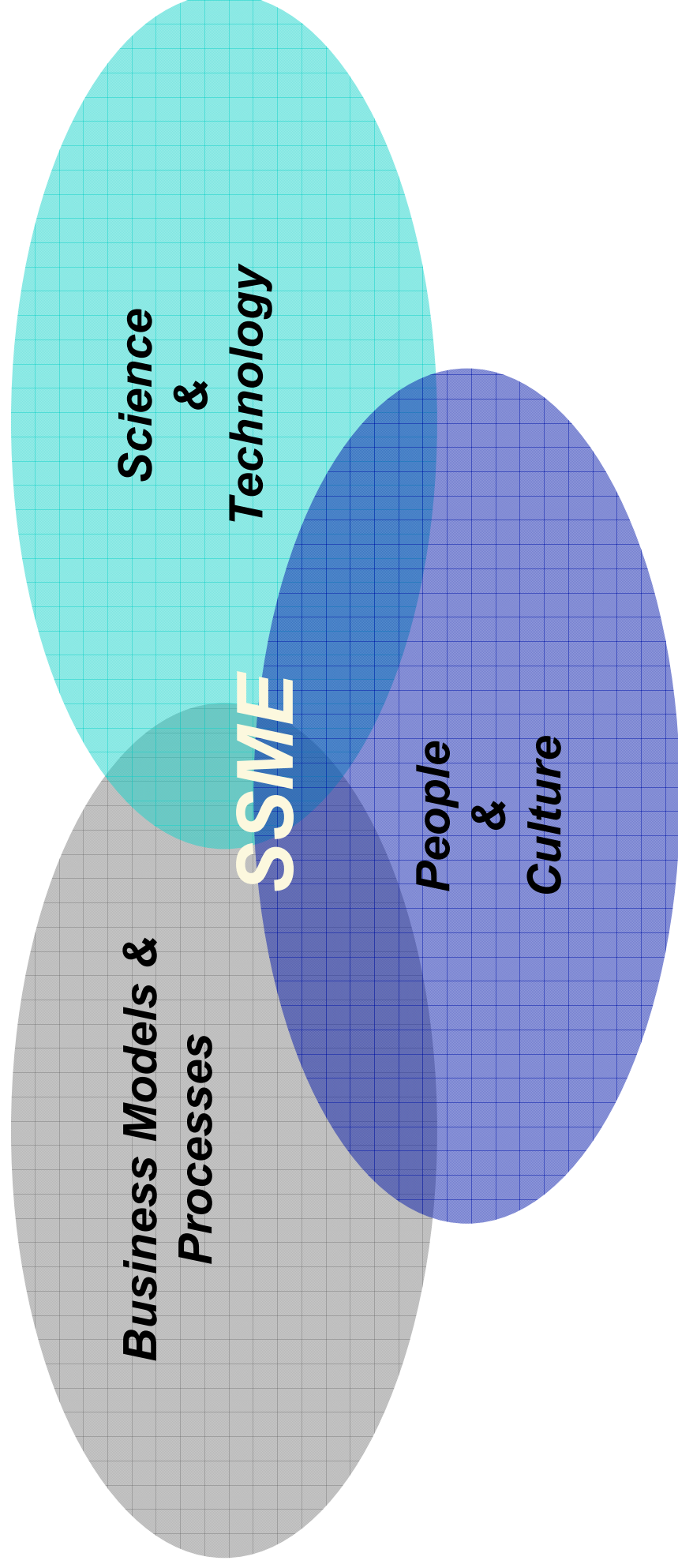
The 21st Century Paradox

- **21st century GDP is service driven with on average more than 70% share of nations' GDP**
- **Only 10 to 20% of nations' R&D is service innovation oriented; major focus remains on technology research and production process innovation**
- **what about service innovation and global competitive differentiation ??**

Real innovation is the result of research

- **Jim Spohrer, Service researcher at Almaden Research Center identified the need for a science which studies the service phenomena of this 21st century from a societal, economic, ICT and engineering and management aspect (2004)**
- **He called it Service Science, Management and Engineering, short SSME**
- **The study of services requires a multi-disciplinary insight of above domains. As from the beginning, we have promoted a move to multi-disciplinary and cross-faculty research and curricula at universities.**

Services Science, Management & Engineering (SSME)



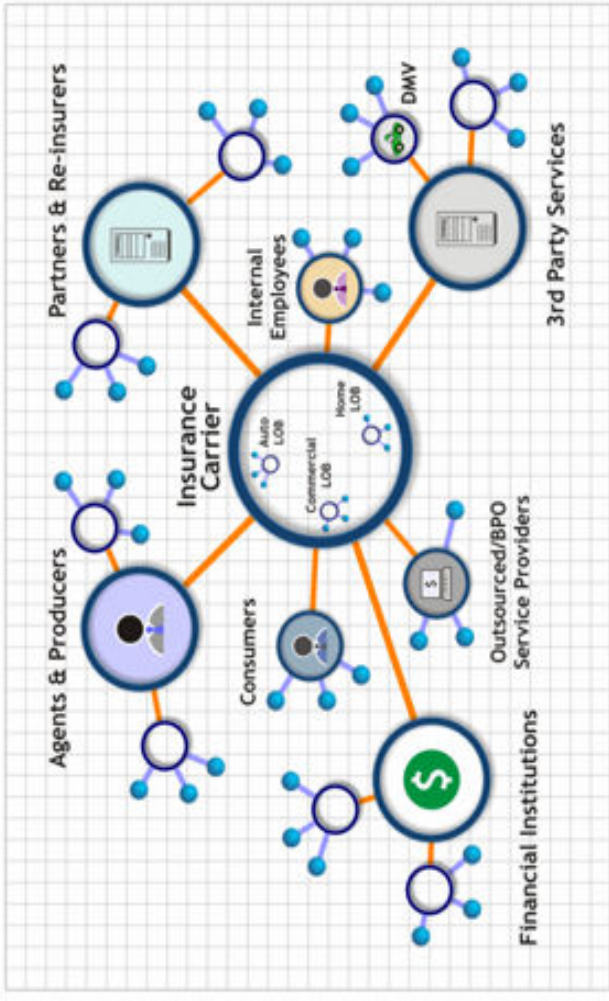
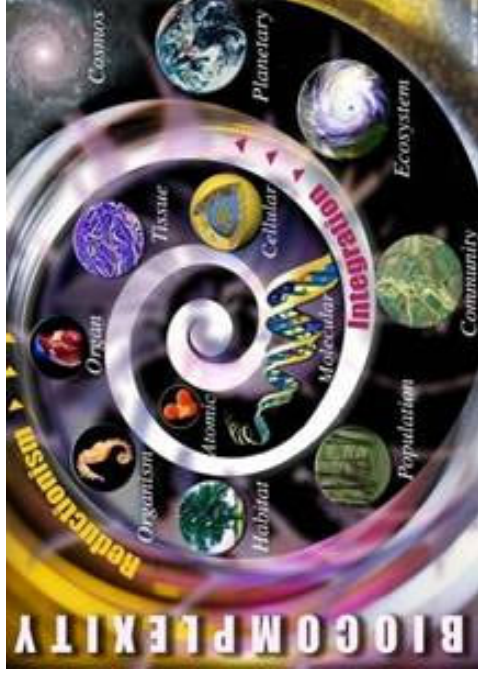
The marketplace requires innovation that combines
people, technology, value and clients

Definition of SSME

- SSME is the application of scientific, management, and engineering disciplines to tasks that one organization beneficially performs for and with another ('service systems')

The key to service value is in actions, performed now or promised for the future. Services often create mutual interdependencies.

A service system is a type of complex system



“People-Oriented, Services-Intensive, Market-Facing Complex Systems – *complex systems and services* – are very similar areas around which we are framing the very complicated problems of business and societal systems that we are trying to understand.”

Irving Wladawsky-Berger, IBM VP Innovation (Oct. 9, 2006)

Impact of Service Innovation

- *Academics need to make service innovation a priority*
 - **University competitiveness for prospective students and attractiveness to business for shared research**
- *Governments need to make service innovation a priority*
 - **GDP growth and employment increasingly depends on it, hence citizens' wellness and satisfaction**
- *Businesses need to make service innovation a priority*
 - **Revenue and profit growth increasingly depend on it**
 - **Competitive value of product driven companies increasingly depends on services**

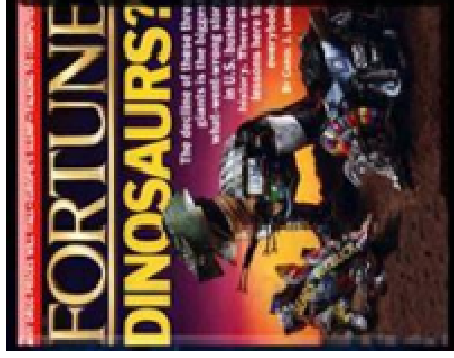
Service Innovation at IBM

IBM's strategic journey

We have set a deliberate new agenda for our clients, our industry and ourselves



1984



1992



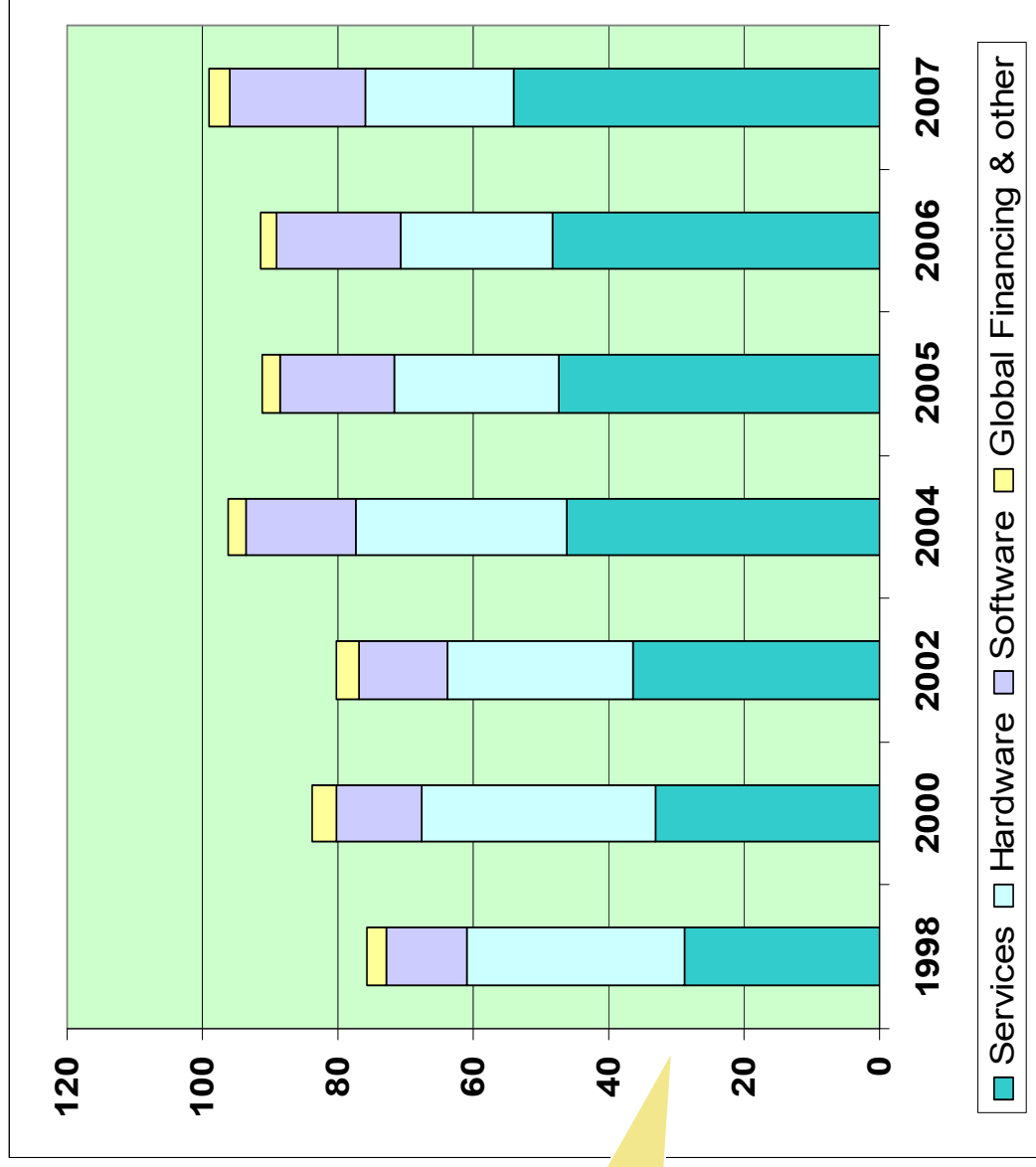
2004



2005

Shape of revenue dramatically changed over past 10 years

3%
20%
22%
55%



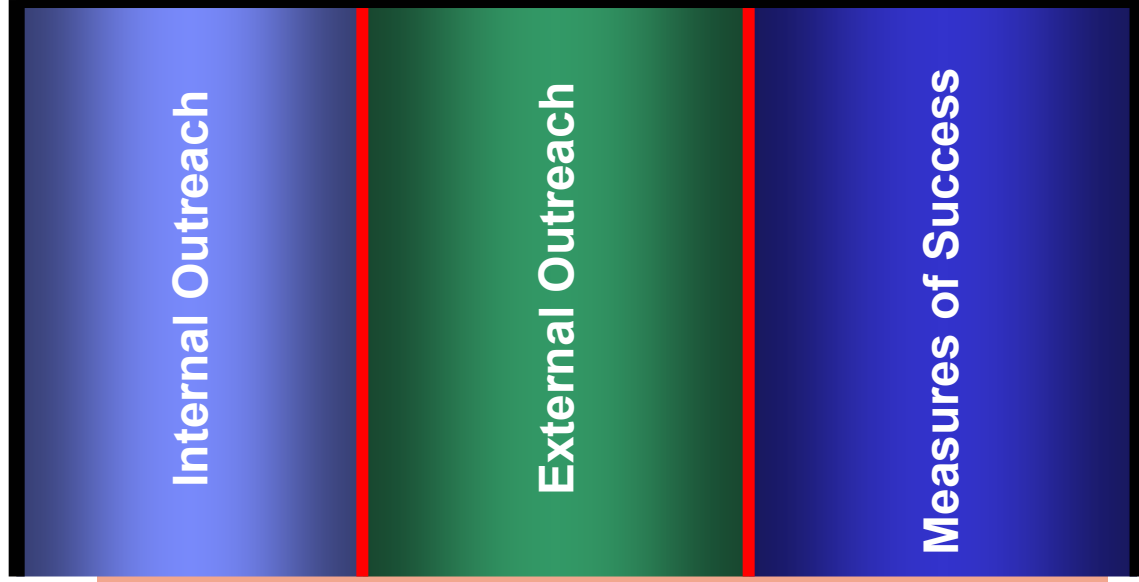
4%
16%
42%
38%

IBM and SSME – what needs doing yet

- **IBM Research**
- **IBM University Programs**
- **IBM Government Programs**
- **IBM Recruiting**
- **IBM Learning Services**

IBM's 2008 SSME Priorities

Create integrated strategy and execution plans to speed the adoption of SSME and build the pipeline of skills we need for the 21st century



Metrics - Awareness/Adoption/Results

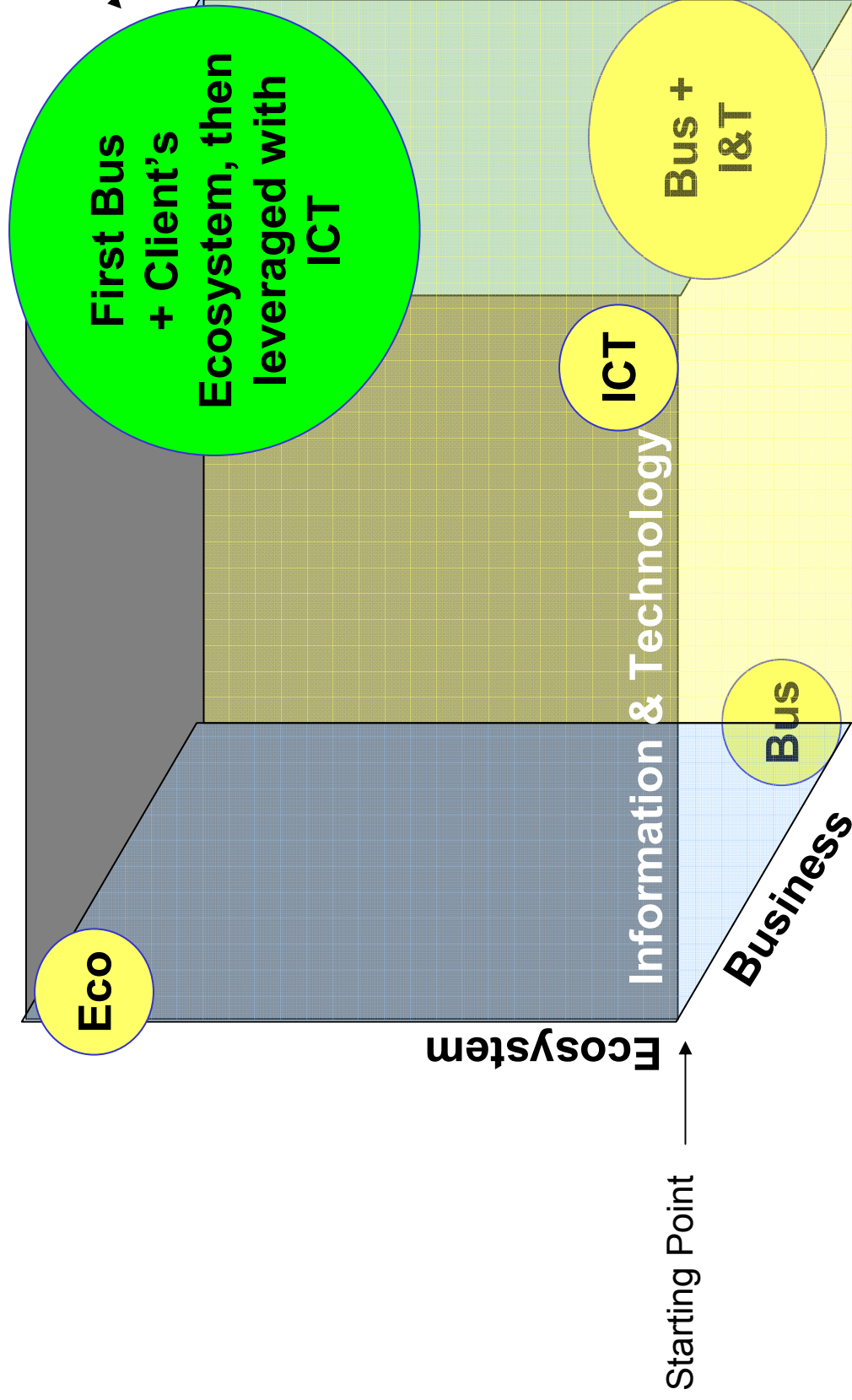
Engage our services organizations in SSME
 Create an internal “buzz” around SSME and skills
 Catalyze SSME education/skills initiative for IBMers
 Connect the dots and create internal governance model

Create a global movement and build momentum
 Encourage funding and policy initiatives for SSME
 Expand IBM lecture series and case studies globally
 Support Research agenda to take SSME to the next level

Thought leadership and press
 Industry and Government participation and adoption
 University and IBM adoption
 Joint research, science and exploratory projects

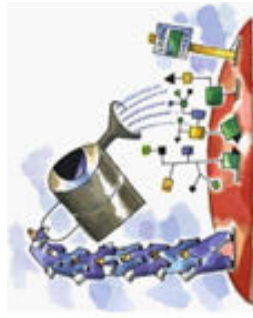
Application of SSME principles to business solutions

The promise of SSME



SSME and EDUCATION

We need a new breed of innovator – the service scientist



**Management
(Business)**

+



**Social Science
(People)**

+



**Engineering
(Technology)**



Tower of Babel

- “Biggest problem in business is people don’t know how to talk to other people in the language they understand.”
- Charles Holliday, CEO Dupont



Service Education is Interdisciplinary



Science and Engineering

Industrial and Systems Engineering

Computer Science & Info. Systems

Math and Operations Research



Economics and Social Sciences

Business Anthropology

Organizational Change & Learning

Business and Management

Need more T-shaped people – both deep and broad

Academic Initiative > Skills for the 21st century >

Services Science, Management, and Engineering



Getting Started

Learn

Teach

Connect

IBM Academic Initiative

Products & technologies

Downloads & CDs

Training

Curriculum & courseware

Skills for the 21st century

- Services Science, Management & Engineering

- Globalization

- Accessibility

Forums & community

Certification

Library

Support

News & events

Membership

Site map

Feedback

Related links

- Student Portal
- Solutions for higher

SSME Highlights



Services Science: A New Field for Today's Economy

→ SSME Conference: Education for the 21st Century



Trends in Services Science

⇨ How IBM is Applying Science to the World of Services

⇨ Big Blue Shift: IBM lowers costs without skimping on service

⇨ IBM Wakes Up to India's Skills

⇨ IBM urges universities to go multidisciplinary

⇨ What is "Service Science"?

⇨ The New Science

What is SSME?

Services Science, Management and Engineering (SSME) is a new academic discipline and research area aimed at studying, improving and teaching services innovation. It is the application and integration of scientific, management and engineering disciplines to tasks that one organization beneficially performs for and with another (that is, "services").

The goal of the SSME discipline is to make productivity, quality, sustainability, learning rates and innovation rates more predictable across the service sector, especially in complex organization to organization services including business to business, nation to nation, government to population, and so on.

"... modern economies are both service economies and economies of innovation. Paradoxically, they are not regarded as economies of innovation in services, that is as economies in which service firms' innovation efforts are proportional to their contribution from the major economic aggregates. It is as if service and innovation were two parallel universes that coexist in blissful ignorance of each other."

SSME Roadmap for University Faculty

1. Learn about Services as a Science

Go to the IBM SSME website www.ibm.com/university/ssme:

- Recommended reading list
- SSME-related conferences
- Course-related linkages

2. Assess what your school is doing now in SSME-related studies and share with IBM and other universities. Identify gaps in curriculum and build SSME curriculum.

3. Collaborate with other Universities who are leaders in SSME research

- Berkley, CMU, Stanford, MIT, Oxford, Tsing Hua, NCSU, GA Tech, SJSU

4. Participate in the SSME evolution:

- Champion efforts to promote SSME
- Conduct research in various challenge areas
- Apply for research and new curricula grants from Government and Foundations
- Build new course curriculum for degree programs
- Build case studies using IBM customer examples, industry studies and business issues studies
- Post SSME curricula and courseware on IBM Academic Initiative website for collaboration
- Engage in SSME conferences and events



Example Curriculum: SSME at North Carolina State University

MBA Concentration in SSME

Required

- Services Management Consulting
- Business Relationship Management

Choose one of the following

- Market Analytics
- Marketing Research
- Marketing Strategy
- Project Management
- Supplier Relations

Elective options

- Market Analytics
- Marketing Strategy
- Supplier Relations

MS Concentration in SSME

Required

- Services Management
- Management of Technology
- Managing People in the High-Tech Environment
- Process Analysis and Design

Requirements and Electives

- in Electrical Engineering or
- Computer Science Masters Programs

What would service scientists actually do?

- Own the body of knowledge around service system problem solving
- Identify a service system that needs improvement
 - Identify the stakeholders
 - their concerns and perceived opportunities
- Envision additional new service systems
 - or reconfigurations of old service systems components that best address all problems and opportunities
 - Identify year-over-year improvement trajectories
 - Identify incentives to change (ROI, leadership, laws)

Over 150 SSME curricula worldwide, examples ..

- Brigham Young University
- **Brussels, V.U.B.**
- Business school of IDC (Israel)
- Cornell University
- Delft University of Technology
- EPFL Federal Institute of Technology Lausanne
- **FUNDP (Namur Belgium)**
- Georgetown University
- Harbin Institute of Technology
- Helsinki Polytechnic Institute
- ITESM (Mexico)
- JAIST
- **K.U.Leuven**
- Long Island University
- Massachusetts Institute of Technology
- Michigan Technological University
- Missouri State
- Northern Illinois University
- Ohio State, Fisher College of Business
- Pace
- Portland State University
- Rensselaer Polytechnic
- RMIT University
- Rochester Institute of Technology
- Sogang University
- State University of Management, Moscow
- Technical University of Brno, Czech Republic
- Tampere University of Technology
- Texas A & M
- Tsinghua
- **U.C. Louvain**
- UNC Keenan Flagler School of Business
- **Uni Luxembourg**
- **Universiteit Antwerpen**
- **Universiteit Gent**
- University of Bridgeport
- University of California, Santa Cruz
- University College, Dublin
- University of Dublin (Trinity College)
- University of Porto
- University of Pretoria
- University of Sydney
- Universidad Federal de Rio de Janeiro
- University of Manchester
- University of MD Baltimore County
- University of Maryland RH Smith School of Business
- University of Pavia
- University of Pennsylvania, Wharton
- University of Virginia
- Universidad Torcuato Di Tella
- University of Tsukuba
- Western Michigan University
- Virginia Tech
- Warwick University
- William and Mary
- York University Canada



SSME and Industry



See and handle Opportunities and Threats in ..

- **Globalisation:**
 - impact on your products & services, your clients & suppliers, your R&D, your hiring
- **Ageing Population / shortage of resources**
- **Ubiquitous network and ICT resources: value leveraging?**
- **Client-centric positioning / participant in solution**
- **Services based business architecture (cfr SOA)**
- **What is the value that you bring to your clients ?**

Industry Trend Reports for Teaching SSME

IBM Global Services > IBM Business Consulting > Innovation and research >

IBM Institute for Business Value

THOUGHT LEADERSHIP STARTS HERE
 The IBM Institute for Business Value brings leading-edge thinking and practical insights to business executives

The IBM Institute for Business Value provides strategic insights and recommendations that address critical business challenges and help our clients capitalize on new opportunities.

“We work in collaboration with industry experts, leading-edge clients and our own field consultants to provide practical recommendations built on a foundation of fundamental research.”

— George Pohle, Partner and Global Leader, IBM Institute for Business Value.

We're here to help
 Easy ways to get the answers you need.

E-mail us

or call us at
1-800-IBM-7080
 ext. BCS

Learn more

Innovation and research podcasts
 This audio series is brought to you directly from the researchers at the IBM Institute for Business Value. Listen in

Business thought leadership from IBM

Our research is used by senior executives to help them:

- Anticipate changes in their industries
- Prioritize strategic and operational alternatives for action
- Formulate road maps for change initiatives
- Determine the best metrics for measuring success
- Quantify the expected return on their investments.

Well over 100 studies are currently available across many industries and areas of functional expertise.

Search our reports

By industry

By business function

More about the IBM Institute for Business Value

The IBM Institute for Business Value is comprised of 60 consultants who conduct research and analysis in 17 industries and across 5 functional disciplines. The institute is a worldwide presence, drawing on consultants in nine countries to identify issues of global interest and to develop practical recommendations with local relevance.

U.S. Service Research and Innovation Initiative (SRII)

- Announced March 2007
- IBM and Oracle founding members
 - Advisory board includes Accenture, Cisco, EMC, Computer Sciences, Hewlett-Packard, Xerox, European Commission, Fraunhofer Institute
 - Research members from University of California, Los Angeles, Wharton School at University of Pennsylvania, Arizona State University
- Mission
 - Forum for collaboration to help set public and private research priorities
 - Pool corporate funds to support academic programs
 - Advise the government on preferred targets of basic research

Service Innovation at EC : some 2007 achievements

- DG ENTR and DG Education and Culture called for a new university discipline for service science in their joint EC communication on skills and innovation.
- Bruegel (Think Tank focusing on economic policy making) has created a new task force on growth and innovation, based on Service Science principles
- Funding for multidisciplinary/service science research and/or curriculum development (FP7 based): - Successful upstart of an FP7 research portfolio in the area of Networked Software and Services
- Broad awareness about Service Science has been created amongst MEP's

Joined initiative by EC and European industry: NESSI: Networked European Software and Services Initiative

“ Promoted by 13 major European ICT corporations (), totaling almost a million jobs and over 300 B€ of revenues, the NESSI Technology Platform aims to provide a unified view for **European research in Service Architectures** and **Software Infrastructures** that will define technologies, strategies and deployment policies fostering **new, open, industrial solutions and societal applications** that enhance safety, security and well-being of citizens.*

(*) Atos Origin, BT, Engineering Ingegneria Informatica, HP, IBM, Nokia, Object Web, SAP, Siemens, Software AG, Telecom Italia, Telefonica, Thales

NESSI: strategic drivers

- European dimension
- ICT simplification
- Adopting a citizen perspective
- A truly multicultural approach
- Business and administrative process flexibility
- Embracing open source as a model
- Open Standards adoption and development
- SME-friendly eco-systems

Open Innovation Policy Group for Services Creation

- Industry led with encouragement and support by the European Commission
- Nokia, Intel, BT, IBM, HP, SAP, Philips, Orange, Items International (non-industry Sitra and NESTA)
- Focus on Strategy and Policy in support of Open Innovation in Europe
- Service Economy and Services Innovation
- The empowered User



| IBM Overview

Recommendations

ON DEMAND BUSINESS™

What to do next ?

- ***Academics need to make service innovation a priority***
 - Intensify collaboration amongst faculties and amongst universities, worldwide
 - Research in Services
 - Students to be better prepared to a multi-disciplinary professional career
- ***Businesses need to make service innovation a priority***
 - Moving from technology based to solutions based is a tough journey
 - Open innovation within industry and with academia
 - Government and Trade associations to support entrepreneurs
- ***Governments need to make service innovation a priority***
 - Policy definition which makes services innovation a priority
 - Encourage academia in their transition into multi-disciplinary research & education
 - Encourage and support industry to invest in services innovation
 - Encourage young graduates to become an entrepreneur

Thank You!