FALCON

Feedback mechanisms **A**cross the **L**ifecycle for **C**ustomer-driven **O**ptimization of i**N**novative product-service design

A journey into European factories of the future: The best Horizon 2020 projects are visiting Graz

01.12.16

Karl Hribernik
BIBA – Bremer Institut für Produktion und Logistik GmbH

Horizon 2020
European Union Funding
for Research & Innovation

SFG
Im Auftrag des Wirtschaftslandesrates

styria region unlimited

Agenda

1. FALCON Project Details
2. Consortium
3. Objectives & Approach
4. Business Scenarios
5. Technical Achievements
6. Exploitation and Dissemination Achievements
7. Value to European Business
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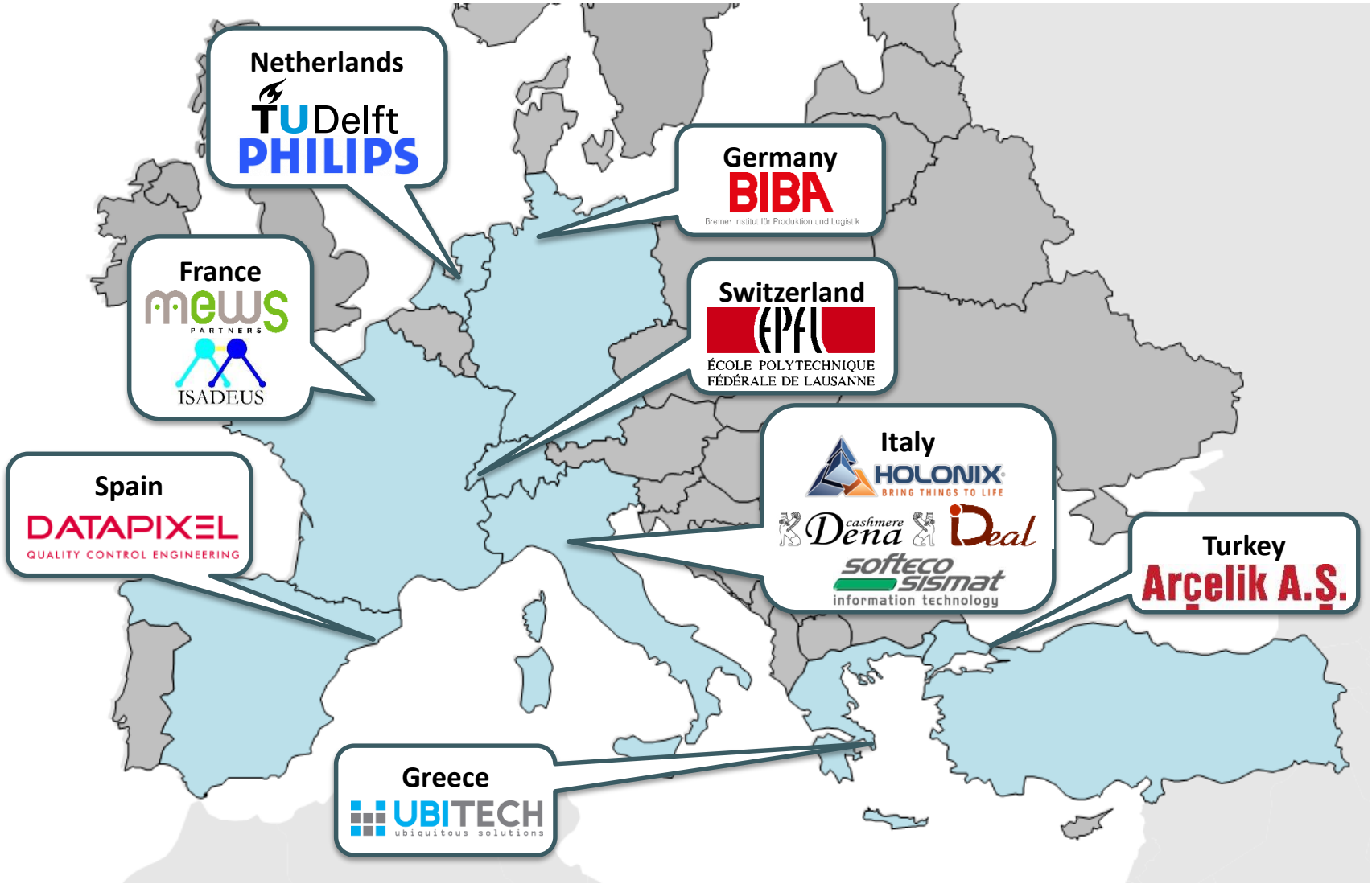
FALCON Project Details

Call:	FoF-05-2014 Innovative product-service design using manufacturing intelligence
Type:	RIA
Project volume:	€ 5 098 268.25
Max Grant:	€ 4 594 975.00 (exl. Switzerland)
Start:	01.01.2015
Duration:	36 months
Coordinator:	BIBA – Bremer Institut für Produktion und Logistik GmbH

Consortium


Netherlands
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information technology
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DATAPIXEL
QUALITY CONTROL ENGINEERING
Turkey
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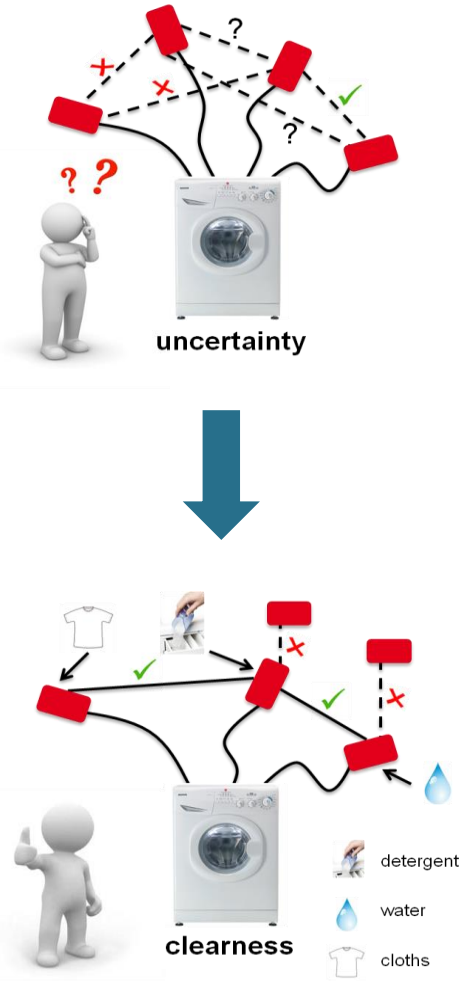
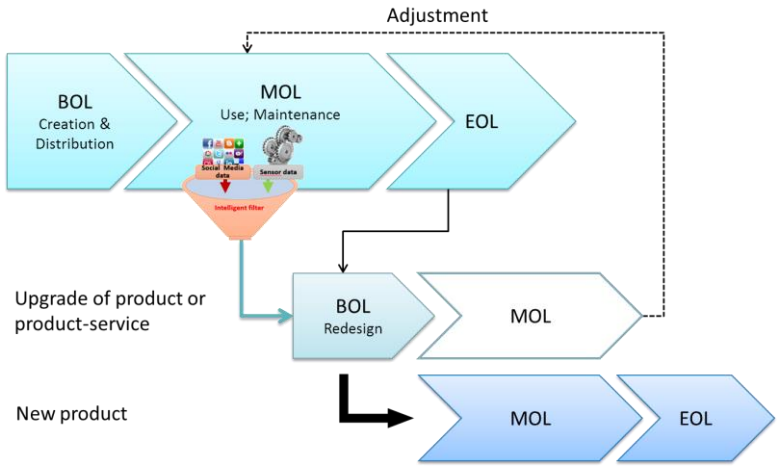
Objectives

- **Objective #1**
  To address product-service information collection through Collaborative Intelligence and Product Embedded Information Devices.
- **Objective #2**
  To enable product-service knowledge representation, exploitation, openness and diffusion.
- **Objective #3**
  To strengthen collaboration and new product-service development through new feedback and feed forward mechanisms.
- **Objective #4**
  To support innovative product-services design using manufacturing intelligence.
- **Objective #5**
  To improve product-service lifecycle assessment approaches.

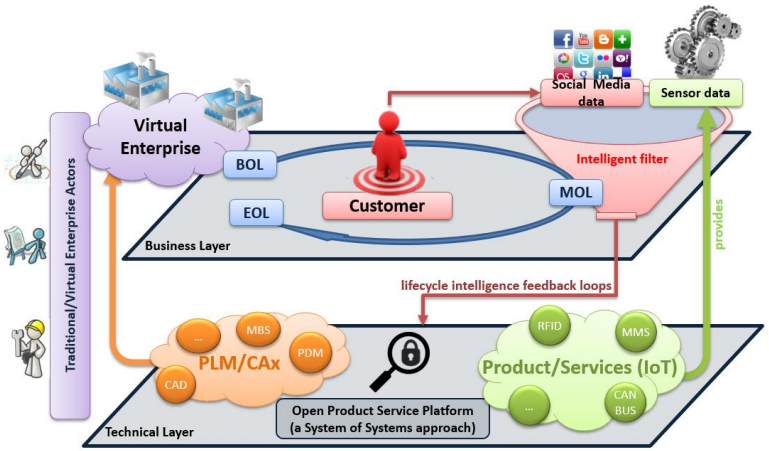


The FALCON Approach

- FALCON's mission is to investigate how and which sources of PUI (Product Usage Information) can be used to (re-)design or improve PSSs (Product Service Systems)
- Sources of PUI are CPS/IoT, social media and equivalents
- The project is developing the FALCON Virtual Open Platform (VOP) for collaborative PSS (re-)design, improvement, manufacturing and lifecycle management
- The FALCON VOP facilitates the use of PUI in design, simulation, forecasting, LCA and other applications
- It leverages semantic representation, natural language processing, sentiment analysis and knowledge-based engineering to support these activities



PUI loops investigated in FALCON



The overall FALCON approach

B2C Business Scenarios

Arçelik A.Ş.

White and Brown Goods

- Capture and analyze real PUI (e.g. washing behavior, television app use)
- Improve product-service quality by enhancing planning, development and testing processes with PUI
- Integration of IOT and social media PUI sources to create valuable information to improve customer offers

cashmere Dena

Clothing Textiles

- Improve feedback collection from customers from the usage phase including new collection proposals
- Improve exchange of information from social networks, marketplaces and our e-commerce site about trends and preferences (colours, fittings, etc.)
- Visualise, forecast and simulate trend developments

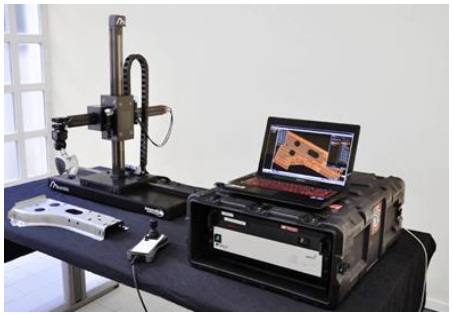
B2B Business Scenarios

PHILIPS

Healthcare Products

- Increase technical reliability of the devices,
- Enable comprehensive diagnostics, and
- Enable user-friendly devices and services

DATAPIXEL
QUALITY CONTROL ENGINEERING

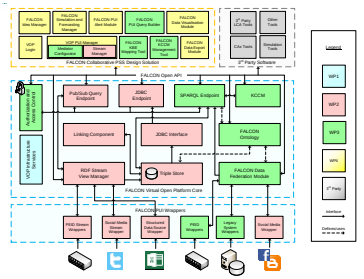


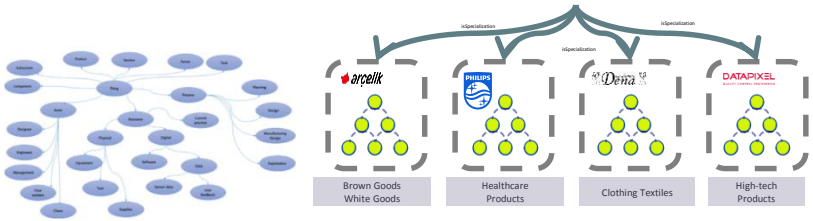
High-tech Products

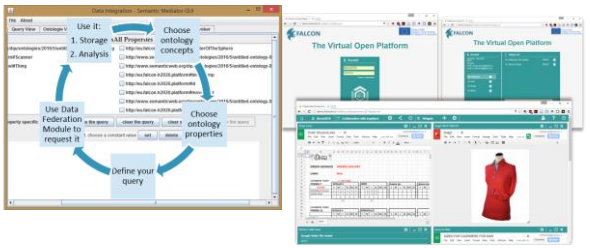
- Identify potential demands for equipment (customisation)
- Increase the competitiveness of metrology solutions, improving their functionalities and ease of use
- Improve and servitise calibration, maintenance & verification processes and enhance machine programming & report content definition

Technical Achievements

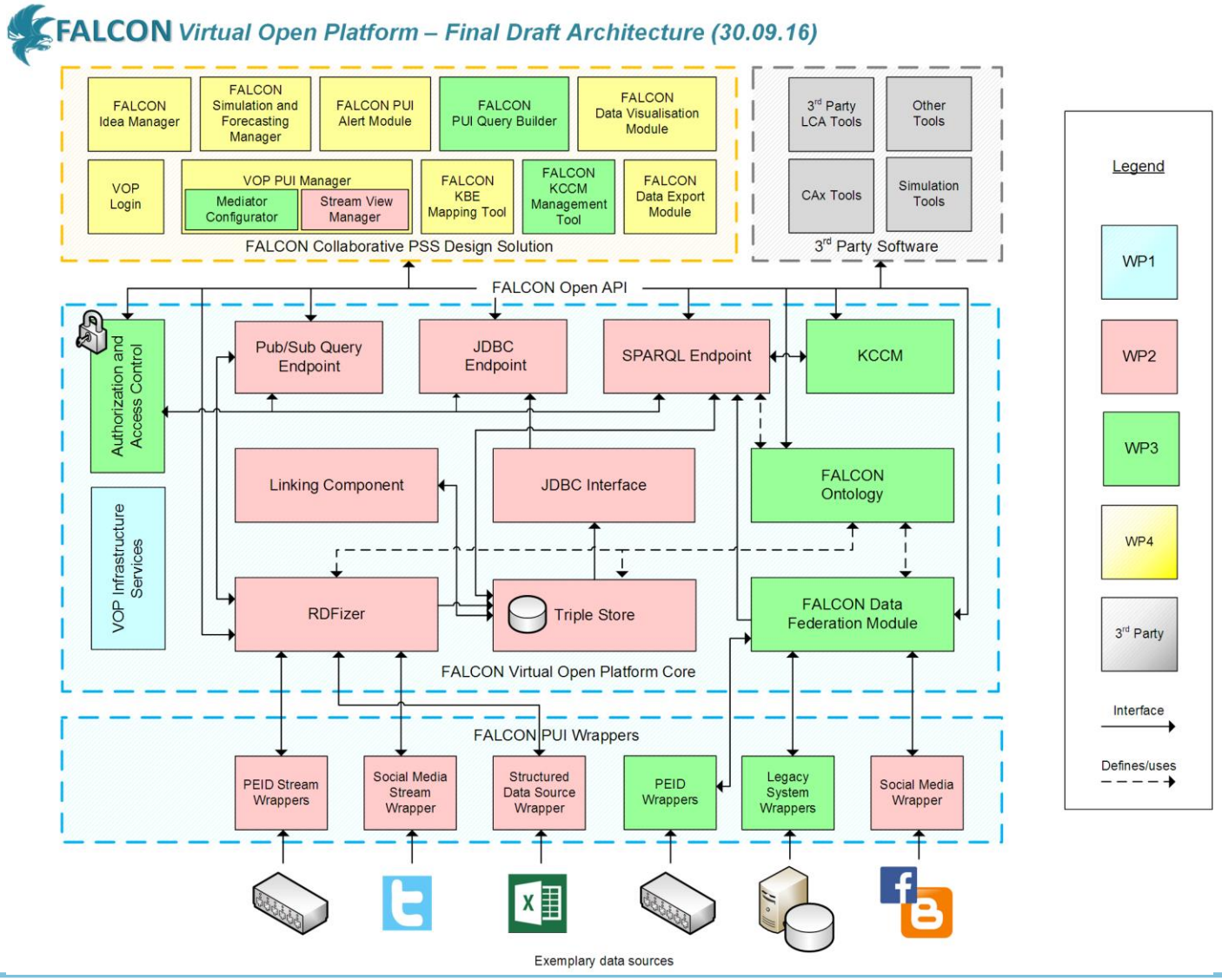
- **FALCON Virtual Open Platform**
  - Open system architecture defined
  - Modular, extensible and scalable
  - Based on semantic technologies
- **FALCON Ontology**
  - Initial definition of upper ontology covering PSS knowledge domain
  - Initial definitions of domain-specific ontologies for FALCON business scenarios
- **GUI Mockups & Business Stories**
  - Development of detailed business stories for each end-user
  - GUI Mockups facilitate understanding of functionality and improve requirements analysis
- **Software prototypes of Functional Modules**
  - E.g. data federation module for knowledge acquisition from static PUI sources (PEIDs, social media, etc.)







Technical Achievements
FALCON VOP Architecture



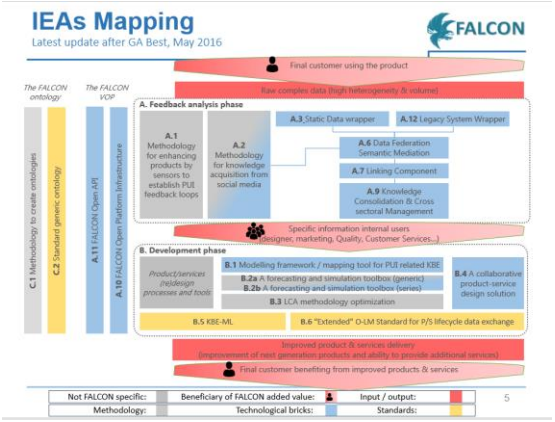
Exploitation Overview

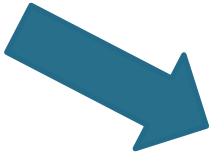
- Exploitation activities commenced at the start of the project
- Our approach is driven by value creation, and follows 8 steps:

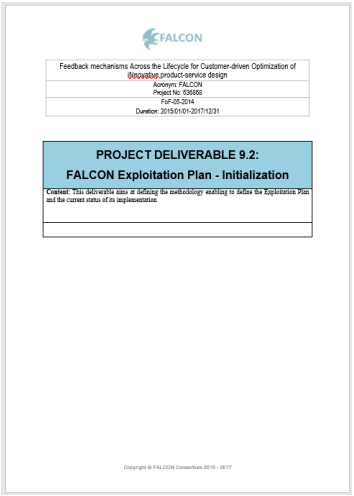
Define the **Value Proposition** of FALCON	1 Define how FALCON should create value (principles)	✓
	2 Identify the "bricks" that actually may create value : the IEA (Innovative Exploitable Assets)	✓
	3 Link each IEA to the application business cases and further potential industries	→
Start the **evaluation** of the Value Proposition	4 Assess the innovation potential of each IEA (market and competition analysis)	→
	5 Formulate and precise the assumptions of value creation	→
Validate the Value Proposition and propose recommendations	6 Define a plan to validate the previous assumptions	
	7 Implement the plan to confirm or change the assumptions, then update and refine the value creation map	
	8 Define an Exploitation Roadmap and recommendations to maximize impact	

Exploitation Activities - IEAs and K-Briefs

18 IEAs identified and prioritized

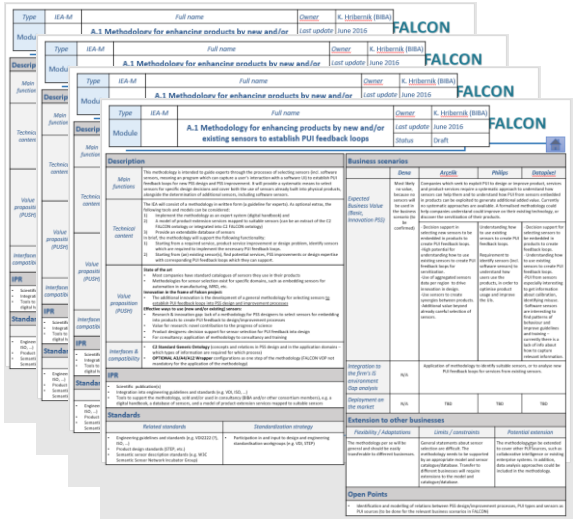


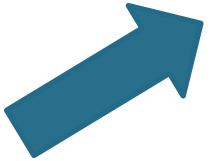




18 K-Briefs

- Description
- IPR strategy
- Standardization
- Business expectations
- Initialization of a market analysis

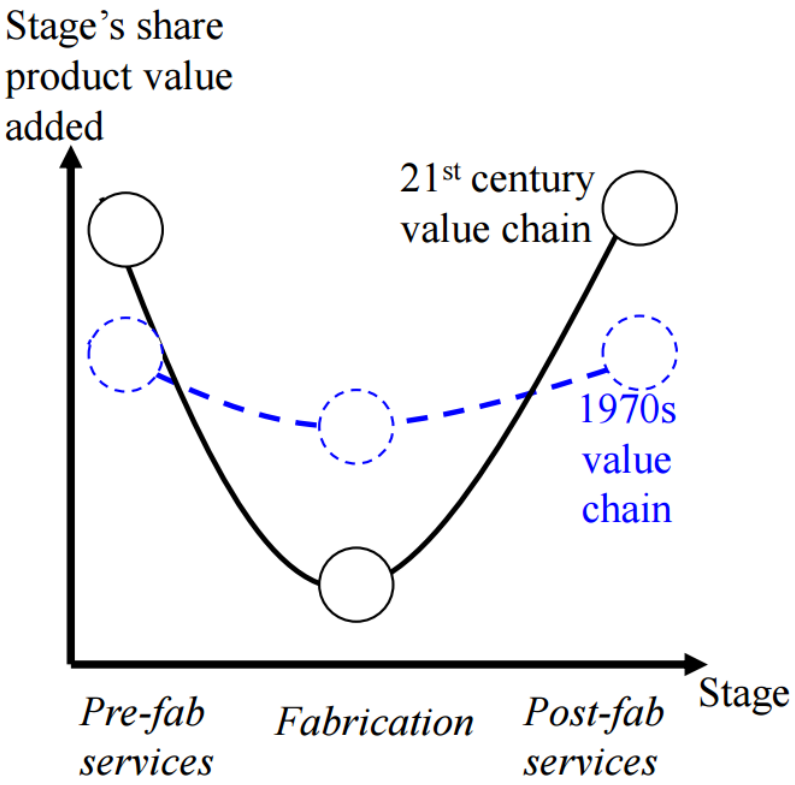




One initialized exploitation plan

Positive Effects of FALCON on European Manufacturing Industry

- Manufacturing is no longer most significant factor in adding value
- Strengthening the edges of the smile curve helps increase European manufacturing industry´s global competitiveness
- FALCON provides tools to support pre-fab (design, development, engineering) and post-fab (product extension) services
- The FALCON VOP provides powerful tools to visualise, analyse and apply PUI from multiple sources
- The FALCON VOP helps companies systematically leverage PUI to improve their service offers, with easy integration into existing design and development tools



Source: Baldwin, Ito & Sato, 2014: The smile curve: Evolving sources of value added in manufacturing

Lessons Learned

- Systematic exploitation activities from month 1 help converge end users, academia and solution provides to create value
- Methodological business story development combined with early system component mock-ups help fast-track requirements analysis and system development based on real industry needs
- Agile software development facilitates fast cycles of feedback from end-users, allowing solution providers to better meet industry needs
- Cooperation with similar projects in the FoF-5 cluster (http://www.fof-pss-cluster.eu/) helps focus FALCON research and achieve synergies

The FALCON consortium at the project kick-off meeting

Thank you for your attention!

Karl Hribernik
FALCON Technical Coordinator,
Department Manager
Intelligent ICT for co-operative production

BIBA - Bremer Institut für Produktion und Logistik GmbH
Hochschulring 20
28239 Bremen
Germany

hri@biba.uni-bremen.de
Tel.: +49 (0)421 218-50108
Fax: +49 (0)421 218-50007

FALCON Project Office
c/o Indah Lengkong
FALCON Project Manager

BIBA – Bremer Institut für Produktion und Logistik GmbH
Hochschulring 20
28359 Bremen
Germany

len@biba.uni-bremen.de
Tel.: +49 421 218 50189
Fax: +49 421 218 50007

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- Objective: Innovative product-service design using manufacturing intelligence
- Theme: FoF-05-2014
- Call: Factories of the Future
- Lead: BIBA – Bremer Institut für Produktion und Logistik GmbH
- Duration: 36 Months
- Start: 2015/01