



Almaden Services Research

Service Science, Management, and Engineering (SSME): An Interdisciplinary Approach to Service Innovation

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On the need for service research...

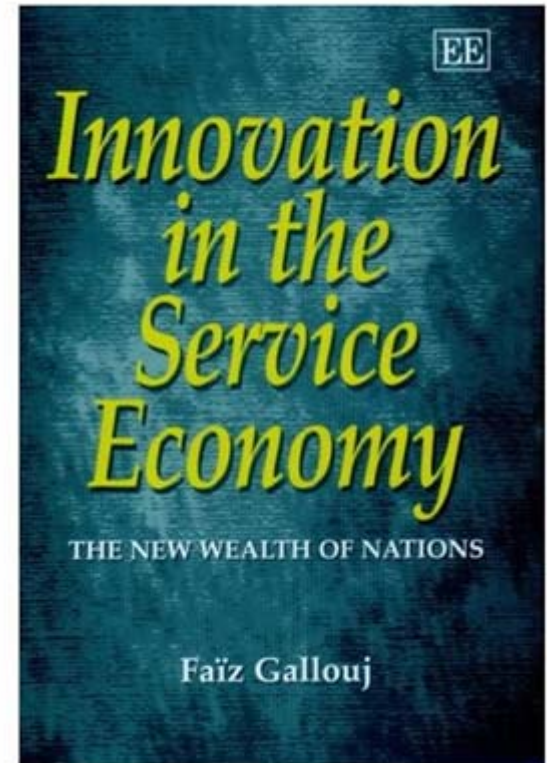
“Services account for more than 80 percent of the U.S. gross domestic product, employ a large and growing share of the science and engineering workforce, and are the primary users of information technology. ... [The] academic research enterprise has not focused on or been organized to meet the needs of service businesses. Major challenges to services industries that could be taken up by universities include: (1) the adaptation and application of systems and industrial engineering concepts, methodologies, and quality-control processes to service functions and businesses; (2) the integration of technological research and social science, management, and policy research; and the (3) the education and training of engineering and science graduates prepared to deal with management, policy, and social issues.”

National Academy of Engineering (2003). "The Impact of Academic Research on Industrial Performance"

Put more crisply...

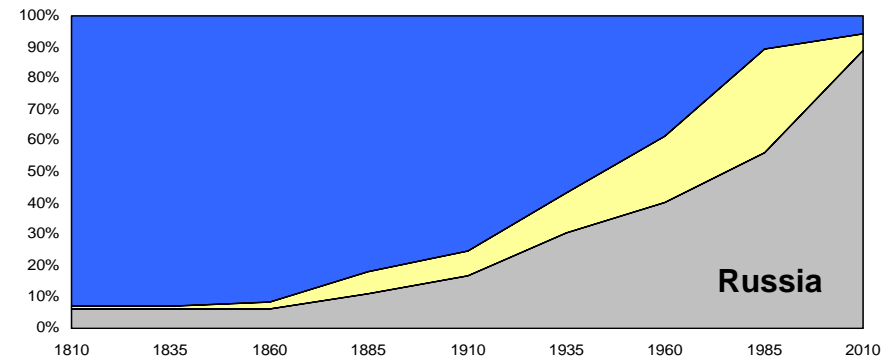
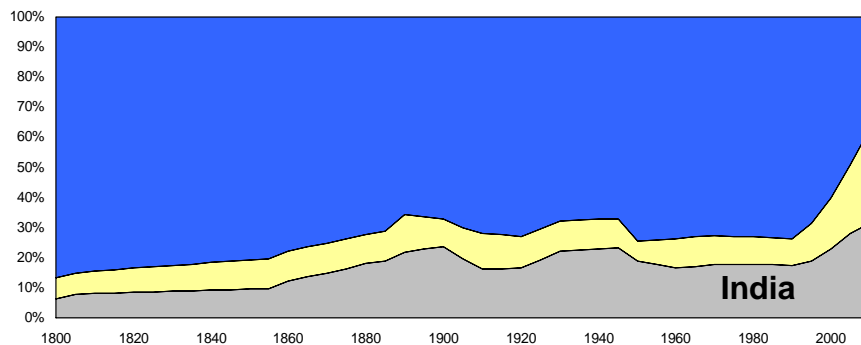
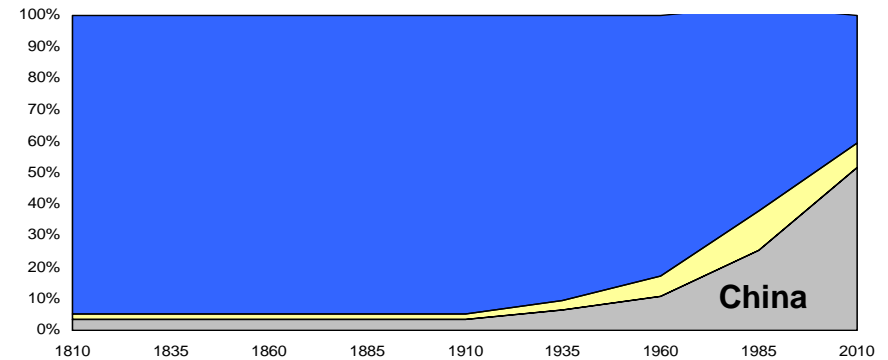
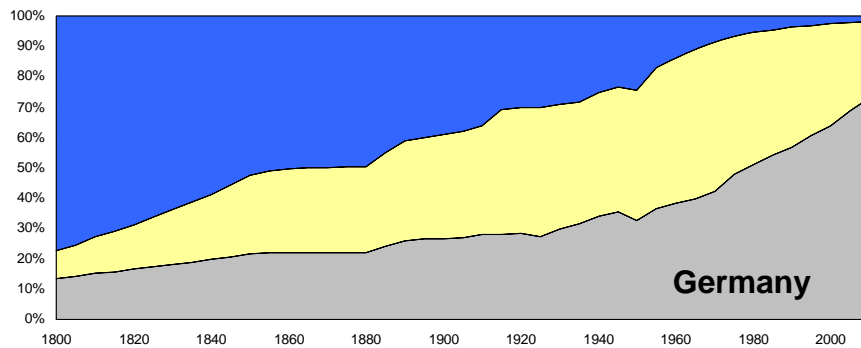
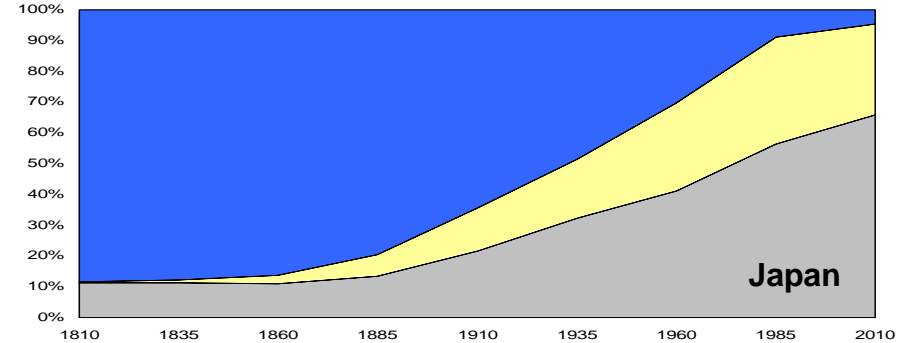
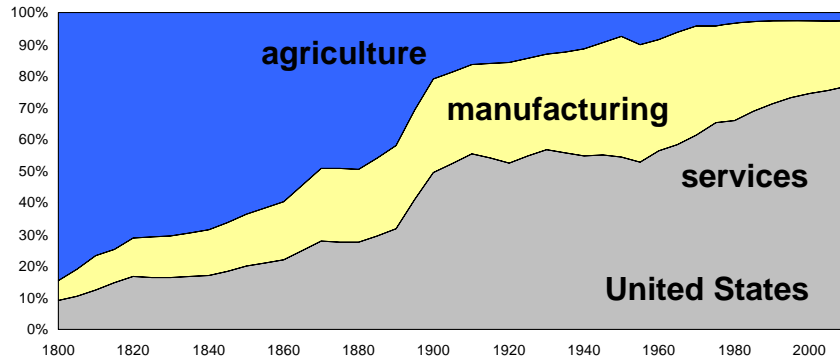
“... modern economies are both service economies and economies of innovation. Paradoxically, they are not regarded as economies of innovation *in* services, that is as economies in which service firms' innovation efforts are proportional to their contribution from the major economic aggregates. It is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

Gallouj, F. (2002). *Innovation in the Service Economy: The New Wealth of Nations*. Cheltenham UK: Edward Elgar.



The Rise of the Service Economy

Source: 2004 IBM Study based on national labor data

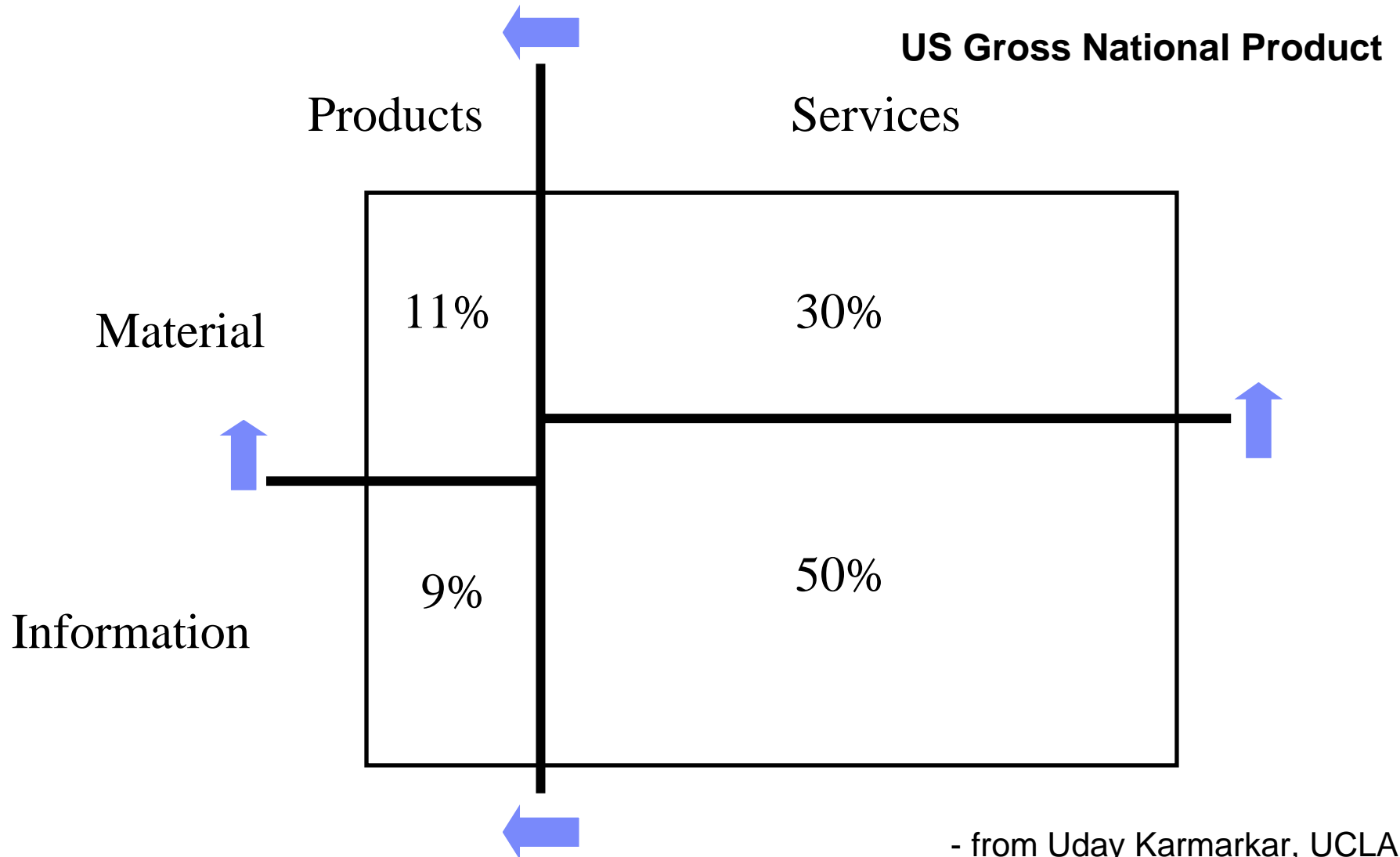


Service Jobs are High Skill Knowledge Worker Jobs

Type of work system	1979	1996			Example
		All	Service	Manufacture	
High-skill Autonomous	34%	40%	40%	40%	Executive, Scientist
Semi-Autonomous	35%	30%	30%	35%	Admin., Manager
Unrationalized Labor Intensive	25%	25%	26%	15%	Maid, child care
Tightly Constrained	6%	5%	4%	10%	Call center, Fast food

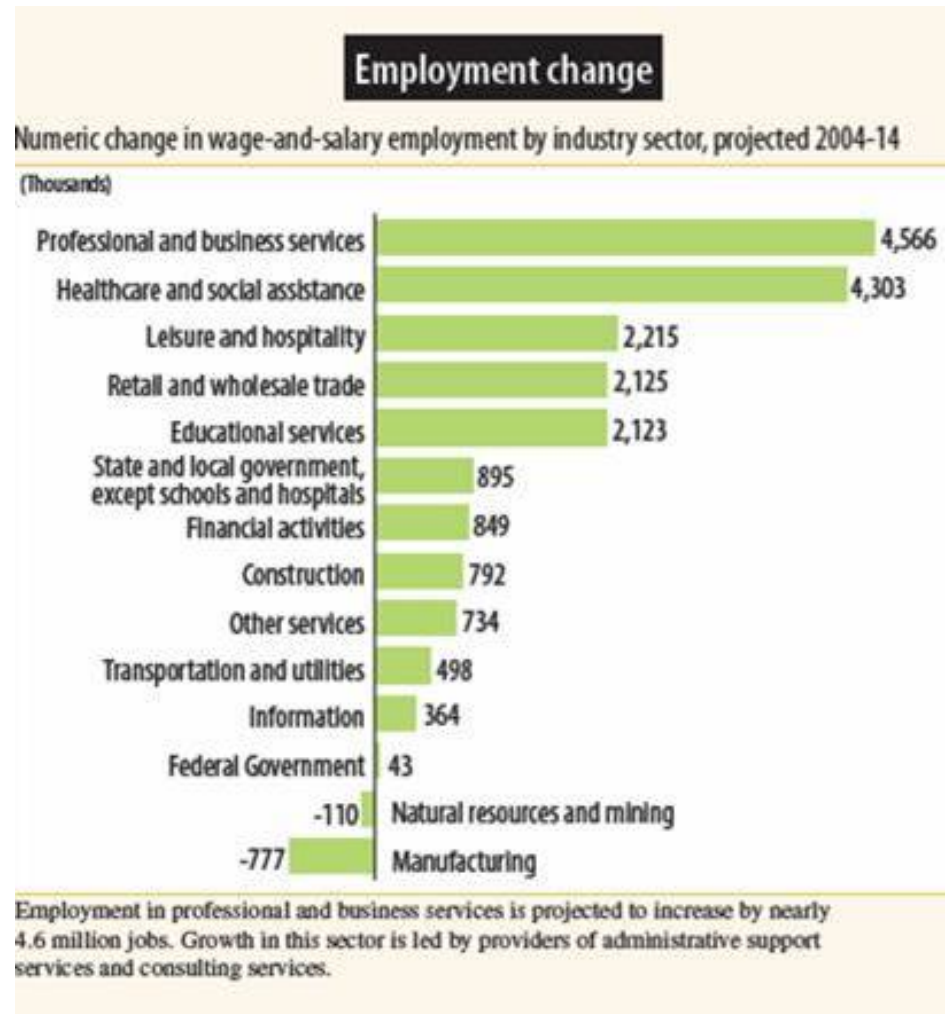
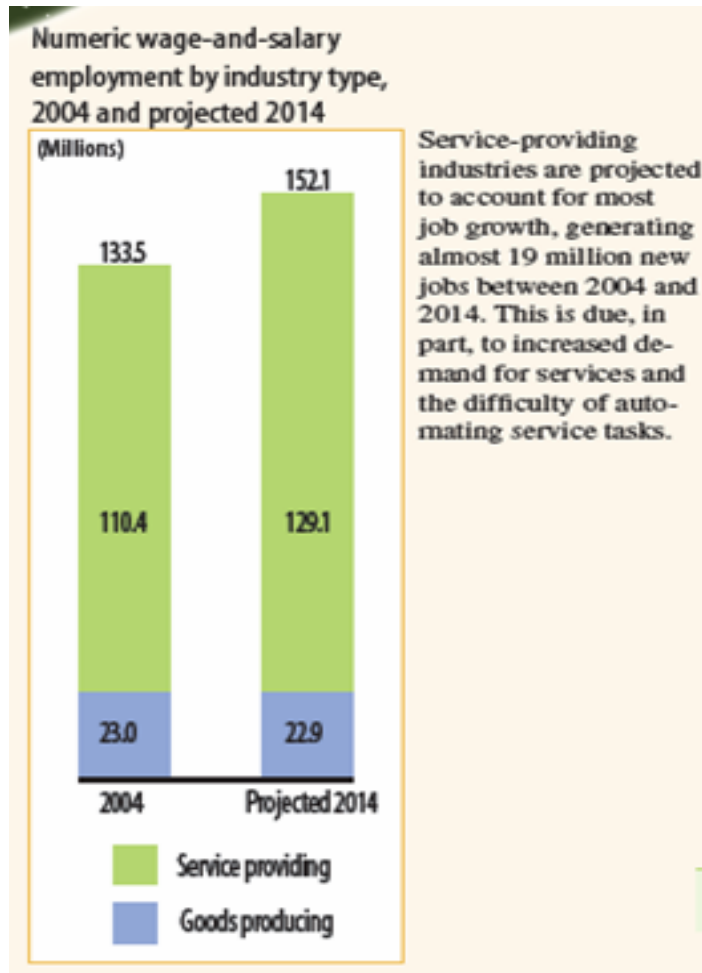
Source: Herzenberg, Alic, & Wial (1998). *New rules for a new economy. Employment and opportunity in postindustrial America.* Cornell University Press.

Information Services are big and getting bigger



- from Uday Karmarkar, UCLA

Projected US Service Employment Growth, 2004 - 2014



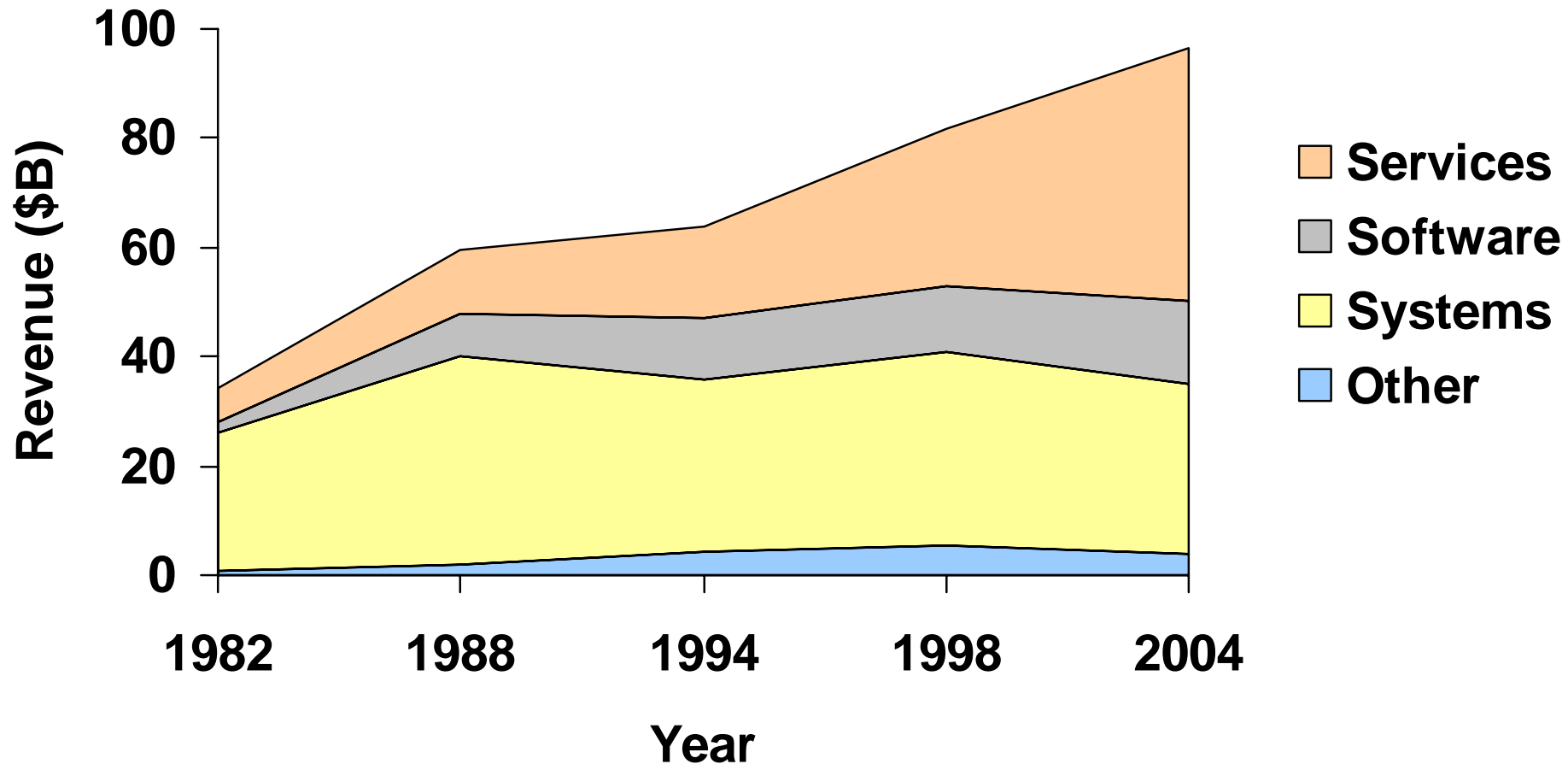
US Bureau of Labor Statistics.

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

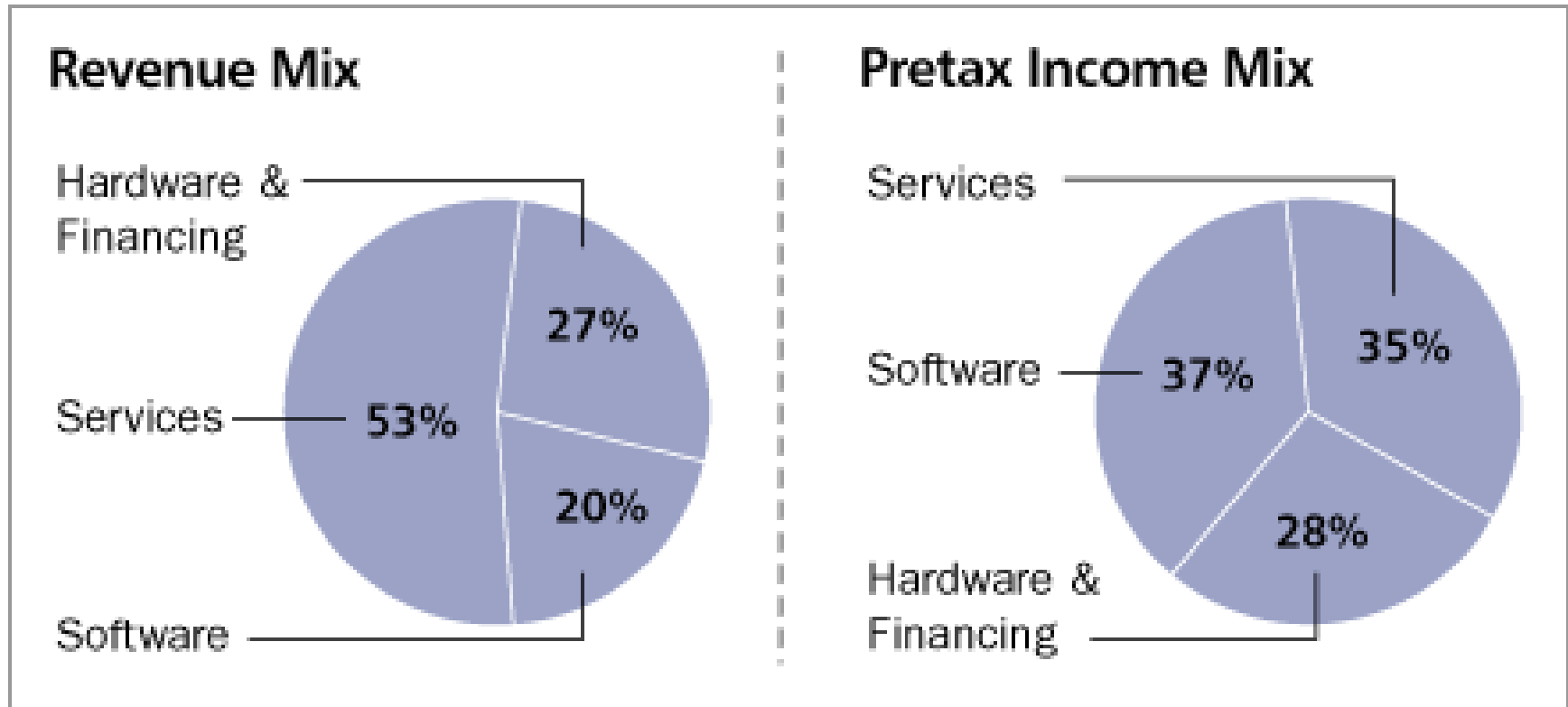
IBM MEANS SERVICES^S

For every business, large or small,
there is an International Business Machines
product.

IBM Revenue Growth is Now Led by Services...



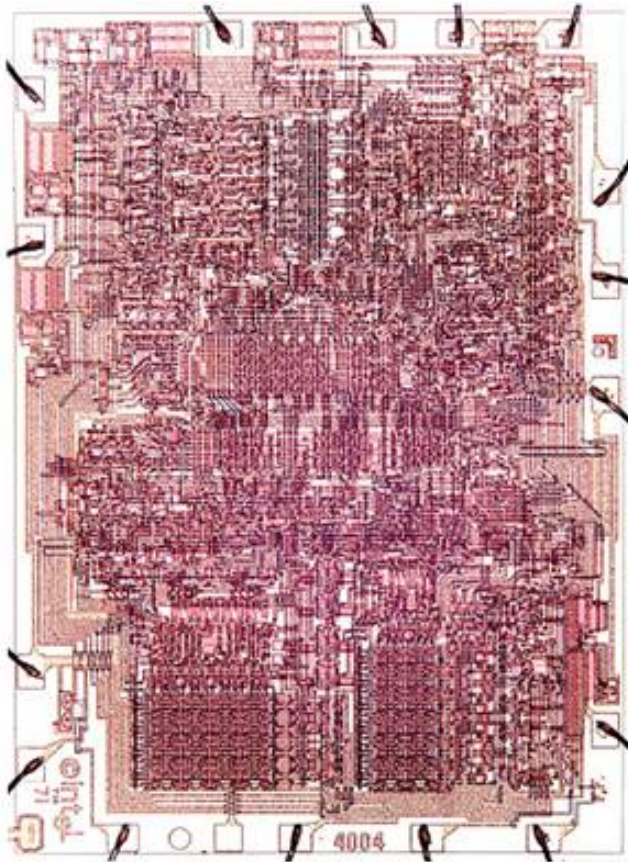
IBM: Why understanding service innovation matters



Fundamental Service Science Challenge:

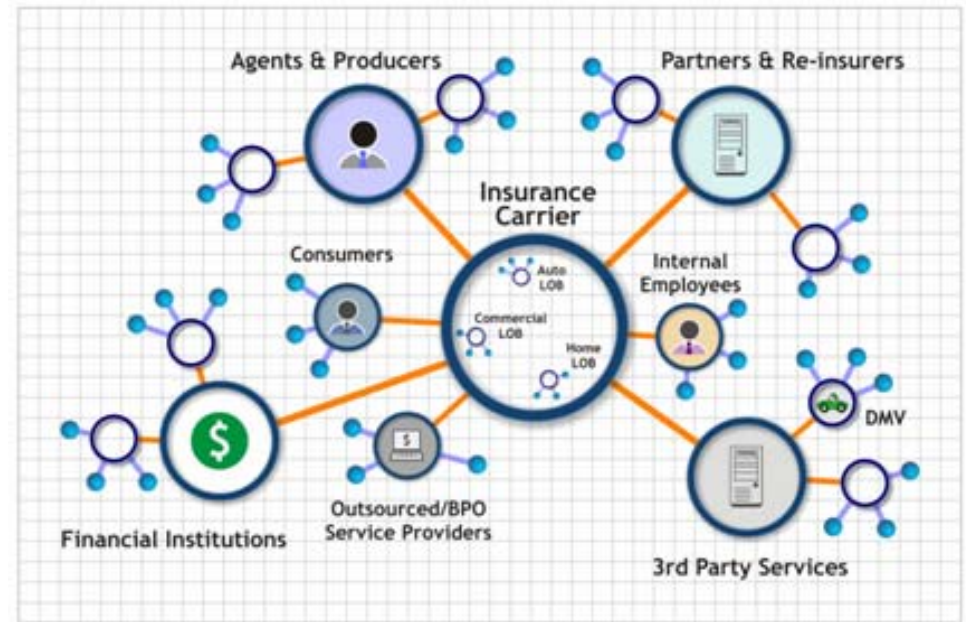
Scaling & Learning Curves Different from Manufacturing Identical Products
Variance may be opportunity (customize) or waste (standardize)

How to Invest to Make Systematic Improvements? (improvement = year-over-year increase in capabilities)



Computational System

Shrink Transistors



Service System

1. People (division of labor, multi-tasking)
2. Technology
3. Internal and External Service Systems
Connected by Value Propositions
4. Shared Information (language, laws, measures)

People do more, high value win-win actions

So What is Service?

In economics and marketing, a **service is the non-material equivalent of a good**. Service provision has been defined as an economic activity that does not result in ownership, and this is what differentiates it from providing physical goods. It is claimed to be a process that creates benefits by facilitating either a change in customers, a change in their physical possessions, or a change in their intangible assets.

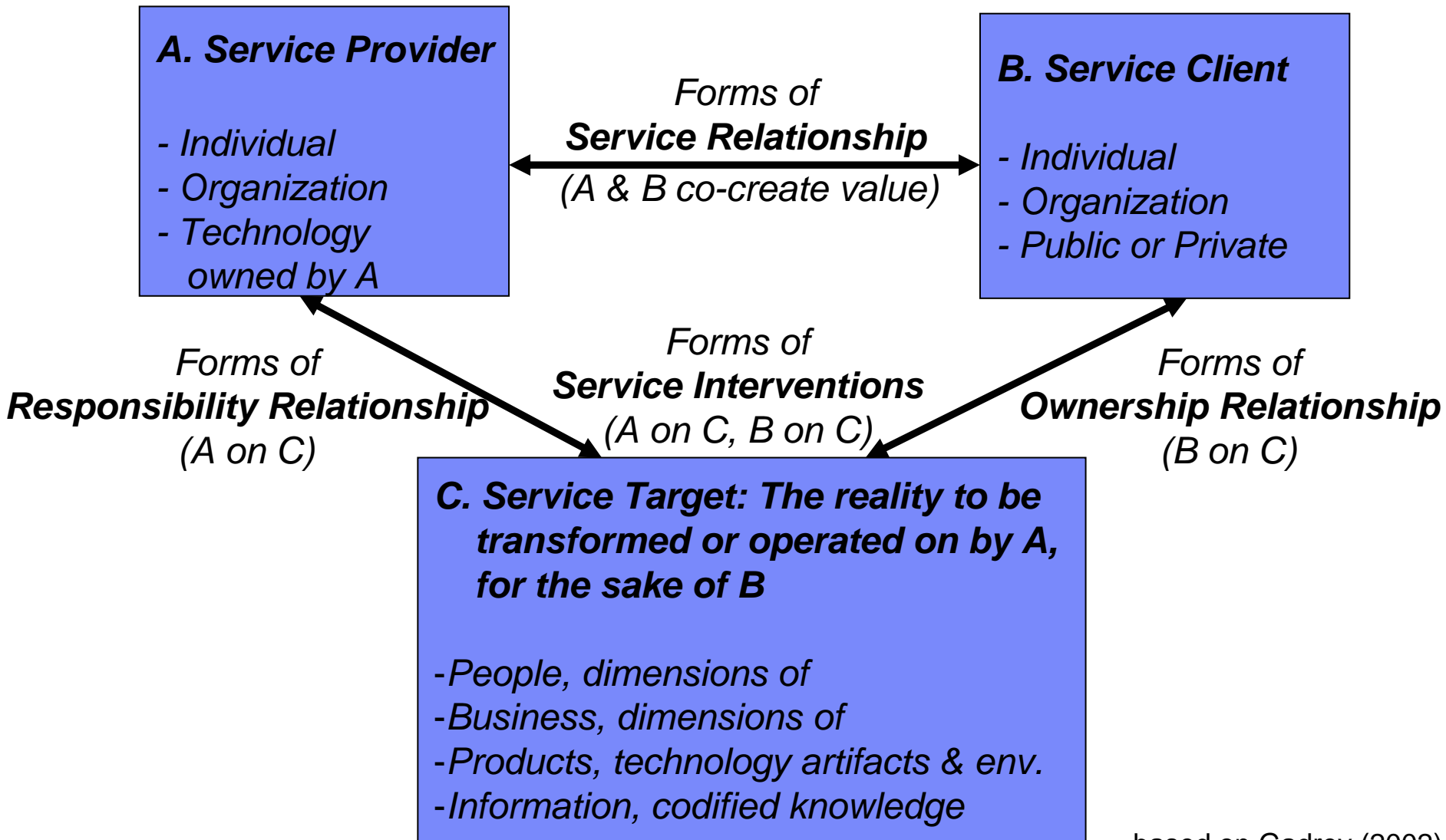
By supplying some level of **skill, ingenuity, and experience**, providers of a service participate in an economy without the restrictions of carrying stock (inventory) or the need to concern themselves with bulky raw materials. On the other hand, their investment in expertise does require marketing and upgrading in the face of competition which has equally few physical restrictions.

— from Wikipedia, see <http://en.wikipedia.org/wiki/Services>

What Really Defines Service?

- Deed, act, or performance
 - Berry (1980)
- An activity or series of activities... provided as solution to customer problems
 - Gronroos (1990)
- All economic activity whose output is not physical product or construction
 - Brian et al (1987)
- A time-perishable, intangible experience performed for a customer acting as co-producer
 - Fitzsimmons & Fitzsimmons (2001)
- A change in condition or state of an economic entity (or thing) caused by another
 - Hill (1977)
- Deeds, processes, performances
 - Zeithaml & Bitner (1996)
- Application of specialized competences through deeds, processes, and performances to benefit another
 - Vargo & Lusch (2004)

Another definition of Service... as systems of relationships



- based on Gadrey (2002)

From Computer Science to Service Science...

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Comput
Science

Need to ... Computer Scientists

Harvard Business Review

www.hbr.org

THE HBR LIST

Our annual survey of emerging management ideas considers the downside of reliability and the upside of flip-flops; new directions for evolving technologies; and the persistent questions of who we are and what we fear.

Breakthrough Ideas for 2005

14. Toward a New Science of Services

Henry W. Chesbrough

Services contribute even more to the global economy than products do. So shouldn't the science of services be an academic field in its own right? Whether it becomes one may depend on the same criteria—including the extent of corporate support—that set computer science apart from engineering, math, and physics.

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Business & Management

Economics & Markets

tists

Can there really be a science of services?

“Wherever there are phenomena, there can be a science to describe and explain those phenomena. Thus, the simplest (and correct) answer to “What is botany?” is, “Botany is the study of plants.” And zoology is the study of animals, astronomy the study of stars, and so on. Phenomena breed sciences.”

- Newell, A., Perlis, A. & Simon, H. A. (1967).
Computer Science, *Science*, 157, 1373-1374.

Possible Objections... to Computer Science

- Only natural phenomena breed sciences
- The term “computer” is not well defined
- Computer Science is the study of algorithms, not computers
- Computers are instruments, not phenomena
- Computer Science is a branch of another science
- Computers belong to engineering, not science

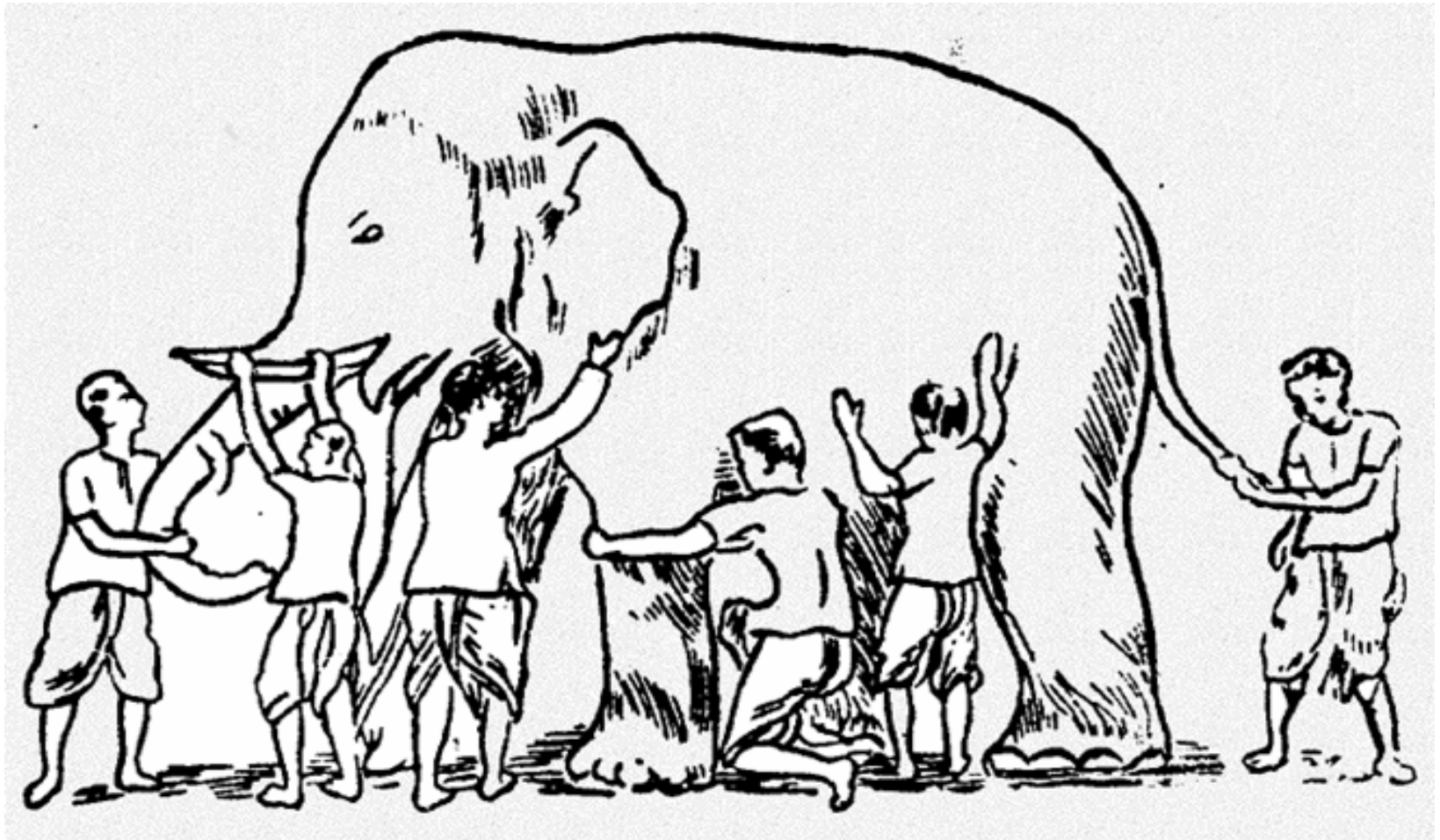
- Newell, Perlis, & Simon (1967)

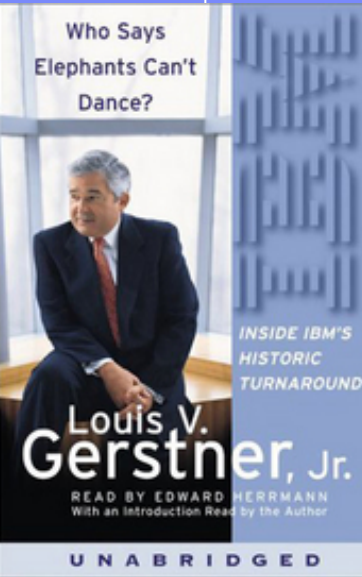
Possible Objections... to Service Science

- Only natural phenomena breed sciences
- The term “service” is not well defined
- Service Science is the study of work, not services
- Services are performances, not phenomena
- Service Science is a branch of another science
- Services belong to engineering (or management), not science

- with apologies to Newell, Perlis, & Simon (1967)

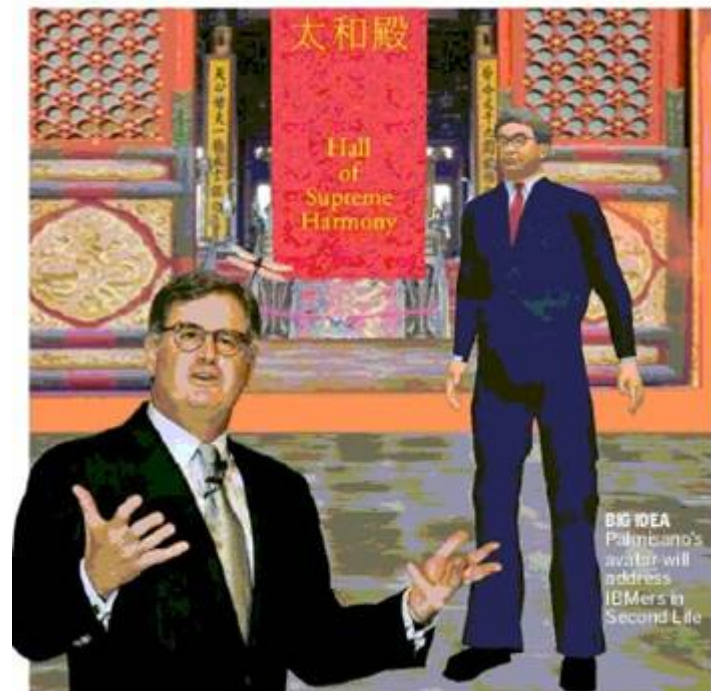
“Service science is just _____”





Now, About Elephants...

- *What I learned at IBM is that culture isn't part of the game. **It is the game.***
 - Louis V. Gerstner
- *Actually, the cultural change required for ITIL [IT Infrastructure Library, related to ISO 20000 Standard for IT Service Management] success is often a much greater challenge than the implementation of any supporting technologies.*
 - Brian Johnson, in CIO News Headlines Oct. 1, 2006
- *We strongly believe that development of an effective services science curriculum in Chinese universities will have a direct impact on China's economic growth*
 - Sam Palmisano, quoted Infoweeek, Nov 14, 2006

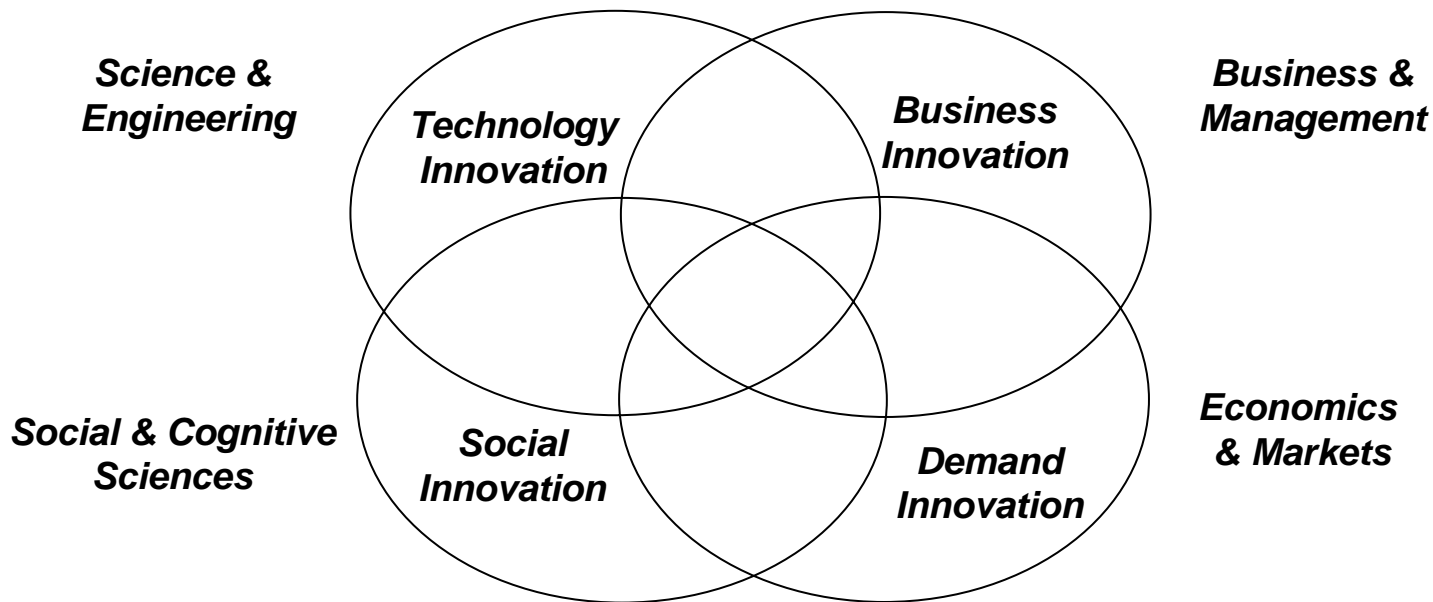


Need shared vocabulary and understanding of what a service system is – a type of complex adaptive system

- Operations Research and Industrial Engineering
 - More realistic models of people
- Computer Science and Electrical Engineering, Information Systems
 - Software and systems that adaptively change with business strategy
- Economics and Business Strategy, Service Management and Operations
 - Better models of scaling and innovation
- Law and Political Economy
 - Better models of social innovation – in what way is passing a law innovation
- Complex Systems and Systems Engineering
 - Better model of robustness and fragility of service systems (sustainability)
- Service systems are value coproduction configurations of people, technology, internal and external service systems (connected by value propositions), and shared information (language, laws, measures, models, etc.)
 - Examples: People, families, cities, businesses, nations, global economy, etc.

What I see...

- Services depend critically on people, technology, and **co-creation** of value
- People **work together** and with technology to provide value for clients
- So a **service system** is a complex **socio-techno-economic** system
- Growth requires innovation that combines **people, technology, value, clients**



So what is “Service Science” or SSME, really?

- An urgent “call to action”
 - To become more systematic about innovation in services
 - Complements product and process innovation methods
 - To develop “a science of services”
- A proposed academic discipline
 - Draws on many existing disciplines
 - Aims to integrate them into a new specialty
- A proposed research area
 - Service systems are designed (computer systems)
 - Service systems evolve (linguistic and social systems)
 - Service systems have scale-emergent properties (economic systems)

Some Fundamental Service Questions

- What are the concepts, typologies and methodologies that might serve to bring some order to the diversity of services particularly with a view of measuring and evaluating results and performance?
- What are the role and social organization of knowledge and intelligence in the production, innovation, consumption and trading of services?
- What are the role of ICTs in the development of services and the rationalization of the processes whereby they are produced, as well as in innovation in services?

— Gadrey & Gallouj (2002). *Productivity, innovation, and knowledge in services*. Cheltenham, UK: Edward Elgar.

Some Service Research Areas

- Measuring work, service intensity, and service complexity
 - What are the limits to self-service? How much work can we shift to end-users?
- Representing and cataloging skills
 - How do we organize and breakdown the human skills needed to do work? How can we take this into account in composing and optimizing teams?
- Global communication tools
 - What are the barriers to highly productive human-human coordination? Distance, trust, communication, common ground, culture, technology?
- Service workforce management
 - Application of supply chain methods to service supply chains, which are people-centered
- Effective service automation
 - Understanding tradeoffs in human vs computer effort in creating customized business services

Grand Challenge: Moore's Law of Service?

- Moore's Law: Computational power doubles at a predictable rate.
- Are there capability-doubling laws in service?
- Consider Amazon's book recommendations
 - Quality of recommendations depends on accurate statistics – the more purchases made, the better the statistics for recommendations.
- Consider call centers
 - Speed and quality of call center responses can be improved given accurate statistics about the kinds and number of queries that are likely to be received. In both, traces of activity are used to improve productivity and quality.
- Imagine three improvement "laws" for service
 - The more an activity is performed (time period doubling, demand doubling), the more opportunities to improve.
 - The better an activity can be measured (sensor deployment doubling, sensor precision doubling) and modeled, the more opportunities to improve.
 - The more activities that depend on a common sub-step or process (doubling potential demand points), the more likely investment can be raised to improve the sub-step.

Grand Challenge: Formalizing Service, Defining Innovation?

■ Problem

- Investment is drawn by the ability to capture value,
- Patenting of service innovation is immature, relatively unknown
- But where would computers be if it had been difficult to patent transistors, disk drives, and the like?
- Government policies must encourage growth of private investment in service innovation. But how?

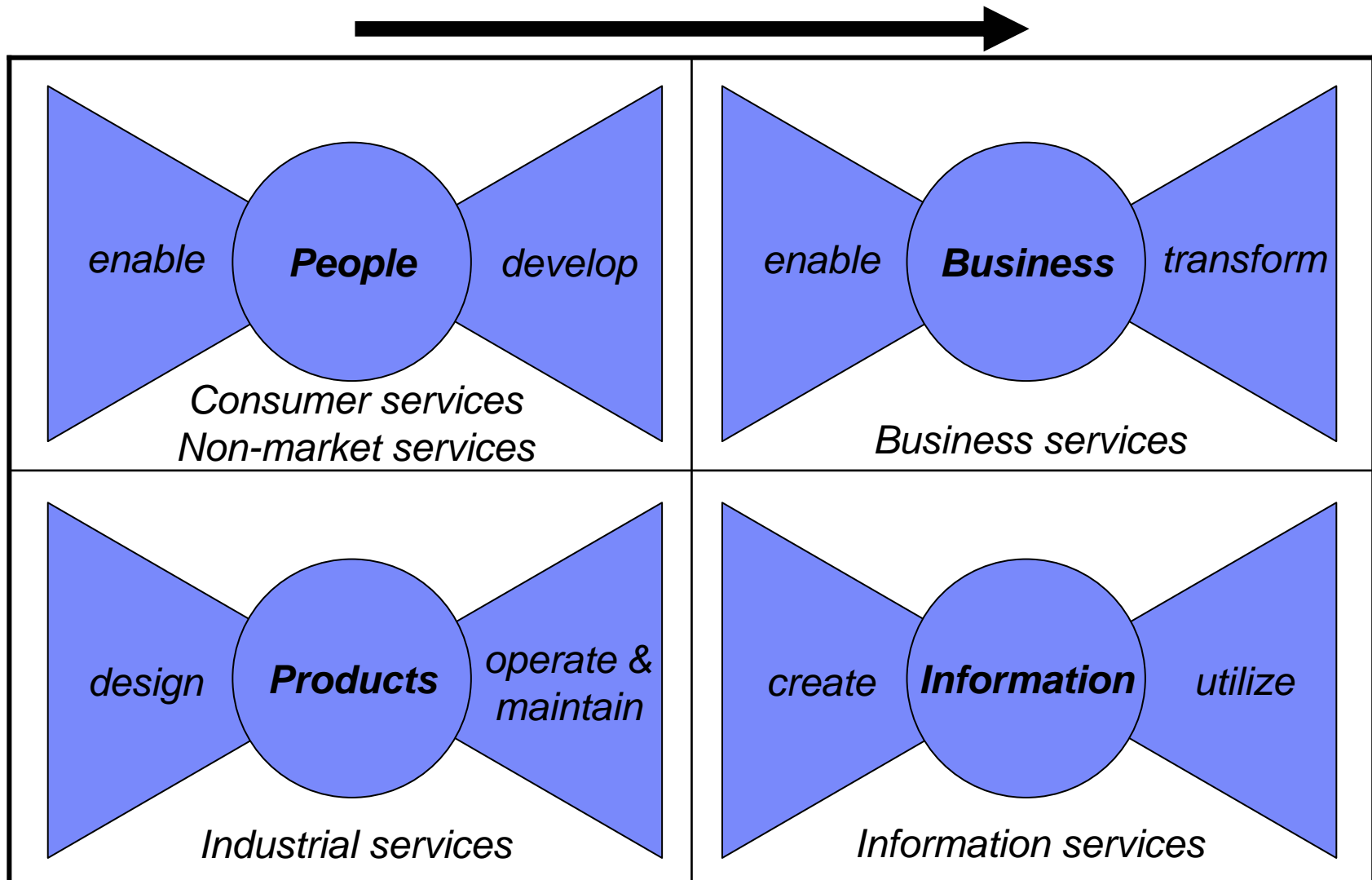
■ Approach

- How can we assess novelty in complex sociotechnical systems?
- What formalism can we use to express design of such systems?
- What methods do we have to understand – or at least simulate – processes in complex sociotechnical systems ?

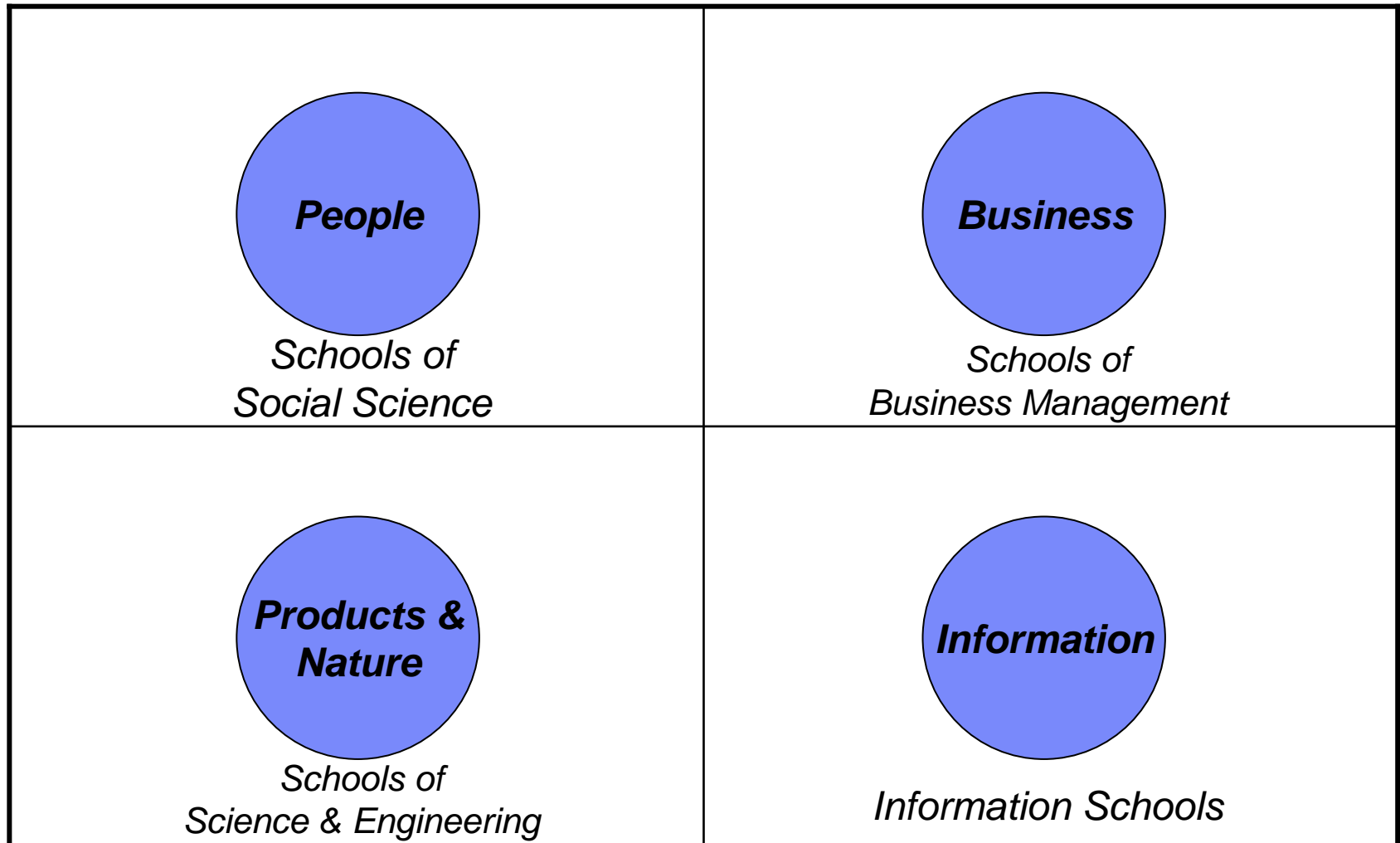
■ Solution?

- The problem is that when we have people working in coordination with one another, taking account of capabilities, motivations, incentives, interactions, and such is not straightforward or predictable.
- Government can bootstrap investment in services research
- Develop tools for specifying service system designs, allowing for formal specifications and simulations to assess novelty.

Complexity 1: So many types of service jobs/industries



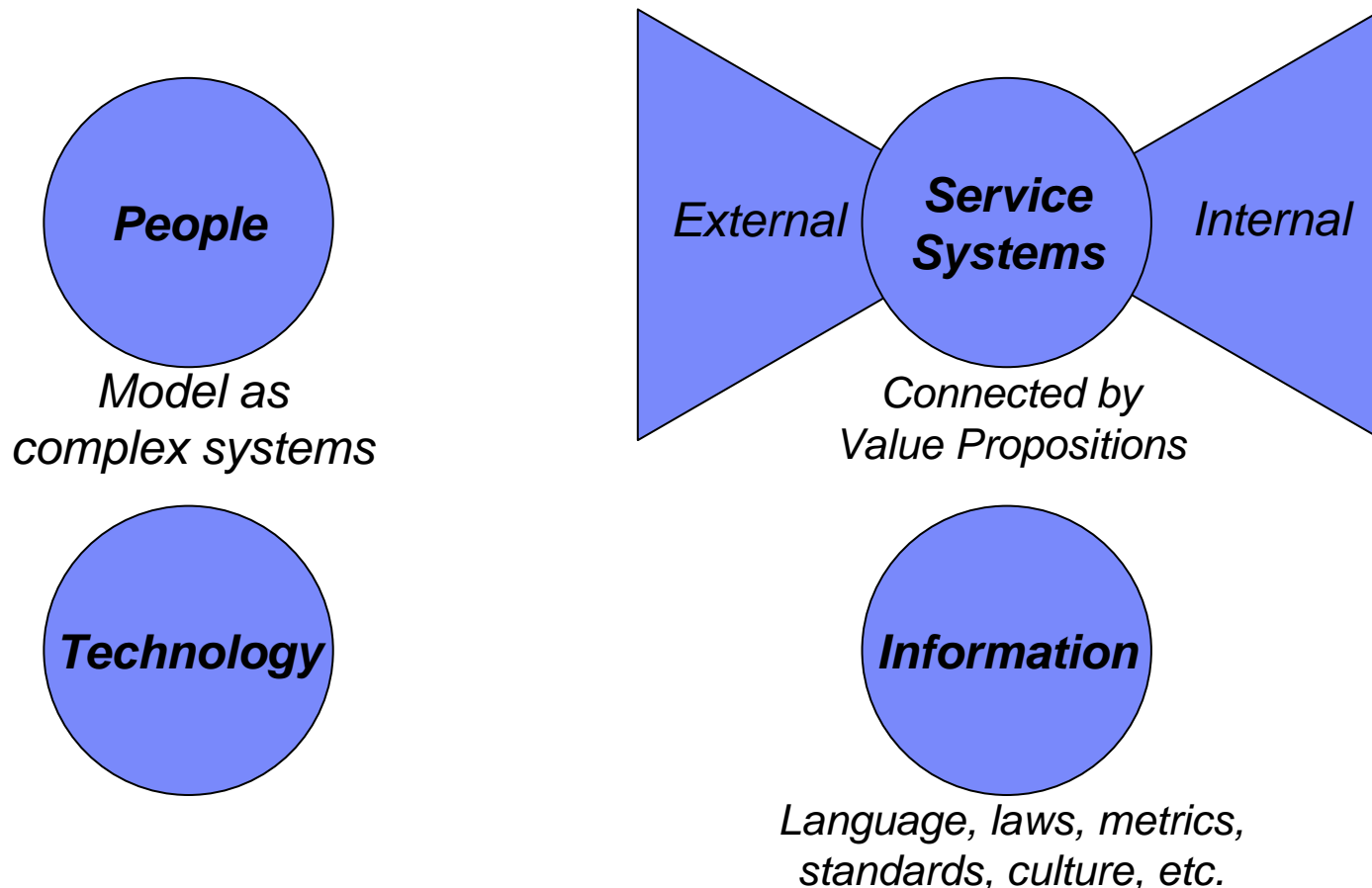
Complexity 2: So many academic disciplines...



Complexity 3: So many definitions of service...

Service: The application of competence for the benefit of another

Service System: A value-coproduction configuration of people, technology, internal and external service systems, and shared information



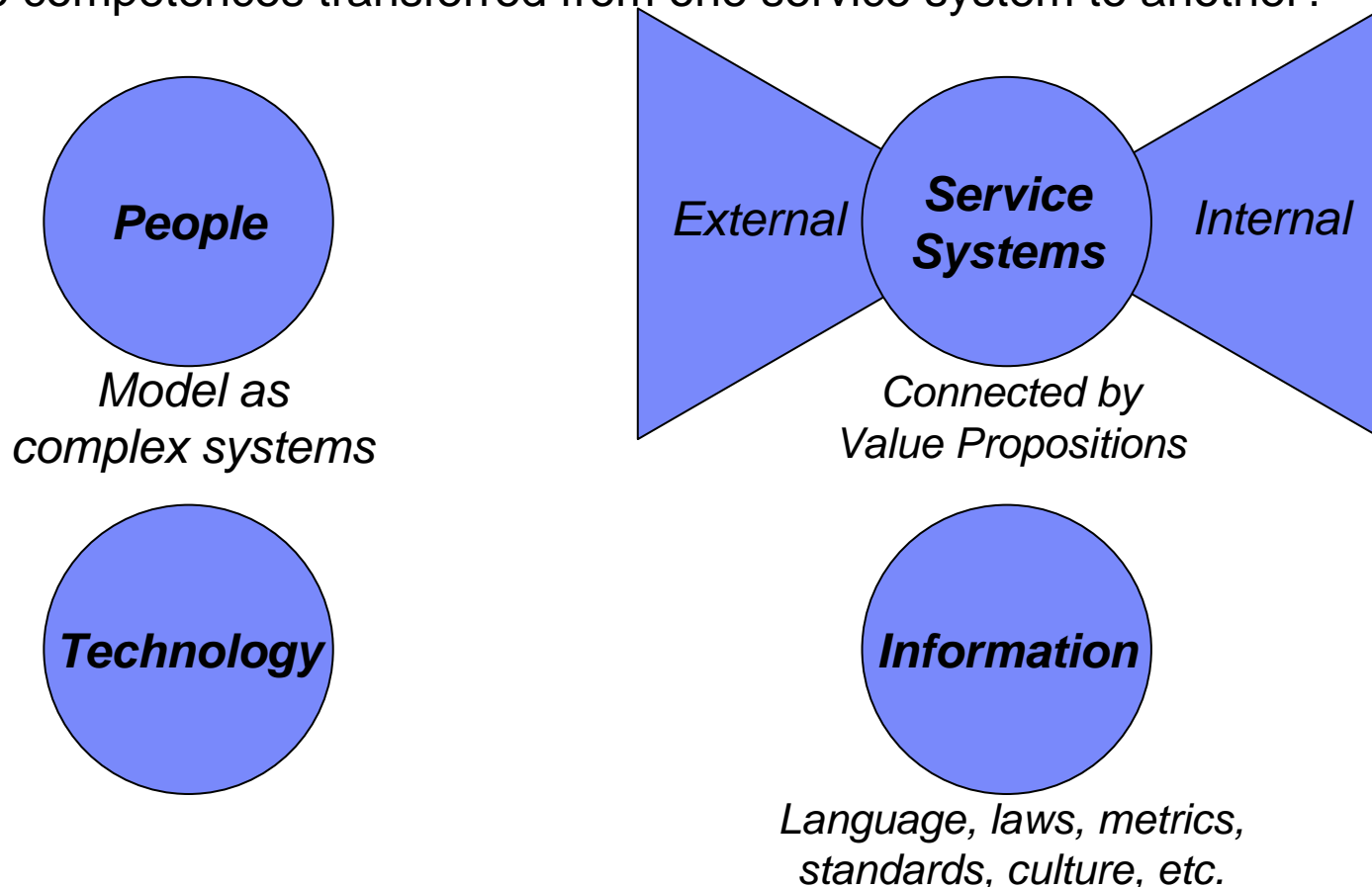
Complexity 4: No unique, fundamental problems...

What are the origins, types, and evolutionary patterns of service systems?

How are service systems similar to/different from other types of complex systems?

Are service systems the most complex type of complex system? How to invest?


How are competences transferred from one service system to another?



Part II: Progress – An Urgent Call to Action (2004-2006)



“The SSME Palisades event was the biggest and most diverse gathering ever in support of service education.” – Roland Rust (Oct. 15, 2006)



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Service Science, Management, and Engineering



Getting Started | Learn | Teach | Connect

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."

(Gallouj, F. (2002). Innovation in the Service Economy: The New Wealth of Nations. Cheltenham UK: Edward Elgar.)

Skills for SSME

All national economies are shifting to services. Major industrialized nations are more than 75% services and developing nations are close behind. The US Bureau of Labor Statistics projects that employment growth will continue to be concentrated in the service-providing sector of the economy (<http://www.bls.gov/news.release/ecopro.nr0.htm>).

What skills are needed for these economies in the 21st century? A services-based economy requires different skills than a manufacturing-based economy:

- next wave of computer science, engineering, and IT
- next wave of business management and administration
- next wave of operations research, industrial and systems engineering
- next wave of business anthropology, economics, and social science

Basic IT skills are becoming embedded in every job role. IT alone is no longer a differentiator. Both depth and breadth is needed in technology, business, and organizational studies even at the undergraduate level.

SSME news

- SSME conference coming in October
- 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
- Lou Barkan: Leading in the Digital Age

SSME resources

- Almaden Institute
- Center for SSME at Arizona State University
- IBM BCS Center for Business Optimization
- IT Services Qualification Center (ITsqc) at Carnegie Mellon
- Networked European Software and Services Initiative (NESSI)
- North Carolina State University services management concentration
- Penn State e-Business Research

Related links

- Student Portal
- Solutions for higher education
- developerWorks
- alphaWorks
- IBM per l'Università - Italia
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<http://www.ibm.com/university/ssme>

Service Research and Education is Interdisciplinary



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Almaden Services Research

Services Sciences, Management, and Engineering (SSME) - Course Materials



This course is about [Services Sciences, Management and Engineering \(SSME\)](#) --- a concept for a multidisciplinary educational foundation for graduate and undergraduate students in science, management, and engineering. SSME is the application of scientific, management, and engineering disciplines to tasks that one organization beneficially performs for and with another ("services"). SSME has the goal of making productivity, quality, performance, compliance, growth, and learning improvements more predictable in work-sharing and risk-sharing (co-production) relationships. SSME is the study of service systems, and it aims at improving service systems, particularly those involved in [complex, IT-enabled, business-to-business services](#) like [IBM Global Services](#) provides.

Many varieties of services education exist today (see our [list of related programs](#)), and this set of materials is culled from a variety of sources (see our [list of references](#)). But we are by no means experts in services research and services education. We present these materials in the hopes of fostering broad conversations and work on developing multidisciplinary service education.

Here we have a fairly modest goal: To provide materials for an introductory SSME course. We envision nine basic modules, and we already have drafts of five of them plus an overview module available. These slides and other materials are posted with no restrictions. You can use and customize them as you see fit. For your convenience, the notes are posted separately as well.

These modules are intended as raw materials that can be used by instructors, who we imagine will choose which of them might be appropriate to enhance current courses, and consider curriculum updates over time. Our intention is to make this an open course, a kind of community course. So we welcome your comments and contributions. If you use the materials, let us know. If are thinking about using them, let us know. If you don't like them for whatever reason, let us know. If you'd like to develop some materials to help our effort or if you'd like to contribute something you've already developed, let us know. Contact [SSME](#).

Module name	Slides MS PPT and PDF	Notes MS Word and PDF	Links to Case Illustrations IBM IBV site
SSME Overview	Overview Slides 415KB Overview PDF 98KB	Overview Notes 256KB Overview Notes PDF 63KB	Specialized Enterprise Time to flex
What are Services?	Services Slides 708KB Services PDF 275KB	Services Notes 254KB Services Notes PDF 169KB	Leisure
Service Systems	Systems Slides 595KB Systems PDF 242KB	Systems Notes 726KB Systems Notes PDF 266KB	E-detailing
Services Management	Management Slides 1521KB Management PDF 416KB	Management Notes 259KB Management Notes PDF 178KB	Managing Organizational Knowledge

Additional Data

- [Global SSME Page](#)
- [Education for Services Innovation](#)
- [IBM Academic Initiative Program](#)

<http://www.almaden.ibm.com/asr/SSME/coursematerials/>

The New York Times

Business

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Academia Dissects the Service Sector, but Is It a Science?

By **STEVE LOHR**
Published: April 18, 2006

On his Asian trip last month, President Bush urged Americans not to fear the rise toward prosperity of emerging economies like India. Education, Mr. Bush said, was the best response to globalization, climbing further up the ladder of skills to "fill the jobs of the 21st century."

[Enlarge This Image](#)



Noah Berger for The New York Times
Kurt Koester, a Berkeley student, is complementing his engineering studies with a course in services science.

But a ladder to where? That is, where are educated young Americans likely to find good jobs that will not be shipped off to India or China?

The answer, according to a growing number of universities, corporations and government agencies, is in what is being called "services science." The hybrid field seeks to use technology, management, mathematics and engineering expertise to improve the performance of service businesses like transportation, retailing and health care — as well as service functions like marketing, design and customer service that are

also crucial in manufacturing industries.

A couple of dozen universities — including the [University of California](#), Berkeley; Arizona State; Stanford; North Carolina State; Rensselaer Polytechnic Institute; and Georgia Tech — are experimenting with courses or research programs in the field.

The push for services science is partly a game of catch-up — a belated recognition that services now employ more than 75 percent of American workers and that education, research and policy should reflect the shift. "Services is a drastically understudied field," said Matthew Realff, director of a new program at the National Science Foundation to finance university research in the field. "We need a revolution in services."

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<http://www.nytimes.com/2006/04/18/business/18services.html>



September 12, 2006

Majoring in IBM

Dissatisfied With Graduates,
Companies Design and Fund
Curricula at Universities

By ANNE MARIE CHAKER

September 12, 2006; Page D1



IBM's Craig Nygard addresses the first Services Management class at North Carolina State University last month.

RALEIGH, N.C. -- When graduate students at North Carolina State University took their seats on the first day of a class called Services Management, the kickoff lecture wasn't delivered by a professor. Instead, it was given by a manager from International Business Machines Corp.



Giuseppe Marchesi

The company, in fact, helped develop the curriculum and awarded grants to the school with the expectation that the course would be taught -- all with the aim of producing graduates better prepared to work for IBM. The guest speaker, a regional manager, began his lecture by saying, "My name is Craig Nygard, and I am a services professional," later adding, "You have started thinking about tackling big problems and turning them into revenue opportunities."

Communications of the ACM, July 2006

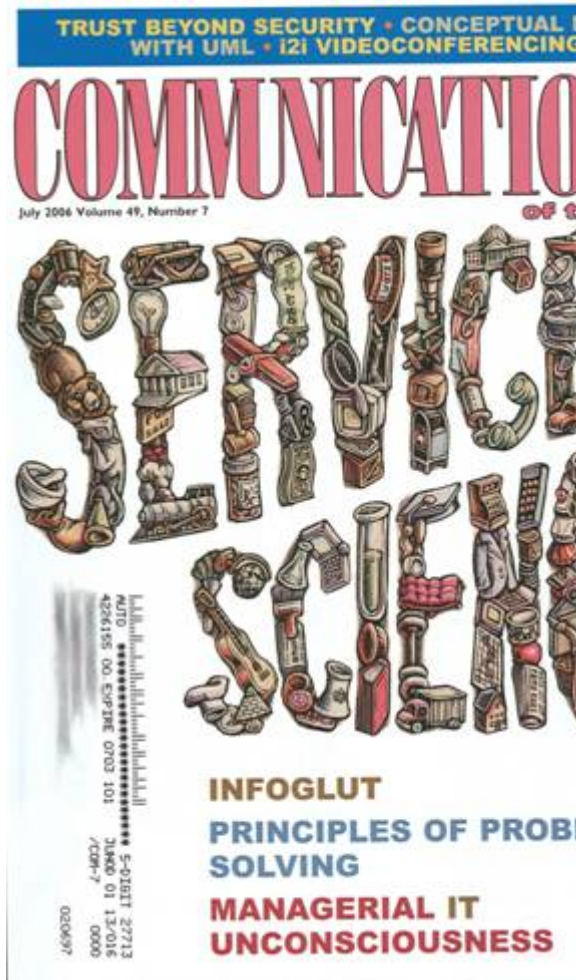


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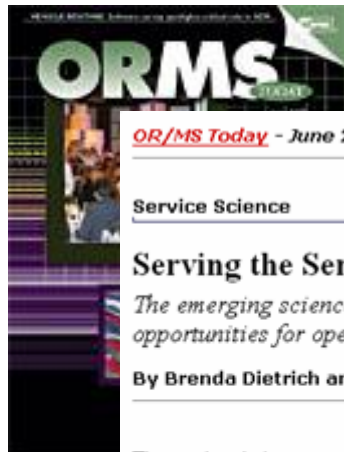
Services Science

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- 35 A Research Manifesto for Services Science *Henry Chesbrough and Jim Spohrer*
- 42 Understanding Service Sector Innovation *Jerry Sheehan*
- 48 The Algorithmic Revolution—The Fourth Service Transformation *John Zysman*
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OR/MS Today - June 2006

Service Science

Serving the Services

The emerging science of service management opens opportunities for operations research and management science.

By Brenda Dietrich and Terry Harrison

The services industry continues to be a rapidly growing segment of many developed economies, including the U.S. economy [1, 2]. Although a significant portion of the services industry is focused on providing services to individuals (medical, insurance, legal, financial), the business services sector, in which one company provides service to another company, is also a rapidly growing segment [3, 4]. Examples include traditional consulting, design, technical support (typically for products), call center operations, IT implementation and IT outsourcing. New business models, based on improving efficiency through automation, aggregation of risk, economies of scale or reduction of capital assets, lead companies to outsource and in some cases off-shore business processes that do not provide differentiation in the marketplace. Transportation and warehousing, procurement, manufacturing, benefits management and back-office processes such as accounting are all now being provided as services. Business services are complex, and are typically purchased and managed by separate organizations within an enterprise.

Over the past several decades mathematical models of traditional manufacturing and logistics systems have been developed and used for strategic planning. More recently similar models have been used to support operational decision-making. Significant gains in efficiency within the manufacturing and logistics industries have been attributed to the use of such models, together with a supporting information technology infrastructure [see 5, 6, 7, 8 for examples]. Manufacturing Resource Planning (MRP), which automated the calculations of material requirements within manufacturing, evolved in to Enterprise Resource Planning (ERP), which monitors all manufacturing enterprise processes, and formed the information base for advanced planning and e-commerce.



Science & Technology Trends Quarterly Review

QUARTERLY REVIEW No. 19 / April 2006

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Trends in Services Sciences in Japan and Abroad

KAZUYOSHI HIDAKA
Affiliated Fellow

1 Introduction

American and European universities are taking a new approach to services. By regarding services as part of science and applying scientific methods to solve problems associated with services, they intend to increase productivity and bring about innovations in services, thereby invigorating the economy. This emerging academic discipline is called "Services Sciences, Management and Engineering," or simply "Services Sciences." The services here refer to the interactive process of creating economic values between the service provider and the user, and include not only the service industry as a tertiary industry but also the service business in the manufacturing sector. This article explains how services sciences have developed (Chapter 2), what services sciences are (Chapter 3), services sciences in European and American universities (Chapter 4), and the current status of this field of research in Japan (Chapter 5), followed by a conclusion (Chapter 6).

2 Background

2-1 U.S. investment in service research as a national strategy

The U.S. Council on Competitiveness published a report (commonly known as the "Palmisano Report"⁽¹⁾) in December 2004 that emphasizes the importance of national innovation strategy from the three perspectives of human resources, investment and infrastructure. Based on an analysis of the current position of the U.S., the report cites, as the reasons that the country needs innovation, threats from other countries as a result of globalization, a slowdown in research in science and technology, and delays in smooth

technology transfer to the manufacturing sector. It also points out the service sector's lack of research investment in innovative business process design, organization and management, despite services' major contribution to the economy. To put it simply, a factor behind this report is a perception that research investment in services should be addressed as part of U.S. national strategy. The report triggered a move toward integrating many recent approaches to services in academia into the term "services sciences."

2-2 Development of the service economy

What kind of role are services given in the global economy? Nowadays, services are increasingly important to the economy. This is evident from two facts: the service industry has grown significantly, and even companies that fall outside of the service industry are more and more reliant on "service-based business."

(1) Development of the service industry

Trends in the working population by industry demonstrate that the workforce in the service industry has increased sharply worldwide. Figure 1 shows the change in the working population in the world's top 10 countries by workforce size over the past two centuries⁽²⁾. In developed countries, mainly in Europe and North America, the working population in the secondary (manufacturing) industry increased sharply over the periods of the First Industrial Revolution, which was ushered in by the improvement of spinning machines in England in the late 18th century, and the Second Industrial Revolution, which took place as a result of the increased use of oil and electricity in the late 19th century. However, by the middle of the 20th century,

Service Science at ASU




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CENTER FOR SERVICES LEADERSHIP

HIGHLIGHTS:

- The 20th Annual Services Leadership Institute March 27-29, 2005 Tempe, Arizona [\[more\]](#)
- The 17th Annual Compete Through Service Symposium November 1-3, 2006 Phoenix, Arizona [\[more\]](#)
- Knowledge@W. P. Carey Special Section on the 2005 Compete through Service Symposium [\[more\]](#)



Science - We are in the business of the science of services - we base our understanding of effective services on research and objective criteria, not just platitudes

Significance - We are in the business of developing and sharing what works in the real business world, not just pure theory

Symbiosis - We are in the business of building a cross-industry and cross-functional network of companies and academics who can help each other discover fresh ways to compete through service - not just business as usual


<http://wpcarey.asu.edu/csl/>

Berkeley SSME Certificate Program

Services Science, Management & Engineering at UC Berkeley

Find out more: [About](#) [Curriculum & Certificate](#) [Research & Publications](#) [People](#) [Partners](#)

What is SSME?




The New Science of Services

Services Science, Management and Engineering (SSME) at UC Berkeley is a multi-disciplinary effort to conduct research and teaching in the emerging discipline of services science. The theoretical foundations of SSME come from the disciplines of economics, computer science, engineering, law, and organizational sociology, each of which provides important perspectives on the evolution of the information and services economy. But SSME would be merely theoretical without the pragmatics provided by business strategy and operations, information technology, accounting and finance, and user-centered design, each of which contributes insight about the services lifecycle from design to implementation to deployment.

SSME Web Directory

- [About](#)
- [Curriculum and Certificate](#)
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News:



Ravi Nemana Named Executive Director
(10 April 2006). Ravi Nemana is named the first Executive Director of the Services Science, Management & Engineering program at UC Berkeley.

"Academia Dissects the Service Sector, but Is It a Science?"
(18 April 2006). NY Times article by Steve Lohr.

On his Asian trip last month, President Bush urged Americans not to fear the rise toward prosperity of emerging economies like India. Education, Mr. Bush said, was the best response to globalization, climbing further up the ladder of skills to "fill the jobs of the 21st century."

<http://ssme.berkeley.edu/>

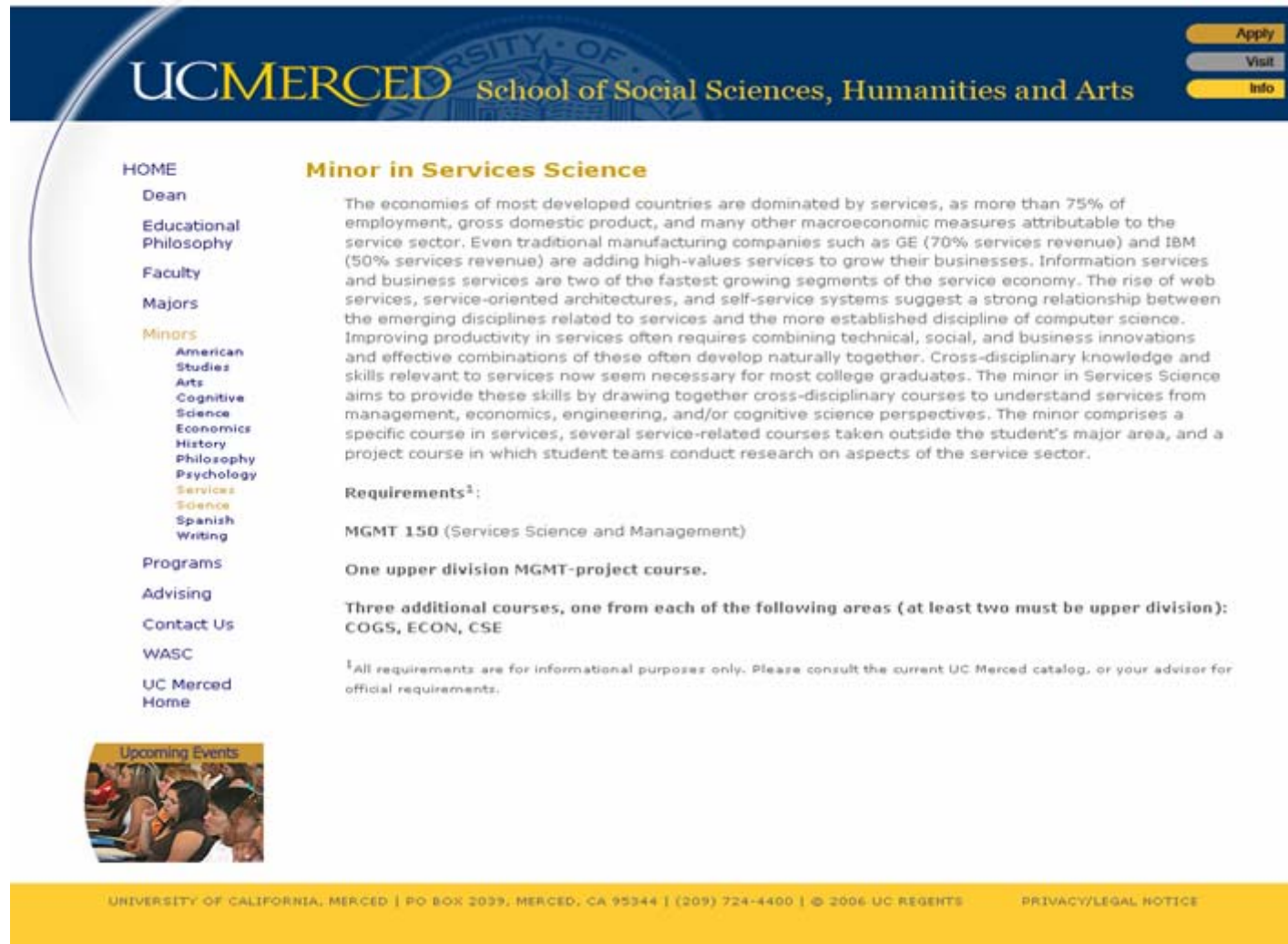
NCSU SSME Curriculum for MBA



The screenshot shows the NCSU College of Management website. At the top, there is a navigation bar with links for NC STATE UNIVERSITY, ABOUT, NEWS & EVENTS, GIVING, DIRECTORIES, SITE MAP, and NCSU MAIN SITE. A search bar is also present. Below the navigation bar, there is a sidebar with links to various resources like NEWS HOME, E-NEWSLETTERS, EVENTS, AWARDS & RECOGNITION, FACULTY PUBLISHED RESEARCH, INTERNSHIP EXPERIENCES, FACT PAGE [PDF], IN THE NEWS, EMPLOYMENT OPPORTUNITIES, and NC STATE NEWS & EVENTS. The main content area features a news article titled "MBA SERVICES SCIENCE CONCENTRATION ANNOUNCED AS PART OF IBM-NC STATE SSME CURRICULUM INITIATIVE". The article is dated Jan. 16, 2006, and discusses the new curriculum initiative in Services Sciences, Management and Engineering (SSME) announced by NC State and IBM. It highlights the collaboration between the two institutions to prepare graduate students for careers in the evolving multidisciplinary field of services management. The article includes quotes from Paul Horn, senior vice president, IBM Research, and Steve Allen, associate dean for graduate programs and research at NC State's College of Management. It also mentions the preparation for a technology-based, services-led economy and the development of new services-related courses that will be added to the MBA and Master of Science in Computer Networking (MSCN) programs. The article concludes by stating that graduates from both programs will have master's-level expertise in business processes, business strategy, information technology, and management of people in the workforce. Both colleges will be admitting students for the new curriculum in fall 2006. IBM will also encourage its employees to enroll in the program. With thousands of technical researchers and business consultants around the world dedicated to services, IBM is in a good position to partner with universities to further develop SSME, providing a perfect breeding ground for testing and developing SSME theories and practices. In addition, many IBM developers and

http://www.mgt.ncsu.edu/news/2006/mba_ssme.php

Minor in Service Science at UC Merced



The screenshot shows the website for the UC Merced School of Social Sciences, Humanities and Arts. The header features the UC Merced logo and the school's name. On the right, there are buttons for 'Apply', 'Visit', and 'Info'. The main content area is titled 'Minor in Services Science' and includes a detailed description of the minor, its requirements, and a list of related disciplines. A sidebar on the left contains navigation links for various university departments and programs. At the bottom, there is a section for 'Upcoming Events' with a photo of students.

UCMERCED School of Social Sciences, Humanities and Arts

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UC Merced Home

Minor in Services Science

The economies of most developed countries are dominated by services, as more than 75% of employment, gross domestic product, and many other macroeconomic measures attributable to the service sector. Even traditional manufacturing companies such as GE (70% services revenue) and IBM (50% services revenue) are adding high-values services to grow their businesses. Information services and business services are two of the fastest growing segments of the service economy. The rise of web services, service-oriented architectures, and self-service systems suggest a strong relationship between the emerging disciplines related to services and the more established discipline of computer science. Improving productivity in services often requires combining technical, social, and business innovations and effective combinations of these often develop naturally together. Cross-disciplinary knowledge and skills relevant to services now seem necessary for most college graduates. The minor in Services Science aims to provide these skills by drawing together cross-disciplinary courses to understand services from management, economics, engineering, and/or cognitive science perspectives. The minor comprises a specific course in services, several service-related courses taken outside the student's major area, and a project course in which student teams conduct research on aspects of the service sector.

Requirements¹:

MGMT 150 (Services Science and Management)

One upper division MGMT-project course.

Three additional courses, one from each of the following areas (at least two must be upper division):
COGS, ECON, CSE

¹All requirements are for informational purposes only. Please consult the current UC Merced catalog, or your advisor for official requirements.

Upcoming Events

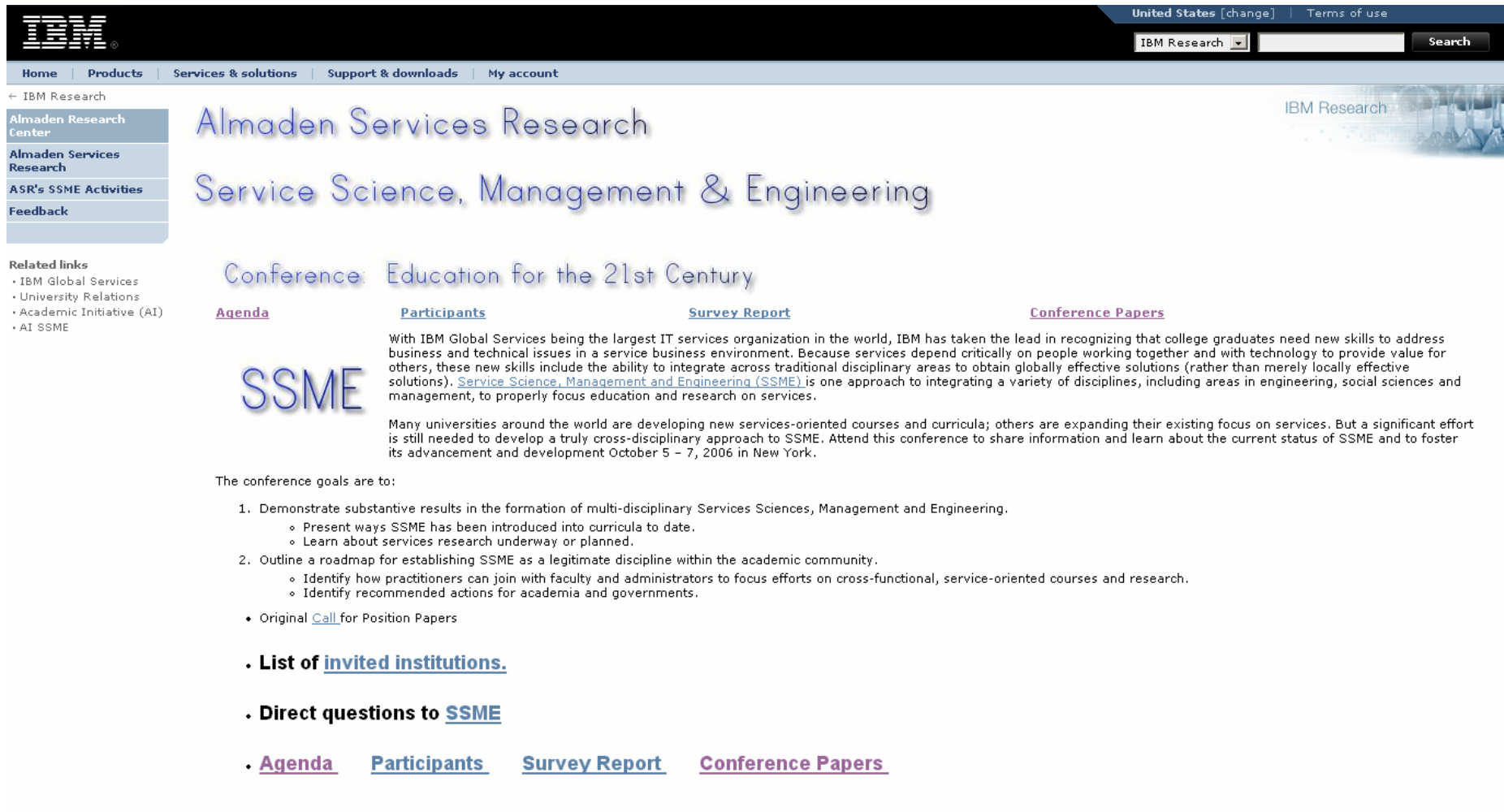
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<http://ssha.ucmerced.edu/2.asp?uc=1&lvl2=77&lvl3=77&lvl4=87&contentid=124>

Some Other University Courses and Curricula

- Tsinghua University and Beijing University
 - Service Science courses offered Spring 2006
- UC Santa Cruz
 - Technology and Innovation Management program started Fall 2005
- EPFL - Switzerland
 - Computer Science Master's for SSME in Fall 2006
- Carnegie Mellon University
 - Master's course "Managing Service Organizations", eSourcing
- RPI
 - Service Engineering Masters offered (for 5-10 years)
- Penn State
 - IE undergraduate degree adding services focus (past 3 years)

IBM SSME Summit, Oct 5 – 7, 2006



The screenshot shows the IBM Almaden Services Research website. The header includes the IBM logo, navigation links (Home, Products, Services & solutions, Support & downloads, My account), and a search bar. The main content area features the title "Almaden Services Research Service Science, Management & Engineering" and a section for the "Conference: Education for the 21st Century". Below this, there are links for "Agenda", "Participants", "Survey Report", and "Conference Papers". A large "SSME" logo is prominently displayed. The text explains that IBM Global Services is the largest IT services organization and has taken the lead in recognizing the need for new skills in college graduates. It describes SSME as an approach to integrating various disciplines. The conference goals are listed, including demonstrating multi-disciplinary results, outlining a roadmap for SSME, and identifying recommended actions. A list of invited institutions and direct questions to SSME are also mentioned.

IBM Research Center

Almaden Services Research

ASR's SSME Activities

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- University Relations
- Academic Initiative (AI)
- AI SSME

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IBM Research

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Service Science, Management & Engineering

Conference: Education for the 21st Century

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SSME

With IBM Global Services being the largest IT services organization in the world, IBM has taken the lead in recognizing that college graduates need new skills to address business and technical issues in a service business environment. Because services depend critically on people working together and with technology to provide value for others, these new skills include the ability to integrate across traditional disciplinary areas to obtain globally effective solutions (rather than merely locally effective solutions). [Service Science, Management and Engineering \(SSME\)](#) is one approach to integrating a variety of disciplines, including areas in engineering, social sciences and management, to properly focus education and research on services.

Many universities around the world are developing new services-oriented courses and curricula; others are expanding their existing focus on services. But a significant effort is still needed to develop a truly cross-disciplinary approach to SSME. Attend this conference to share information and learn about the current status of SSME and to foster its advancement and development October 5 – 7, 2006 in New York.

The conference goals are to:

1. Demonstrate substantive results in the formation of multi-disciplinary Services Sciences, Management and Engineering.
 - Present ways SSME has been introduced into curricula to date.
 - Learn about services research underway or planned.
2. Outline a roadmap for establishing SSME as a legitimate discipline within the academic community.
 - Identify how practitioners can join with faculty and administrators to focus efforts on cross-functional, service-oriented courses and research.
 - Identify recommended actions for academia and governments.

- Original [Call](#) for Position Papers
- **List of [invited institutions](#).**
- **Direct questions to [SSME](#)**
- [Agenda](#) [Participants](#) [Survey Report](#) [Conference Papers](#)

<http://www.almaden.ibm.com/asr/summit/>

16th Annual AMA Frontiers in Service Conference

**2007
October 4 - 7**

The conference will highlight the latest thinking in service, particularly those that combine aspects of technology, social science, and business.



<http://www.rhsmith.umd.edu/ces/frontiersconference.html>

Questions?

pmaglio@almaden.ibm.com