

POLITECNICO
MILANO 1863

SCHOOL OF MANAGEMENT

PhD in Management, Economics and Industrial Engineering

International Conference on
Design and Production Engineering
July 25-26, 2016 Berlin,Germany

Optimization of the flexibility – efficiency trade-off in engineer-to-order industries

Cannas Violetta Giada

Agenda

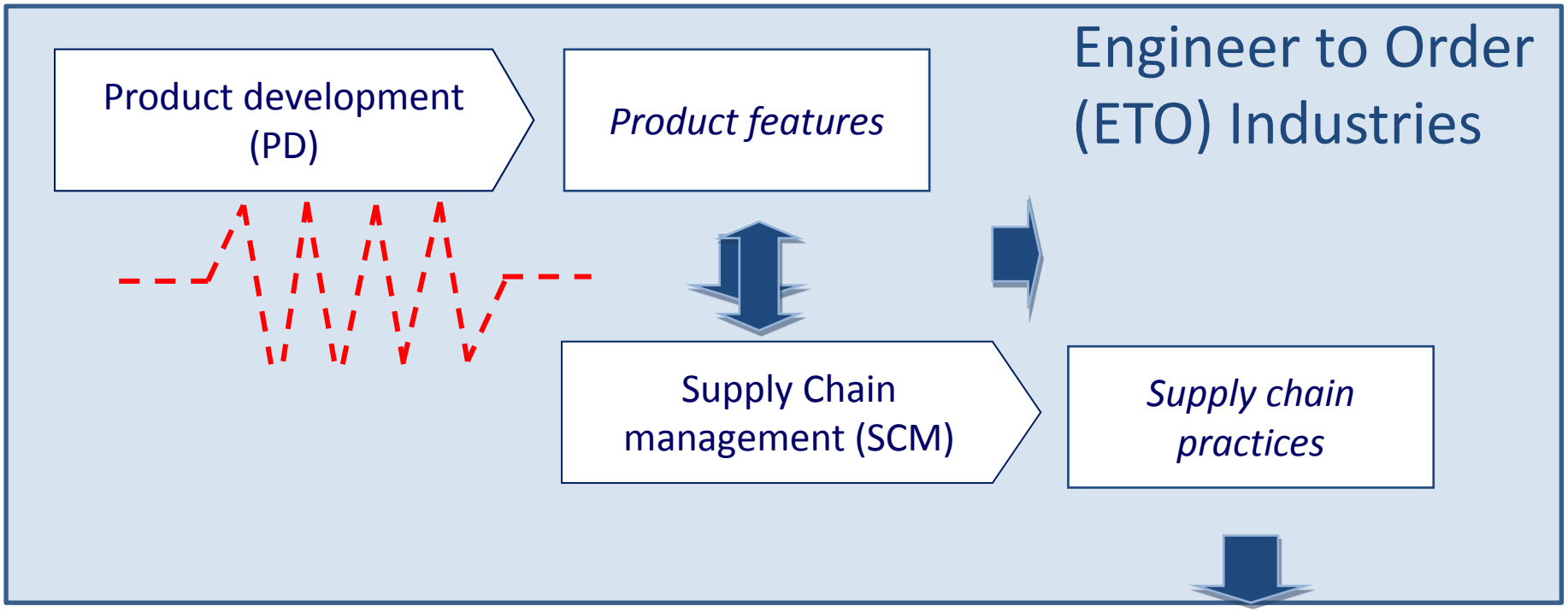
- Area of investigation
- State of the art
- Future research directions

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Area of investigation

Product development – Supply chain management alignment in Engineer-to-order industries



According to: Naylor et al. (1999); Rahim and Baksh (2003); Ben et al. (2004); Rudberg and Wikner (2004); Wikner and Rudberg (2005); Chen (2006); Dekkers (2006); Powell et al. (2014); Pero et al., 2010a; Gan and Grunow, 2015; Gosling et al. 2015

Area of investigation

Product development – Supply chain management alignment in Engineer-to-order industries

Traditionally ETO competed on customization level:

- Quality and technology level were the main sources of competitive advantage
- Production adapted to dynamic change of the business context

Globalization brings new competitors and changes in the competitive ecosystem

- Huge time compression and high pressure
- Need for additional competitive sources of advantage

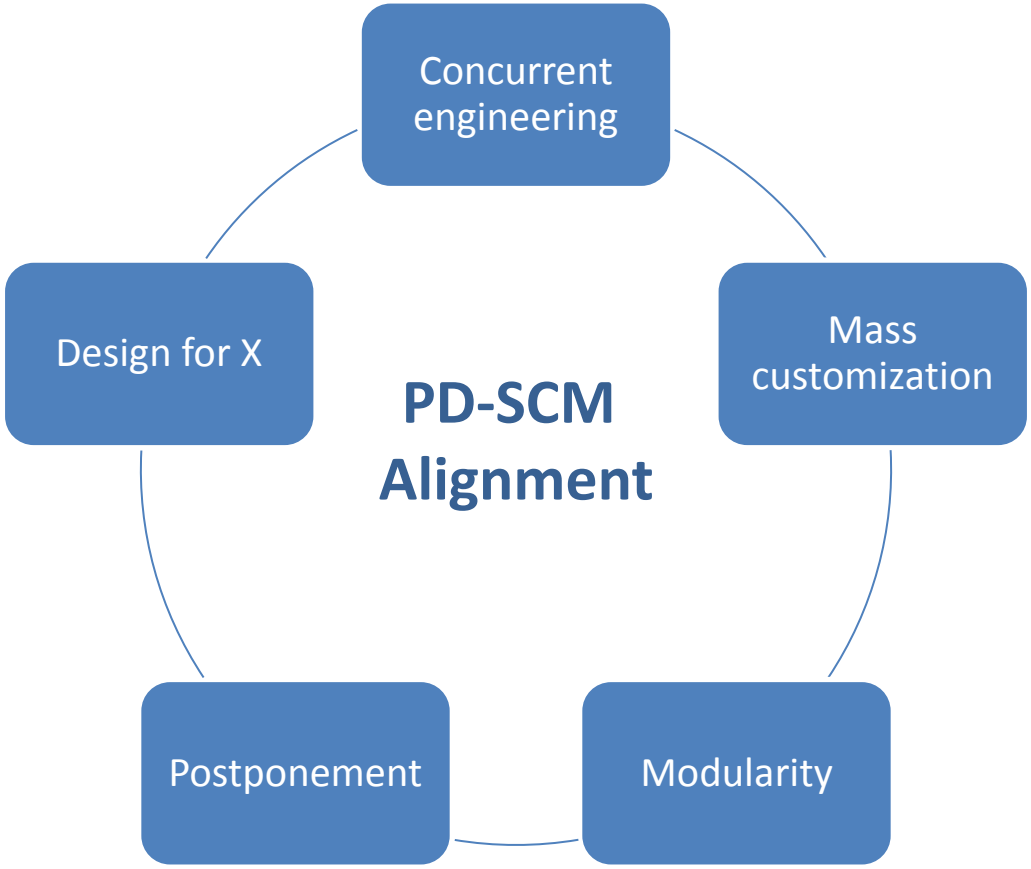
Customers require faster and reliable deliveries of high customized products

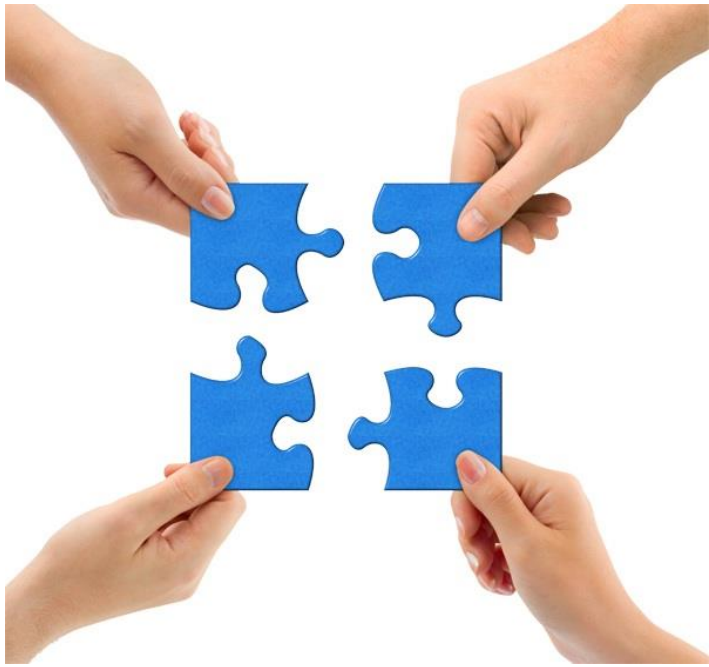
- Critical success factors become time and variety
- Trade-off among efficiency and flexibility

According to: Cameron and Braiden, 2004; Xie and Tu (2006); Chen et al. (2010); Gosling et al. (2015); Birkie and Trucco (2016)

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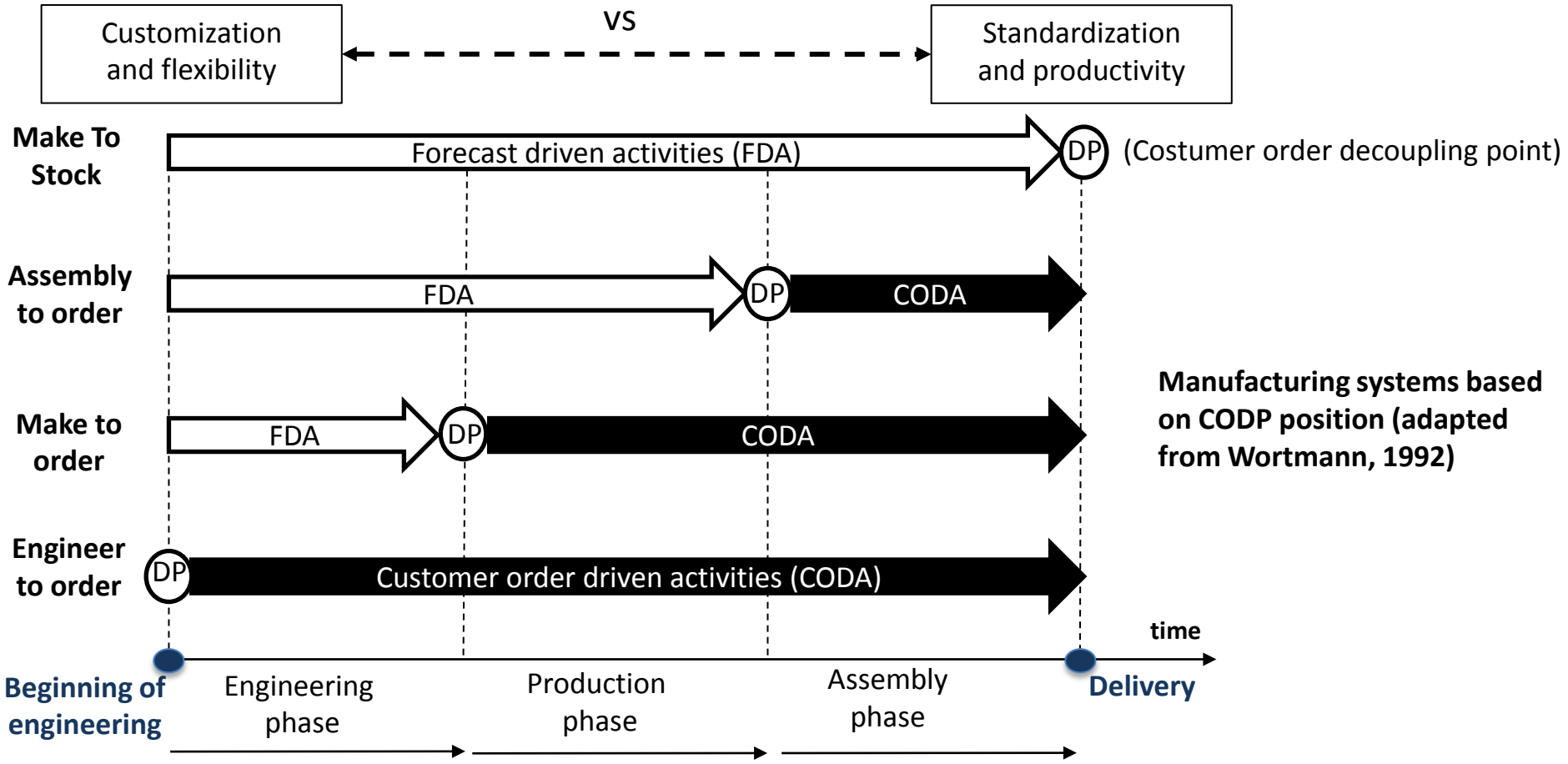




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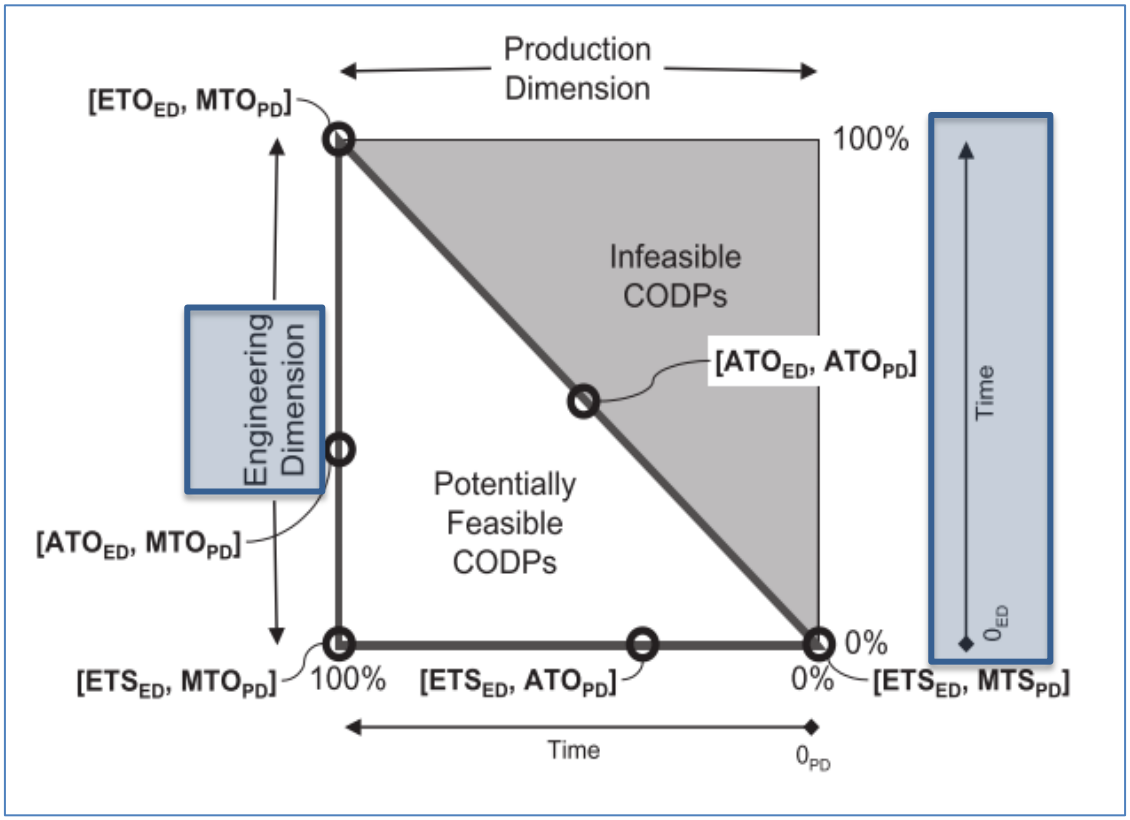
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State of the art Traditional ETO concept – One dimensional CODP



State of the art

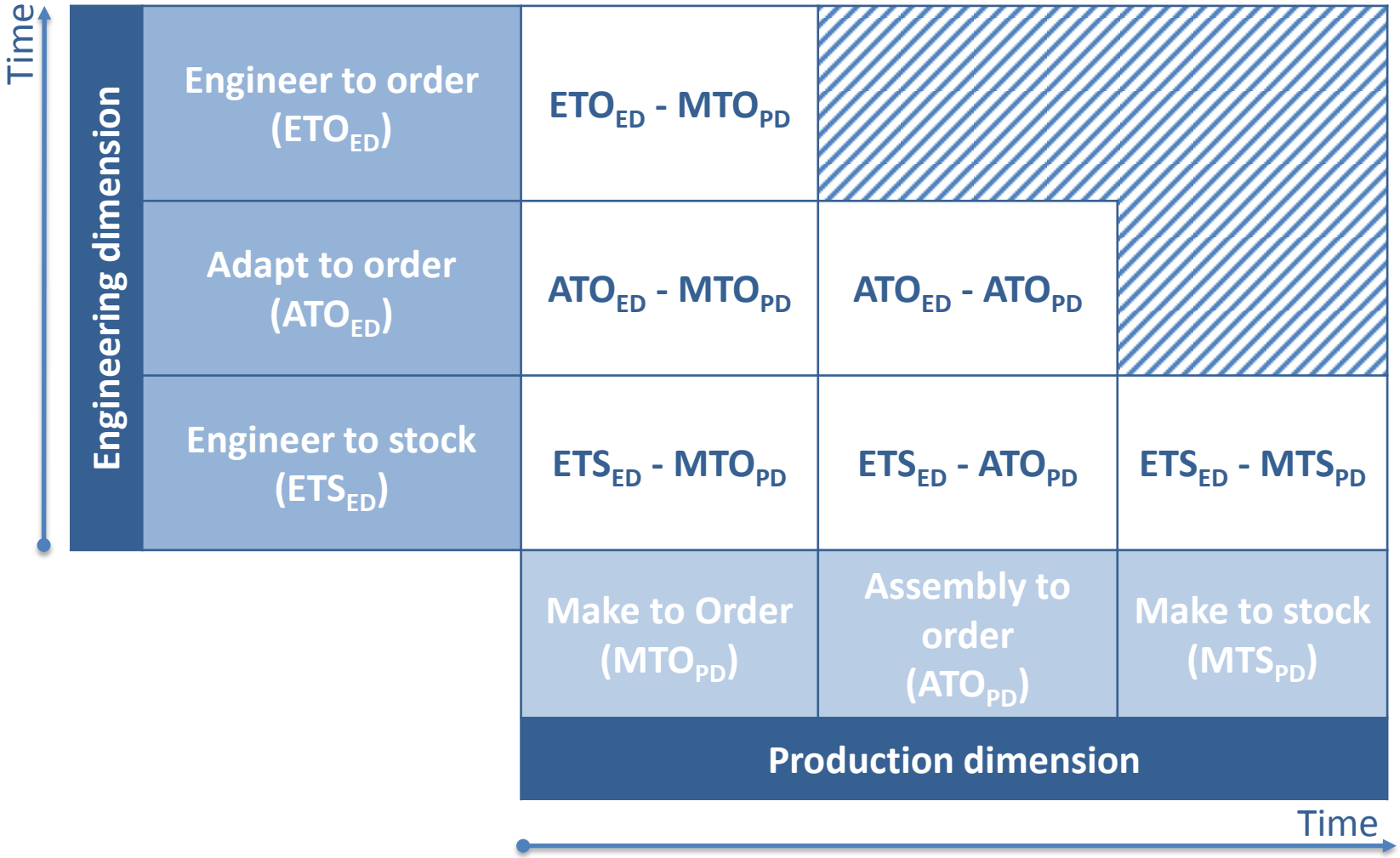
New ETO concept – Two dimensional CODP



The two-dimensional CODP space (source: Rudberg and Wikner, 2004)

State of the art

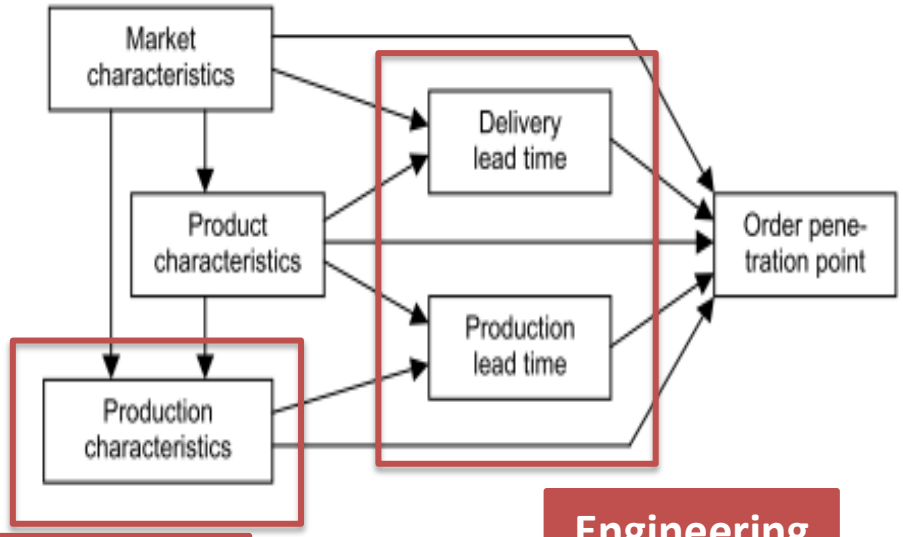
New ETO concept – Two dimensional CODP



The two-dimensional CODP space (adapted from Rudberg and Wikner, 2004)

State of the art
CODP positioning

Conceptual impact model framework (source: Olhager, 2003)



Engineering characteristics?

Engineering lead time?

Reasons and effects for the engineering dimensions?

Identification of the main factors affecting the CODP positioning based on the P:D ratio

Definition of the role of the CODP in a manufacturing strategy

Identification of the reasons and effect of the CODP forward and backward shifting

Manufacturing efficiency	⟺	Product customization
Risk of obsolescence	⟺	Long delivery lead times

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Future research directions

How to position the customer order decoupling point considering both engineering and production dimensions, in order to enhance both PD and SCM performance and balance the trade-off among flexibility and efficiency?

RQ1: *What are the PD and SCM performance affected by the positioning of the two-dimensional customer order decoupling point?*

RQ2: *How are the PD and SCM performance affected by the positioning of the two-dimensional customer order decoupling point? Which is the trade-off dictated by the forward or backward shifting of the two-dimensional customer order decoupling point?*

RQ3: *What are the main factors that affect the positioning of the two-dimensional customer order decoupling point?*

RQ4: *How do the factors affect the positioning of the two-dimensional customer order decoupling point?*





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THANK YOU VERY MUCH FOR YOUR ATTENTION

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