

INDUSTRY 4.0 & ITS IMPACT ON COMPETENCES IN PROCUREMENT 2022

Prof. Dr. Michael Henke | Fraunhofer Institute for Material Flow & Logistics and
LFO at TU Dortmund | Helsinki, 28.09.2018



Agenda



1. Fraunhofer IML and LFO at TU Dortmund
2. Management of Industry 4.0
3. Digitalization and Procurement 4.0
4. Future Competence Requirements

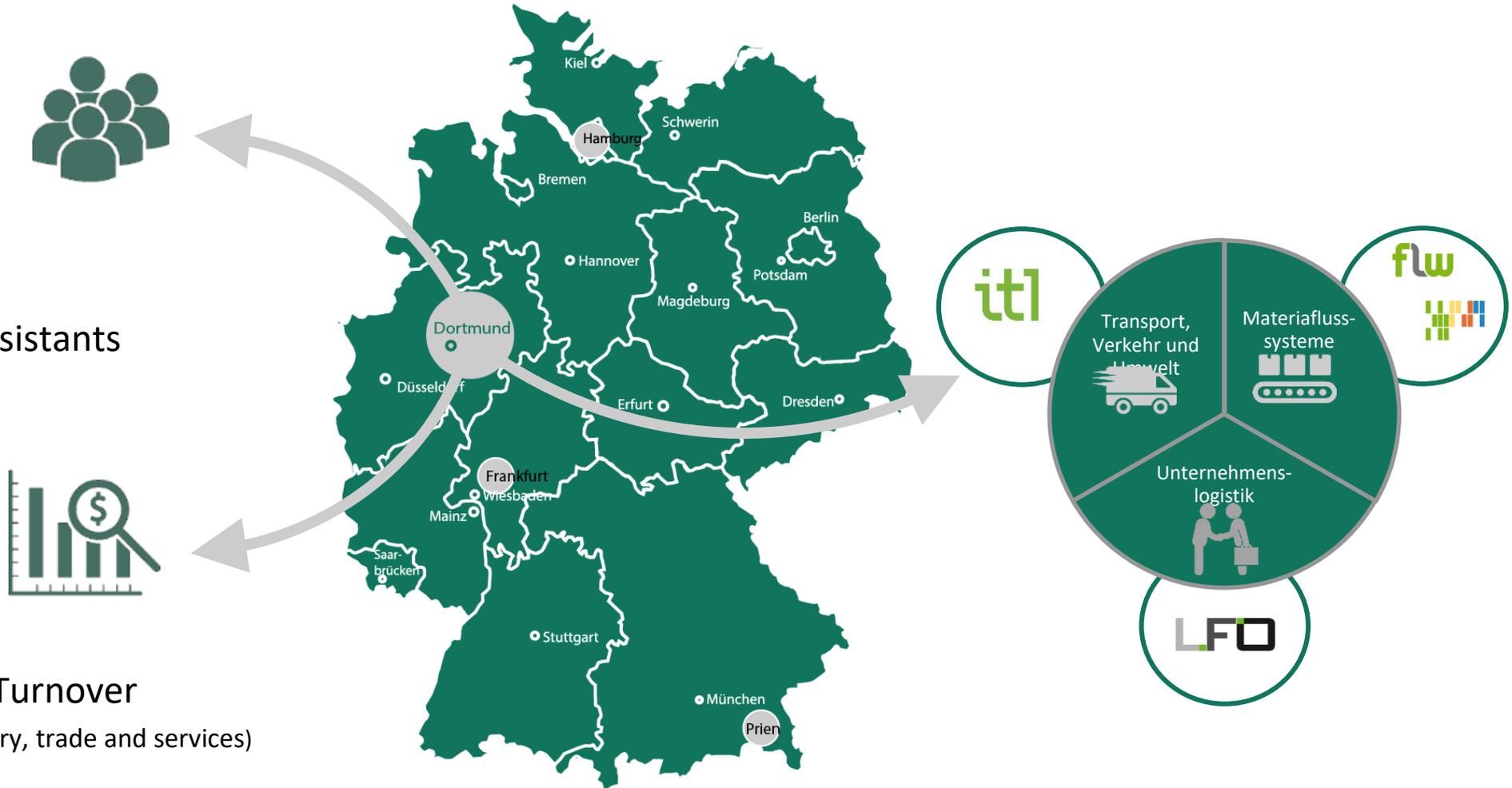
Fraunhofer Institute for Material Flow and Logistics as well as Chair of Enterprise Logistics at TU Dortmund University of Technology

280 Scientists

250 Student assistants

30 Mio. € Turnover

(45% thereof from industry, trade and services)



100% LOGISTICS



Prof. Dr. Michael Henke

100% Management

Processes | Organization

Prof. Dr. Dr. h. c. Michael ten Hompel

100% Technologie

Hardware | Software

Prof. Dr. Uwe Clausen

100% Mobility

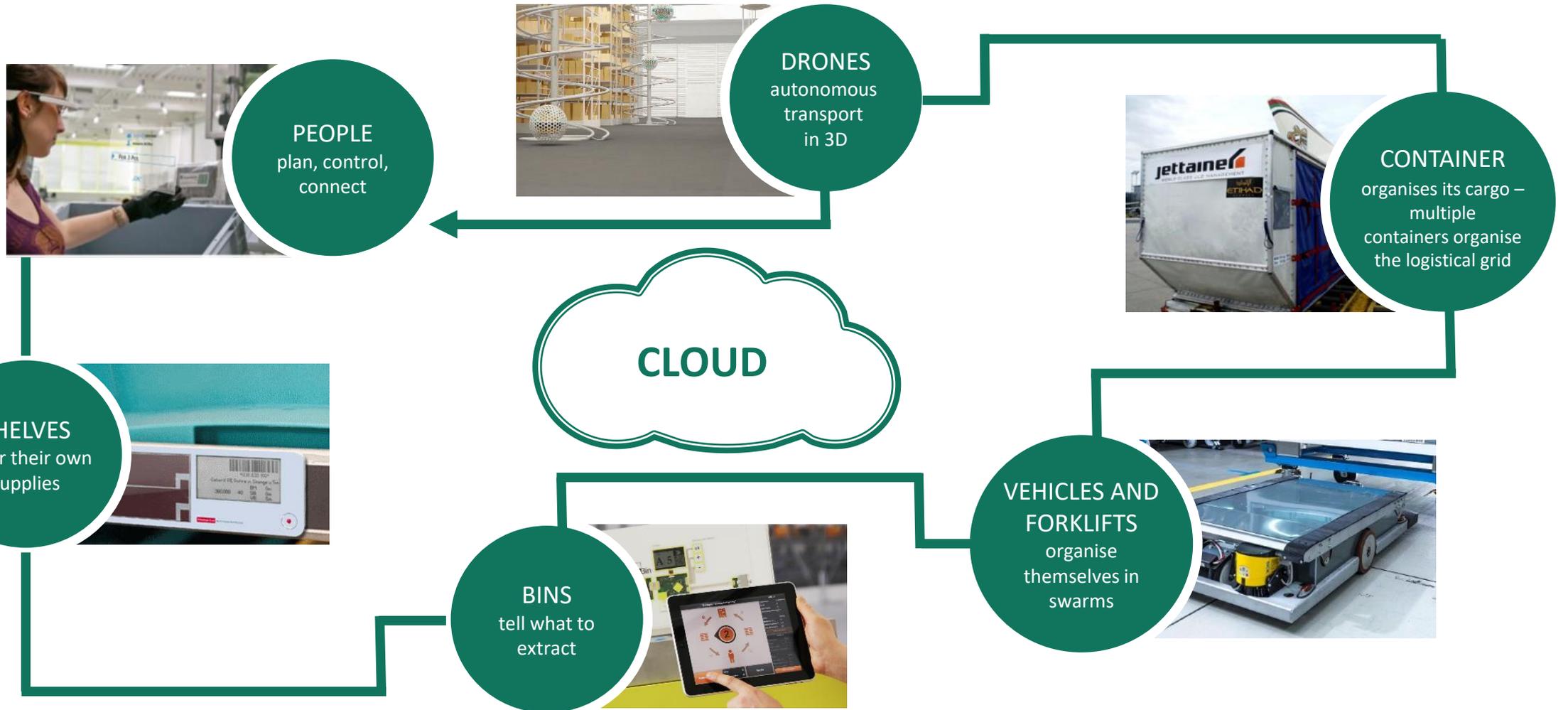
People | Goods

Agenda

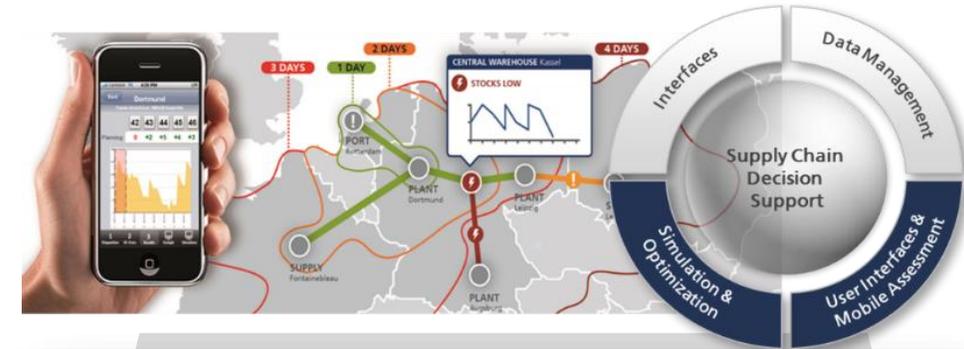
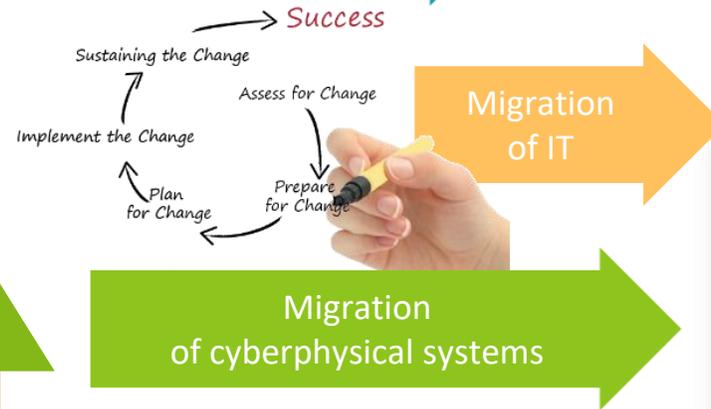
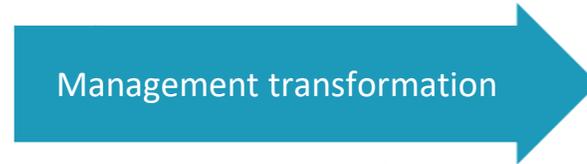
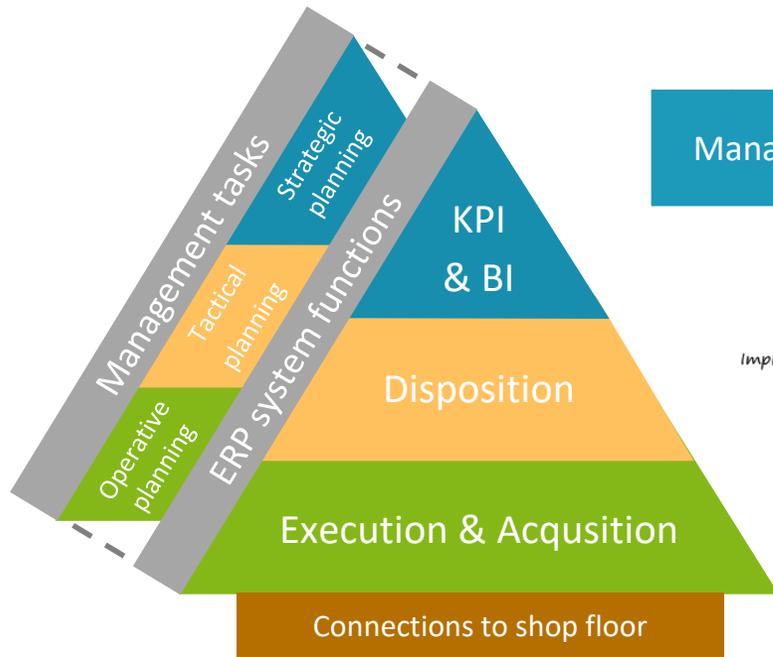


1. Fraunhofer IML and LFO at TU Dortmund
2. Management of Industry 4.0
3. Digitalization and Procurement 4.0
4. Future Competence Requirements

Industry 4.0 • Internet of Things and Services



Acceleration Factors: Transformation, Migration and Change



- Classical automation pyramid
- Hierarchically organized
- Deterministic
- System modification by customizing
- Application-specific solutions

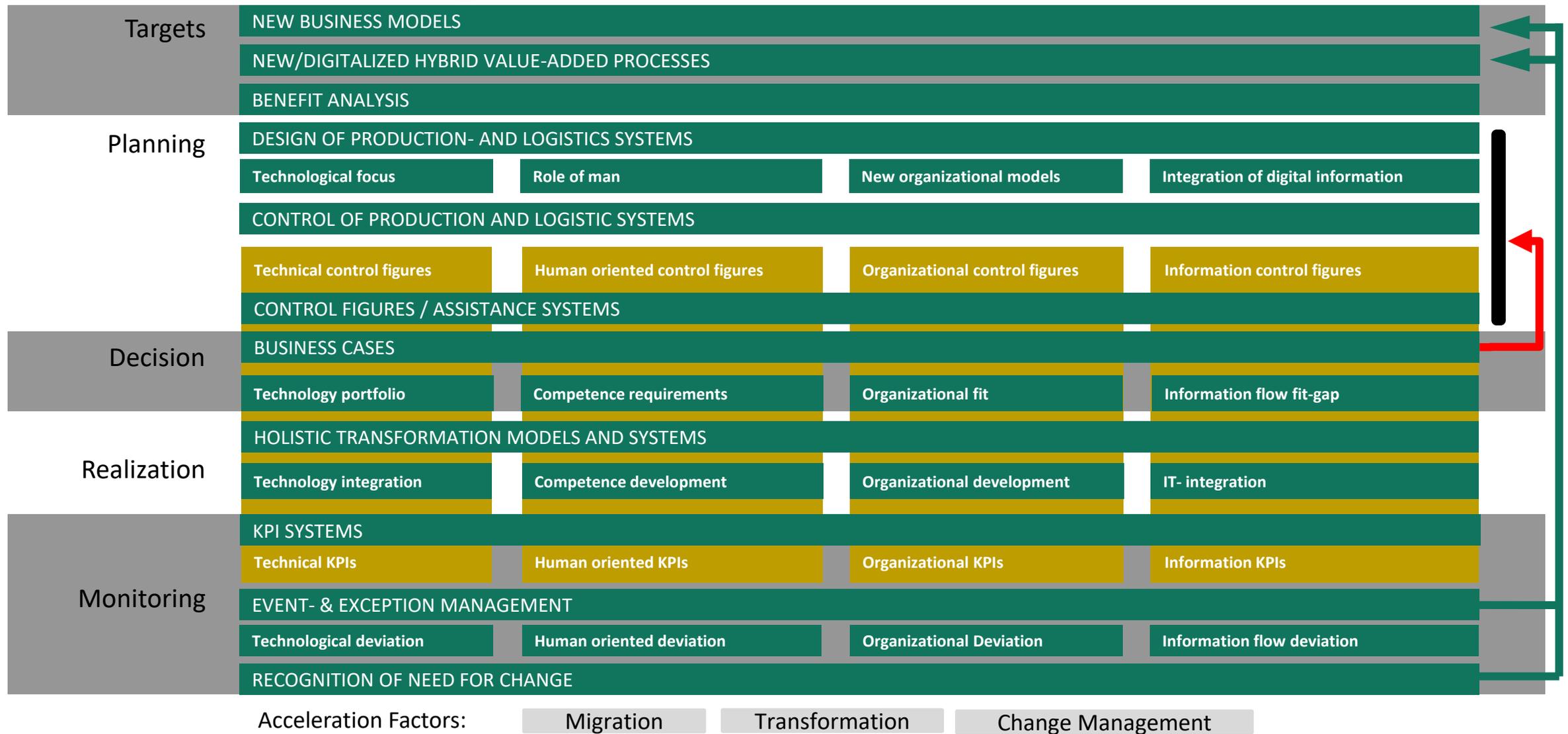
- Flexible and changeable
- Not deterministic
- Extremely decentralized
- Multi-agent-control
- Cloud-based
- Situation specific solutions

Need for a Holistic Management Model

100%
MANAGEMENT

»The success of Industry 4.0 and Digitalization depends on its Management« (Henke 2016)

The Dortmund Management Model



Management Implications: Operationalization of the Model – 10 Theses (Henke 2016)

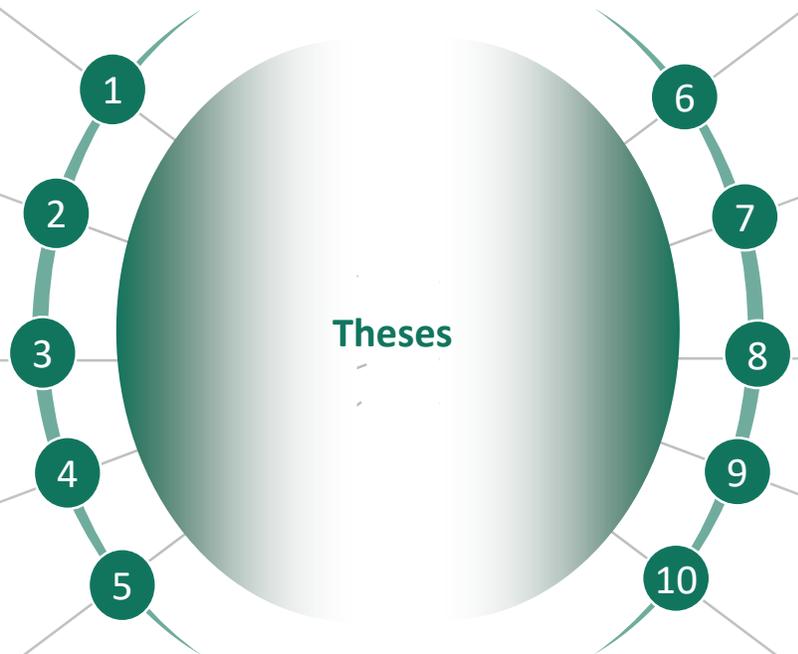
Without Management 4.0, Industrie 4.0 will not work!

A Business won't be Industry 4.0 at one blow

Also employees will not be 4.0-suitable by pressing a button!

The business culture is no quantité négligeable!

Get rid of traditional organisational structure!



Fail fast: Make mistakes!

We need disruptive business models

No more compliance-arias!

Just do it!

We need Business Studies 4.0!

Agenda



1. Fraunhofer IML and LFO at TU Dortmund
2. Management of Industry 4.0
3. Digitalization and Procurement 4.0
4. Future Competences Requirements

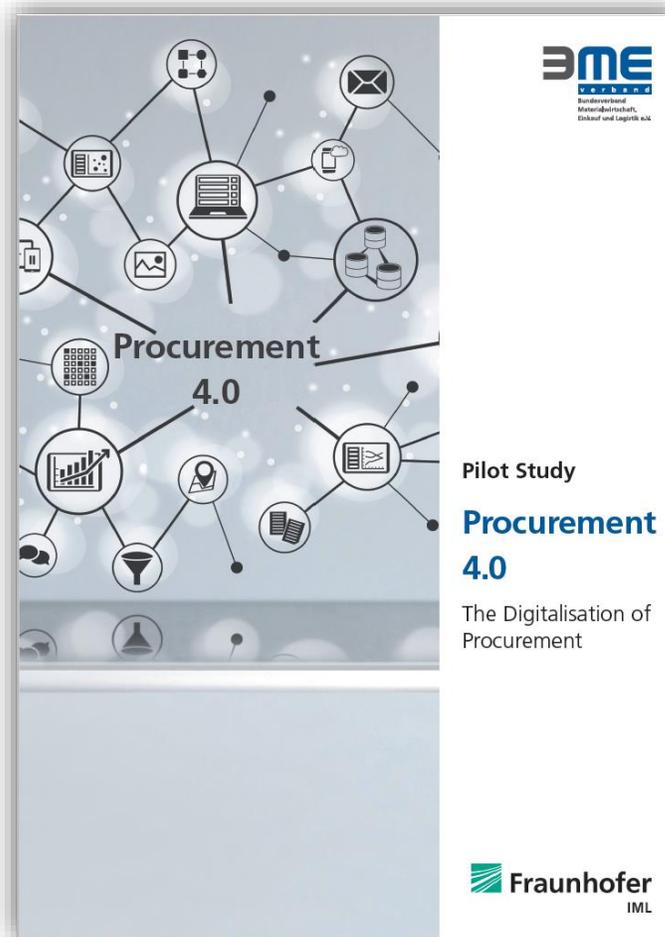
Pilot Study “The Digitalization of Procurement – Procurement 4.0”

Initial Theories

- Digitalization will offer the **unique opportunity** for procurement to meet the demand that it plays a strategic role.
- Procurement plays a decisive role in bringing **innovations** into a company.

Objectives of the Pilot Study

- Analysis of **the current value** of Industry 4.0 from the viewpoint of procurement.
- Identification of **challenges and objectives**.
- Derivation of **fields of action**.



12 Theses of the Pilot Study Procurement 4.0 (1/3)

1

Procurement is shrinking and operative procurement is becoming autonomous in most areas.



2

The demands placed on and expectations of strategic procurement are growing and the demand for a higher value contribution is therefore increasing.



3

In the future, procurement will take on a completely different form and traditional purchasers will be a thing of the past.



4

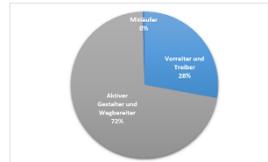
Personal relationships will also continue to be extremely important in Procurement 4.0.



12 Theses of the Pilot Study Procurement 4.0 (2/3)

5

Procurement is not fully responsible for the implementation of Industry 4.0 but it does play an essential role.



6

The changes taking place relate to all relevant procurement dimensions.



7

Creating transparency is the most important requirement in order to be able to implement Industry 4.0.



8

Big data and data processing technologies are key technologies involved in digitalization.



12 Theses of the Pilot Study Procurement 4.0 (3/3)

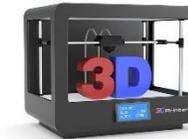
9

Procurement needs to adapt its own structures and processes to suit digitalization.



10

Procurement needs to manage a procurement portfolio that has been partially modified and is becoming increasingly digitalized.



11

Vertical and horizontal networking facilitates the transformation from a functional perspective to a process-based Perspective.



12

Procurement is a driving force behind horizontal networking.



What Does Digitalization and Industry 4.0 Mean for Procurement? – some Research Questions



How can procurement prove **its relevance for the company** in the course of digitalization?



How can procurement influence the emergence of **new business models**?



What measures are necessary to achieve maximum horizontal and vertical **networking**?



How can the transformation of previous tasks towards a completely **new assignment profile** succeed?

Procurement 4.0



How can an **innovative purchasing portfolio** be implemented alongside **hybrid services**?



What are the requirements for **automized/autonomous** procurement decisions, negotiations and payment processes?



How can purchasers be **trained (selected?)** towards the new requirements?



Which **technologies and systems** allow an increase of efficiency of procurement?



Which new **key figures** do we need for Procurement 4.0?

Current Digitalization Projects in Procurement

Tool Management



Blockchain-based tool database for the worldwide management and disposition of tools in real-time

Innovation Sourcing



Identification of innovations at existing and new suppliers and development of KPIs to measure value contribution through innovations

Bill of Material



Risk minimization through complete product traceability by using a tamper-proof Material-Blockchain

Supplier Integration



Blockchain-based order processing of services for SMEs in technical trade

Demand- & Capacity-Planning



Smart Analytics tool for predicting market and price developments and assessing supply risks

People Management



Creating transparency and generating knowledge: Education and training programs Procurement 4.0

How will Procurement Job Profiles Change?



DATA ANALYST

Procurement needs to be characterised by speed and agility in the future.

➔ Smart Analytics enable procurement.



INNOVATION CATALYST

Procurement is jointly responsible for the competitiveness of the company.

➔ Procurement needs to supply the right innovations, with the right quality, at the right time for the right price.



NETWORKER

Procurement is the first to benefit from a high degree of networking.

➔ Procurement needs to push networking vertically/ horizontally by exemplifying the exchange between human-machine/system-process.

Agenda



1. Fraunhofer IML and LFO at TU Dortmund
2. Management of Industry 4.0
3. Digitalization and Procurement 4.0
4. Future Competence Requirements

Project PERFECT

Overview



Purchasing Education and Research
for European Competence Transfer

www.project-perfect.eu



Disclaimer
The creation of these resources has been (partially) funded by the ERASMUS+ grant program of the European Union under grant no. 2015-1-DE01-KA203-002174. Neither the European Commission nor the project's national funding agency DAAD are responsible for the content or liable for any losses or damage resulting of the use of these resources.

tu technische universität
dortmund

 **HOCHSCHULE MAINZ**
UNIVERSITY OF
APPLIED SCIENCES

 **Lappeenranta**
University of Technology

**UNIVERSITY
OF TWENTE.**

 **STAFFORDSHIRE
UNIVERSITY**

PERFECT – Purchasing Education and Research for European Competence Transfer

Project Lead

Univ. Prof. Dr. habil. Michael Henke, TU Dortmund

Project Term

01-09-2015 to 31-08-2018

Project Objectives/Milestones

- PSM* Skills Concept
- Company Case Interviews
- Survey
- Harmonized European purchasing curriculum
- Skills self-assessment tool
- Massive Open Online Course (MOOC)

*PSM = Purchasing and Supply Management

Project PERFECT

Research Design – 6 linked Intellectual Outputs



PERFECT

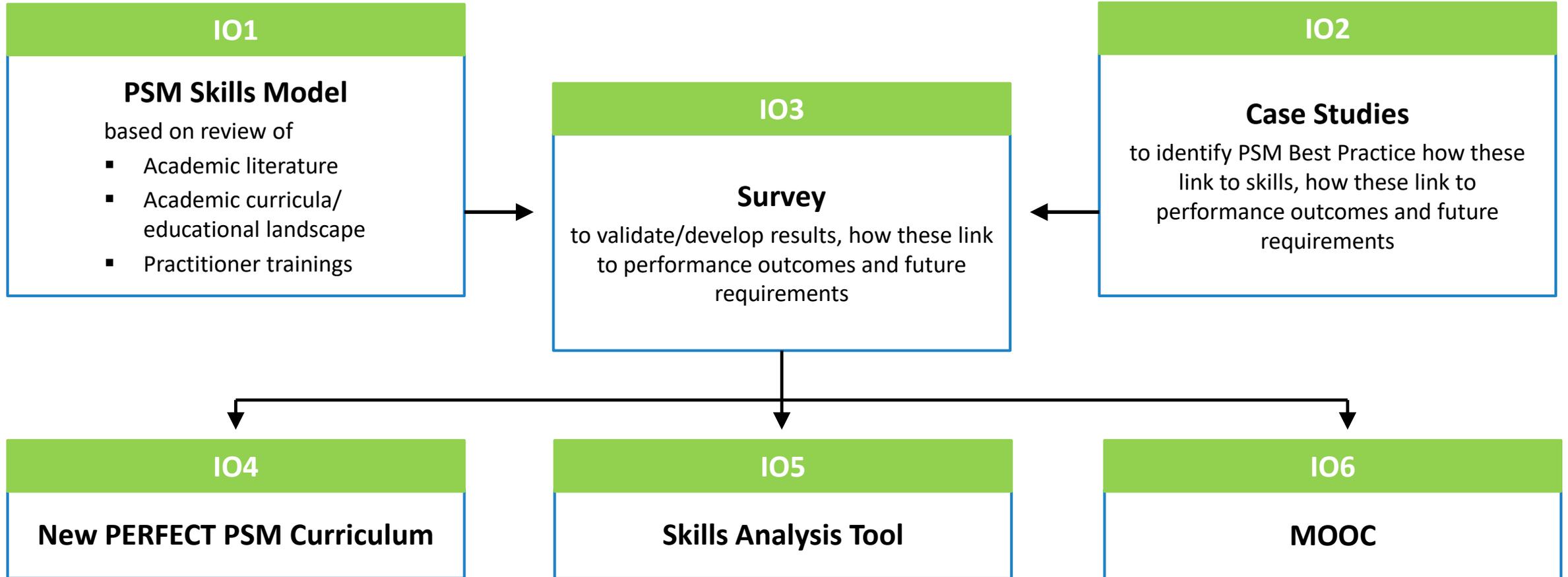
Purchasing Education and Research
for European Competence Transfer

www.project-perfect.eu



Erasmus+

Disclaimer
The creation of these resources has been (partially) funded by the ERASMUS+ grant program of the European Union under grant no. 2015-1-DE01-KA203-002174. Neither the European Commission nor the project's national funding agency DAAD are responsible for the content or liable for any losses or damage resulting of the use of these resources.



Future Competences

from Case Company Interviews, Project PERFECT (1/2)

Future competences and trends (PERFECT case company interviews in line with other studies):



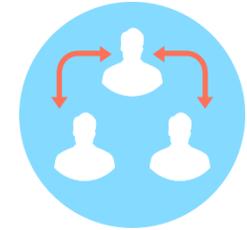
Increase in **automation** and related **outsourcing** will deeply impact PSM organisations



PSM staff need to **understand new technologies** & integrate them into practice



PSM to focus on **analysis** and **cross-functional** work to improve decision models



Collaborative optimisation & building **supplier relationships** focusing on value generation rather than on cost minimisation



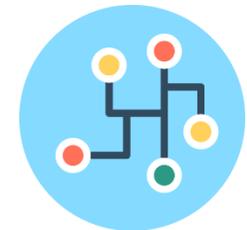
Drive **innovation** with suppliers



Increased importance of the ability to mitigate **risks** and manage **supplier contracts**



Finance and **controlling** competences



Need for **creativity, adaptability** & **flexibility**

n= 43 Case Studies



PERFECT

Purchasing Education and Research
for European Competence Transfer

www.project-perfect.eu



Erasmus+

Disclaimer
The creation of these resources has been (partially) funded by the ERASMUS+ grant program of the European Union under grant no. 2015-1-DE01-KA203-002174. Neither the European Commission nor the project's national funding agency DAAD are responsible for the content or liable for any losses or damage resulting of the use of these resources.

Future Competences

from Case Company Interviews, Project PERFECT (2/2)



PERFECT

Purchasing Education and Research
for European Competence Transfer

www.project-perfect.eu



Disclaimer
The creation of these resources has been (partially) funded by the ERASMUS+ grant program of the European Union under grant no. 2015-1-DE01-KA203-002174. Neither the European Commission nor the project's national funding agency DAAD are responsible for the content or liable for any losses or damage resulting of the use of these resources.

Competences to become **more important in the future** than today:

Some additional areas to current requirements

- "eProcurement technology", "Big Data Analytics", "Computer literacy", "Analytical skills" → technology focused
- Sustainability
- Holistic and strategic thinking



How to Train and Educate PSM Personnel?

from Case Company Interviews, Project PERFECT



PERFECT

Purchasing Education and Research
for European Competence Transfer

www.project-perfect.eu



Erasmus+

Disclaimer
The creation of these resources has been (partially) funded by the ERASMUS+ grant program of the European Union under grant no. 2015-1-DE01-KA203-002174. Neither the European Commission nor the project's national funding agency DAAD are responsible for the content or liable for any losses or damage resulting of the use of these resources.

Pro-active development and re-education:

DIFFERENT

teaching styles

MENTORING

and buddying to share tacit knowledge
and experience effectively

CONTENT

needs to be updated

DIGITALIZATION

urgent need to evaluate these
new requirements

TRAINING

on interpersonal communication that cover
the role of PSM being a
networker/interface to internal and
external customers, suppliers and other key
stakeholders

SUSTAINABILITY

informal training methods
such as case studies, dealing
with dilemma situations,
project assignments

Results of the European Purchasing Skills Survey 2017



PERFECT

Purchasing Education and Research
for European Competence Transfer

www.project-perfect.eu



Erasmus+

Disclaimer
The creation of these resources has been (partially) funded by the ERASMUS+ grant program of the European Union under grant no. 2015-1-DE01-KA203-002174. Neither the European Commission nor the project's national funding agency DAAD are responsible for the content or liable for any losses or damage resulting of the use of these resources.

N= >500, What are you good at? What is the focus of your success?

	Skills that lead to purchasing success	Delivery	Sustainability	Supply Satisfaction	Longterm competition	Quality	Costs	Innovation	#
1	Technical knowledge of products and production systems	X			X	X	X	X	5
2	Cross-cultural Awareness Skills - The ability to become aware of cultural values		X			X		X	3
	Global Sourcing / Supplier Acquisition	X			X	X			3
	Innovation Implementation - Implementing suppliers innovations		X			X		X	3
	Solicit Offers (RfQ / RfP / RfI) Request for Quotation (RfQ) / Proposal (RfP)	X	X		X				3
3	Inventiveness - Being imaginativeness.					X		X	2
	Leadership - Managing employees in teams.			X			X		2
	Cost Reduction Techniques	X					X		2
	Negotiation the Specific Terms		X				X		2
	Project Management Skills	X	X						2
	Supplier Relationship Management	X		X					2
	Sustainable purchasing		X		X				3
	Working together with the department Research and Development	X				X		X	2
	Working together with the Legal department			X			X		2
	Cost Reduction techniques	X					X		2

European Education Landscape

Current Core Characteristics



PERFECT

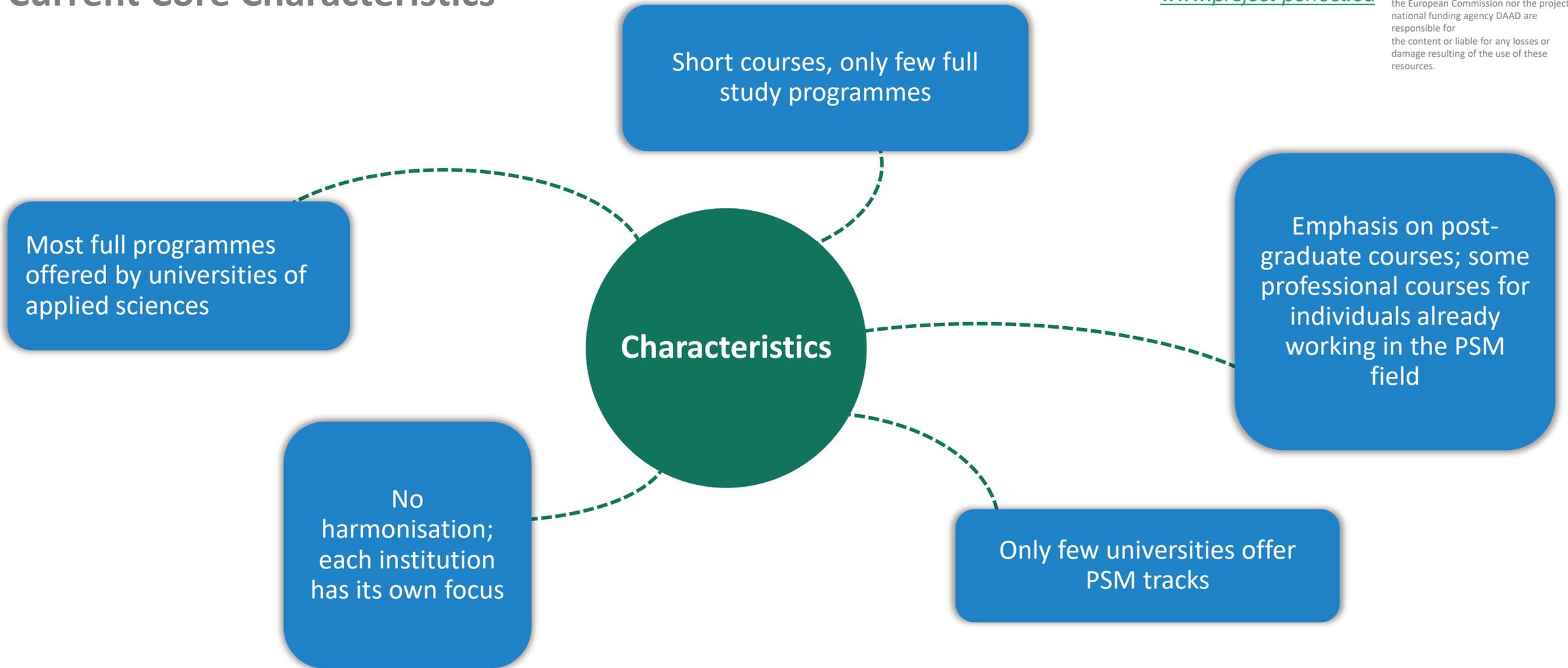
Purchasing Education and Research
for European Competence Transfer

www.project-perfect.eu



Erasmus+

Disclaimer
The creation of these resources has been (partially) funded by the ERASMUS+ grant program of the European Union under grant no. 2015-1-DE01-KA203-002174. Neither the European Commission nor the project's national funding agency DAAD are responsible for the content or liable for any losses or damage resulting of the use of these resources.



Methodology of the New Curriculum Development

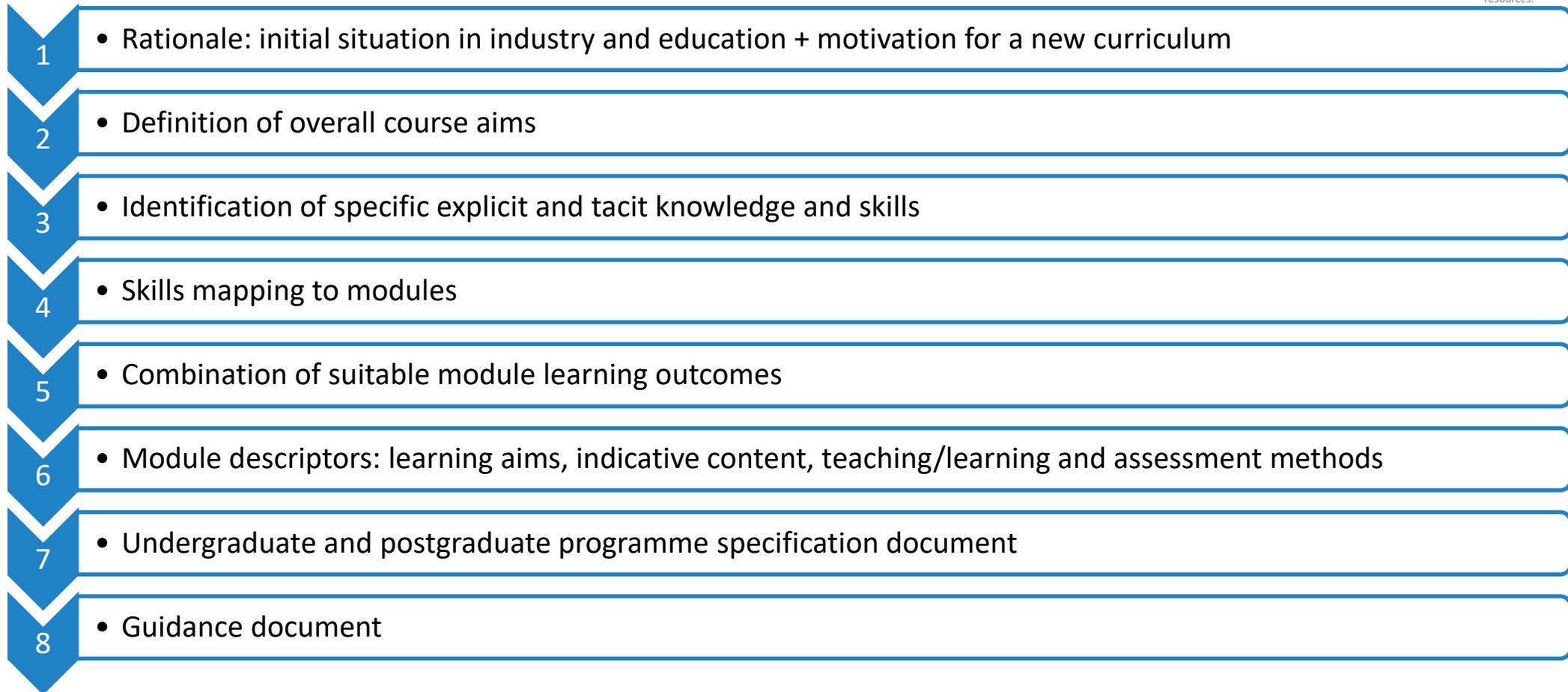


Purchasing Education and Research
for European Competence Transfer

www.project-perfect.eu



Disclaimer
The creation of these resources has been (partially) funded by the ERASMUS+ grant program of the European Union under grant no. 2015-1-DE01-KA203-002174. Neither the European Commission nor the project's national funding agency DAAD are responsible for the content or liable for any losses or damage resulting of the use of these resources.



Study Plan Example of the new PSM Curriculum



PERFECT

Purchasing Education and Research for European Competence Transfer

www.project-perfect.eu



Erasmus+

Disclaimer
The creation of these resources has been (partially) funded by the ERASMUS+ grant program of the European Union under grant no. 2015-1-DE01-KA203-002174. Neither the European Commission nor the project's national funding agency DAAD are responsible for the content or liable for any losses or damage resulting of the use of these resources.

Bachelor	10 ECTS		10 ECTS		10 ECTS	
1st semester	Purchasing Fundamentals			The Business Context		
2nd semester	Category Management	Optional Language Modules	Personal Skills	International Context of PSM		
3rd semester	Supply Chain Management	Optional Language Modules	People Skills	Entrepreneurial PSM		
4th semester	Operations Management	Cross-functional working	Personal Skills	Negotiation		
5th semester	PSM Technology in a Digital Environment		People Skills		Customer Service	
6th semester	Sustainability Management	Management & Leadership in a PSM context		Advanced Category Management		Optional Language Modules
7th semester	Management & Leadership in a PSM context	1st semester		Management & Leadership in a PSM context	Organisational Change	Advanced Category Management
		2nd semester		Company Project	People Skills	Personal Skills
		3rd semester		Master Thesis		
				Customer Service	PSM Technology in a Digital Environment	Law for PSM
				International Context of PSM		

Exemplary courses focusing on new skills

Self Assessment Tool & Massive Open Online Course



Purchasing Education and Research
for European Competence Transfer

www.project-perfect.eu



Disclaimer
The creation of these resources has been (partially) funded by the ERASMUS+ grant program of the European Union under grant no. 2015-1-DE01-KA203-002174. Neither the European Commission nor the project's national funding agency DAAD are responsible for the content or liable for any losses or damage resulting of the use of these resources.



Purchasing and Supply Management (PSM) Fundamentals (#PERFECT)

course duration: Self-study course
Instructor: PERFECT
Language: English

★★★★★

free

[enrol now](#)

[f teilen](#) [tweet](#) [whatsapp teilen](#) [in mitteilen](#) [x teilen](#)

What is this course about?

More than half of the total turnover of a modern industrial firm in Europe is directly transferred to suppliers and the bulk of supplies is no longer of domestic origin but European and international. Network economies with a low depth of production and high reliance on international suppliers let firms struggle to cope with the complexity and the new responsibilities. There is no harmonised skill profile and competence set for Purchasing & Supply Management (PSM).

This course arises from the Erasmus+ project PERFECT (project-perfect.eu) which develops a harmonised curriculum in PSM and aims at an increase in the number of highly qualified students who are suitable for entering the workplace in PSM related jobs in any size of organization and industrial setting.

! What do you learn in this course?

How is the course structured?

Over the course, you have the chance to participate in the following sequences on Purchasing & Supply Management (PSM) basics.

0. Introduction to project PERFECT
1. Definition and Meaning of PSM
2. PSM Organisation and Roles
3. PSM Processes
4. Strategic Procurement
5. Offers, negotiations, contracts
6. Supplier Relationship Management
7. Procurement Technology & Digitalisation
8. PSM Controlling
9. Risk Management in PSM

Available via www.project-perfect.eu

Contact



Univ.-Prof. Dr. Michael Henke

Director of the Institute, Division Enterprise Logistics
Fraunhofer Institute for Material Flow and Logistics IML

Joseph-von-Fraunhofer-Str. 2-4
44227 Dortmund, Germany

Phone: +49 (0) 231 / 97 43-1 00

Fax: +49 (0) 231 / 97 43-77 10

michael.henke@iml.fraunhofer.de

<http://www.iml.fraunhofer.de/en>

