

# Servitization in Manufacturing Companies

Literature Review, Research Progress and Cambridge Service Research

Guangjie Ren and Mike Gregory  
Institute for Manufacturing, University of Cambridge

- **Outline**
  - **IfM service and support programme**
  - **Literature review**
    - Background
    - Defining the domain
    - Empirical studies
  - **PhD research progress**

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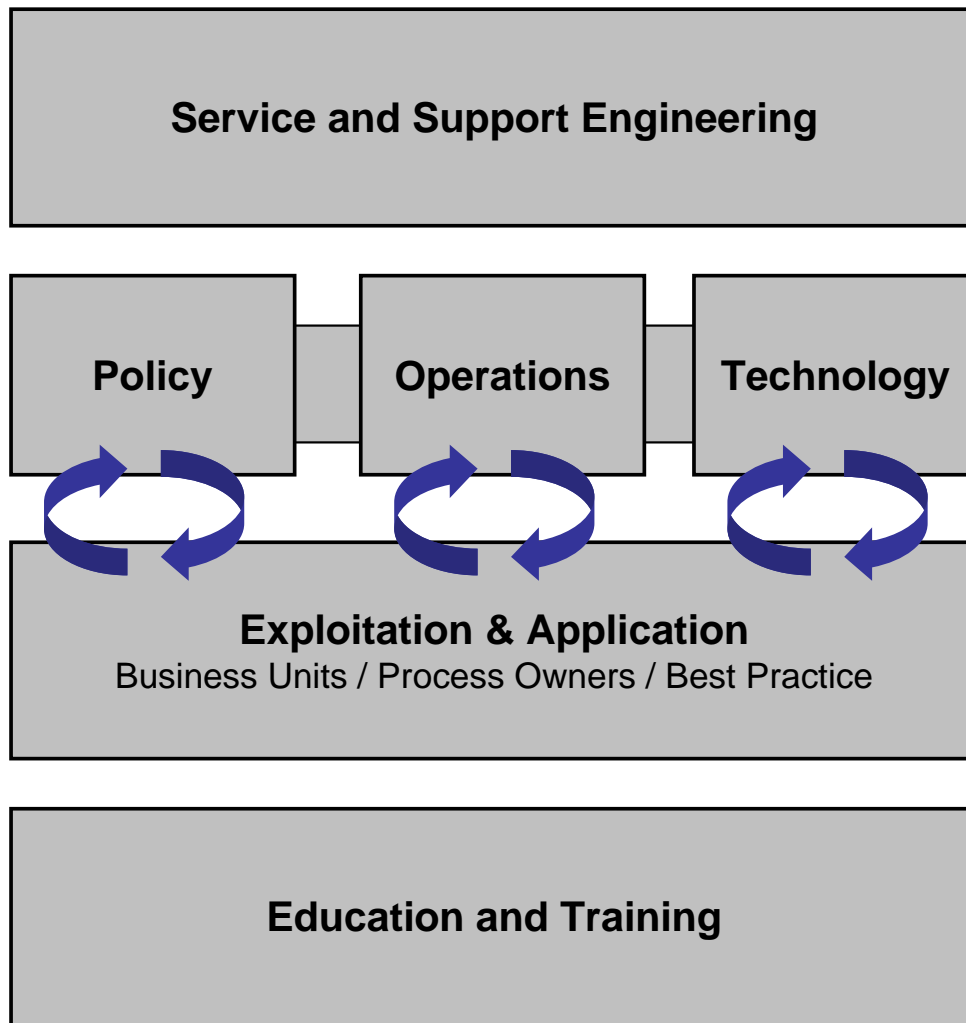
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# Service and Support Programme at the IfM

- Natural evolution from Big M to high value manufacturing
- Service engineering activities at IFM/UC commenced in 2003/4
- Programme established with BAE Systems in Sept 2003
  - ~£4M programme to end 2011
  - RAE supported Professor of Service & Support Engineering appointed Oct 2006
  - Exploring the research potential 2003-06
  - Focus on initial activities 2006-07
  - Expanding sector scope, academic & industrial involvement
- Objectives
  - To enable transformation to Through Life Capability provision
  - To develop and lead new academic thinking in service & support engineering

# Research Focus and Framework



**Policy:** Informing the development of future support solutions

- Visualisation, Modelling & Analysis
- Through Life Capability Management
- Supply Network Configuration

**Operations:** Development of protocols for the design of effective service networks

- Supply Network Capability
- Organisation Design & Cultural Change
- Service Requirements Management

**Technology:** Exploiting emergent technology to enhance support solutions

- Information Networks & Data Management

**Exploitation:** Various projects to transfer adjacent research into current support business applications

**Education:** Scoping potential content and approach for Support Engineering education

# BAE/Cambridge Research Programme (2006-7)

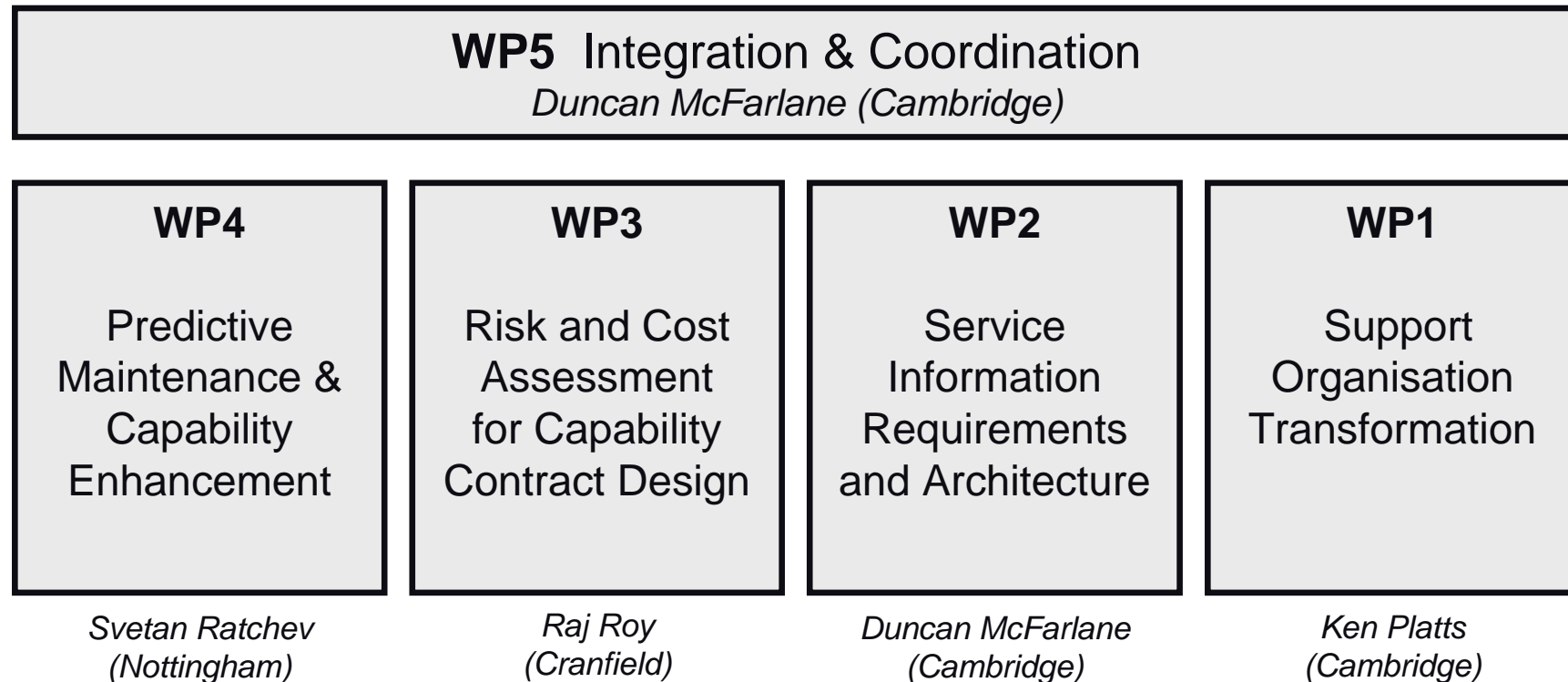
- **Strand #1 – Models, Maps & Frameworks:** Develop techniques and resources to understand and analyse the configuration of, and transition to, effective service delivery networks
- **Strand #2 – Requirements Capture:** Develop the ability to apply product systems knowledge to the development of service systems (closed end 2006)
- **Strand #3 – Through-life Capability:** To build a Capability Framework and Technology Insertion capability within the service and support arena
- **Strand #4 – Managing the Supply Network:** Development and deployment of network capability assessment and configuration mapping tools to support service activities
- **Strand #5 – Support Information Networks:** To demonstrate the impact of improved product information on support operations
- **Strand #6 – Organisation Design:** Exploration of the principles and practice of organisation design as applied to a partnered support project

# EPSRC/BAE Support Service Solutions: Strategy and Transition (2008-9)\*

\* Funding still to be confirmed

## Research questions

- What should an [affordable] support service offering for availability contracting look like and what type of organisation is required to deliver it?
- How can more traditional offerings (& organisations) be migrated to help a company achieve this target?



# Service Research at Cambridge

## Academic disciplines

- Judge Business School
- Engineering Design Centre
- Service Systems Forum
- <http://www.talks.cam.ac.uk/show/index/8553>

## Industrial engagement

- BAE Systems
- Rolls Royce
- Boeing
- Caterpillar
- IATA

## UK funding bodies

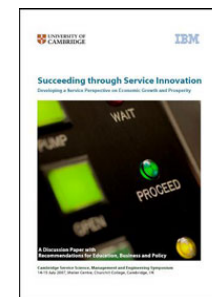
- KIM – Knowledge and Information Management
- SAIM – Strategies for Asset Information Management

## EU funding bodies

- PROMISE – Product Lifecycle Management and Tracking
- BRIDGE – Building RFID Environments in the Supply Chain
- ILIPT – Intelligent Logistics for Innovative Products

## Service Science initiative

- Cambridge SSME Symposium (IBM/BAE)
- Service Innovation White Paper
- [www.ifm.eng.cam.ac.uk/ssme](http://www.ifm.eng.cam.ac.uk/ssme)



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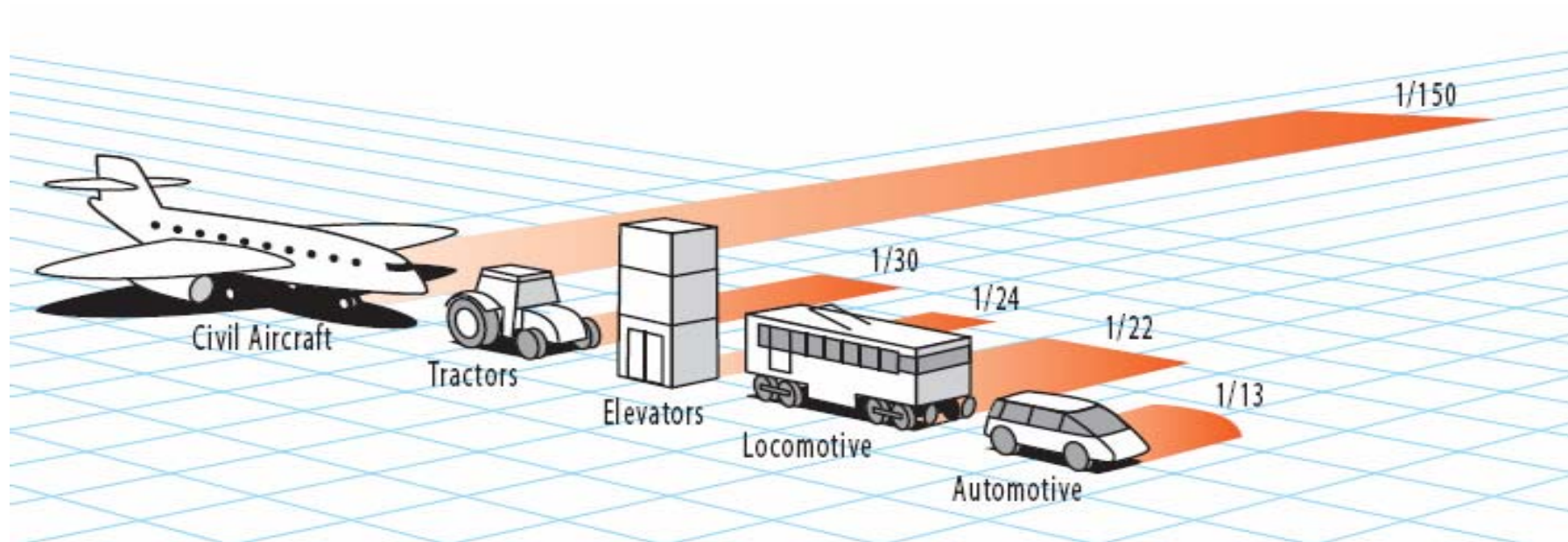
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# Background

## Servitization/Servicisation

New order intake / Installed base



Source: IfM, 2004

# Background

## Servitization/Serviceisation

INDUSTRY	MARGIN IN OEM BUSINESS	MARGIN IN SERVICE	MARGIN LEVERAGE <sup>1</sup>
Paper Machines	1-3%	10-15%	5
Power Equipment	2-5%	15-20%	4
Metallurgy Equipment	-3 - +6%	15-20%	4
Rail Vehicles	3-6%	8-10%	2
Machine Tools	1-12%	5-15%	2

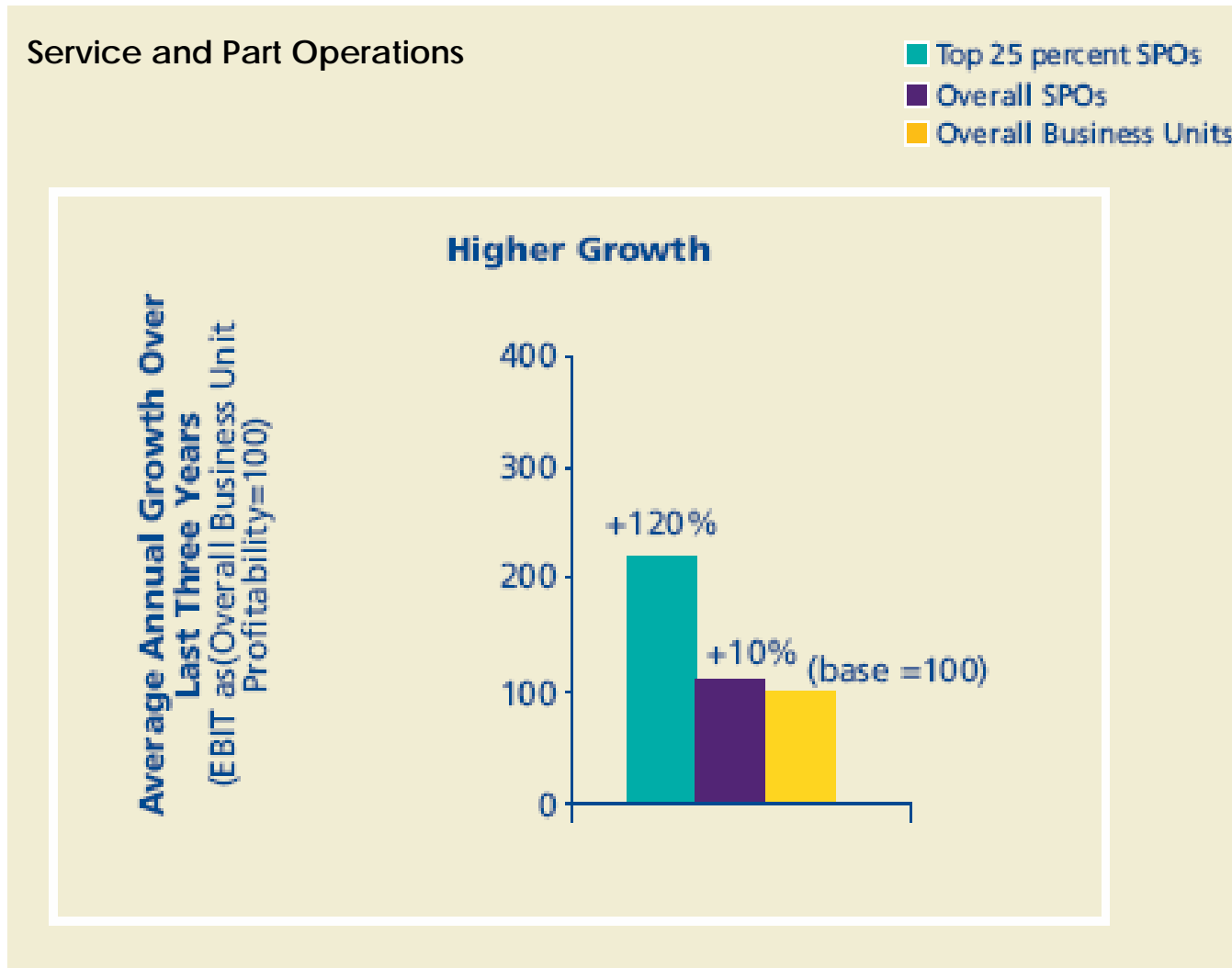
Note: 1 Margin Leverage = Margin in Service / Margin in OEM-Business

Source: Annual Reports, Expert Interviews, Monitor Analysis

Source: Monitor, 2004

# Background

## Servitization/Serviceisation



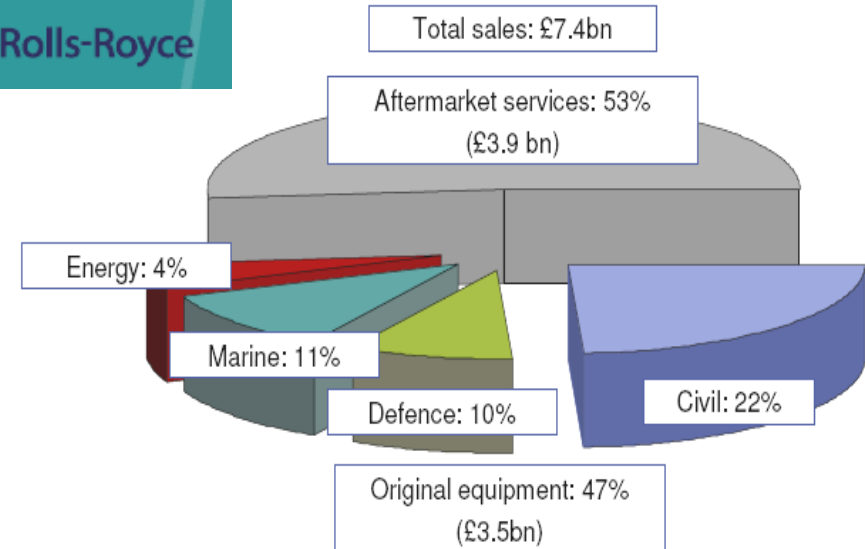
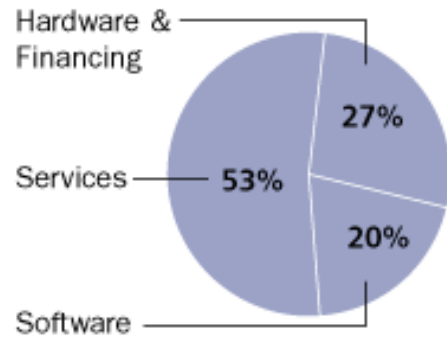
Source: Deloitte, 2006

# Background

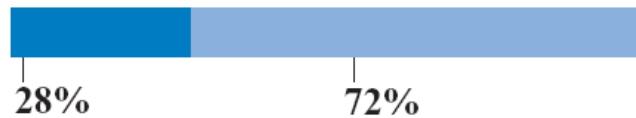
## Servitization/Servicisation



### Revenue Mix



### Revenue Stream



Approximately 28% of our revenue comes from equipment sales, from either lease arrangements that qualify as sales for accounting purposes, or outright cash sales.

The remaining 72% of our revenue, "Post sale and financing," includes annuity-based revenue from maintenance, services, supplies, and financing, as well as revenue from rentals or operating lease arrangements.

## However, it is not clear ...

- What is servitization/servicisation?
- What are the driving forces behind the phenomenon?
- How has it been approached by the literature?
- What are the foundations and gaps in empirical studies?

# Review Approach

- Servitization – the very first appearance came a bit late
- Database search *and* targeted search
- Scope: service activities and service business development in manufacturing/product companies
- Backdrops in manufacturing, operations and marketing to help understand the context
- 200+ publications are included

# Defining the Domain

- Driving forces
- Literature evolution
- Prior conceptualisations
- Towards a working definition

## #4 – Developments in Tech/Processes/Infra-structure

- Products were less reliable
  - reactive, on-site and high-cost support
- 
- Products are more reliable
  - Preventive, remote, & low-cost support

Backdrops: Technology innovation – reliability, affordability; Process innovation: TPM, BPR

## #3 – Outsourcing

- Previously run by the customer
  - Multiple sourcing
- 
- Increasingly run by the supplier
  - Single Sourcing

Backdrops: Core Competences (Prahalad & Hamel, 1990); Service-based Strategies (Quinn et al., 1990)

## #2 – Market Evolution

- Conventional expansion
- Product/Geography/Diversification
- 
- Strategic Innovation
- Value creation and capture

Backdrops: Product/Industry life-cycle (Levitt, 1965); Value migration (Slywotzky, 1996)

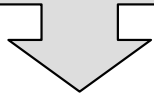
## #1 – Customer Orientation

- Production-driven
- The customer bought what was offered
- 
- Customer-driven
- The customer dictates what is offered

Backdrops (Sipper & Bulfin, 1998: 5-6): Overcapacity; Increasing customer sophistication; The rise of Japanese manufacturing

## Long history of service activities

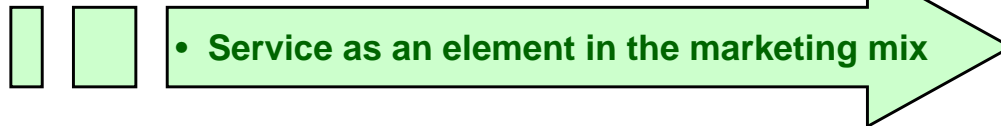
- **Product warranty:** back to the trade activities (Murthy & Djameludin, 2002)
- **Servicing** mechanical, electrical and electronic goods (e.g. Hull, 1936)
- **Maintenance & Plant Engineering** (e.g. Morrow, 1966, 2/e)



## Driving forces at work

- Customer Orientation
- Market Evolution
- Outsourcing
- New Developments

**1960-1980**



## Main Features

- Early overviews in industrial goods sectors
- Physical distribution services
- Warranty and repair services

## Research Focus and Approach

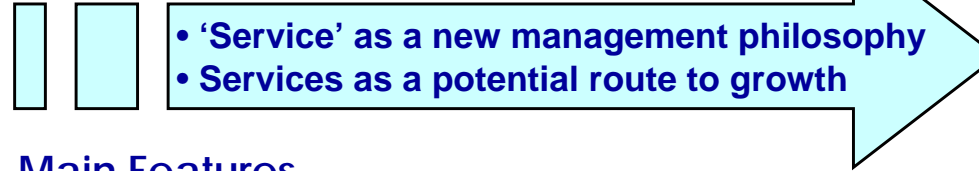
- Supplementary services
- Buyer behaviour and segment analysis

Long history of service activities

## Driving forces at work

- Customer Orientation
- Market Evolution
- Outsourcing
- New Developments

### 1980-late 1990s



### Main Features

- Service Mindset & Relationship Marketing
- Service Factory
- After-Sales Services
- Service Business Development

### Research Focus and Approach

- Paradigm shift towards the customer
- Services assume an increasingly important role
- expanded scope of services but still confined
- Very few studies on the implications of servitization
- Predominantly conceptual and anecdotal

### Pre-1980



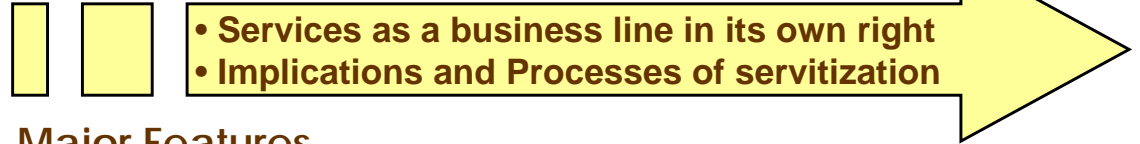
Long history of service activities

# Evolution of the Servitization Literature

## Driving forces at work

- Customer Orientation
- Market Evolution
- Outsourcing
- New Developments

### Late 1990s-present



- Services as a business line in its own right
- Implications and Processes of servitization

### Major Features

- Proactive/Risk-taking service offerings
- Services as a revenue and profit pool
- Opportunities and challenges facing manufacturers
- Emerging communities and programmes

### Research Focus and Approach

- High value added service offerings
- More detailed classification of services
- Part of the black box revealed through case studies
- But missing link with existing knowledge

### 1980-late 1990s



- 'Service' as a new management philosophy
- Services as a potential route to growth

### Pre-1980



- Service as an element in the marketing mix

Long history of service activities



... 1960s 1970s 1980s 1990s 2000s

# Evolution of the Servitization Literature

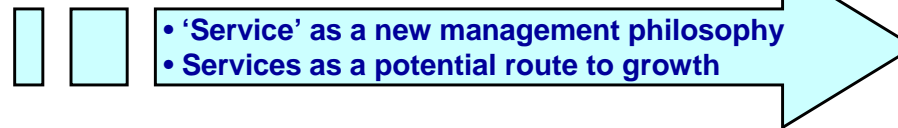
## Driving Forces

- Customer Orientation (industry/economy)
- Market Evolution (product/industry/economy)
- Outsourcing (industry/economy)
- New Developments (industry/economy)

### Late 1990s-present



### 1980-late 1990s



### Pre-1980

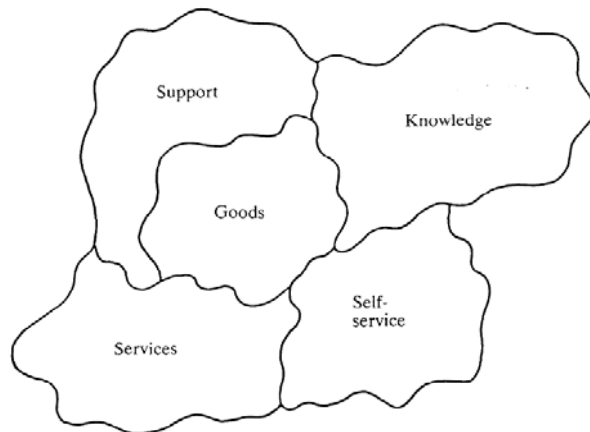


Long history of service activities



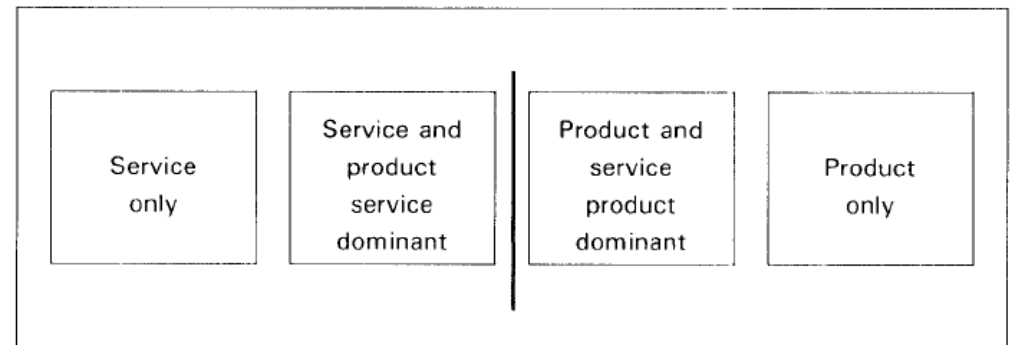
# Prior Conceptualisations

- It was clearly indicated at the beginning
  - Goods or Services → Goods + Services → Goods + Services + Support + Knowledge + Self-Service



Source: Vandermerwe & Rada, 1988

- However, the concept is oversimplified in subsequent studies.



Source: Martin & Horne, 1992

- **Imprecise and ambiguous conceptualisation of servitization may lead us to nowhere.**
- **To define something as complex as 'servitization', classification is an important step.**

# Modes of Servitization

<b>Pre-sale</b>	<b>Design and operations</b>	<b>Post-sale</b>	<b>Others</b>
<b>Problem-solving solutions</b>	<b>Manufacturing service</b>	<b>Growing importance of product support</b>	<b>The service factory</b>
<b>Business consultancy</b>	<b>System integration</b>	<b>Product support as a business line</b>	<b>Distribution channel</b>
<b>Financing</b>		<b>Performance-based service contract</b>	
		<b>Operating and managed service</b>	<b>Corporate knowledge</b>
		<b>Expansion into other OEM's installed base</b>	<b>Adjacent service chains</b>
<b>Integrated solutions</b>			

Source: Blumberg, 1987; Canton, 1984, 1988; Vandemerwe & Rada, 1988; Chase & Garvin, 1988; Davies et al., 2001; Oliva & Kallenberg, 2003; Sawhney et al., 2004.

# Towards a Working Definition

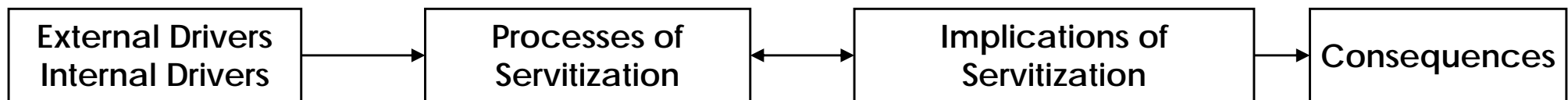
- Previous definitions
  - Servitization is a movement in which companies consciously drive their businesses into services to gain competitive ground (Vandermerwe & Rada, 1988).
  - Servitization is a trend in which manufacturing firms adopt more and more service components in their offerings (Desmet et al., 1998).
  - Servitization is the generic term that has come to mean any strategy that seeks to change the way in which product functionality is delivered to its markets (Slack, 2005)
- A working definition
  - Servitization is a change process wherein manufacturing companies embrace service orientation and/or develop more and better services, with the aim to satisfy customer's needs, achieve competitive advantages and enhance firm performance.

# Review Outline

- Defining the domain
- **Empirical studies on servitization**
- Gaps and future directions

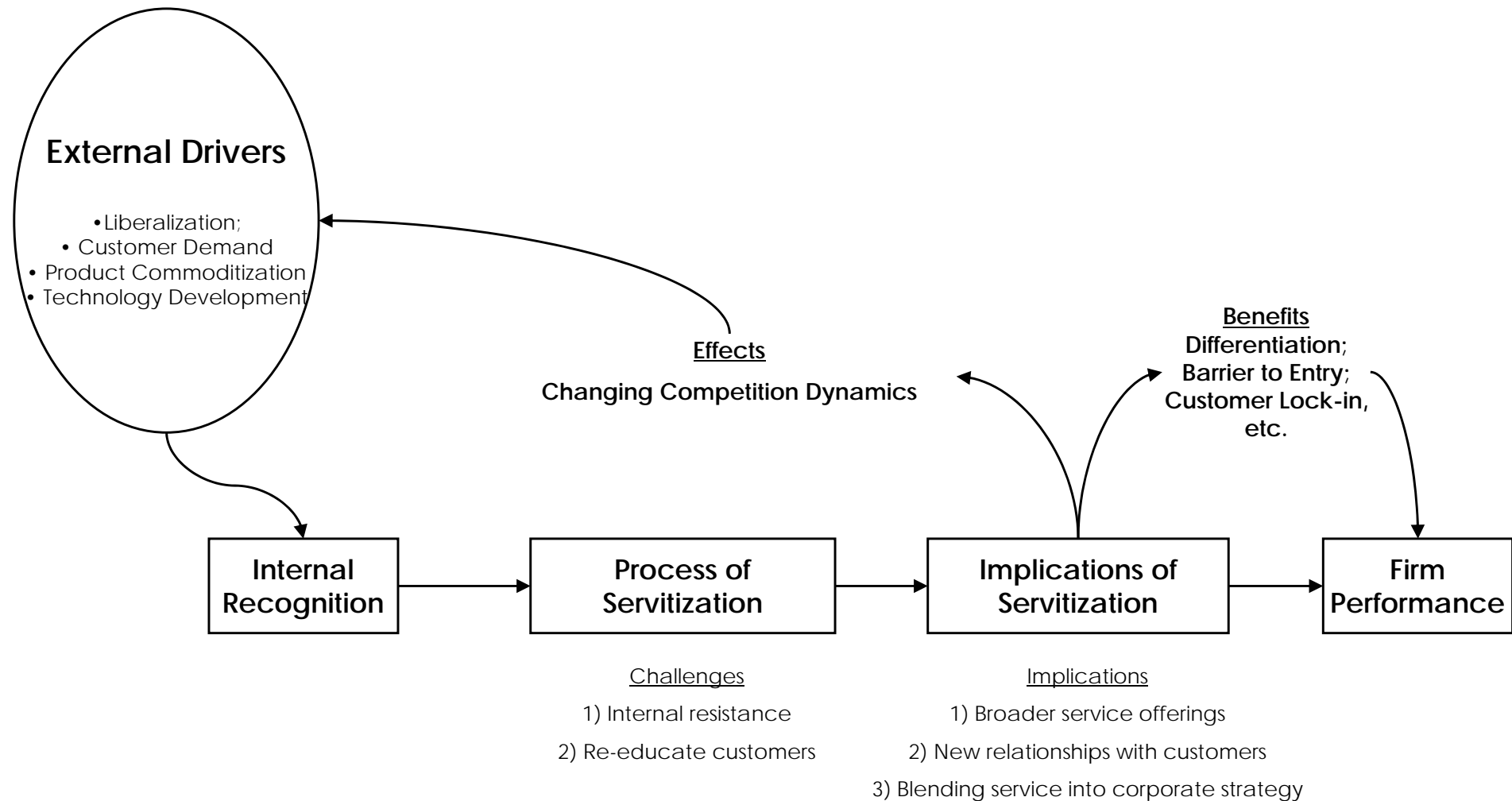
# Empirical Studies on Servitization

- Servitization entails complex decisions beyond service offerings
- Four key dimensions of the concept



# Empirical Studies on Servitization

- Four key dimensions – an example

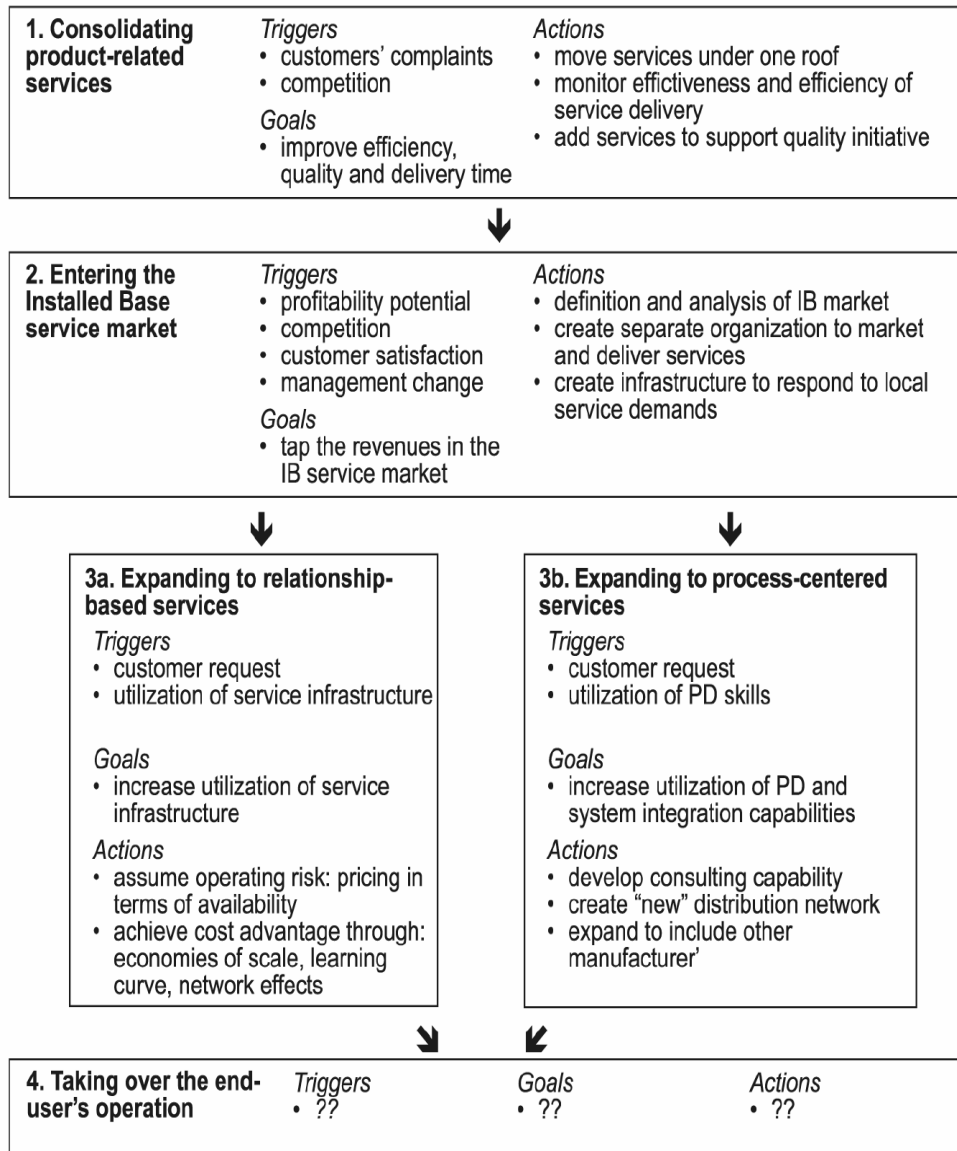


Source: Vandermerwe & Rada, 1988

# Implications

- Service offerings and their characteristics
- Service capabilities
  - Processes and resources to fulfil promises
- Implications for the organisation
  - Overall implications of servitization
    - e.g. product design, service operations, organisation structure and culture, etc.
  - Specific implications of service offerings
    - e.g. integrated solutions, corporate consulting, maintenance service contract, etc.
- An overall framework is missing

# Processes



- Lack of a process view as to
  - how servitization is stimulated, planned, and implemented in manufacturing companies (and the networks)
  - How servitization is managed in the presence of conflicting interests, values, and processes.

Source: Oliva & Kallenberg, 2003

# Review Outline

- Defining the domain
- Empirical studies on servitization
- **Gaps and future directions**

# Theoretical Limitations

- Oversimplification of servitization as the expansion of services
- Fail to incorporate the types of servitization into the analysis of implications
- Lack of a holistic framework for servitization implications
- Lack of systematic research on servitization as a strategy change process

# Future directions

- A historical view of the servitization research
- A holistic picture of the servitization phenomenon
- A grounded approach to theory building
- A fruitful area for research and practice

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# PhD Research

## Research Question

*How have manufacturing companies managed the transition from product-dominant to service-oriented businesses?*

- Research objectives
  - drivers for, and consequences of, servicisation
  - different types of service offerings and their characteristics
  - implications of servicisation for various aspects of the manufacturing organisation
  - evolution of the servicisation process

# PhD Research

## Research Question

*How have manufacturing companies managed the transition from product-dominant to service-oriented businesses?*

### • Industries

- Energy equipment
- Mechanical seal
- Inkjet printer
- Automation technologies
- Medical device
- Metrology instruments
- Power technologies
- Semiconductor equipment

### • Service offerings

- Integrated solutions
- Maintenance and repair services
- Performance-based service contracts
- Operating and managed services
- Business consulting services
- Quick delivery services
- Technical specification services
- Design and engineering services

### • Emerging Themes

- Customer focus and service orientation
- Total product and integrated solutions
- Innovation in service offerings and operations
- Application of ICT in service delivery
- Integration between products and services divisions
- Global strategy for service operations
- Strategic, organisational and cultural change

# Comments & Questions

