I Introduction

- Productivity measurement concepts in **manufacturing**:  
  - Introduced decades ago  
  - Based on contrasting input and output

- Productivity measurement concepts in **services**:  
  - Currently under intense research  
  - Measurement concepts from manufacturing cannot simply be transferred due to the service peculiarities  
  - Even more challenges for measuring productivity of innovative and knowledge-intensive services

What are the requirements for a productivity measurement concept for services that are innovative AND knowledge-intensive at the same time?
# Presentation Structure

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Innovative Services

- Only in very rare cases service innovations are radical.
- Strong linkage between organizational learning and service innovation:
  - „real innovations“ come from innovation processes, are repeatable.
  - „organizational learning processes“ are incremental innovations, based on adaptations for the customer undertaken by the service worker, often not repeatable (Sundbo, 1997).
  - Difference between these both cannot easily be quantified (Hipp/Grupp 2005).
- Development process happens “ad hoc.”
- Short life cycle of services.
- Investments lower than for product innovations, hence risk is lower as well (Martin/Horne 1992).
Knowledge-Intensive Services

- Knowledge-intensive services are delivered by service and manufacturing companies
- Supplied to organizations, not individuals
- Heavily depend on the knowledge of experts
- Knowledge and information from customer needed for service production and innovation
- Carried out as projects
- No dedicated R&D team in most cases

Interactive Services
- e.g. personal services, call center, counter services etc.

Knowledge-intensive Services
- e.g. management consulting, technology consulting, engineering, event management, legal advisory etc.

Standardized Services
- e.g. housekeeping services, security services, self-services etc.

Modular Services
- e.g. insurance activities, technical maintenance services, programming etc.

(Baumgärtner/Bienzeisler, 2006)
Service Peculiarities

- Services were regarded as being of inferior productivity for a long time.
- Gap between manufacturing productivity and service productivity was seen as “service immanent”.
- Characteristic features of services (IHIP-criteria) were detected as reasons for that gap in measuring results:
  - **Intangibility**: services are incapable of being perceived, especially by the perception of touch (physical and mental intangibility).
  - **Heterogeneity**: services are unique products (or unique processes).
  - **Inseparability**: services are consumed whilst production and customer interaction is required.
  - **Perishability**: service capability without corresponding demand cannot be utilized to meet future demand.
# Service Peculiarities and Innovative and Knowledge-Intensive Services

<table>
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<tr>
<th>Criterion</th>
<th>Innovativeness</th>
<th>Knowledge-Intensity</th>
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<tr>
<td>Intangibility</td>
<td>“mental intangibility of services”: the outcome of innovative services is uncertain; close interaction with the client is needed</td>
<td>outcome of knowledge-intensive services is intangible</td>
</tr>
<tr>
<td>Heterogeneity</td>
<td>no previous experience with the service within the providing company</td>
<td>project based structure of business: service delivery is regarded as a project – results hence vary</td>
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<tr>
<td></td>
<td></td>
<td>outcome of service production strongly depends on the personal component on both sides, provider and customer</td>
</tr>
<tr>
<td>Inseparability</td>
<td>client participation in both, service production and service innovation</td>
<td>production and consumption cannot be separated: outcome of the service production does not only depend on the service worker, but also on its counterpart on the customer side</td>
</tr>
<tr>
<td>Perishability</td>
<td>no previous experience with the level of service-readiness needed within the providing company</td>
<td>experts and their knowledge are one of the most important factors of service readiness</td>
</tr>
</tbody>
</table>
Requirements for productivity measurement of innovative, knowledge-intensive services

- Besides output quantity and output quality, innovativeness of the output shall be covered and compared
- "Internal output" of service process has to be included into productivity formula
- Provider's and customer's input and also interactive inputs, e.g. time and costs induced by interactive loops

Knowledge as input AND output factor

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Streams of literature dealing with measuring service productivity (Bartsch et al., 2011):
- industrial productivity (e.g. Levitt, 1972)
- service production (e.g. Corsten, 1994)
- customer integration (e.g. Johnston/Jones, 2004)
- service marketing (e.g. Grönroos/Ojasalo, 2004)

**Service production: Corsten, 1994**
- Based on approach from production theory, using a service provider point of view:
Customer integration: Johnston/Jones, 2004

- Based on two perspectives ("client productivity"): 
  - Operational productivity: “function of the ratio of operational outputs to inputs over a period of time” (Johnston/Jones, 2004, p. 205)
  - Customer productivity: function of the ratio of customer outputs and value to customer inputs
- Principle of manufacturing productivity cannot transferred to services
- Process of service delivery and customer’s experience overlap due to customer’s role as co-producer of service

![Diagram of Service Productivity Measurement Concepts](image-url)
Service Productivity Measurement Concepts (Cont.)

Inputs:
- Service Provider's Inputs:
  - Personnel
  - Technology
  - Systems
  - Information
  - Time, etc.

- Customer's Inputs:
  - Own participation
  - Participation by fellow customer

Outputs:
- Service Provider producing the service in isolation from Customer (back office)
- Service Provider and Customer producing the service in interaction (service encounter)
- Customer producing the service in isolation from the Service Provider

Service Productivity:
\[ f (\text{Internal Efficiency, External Efficiency, Capacity Efficiency}) \]

Efficiencies:
- Internal Efficiency (Cost Efficiency)
- External Efficiency (Revenue Efficiency)
- Capacity Efficiency (Capacity Utilisation)

Service Marketing:
Grönroos/Ojasalo, 2004
Wrap up:
- Neither of the existing concepts does already fulfil the requirements
- Most promising approach is to enhance Grönroos’ and Ojasalo’s model

Next Steps:
- Revisit “classic” controlling literature on productivity measurement concepts from manufacturing and manufacturing-related services
- Use dynamic modelling to examine the mid- and long-term effects of innovativeness and knowledge-intensity on service productivity
Thank you for your attention

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