

Services: Science, Management, & Engineering (SSME) Overview

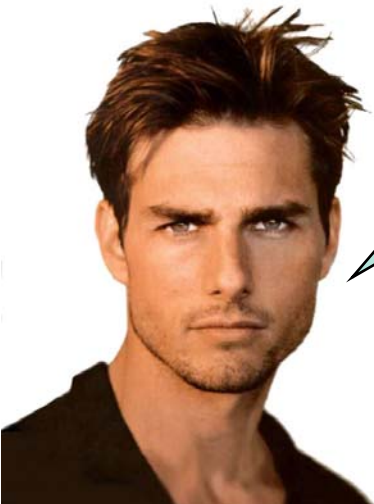


Ravi Nemana, Executive Director
Services: Science, Management & Engineering

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What is SSME?

- Services: Science, Management, and Engineering (**SSME**) is a **new academic curriculum** and **research area**
- Aims **to improve the performance of services** through the scientific study of the configurations of people, technology and business.
- Goal is to improve the **predictability, productivity and quality** of services by applying **scientific, management and engineering** disciplines to services



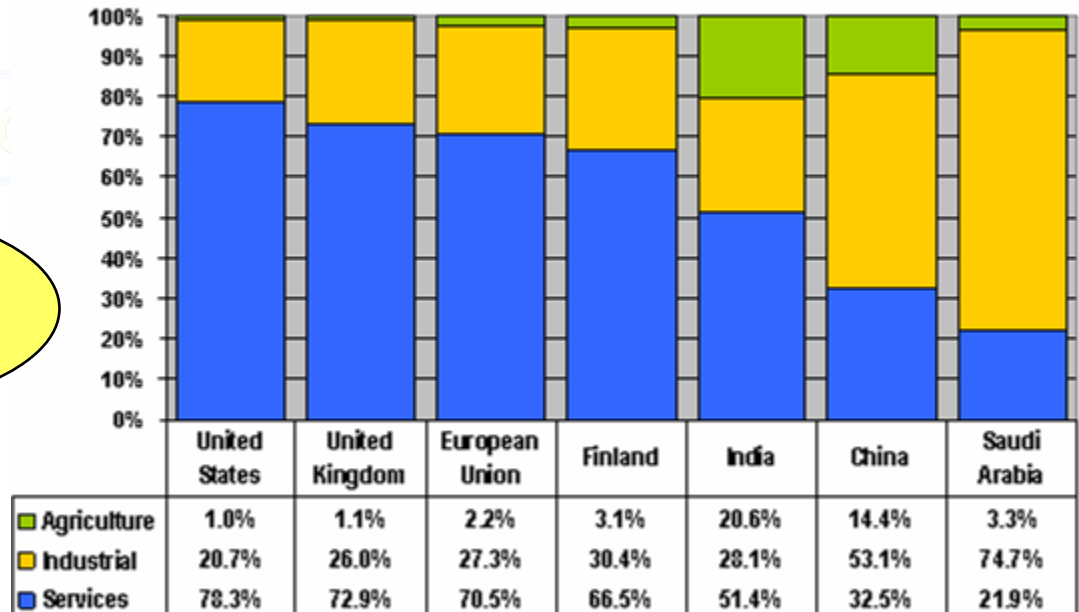
So why is SSME a big deal?

Why SSME?

- We are all **knowledge workers**
- We are all part of a **services economy**
- Services are a very **large, rapidly growing** part of the GDP of many countries
- One of next **frontiers** in education, *innovation*, employment, and economic growth.

GDP Composition of Selected Countries / Regions

-- CIA World Factbook, 2005 est.



Yes! But what are **Services** and what is **Innovation**?

What are services? Innovation?

- **Nonmaterial equivalent of “goods”**
- **Things of economic value** that you **can’t “kick”**
 - ▶ Everything from food-service to financial advice and a great deal in between
 - ▶ Particularly interested in complex business services (IT-enabled, knowledge intensive)
- Firms, machines, and/or individuals can be **service providers**
- Firms can be composed of service **components**
- Value and competitiveness comes from the **chains and interrelationships of the service components**
- **Service Innovation creates new value** (chains)

INNOVATION = INVENTION + VALUE



Services are Co-produced, ...



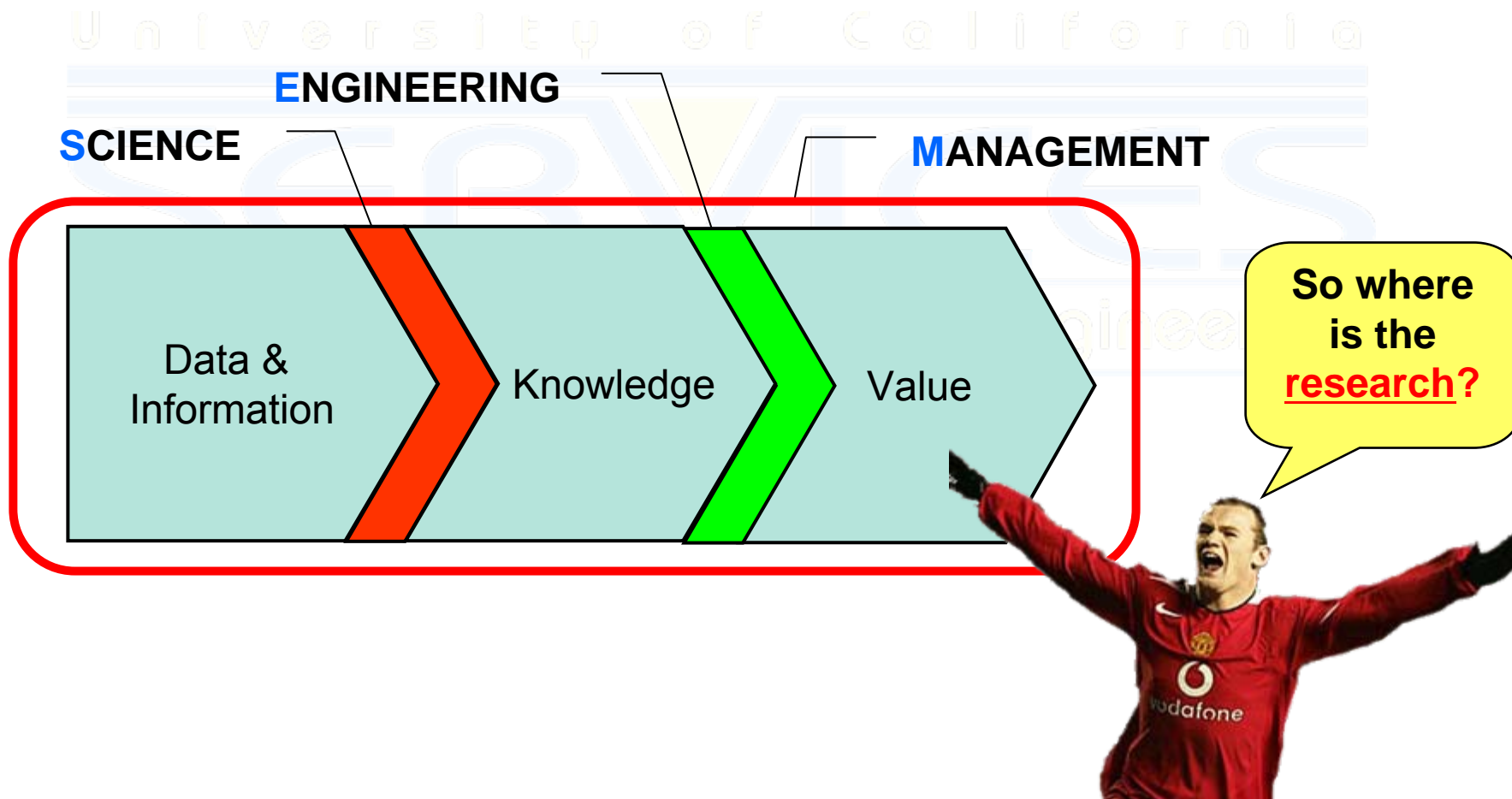
Services are also...

But where is the
science, management
and **engineering?**



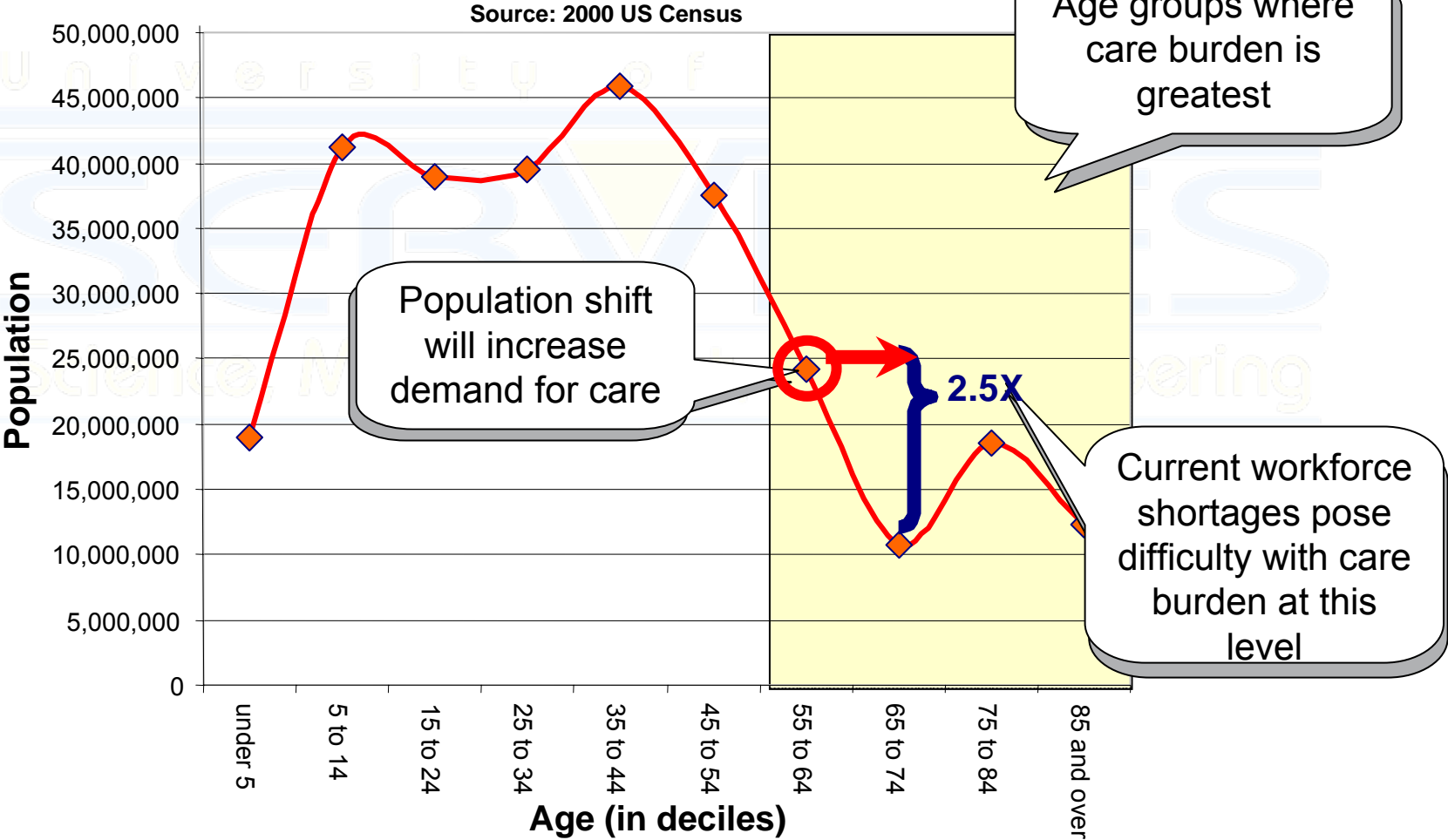
What is SSME?

- Inherently multi-disciplinary way of studying how value is created in services



Healthcare: A Big role for SSME

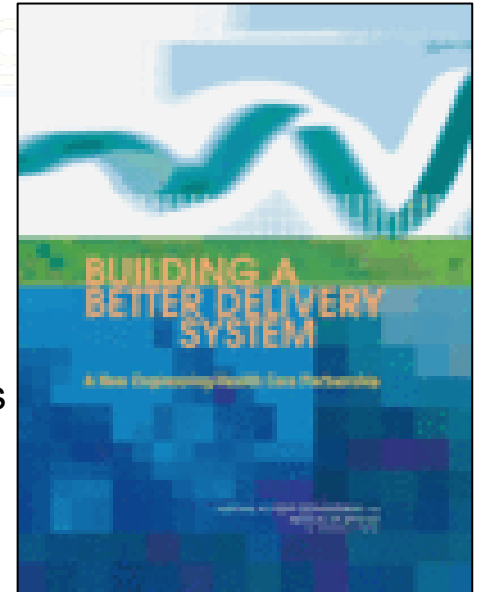
Age Distribution of the US Population



Lowensohn, Kaiser Research

SSME: Innovative solutions to Real Problems

- Most approaches on the horizon help optimize **existing capacity**
- **Re-engineering required** for new capacity in the health system
 - ▶ Central role for innovative **Methods, Technologies, Policies and Tools**
 - Self Care
 - Remote Patient Management
 - Social Care models
 - Consumer Devices and incentives
 - Gaming & Entertainment
 - Security
- SSME graduates will ...
 - ... study the **configurations of people, technology and business** to invent ways of delivering care more efficiently
 - ... move Healthcare from **optimization → innovation**
 - ... use their **multi-disciplinary** knowledge, tools, methods, and skills to design new service models and healthcare services
 - ... **reconfigure** service components to increase health system capacity



Case Study for Services Science: Healthcare



- The Chairman of Surgery of a moderate sized hospital
- Problem: **small, but significant, number of patients return to the Operating Room** every month.
 - ▶ Unexpected complications
 - ▶ Patients had bleeding and prolonged antibiotic use for deep wound infections
- Peer review: reports of “unexpected results, but within standard of care.”
- Chair’s view: **2% complication rate is too high**
 - ▶ One particular physician seems to have a majority of cases return to the OR.

How should she proceed to lower her complication rate?

A Complex Service Environment

→ Hospitals face many challenges:

Innovation, Policy,
Engin./Technology

Organizational
Theory

Innovation,
Information Science

Information Science,
IEOR

- ▶ Physicians in **short supply**
- ▶ Tension: **utilization** v. **quality**
- ▶ **Regulatory issues** for both hospital and physicians
- ▶ Discomfort with questioning “**clinical judgment**” and bringing about **Change**
- ▶ Poor **data for management**
- ▶ Strategic **ripple effects** of “heavy” tactics
 - Slander, libel, defamation, anti-trust, retribution, trust
- ▶ **New:** entrants, models, and service expectations

Service Innovation &
Strategy

→ Physician margins also pressured

Document Engin.,
Operations, Modeling

- ▶ **Productivity** is crucial
- ▶ New competitors/ models, and difficult relationships
- ▶ “One-chart-at-a-time” in the face of **tremendous demand**

What is SSME at CITRIS?



ACADEMIC ADVISORY BOARD

H. Chesbrough, R. Glushko, R. Neman, R. Richter, A. Saxenian, S. Sastry



Research

Curriculum

CENTER FOR HEALTH SERVICES INNOVATION ??

Goals of the SSME Program

- Serve as a **unified point of contact** for the coordination for Services Science, Management, and Engineering (SSME)
- Create mutually beneficial **opportunities for faculty, student and industry collaboration** in Services research
- Help students to develop the **skills to thrive in and contribute to the services economy** through extracurricular and curricular activities
- Benefit society by educating a **new wave of labor** with the skill set to **innovate services**
 - ▶ Roles: executives, solution designers, entrepreneurs, scientists, consultants, engineers, policy-makers, venture capitalists, etc.

The Curriculum: SSME @ Berkeley

- **Masters students:** Haas School of Business, I-School, and Engineering
- **Approach:** A certificate in Services Science, Management, Engineering (SSME) as part of the Masters Degree (pending faculty approval)
 - ▶ Total of 13 units for the program, pool of ~20 offered courses
 - ▶ 2 core courses – required
 - SIMS 210 – Information and the Services Economy
 - SIMS 211 – Business Architectures and Services Science
 - ▶ 1 lecture series – required
 - ▶ Remainder of units – student’s choice
 - ▶ 20 Courses so far part of the curriculum
- **Develop “T-people”**
 - ▶ Skilled in **practices, techniques and technologies** that span service and financial engineering, marketing, computational modeling, service delivery planning, logistics, and information science, among others.

Research in SSME

→ Session Four: Service Science

- ▶ **Intellectual Agenda** – Living document

- ▶ <http://www.citris-uc.org/services>

→ Industrial Advisory Board

→ Symposia

→ Center for Health Services Innovation ??

- ▶ Innovation in care delivery and service provision in health care through combinations of technology, business process, and people



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