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# Interactions between Service and Product Lifecycle Management

by

**Stefan Wiesner, Mike Freitag, Ingo Westphal and Klaus-Dieter Thoben**

Presenting Author: Stefan Wiesner

BIBA – Bremer Institut für Produktion und Logistik GmbH at the University of Bremen

Bremen, Germany

wie@biba.uni-Bremen.de

# Agenda

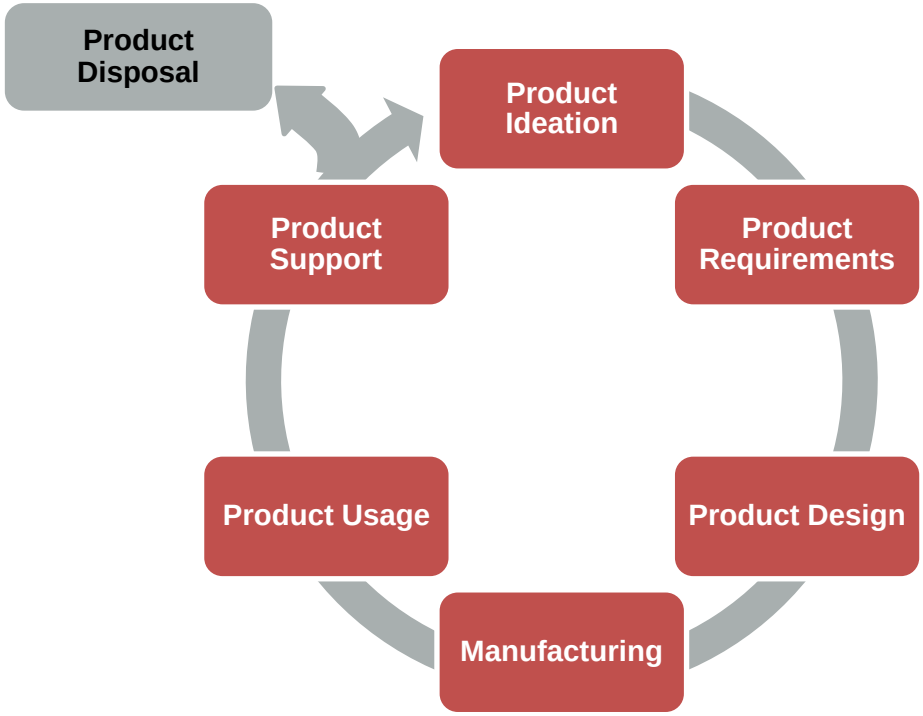
- Introduction
- Product and Service Lifecycle Management
- High-level PLM/SLM interaction patterns
- Interactions on operational level
- Approach for integration of PLM and SLM
- Conclusions and Outlook

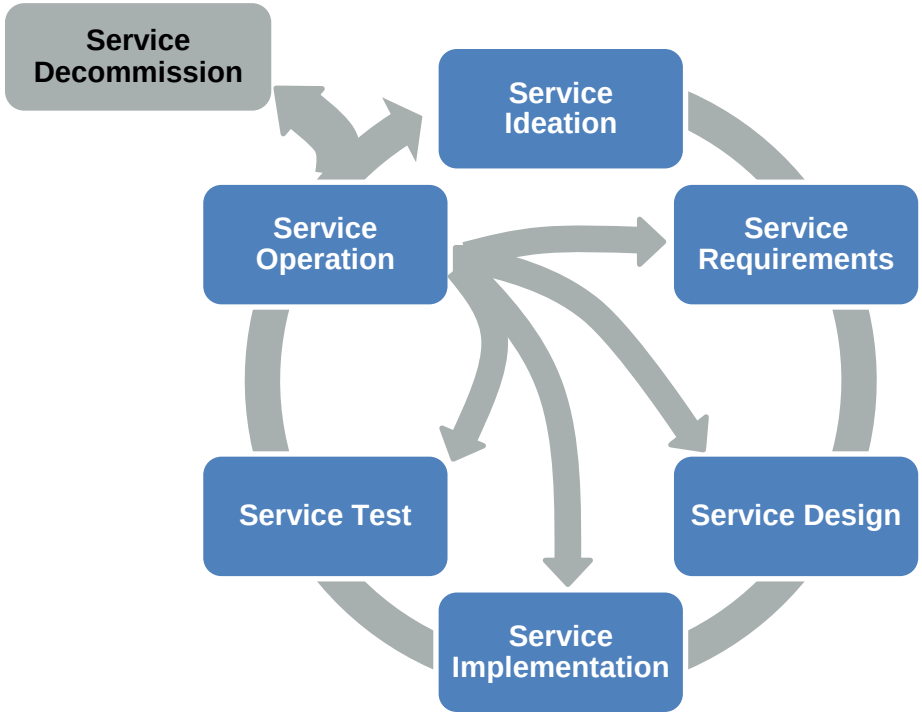
# Introduction

- For PSS, both product and service lifecycle must be managed, interact and exchange information
- When PLM approaches consider services, they are mostly treated as an addition to the product
- Highly integrated PSS require a systematic bi-directional coordination and interaction between the product and service lifecycle
- Feedback loops between PLM and SLM need to be established, in spite of varying time spans

➢ *Interaction mechanisms and patterns are analyzed based on expert interviews and three use cases*

# PLM and SLM

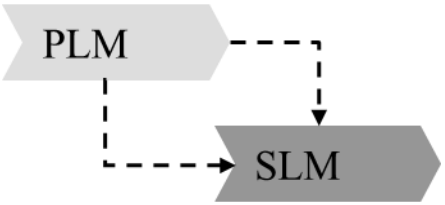



[Stark 2011]
[Freitag et al. 2013]

# Case A: SLM follows PLM

New service development is dependent on product lifecycle

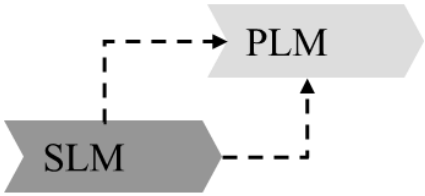



IBARMIA.

- Focus on product innovation and customization
- Intelligent Maintenance is triggered by phases or changes in PLM
- Service ideation and evolution have low relevance

# Case B: PLM follows SLM

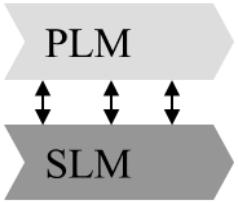
New product development is dependendent on service lifecycle



- Focus on online configuration and sizing of shirts
- Shirt production is triggered by phases or changes in SLM
- Manufacturing is outsourced to third party companies

# Case C: PLM aligned with SLM

New service and new product lifecycles with reciprocal interconnections

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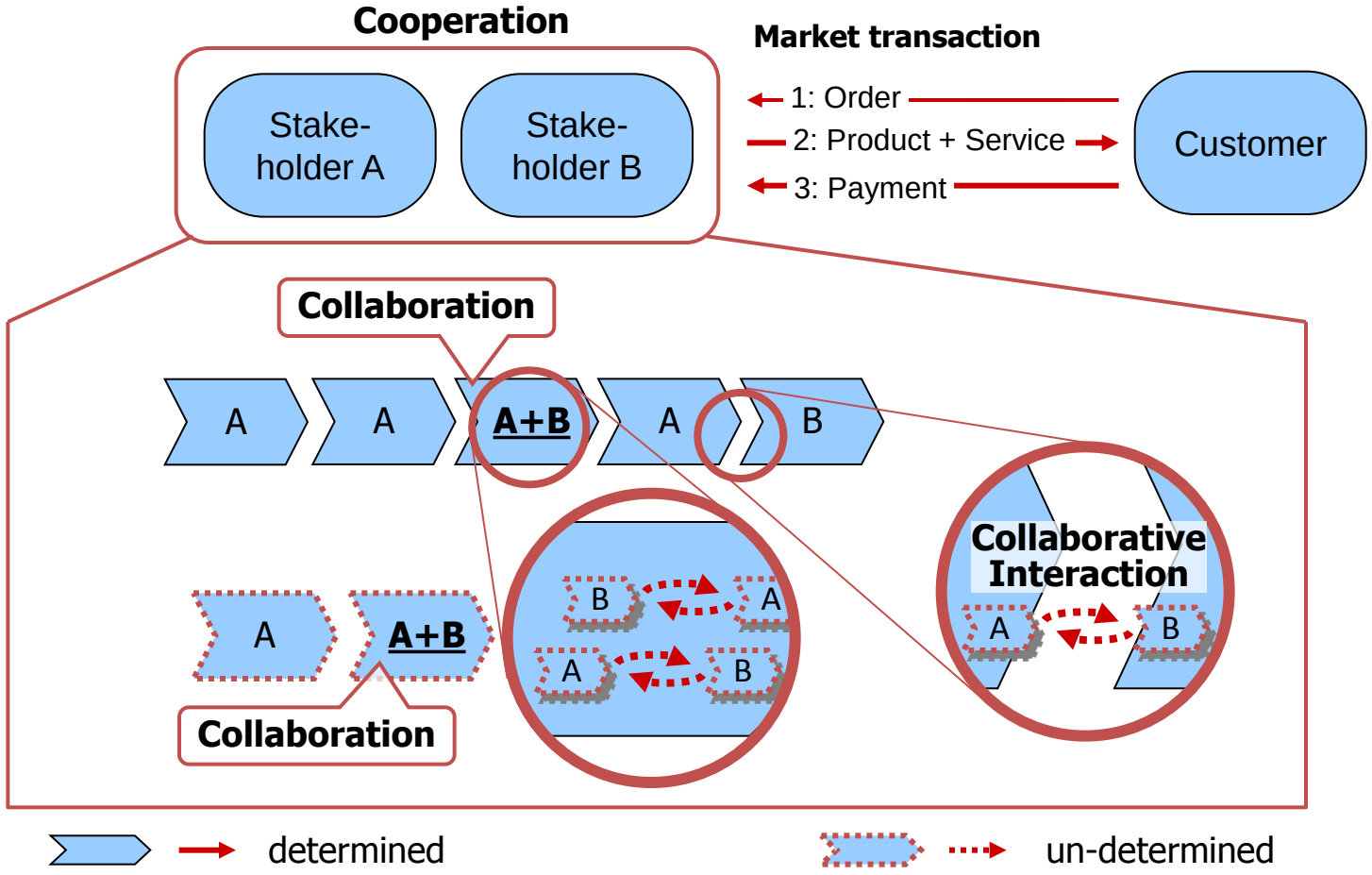
- Carefree Washing PSS
- Product and Service rely on each other
- PLM and SLM are more or less in parallel
- Interactions take place when deemed necessary

# PLM integrated with SLM

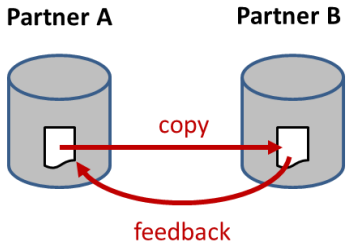
**Alternative D**: Fully integrated new service and product development and lifecycles

PLM & SLM

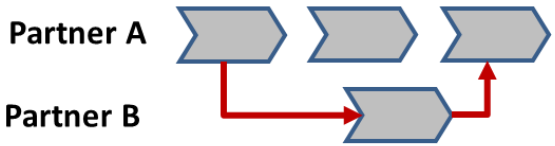


# Types of Interaction

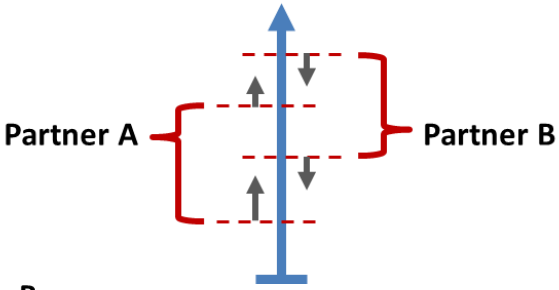
- Information Exchange



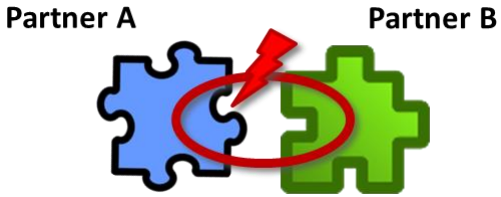

- Coordination



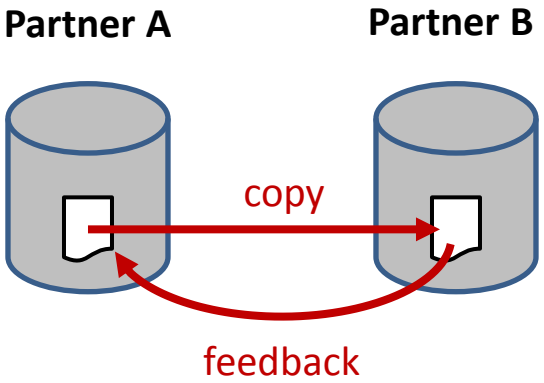

- Negotiation




- Conflict solving



# Information Exchange

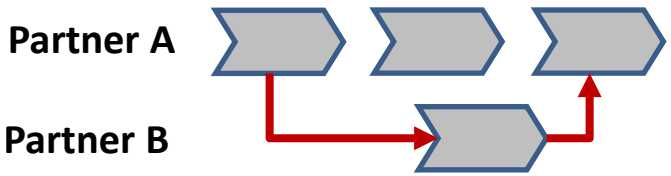



- **Sharing ideas**
- **Stakeholder requirements**
- **Solution specification**
- **Usage data**
- **…**

**This means for PSS:**

- Definition of interfaces and information that has to be exchanged between the stakeholders along the lifecycle
- Participation of stakeholders from the product and service area in the PSS ideation process
- Common requirements elicitation and management for specification product and service components
- Feedback loops from product usage to service design and vice versa

# Coordination

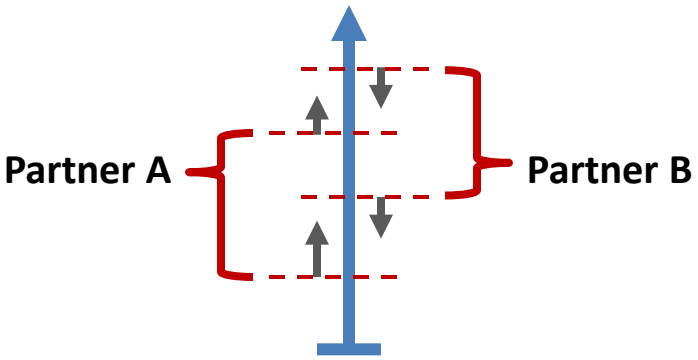



- **Align strategy**
- **Adjust plans**
- **Sychronize activities**
- **…**

**This means for PSS:**

- Coordination is in particular relevant during the development process of the PSS
- A common vision of the PSS has to be established among the stakeholders from the product and service area
- Project management should be implemented across domains and inter-organisational

# Negotiation

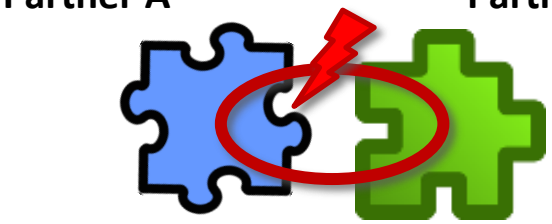



- **Decision making**
- **Agreement on common objectives**
- **…**

**This means for PSS:**

- Trade-off between the optimal solution for the product and the optimal solution for the service
- Example: Frequency of measuring data => service expects higher frequency, machine offers lower frequency.
- Agreement on non-technical issues like profit sharing etc.

# Conflict Solving

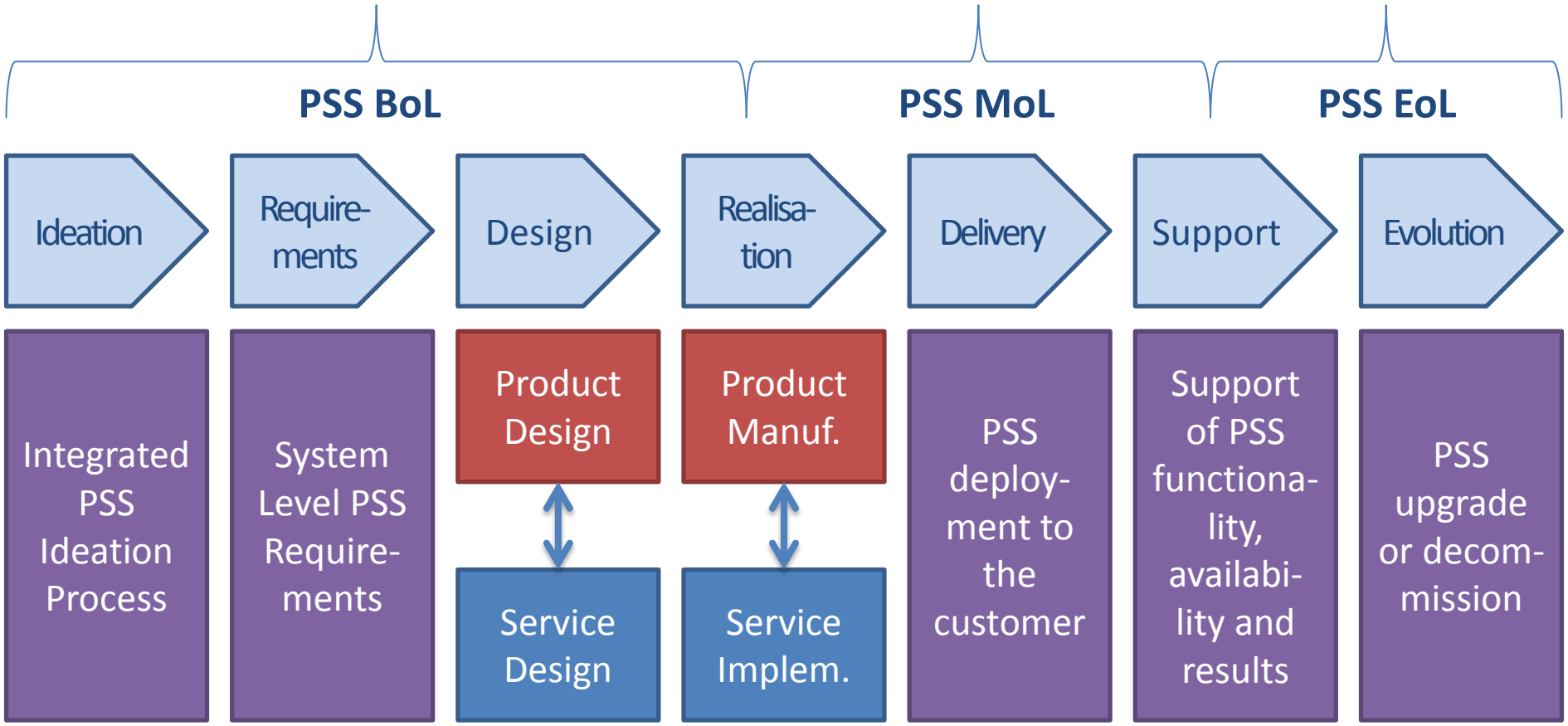



- **Identification of conflicts**
- **Development of solutions**
- **Agreement on standards**
- **…**

**This means for PSS:**

- Strongly connected to negotiation
- Ensure that the service could really work with the product.
- Example: If the service requires a certain data exchange standard, and the product only supports another standard.
- Financial conflicts, competition among stakeholders etc.

# P-SLM Vision


PSS BoL
PSS MoL
PSS EoL
Ideation
Require-ments
Design
Realisa-tion
Delivery
Support
Evolution
Integrated PSS Ideation Process
System Level PSS Require-ments
Product Design
Service Design
Product Manuf.
Service Implem.
PSS deploy-ment to the customer
Support of PSS functiona-lity, availabi-lity and results
PSS upgrade or decom-mission

# Conclusions and Outlook

- PLM/SLM integration is present in different degrees in the analyzed use cases
- Four temporal interaction patterns could be found between PLM and SLM
- Full PLM/SLM integration requires collaborative processes of information exchange, coordination, negotiation and conflict solving

➢ *Further research will describe the P-SLM phases and the underlying collaborative processes in detail*

➢ *Final objective is the development of a symbiotic Product-Service Lifecycle Model*

# Thank you for listening!


**Contact**

Dipl. Wi.-Ing. Stefan Wiesner

**BIBA** - Bremer Institut für Produktion und Logistik GmbH at the University of Bremen

wie@biba.uni-bremen.de



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BIBA - Bremer Institut für Produktion und Logistik GmbH
an der Universität Bremen

Postanschrift: Postfach P.O.B. 33 05 60 · D-28335 Bremen / Germany
Geschäftssitz: Hochschulring 20 · D-28359 Bremen / Germany
USt-ID: DE814890109 · Amtsgericht Bremen HRB 24505 HB
Tel: +49 (0) 421/218-02 · Fax: +49 (0) 421/218-50031
E-Mail: info@biba.uni-bremen.de Internet: www.biba.uni-bremen.de
Geschäftsführer: Prof. Dr.-Ing. K.-D. Thoben

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