



# 4° Knowledge and Services

# IT Services Classification

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- The Lovelock's classification (and others) were not designed taking into account the use of IT in services
- We need classifications with technological and information management implications and **knowledge dimension** (IT services)



# The Role of Knowledge in Services

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- Knowledge intensity and ICT are factors of innovation
- Knowledge management and technologies become crucial strategies for service industry
- Different knowledge typologies:
  - *know-how, organizational, scientific-technical, informational, cultural, etc.*

# Knowledge in IT Services

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- Knowledge is **output** of service:

*Data collection, storage, modification, updating and dissemination of knowledge to create value for the customer: information services, communication, newsletters, information retrieval systems, high-tech products, online medical information ...*

- Knowledge is **placed in the supplier experience** (tacit knowledge), a unique, not repeatable and personalized result:

*consulting services, lawyers, doctors, R&D ...*

- Knowledge is **embedded into the process or service system**, the result is replicable, ICT is essential for extending service:

*automatic ticketing, online travel reservations, ATMs, web services (Amazon)*

# Kang Framework

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## Knowledge-based services

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- Computer graphic
- Computer aided design
- Beauty salons
- Exercise clinics
- Haircutting
- Education
- Professional services
- Legal services
- Health care
- Information services
- Management consultants
- Accountants

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## Knowledge-embedded services

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- Automated car washes
  - Fast food
  - Passenger/freight transportation
  - Laundry
  - Dry cleaning
  - Vending machines
  - Package delivery
  - Shipping and distribution
  - Broadcasting
  - Telephone operator
  - Security services
  - Banking/insurance
  - Theatres/museums
  - Travel/recreation
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“**Knowledge-based services** where value, knowledge, is the heritage of the person providing the service.

**Knowledge-embedded services** where value is inherent in the system that provides the service.”

# Examples from Kang

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Knowledge-based	Knowledge-embedded
Computer graphic for publishing: technology supports (does not replace) the worker skills => greater speed, efficiency, repeatability and quality	Automatic vehicle wash: worker puts into operation the technology representing the added value of the service
Distance learning: teacher role remains fundamental, technology extends its ability to reach students	Orders and deliveries management: worker depends on technology helping him to manage orders, the customer interacts with the technology to monitor the status of the delivery

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# Knowledge Management, what is?

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## Definition:

*“Theoretical and application research developing the **knowledge cycle** within a community of practice or learning (in companies) through IT tools”*

## Goal:

Capturing the people **tacit knowledge** and transforming it into a **corporate “asset”** by formalizing and codifying it

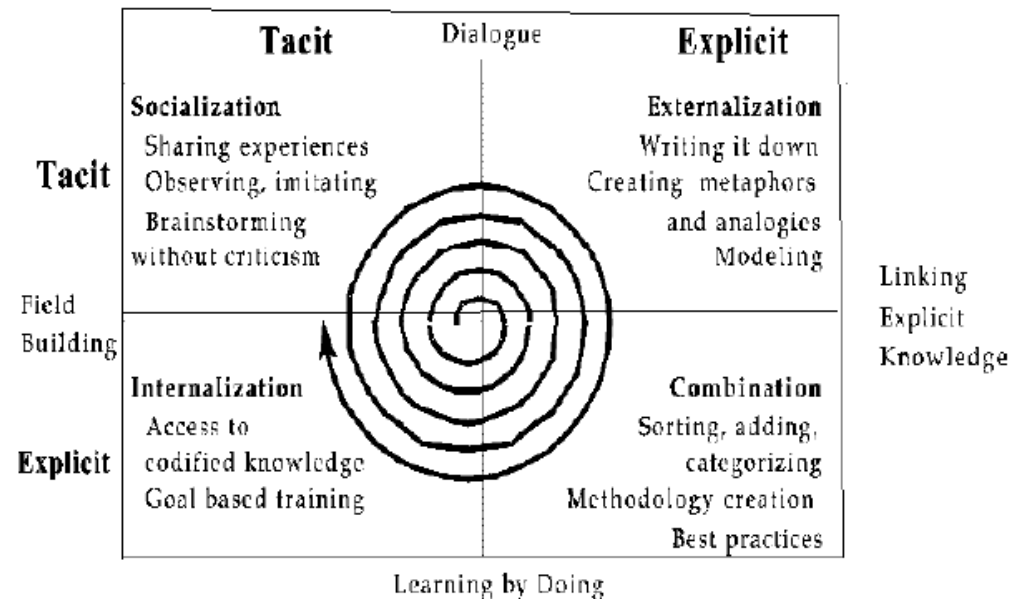
- Improve people's efficiency by explaining and sharing their professional knowledge
- Put the specific professional knowledge of each member at the service of the whole company



# Tacit Knowledge

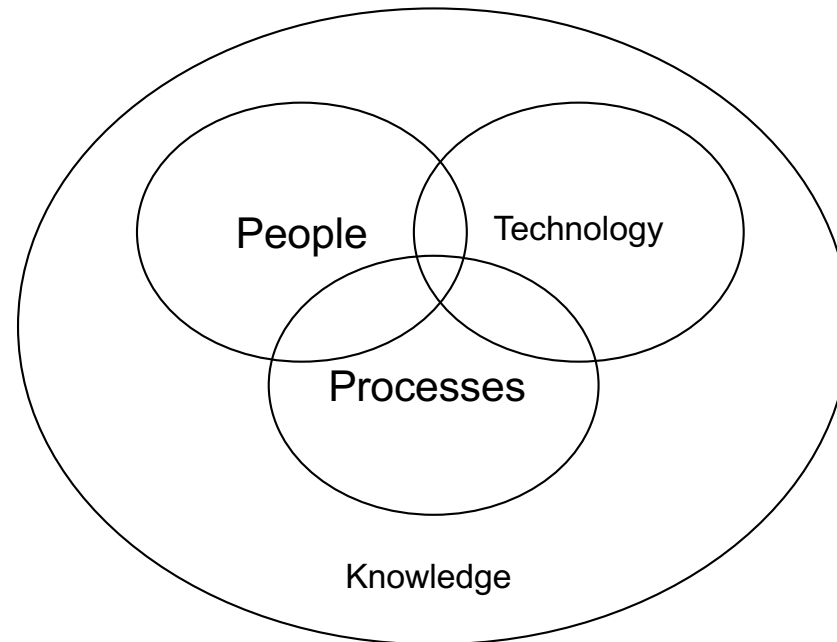
- People are holders of a type of knowledge that cannot be expressed, "know-how", which cannot be stored or managed with information systems
- Several KM theories claim to be able to capture this tacit knowledge, e.g. Nonaka and Takeuchi and the spiral of knowledge (SECI model, 1995)

***“We can know  
more than  
we can tell”  
(Polanyi 1966)***



# Knowledge Management, Components

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**KM implies the relationship between people, work processes and technologies to create and share knowledge**

# KM & KIBS

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- Analyze flows of tacit and formalized knowledge into the KIBS
- Conversion process is highly dynamic and produces different and multiform outputs
  - improvement of company internal communication,
  - market understanding,
  - application systems know-how,
  - client negotiation,
  - collaboration,
  - problem-solving,
  - decision-making
  - ...

# KIBS, knowledge intensive business services

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- Acronym is used to indicate both services with a high content of knowledge and organizations that provide these services
- First studies on KIBS (1990s) identified their distinctive function in the unidirectional transfer of information and knowledge from the KIBS to their clients
- The most recent contributions, instead, highlight a more complex process of interaction or "fusion", and co-production of knowledge that involves the KIBS and their clients
- *Suppliers have strong professional knowledge and strong use of technology, services are inputs for industrial processes or for the production of other services (Miles 1995)*

# T-KIBS & P-KIBS

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- Miles distinguishes:
    - T-KIBS, knowledge-intensive services that create and use new technologies within processes, including, e.g., IT or engineering activities
    - P-KIBS, traditional low-intensity professional services, such as communication, consulting, legal and accounting services
- (...like Kang)

# KIBS, features

- Two important facts:
  - The role of **tacit knowledge** in the process
  - High degree of **customization** that generally characterizes KIBS services
- Three key concepts:
  - Knowledge
  - Innovation (KIBS as Innovation hubs or incubators)
  - Territorial proximity (Metropolitan areas, industrial districts ...)
- Examples:
  - Accounting;
  - Organizational consultancy;
  - Construction (e.g., topography, civil engineering, architecture);
  - R&D;
  - Design;
  - Computer science and computer-based;
  - Legal services;
  - Marketing and advertising;
  - Training;
  - Financial services;
  - Employment services (temporary);
  - ...

# KIBS, economic value

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- With reference to EU GDP, the share of the value of services is around 70% while in US is 75%
  - Personal services
  - Business services
  - Non Market Services (Education, Health, PA)
- The share of KIBS in GDP is around 11% in the EU, 13% in the US and 8% in Japan
- The contribution of KIBS to GDP growth since 1996 was 17% in the EU, 28% in Japan, and 22% in the US (World Bank 2012)

# KIBS, economic value (2)

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- KIBS therefore contribute to economic growth taking into account:
  - Growing importance of KIBS sectors in the economy;
  - Role of KIBS as intermediate input (specially in manufacturing);
  - Importance of technology flows between KIBS and companies in the manufacturing sector;
  - Increasing convergence of production and services



# KIBS, in industry

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- For a manufacturing company, KIBS can be:
  - Cooperation with a professional firm or a design company
  - Cooperation in the design phase with a subcontractor
  - Cooperation with a training institution or a research center
  - Cooperation with retail company
  - Interaction with a competing company
  - Co-Marketing with a company in a complementary sector

# KIBS, what are today

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- More and more companies use KIBS for intermediate inputs supporting their production, e.g.:
  - In the air transport or banking sector, IT is often outsourced
  - Many big companies have also outsourced personnel management (pay slips, business travel reports, ...)
  - In several manufacturing companies the main KIBS also concern the outsourcing of design services

**Manufacturing companies also use KIBS to offer services associated with their traditional physical products**

# Conclusions

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We can generalize:

The "tertiarization" of a company process (e.g., manufacturing) often develops a KIBS area

This tendency is often called "convergence between production and services" or  
**Servitization**



# 5° Business Strategies

# Innovation of Business Models

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- Servitization
- Open Innovation
  - Knowledge acquisition from outside
  - Enhancement of innovative results on the market

# Servitization, Theoretical Bases

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- New Service Dominant Logic: from the product logic to the service logic (Vargo e Lusch)
- Primacy of service on the product (B2B)
- Increase of the service dimension in the customer-supplier relationship, with reference to manufacturing companies
- Services are no longer an addendum to the industrial product, they acquire a central value in the company offer

# Definition

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- Vandermerwe and Rada (1988): study of the evolution of business models of manufacturing companies
- Indicates a strategy to expand the offer through a broader portfolio of products and services

*“The increased offering of fuller market packages or ‘bundles’ of customer focused combinations of goods, services, support, self-service and knowledge in order to add value to core product offerings”*

# Servitization Evolution

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- Servitization, favored by technology, globalization and increasing competitive pressure, is divided into three phases:
  - goods or services;
  - goods + services;
  - goods + services + support + knowledge + self-service

*“Innovation in the capabilities and processes of a company move from selling products to selling **product-service systems**”*

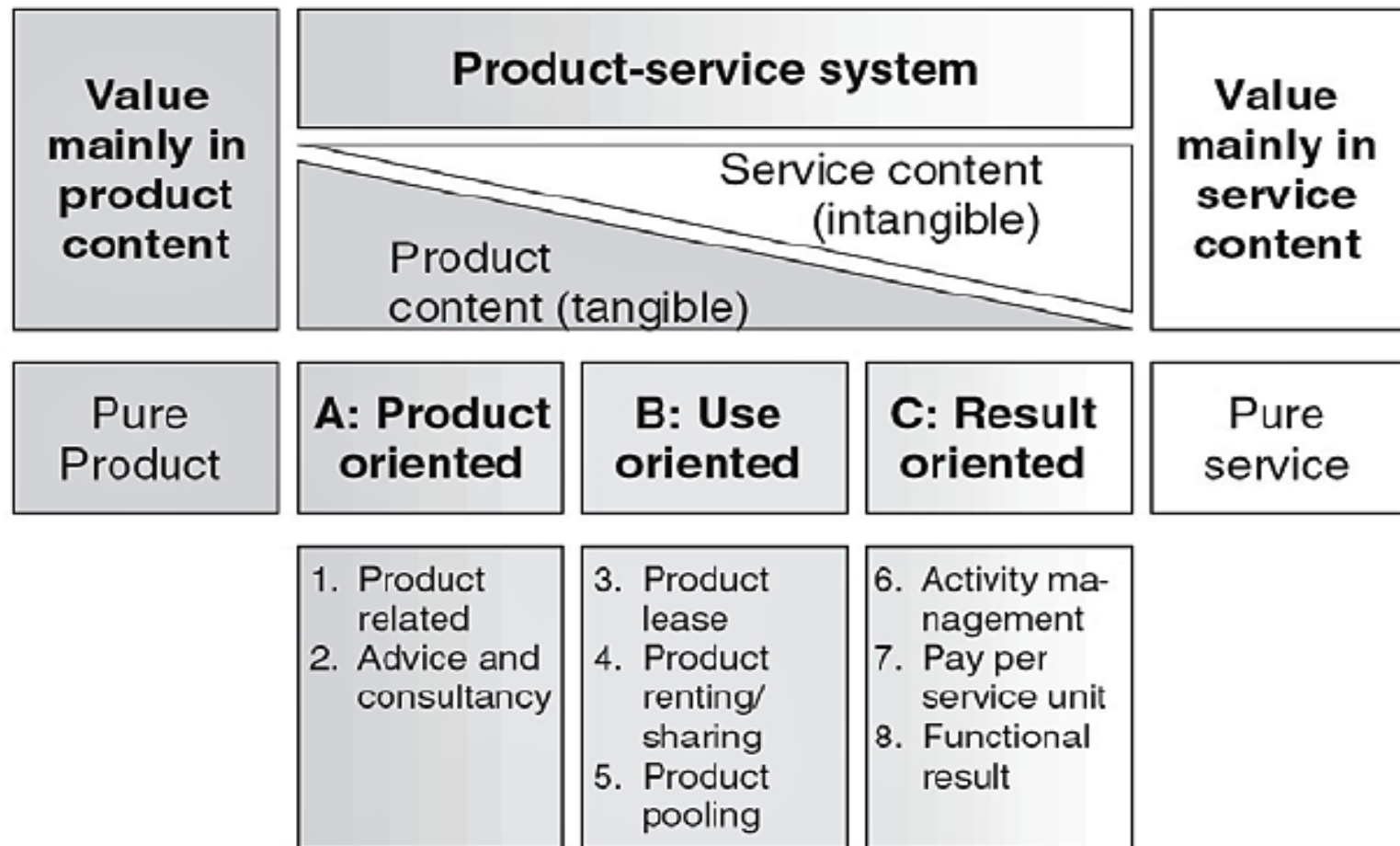


# Product Service System

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- PSS is a business model in which a manufacturer provides an offer consisting of products and services
- Born as a tool to promote the collaborative consumption of products and services in order to limit their environmental impact
- It also includes the "sale of the use" rather than the sale of a product

# PSS Model



# Case Studies

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- 60s: Rolls-Royce "power-by-the-hour"
- 80s/90s: IBM, Xerox, General Electric, household appliance company in Tokyo
- 2000s: empirical analysis of companies by Neely ("high-tech sectors have a tendency to higher servitization")

*«If everybody wants to have an IBM terminal it is because IBM services are the best» (IBM adv 1985)*

# Rolls Royce

- With Total-Care package, the customer does not buy the property of the object, but pays for its use
- The system called "**power-by-the-hour**" allows the customer to use Rolls Royce aircraft turbines by paying a monthly/annual fee based on actual usage

