

[Services science as a field of cooperation between theory and practice]

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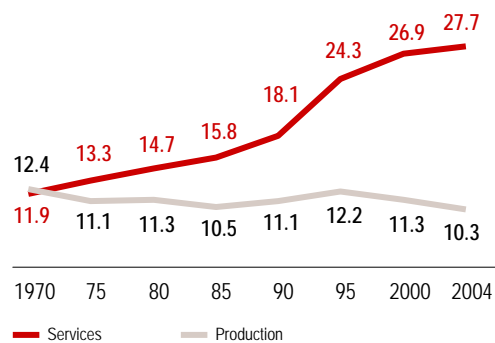
- A. Why services are different
 - B. Creating knowledge in a knowledge-based economy
 - C. Supporting innovation in services
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[A.]

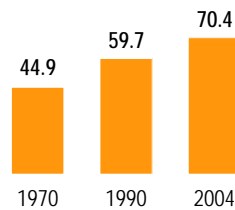
Why services are different

[1. Services have advanced in the past 35 years to become the dominant economic sector]

Employees in D by sector [million]



EMPLOYEES IN SERVICES IN D
[% of total workforce]

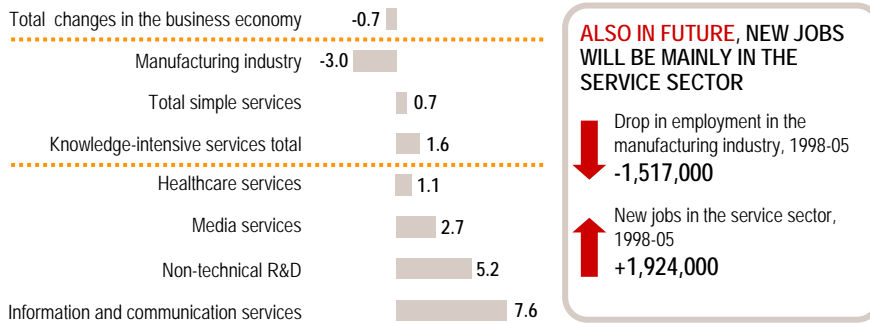


> Over the past 30 years, jobs have mainly been created in the service sector

Source: Statistisches Bundesamt

2. The structural shift to a service economy will continue – Knowledge jobs are the winners

Annual average changes in the German workforce, 1998-2004 [% p.a.]



> Knowledge-intensive services form the basis for a modern economy

Source: BMBF, Destatis, Roland Berger calculations

3. Most successful new businesses were established in the service sector



> The big advantage of establishing businesses in the service sector:
Comparatively low capital intensity

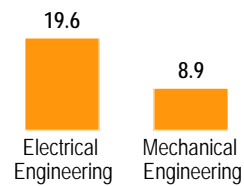
Source: xxx

4.1 Services are also becoming more important in traditional industries

Encapsulation of services and manufactured products

| | | |
|------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------|
| Monitoring and diagnostic services | Purchase finance and leasing facilities, delivery | Purchase and operation of related support activities; expert advice/consultancy |
| PHYSICAL PRODUCT | | |
| Retrofitting and updating | Repurchase and/or disposal | Maintenance and repair |

SHARE OF PRODUCT-RELATED SERVICES IN TOTAL SALES IN D 2002 [%]

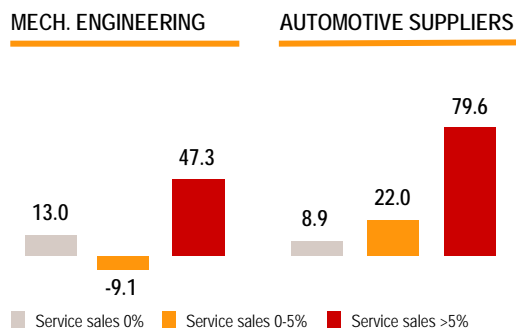


> Product-related services help differentiate traditional products, and make individual customization and maintaining customers easier

Source: Destatis 2004

4.2 It pays for industrial companies to incorporate services in their product portfolio

Employment trends of businesses with varying degrees of services in D 2000-2003 [%]



REASONS FOR AN INCREASING FOCUS ON SERVICES

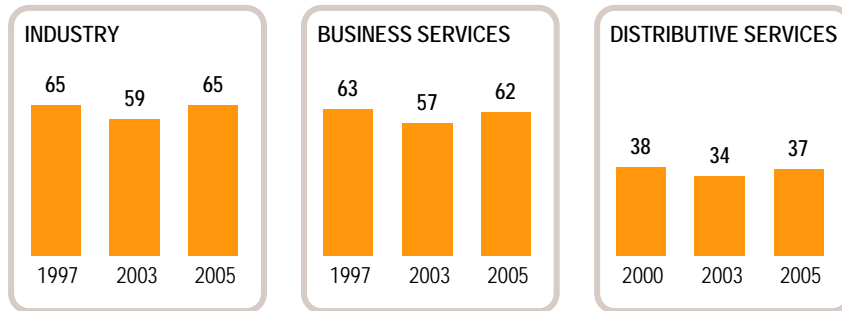
- > Customers want comprehensive solutions
- > Product-related services represent a USP
- > Products and services together are less price-transparent

> 38% of all companies in German manufacturing offer product-related services – generating EUR 52.6 billion in service sales

Source: Fraunhofer ISI

5. Companies offering services have similar innovation levels as industrial companies...

Innovation ratios in Germany [% of German companies]

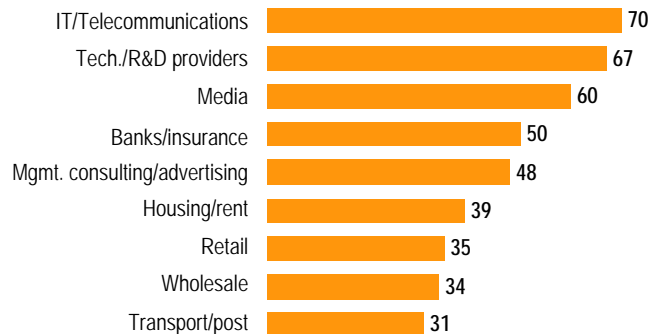


> Industrial companies generate 7.6% of their sales from new products, whereas business service companies generate only 4.9% from new products

Source: ZEW 2005

... and most service companies continuously offer innovations

Share of innovative companies in selected industries of the service sector in D 2004 [share of companies in %]



Source: ZEW 2005

[... but innovation in the service sector is different from innovation in the industrial sector]

Service features

- > Intangible
- > Interactive with a high degree of customer contact during preparation, delivery and consumption
- > Fixed to location and schedule
- > Customized
- > Information intensive

THE INNOVATION FEATURES OF SERVICES

- > Innovation not only in product/process, but also in customer interaction
- > Innovation in services is mostly on-the-fly and tailored to the special needs of a customer (and therefore difficult to reproduce)
- > Innovation is difficult to patent and protect
- > Generally less focus on technology as compared with industry

> **Different innovation patterns require different innovation management and a different innovation policy than in the industrial sector**

Source: Oxford Handbook of Innovation

[6. Increasing knowledge intensity requires the integration of external and internal knowledge]

Instruments for integrating external and internal knowledge

- > **Effectively managing human resources**
 - Hiring experts
 - Creating multidisciplinary research teams to broaden knowledge base
- > **Establishing appropriate organizational structures**
 - Setting up dedicated business units that scan the environment to develop more expertise
 - Institutionalizing cooperation with other firms
- > **Forging effective networks and linkages**
 - Participating in networks
 - Cooperating closely with suppliers
 - Working closely with customers on new solutions
 - Establishing joint projects with research

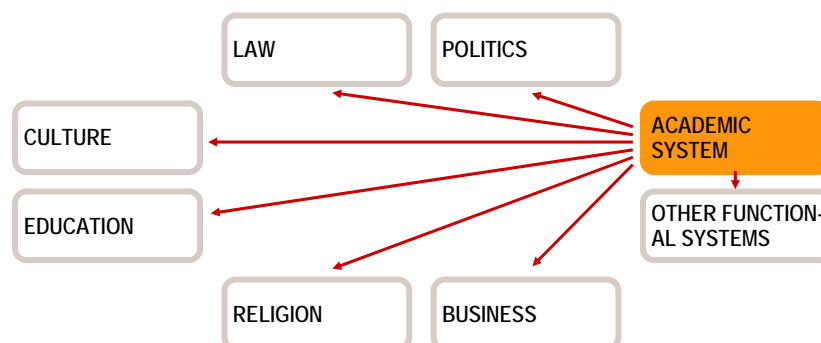
Source: OECD

[B.]

Creating knowledge in a knowledge-based economy

[1.1 Background: In the past, mainly the academic system was responsible for creating knowledge]

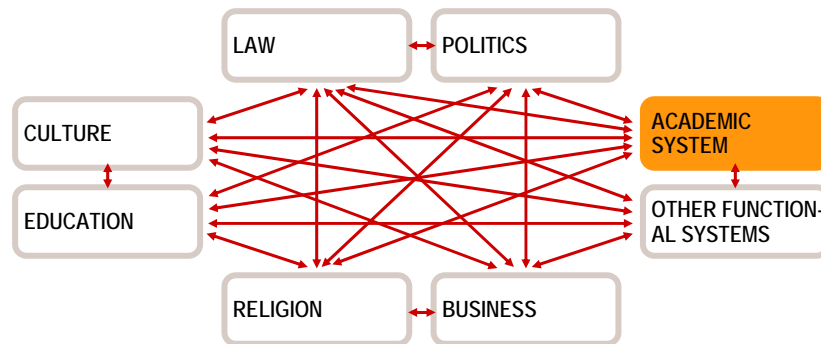
Traditional model for generating knowledge in a society



> Old model: Transfer from the academic system to the rest of society

1.2 Today, knowledge is created in all of the societal subsystems

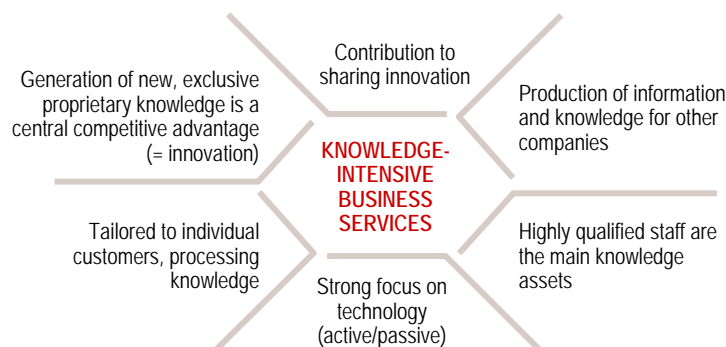
Knowledge generation in the information society



> Increasing importance of knowledge is accelerating individual generation of knowledge in each subsystem – sharing is necessary

2.1 The high demand for knowledge has already become its own economic sector

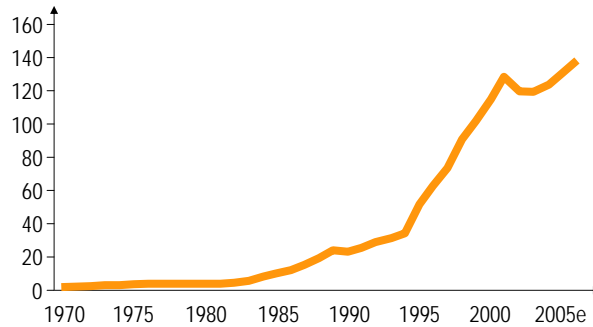
Characteristics of knowledge-intensive business services



> But the level of knowledge-intensive services depends on cooperation with academia

2.2 Knowledge-intensive services are growing fast – the case of management consulting

Global demand for management consulting
1970-2005 [USD bn]



> Share of business services in gross value added in Germany has increased from 14.0% (1991) to 16.9% (2000) – rising importance is obvious

Source: Kennedy, BMWI

3. Knowledge-intensive services are facing special challenges – consulting as an example

Characteristics of knowledge-intensive business services – example consulting

TIME ASPECT

- > Considerable volatility of knowledge
- > Knowledge is highly dependent on the context
- > Increasing momentum of information creation

PHYSICAL ASPECT

- > Lacking ability to generalize (no theories or rules)
- > Strong dependence on individual persons (didactic competency/ soft skills)
- > Reputation and brand have considerable importance

OPERATING ASPECT

- > Impossible to completely store knowledge
- > It is necessary to constantly regenerate knowledge, because providing knowledge can compromise knowledge sources

> Continuous knowledge input is necessary – but also the academic system benefits from such cooperation

4. Cooperation of business and academia can promote the knowledge-based economy

When business and academia cooperate, the players get stronger

KNOWLEDGE-INTENSIVE BUSINESS SERVICES

- > Market relevance
- > Focus on practice
- > Methodological competency in conducting research projects (project management)

COOPERATION

ACADEMIA

- > Theory
- > Methodological competency
- > Systematic and objective findings from meta-observations

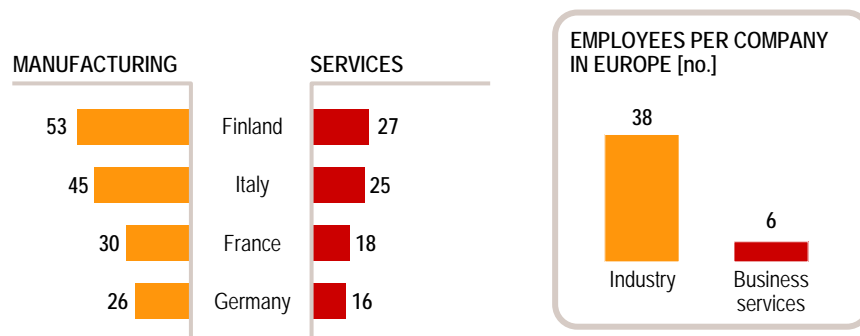
> Win-win situation: The real world generates new questions for academia and vice versa

[c.]

Supporting innovation in services

1. Service companies are relatively small and receive less public funding

Share of innovative firms benefiting from public support programs

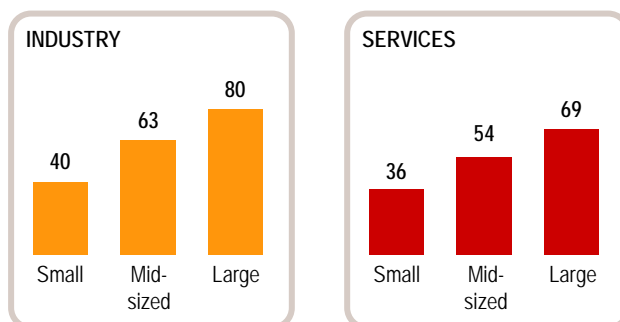


> It is almost impossible for small companies to conduct their own research

Source: OECD 2005 / EU

2. Without external input, small companies can hardly be innovative...

Proportion of companies with innovation activity in the EU 1998-2000 [%] ¹⁾

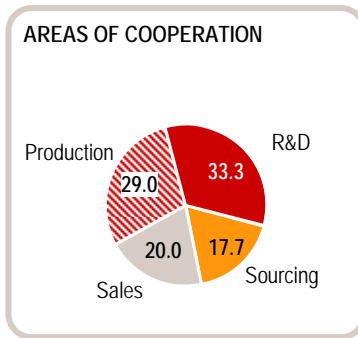
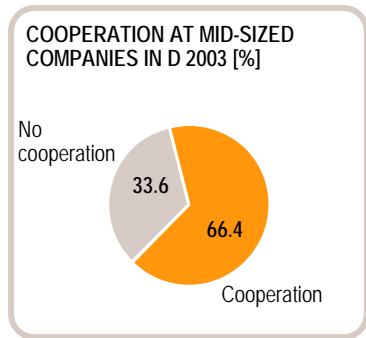


¹⁾ Small companies: 10-49 employees, medium-sized companies: 50-249 employees, large companies: >250 employees

> SMEs need external input to obtain the most recent knowledge

Source: EU

[... even though mid-sized companies are willing to cooperate – particularly in R&D]



- > In R&D, main cooperation partners are universities (38%)
- > Main target of cooperation is creating new products (65%)

Source: BDI; ifm

[3. In most cases, knowledge transfer options are insufficiently institutionalized]



Importance of interaction between business and academia at universities
[Percentage of respondents who consider the type of interaction important/very important]



WEAKNESSES OF CURRENT TYPES OF INTERACTION

- > Mostly on an ad-hoc basis
- > Case/project-related
- > Little knowledge exchange
- > Not institutionalized

- > Relevant knowledge on service innovations is generally tacit – in order to develop it, personal contact is required. Solid, long-term networks can lead to institutionalization

Source: ifo

4. "Traditional" cooperation with universities has its limits

Limitations

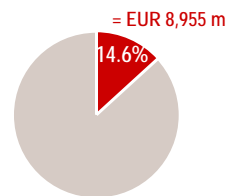
- > Academia lacks an understanding of current problems and challenges in the global economy
- > There is a lack of focus on service innovations
- > Cultural and language barriers between business and academia
- > Timelines of business and academia are different
- > Incentive systems are different (practical cooperation is not rewarded in the academic community)
- > Cooperation is often based on a close personal relationship between a specific businessperson and an academic – such relationships cannot be reproduced/built on

> **New cooperation models are needed**

5. The service sector is underrepresented in German academia

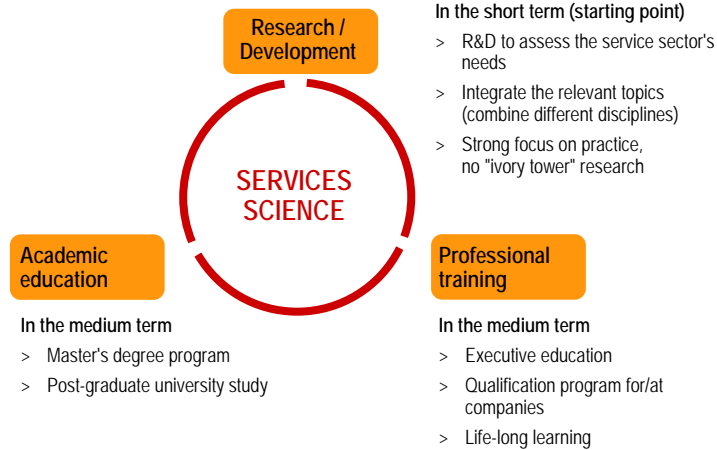
- > There are five specialized service chairs in Germany
- > Approx. 30 chairs/research institutes are close to the service sector
- > There are 6 Internet communities for service research
- > In Germany, there is no academic journal for the service sector

SHARE OF TOTAL SPENDING ON SERVICE-RELATED R&D (BMBF 1993-2004¹⁾)



1) Source: Bundesbericht Forschung 2004, Table 8b (only cumulative R&D spending 1993-2004, 2003/2004 target values); IT not included, and the definition of services is broad, so the value is overestimated

6. Our vision: The founding of a services science to encourage research and teaching in services



7. Services science should be interdisciplinary combined with a problem/practice-oriented focus

Characteristics

- A melting pot** of practitioners and academics for an advanced and relevant approach: close cooperation between theory and practice
- An transdisciplinary approach:** Integrating different disciplines that are relevant to complex services-related issues (business admin., operations research, decision sciences, law, social sciences, cognitive science, etc.)
- The innovation of innovations:** A never-before applied model that focuses on cooperation between disciplines, as well as business and academia
- A common incentive system** – So that everyone is equally motivated to perform
- In the medium-term, create a **new training offer** – for better-qualified staff (through networks, service orientation, etc.) and increased competitiveness

8. Establishing services science may help us understand pressing challenges of service management

Examples of practical research topics

- Public Private Partnerships
 - > Managerial challenges in PPPs
 - > Customization of formerly standardized public services
- Servicization of industry
 - > Growing importance of services for value creation
 - > Product-related services as a competitive advantage and as a way for industrial companies to differentiate themselves
- Industrialization of services
 - > Modularization of service provision
 - > Outsourcing of services to external partners

> **Services Sciences as a research program for the knowledge economy**

9. The benefits of a services science are obvious

IN THE SHORT TERM

- > More practice-oriented research
- > Improved service innovation
- > Clear profiles geared toward the strongest economic sector

IN THE MEDIUM-/LONG TERM

- > New training offer = better education
- > Establish research that focuses on service topics = innovation drive in the service sector
- > Internal academic competitiveness (US universities are already in the process of establishing service science faculties)
- > Initiate structural change

> **Service science can institutionalize the exchange between business and academia – and generate competitive advantage**