Vienna Configuration Workshop 2013

Choice Navigation: Towards a Methodology for Performance Assessment

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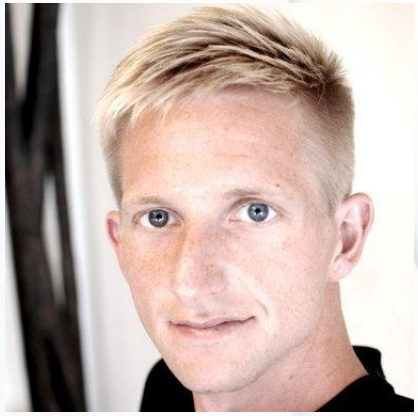

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Configuration & Cost Management
Vestas Wind Systems A/S

Industrial Research Project
2011- exp. 2015
Three-part collaboration

Vestas
Wind. It means the world to us.™

Research project:
Agility in New Product Introduction

AALBORG UNIVERSITY DENMARK

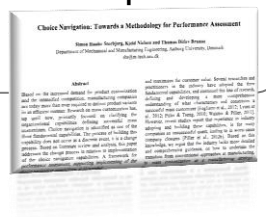
The Danish Agency for Science Technology and Innovation

Purpose & Agenda of Presentation

Purpose

1’ Receive feedback on: relevance, approach and expected results

2’ Present results reported in paper


Choice Navigation: Towards a Methodology for Performance Assessment

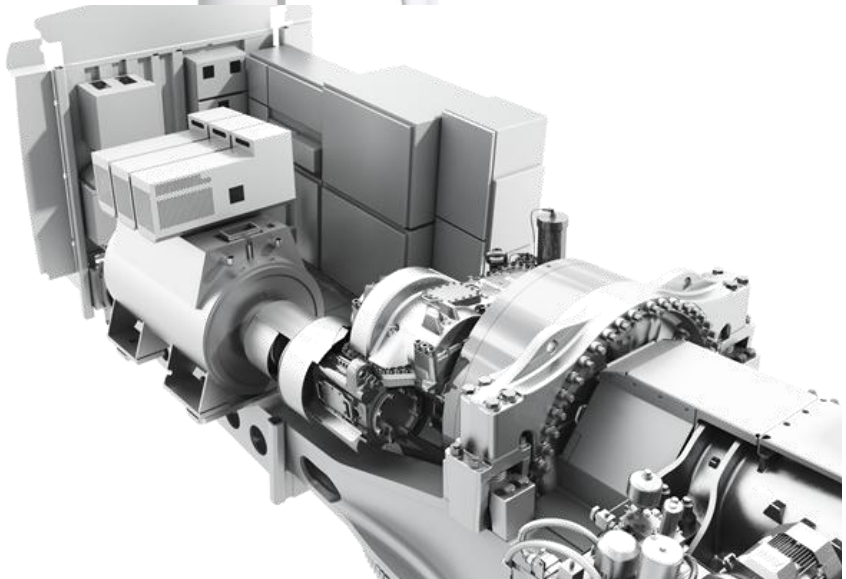
3’ Invite for further discussion and collaboration

Agenda

1) Introduction
2) Motivation for the Research Project
3) Design of Research Project
4) Framework for Performance Assessment
5) Ongoing & Future Work

Introduction

Vestas Wind Systems Product Portfolio

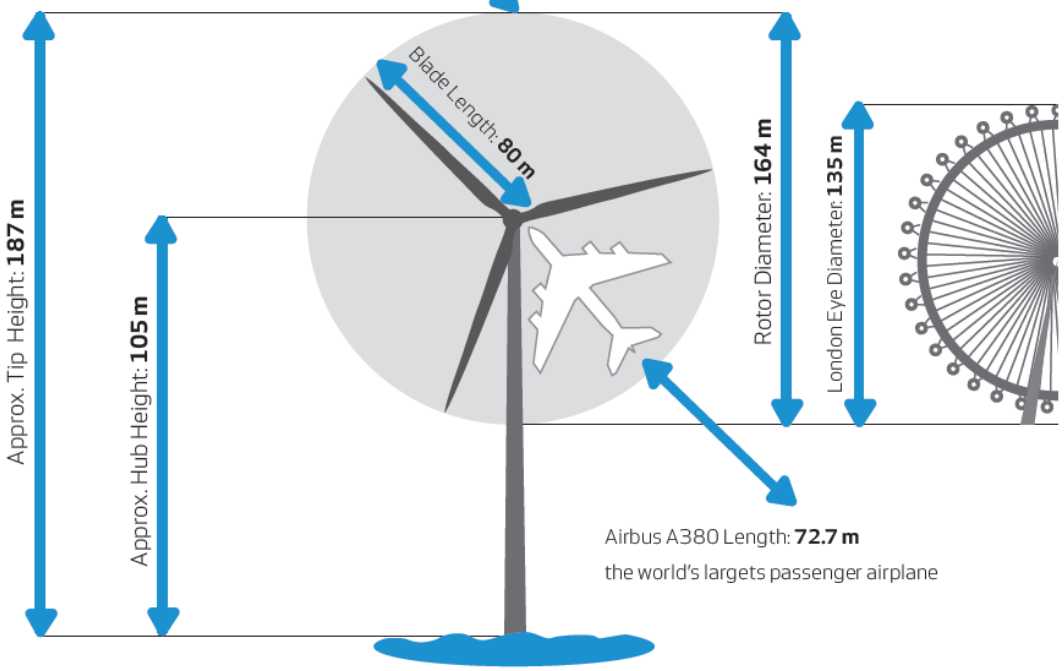


Introduction

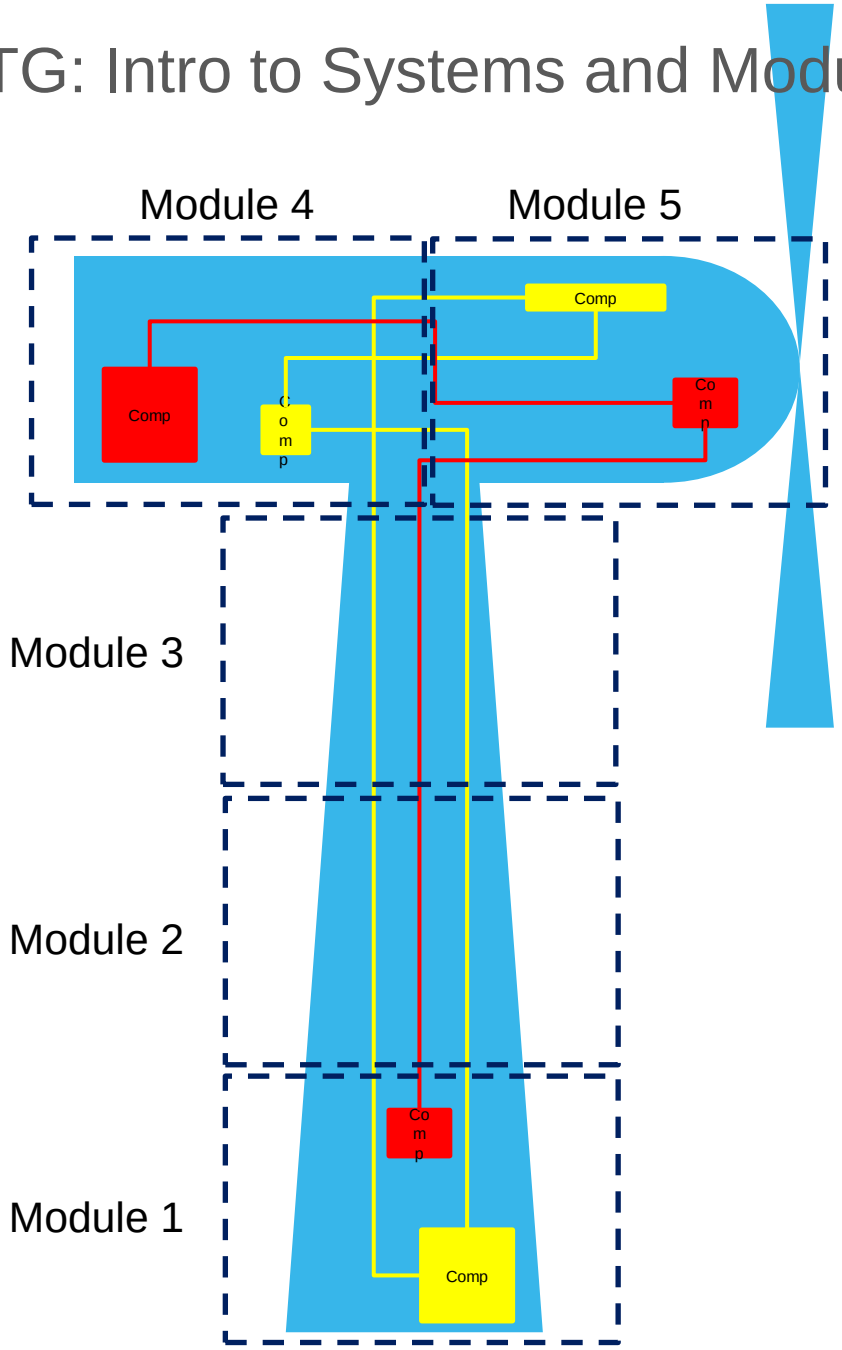
Vestas Wind Systems Product Portfolio

Swept Area:	**21124 m2**
Mega Watt:	**7.0**
Blade Length:	**80 m**
Approx. Hub Height:	**105 m**
Rotor Diameter:	**164 m**
Approx. Tip Height:	**187 m**
Weight (ex. Tower):	**≈500 tonnes**

7 MW



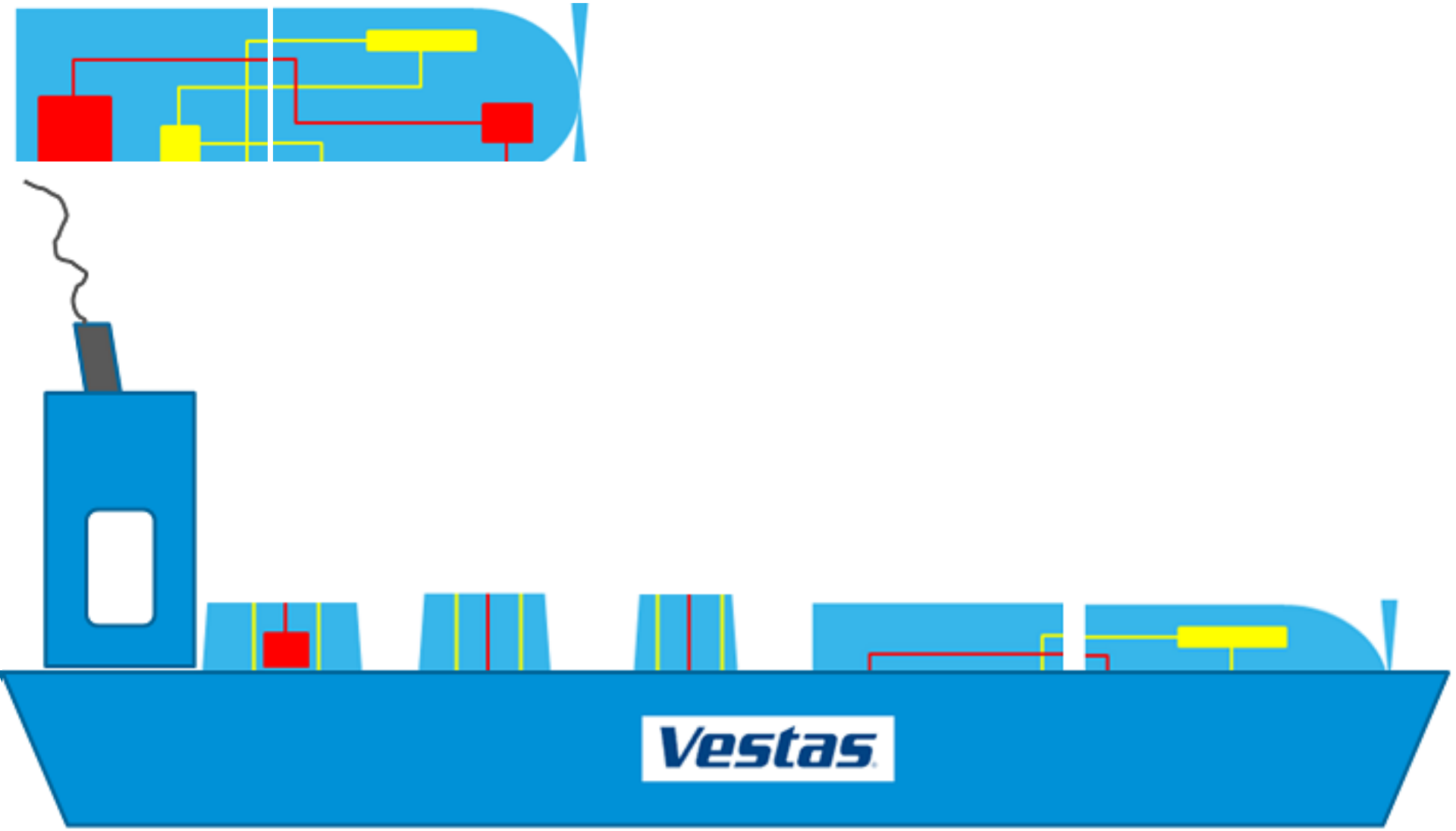
WTG: Intro to Systems and Modules



System A
e.g. Electrical sys

System B
e.g. Hydraulic sys

Intro to Systems and Modules – contd.



Motivation for the Research Project

Unsustainable setup that creates an variant in Engineering every time we create a sales variant

Turbines
(the individual variants we administrate)

Production
(the variants they produce)

SBU
(the variants they sell)

Complete set of
Mk 1 doc
- CAD
- RS
- DFMEA
- etc.

MSI xxx
MSI xxx
MSI zzz
MSI BoM

Complete set of
Mk 2 doc.
- CAD
- RS
- DFMEA
- etc.

MSI xxx
MSI yyy
MSI zzz
MSI BoM

Complete set of
Mk 3 doc.
- CAD
- RS
- DFMEA
- etc.

MSI xxx
MSI yyy
MSI zzz
MSI BoM

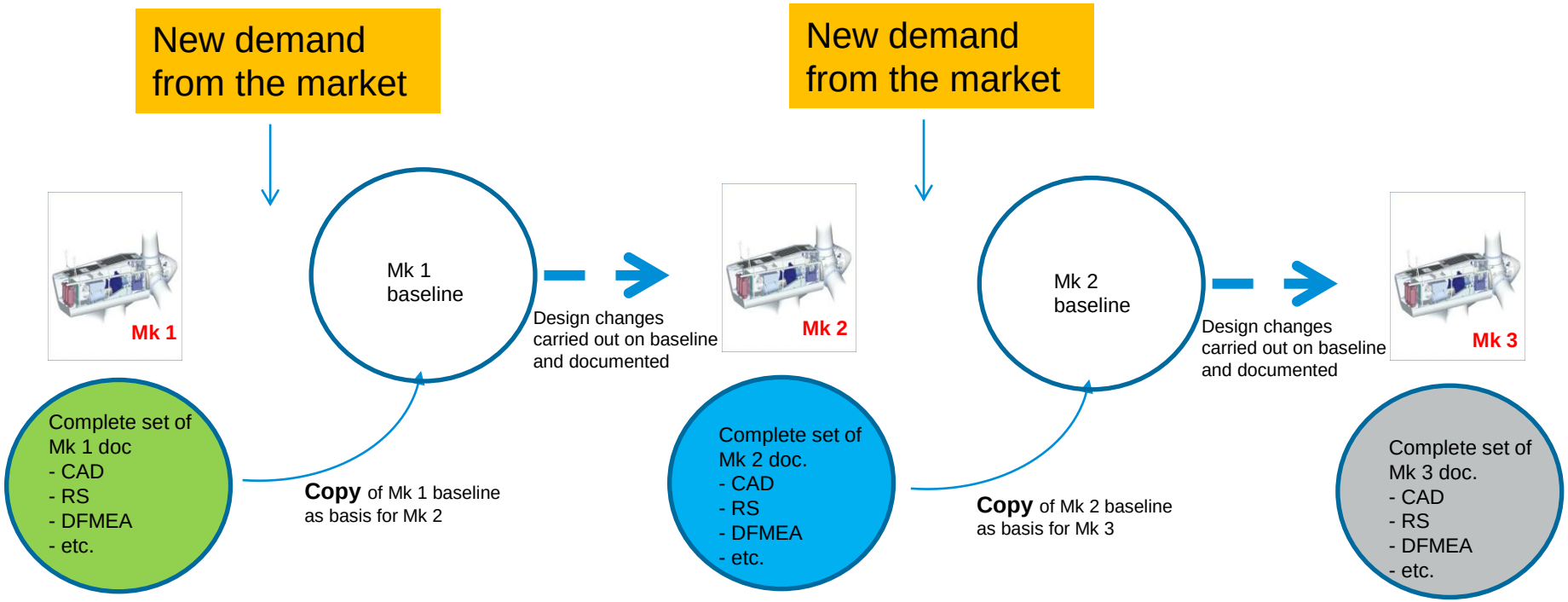
The 100% Engineering BoM is **converted** into a 100% Production BoM

MSI BoM

Sales Configuration

Motivation for the Research Project

Inefficient approach at variance creation



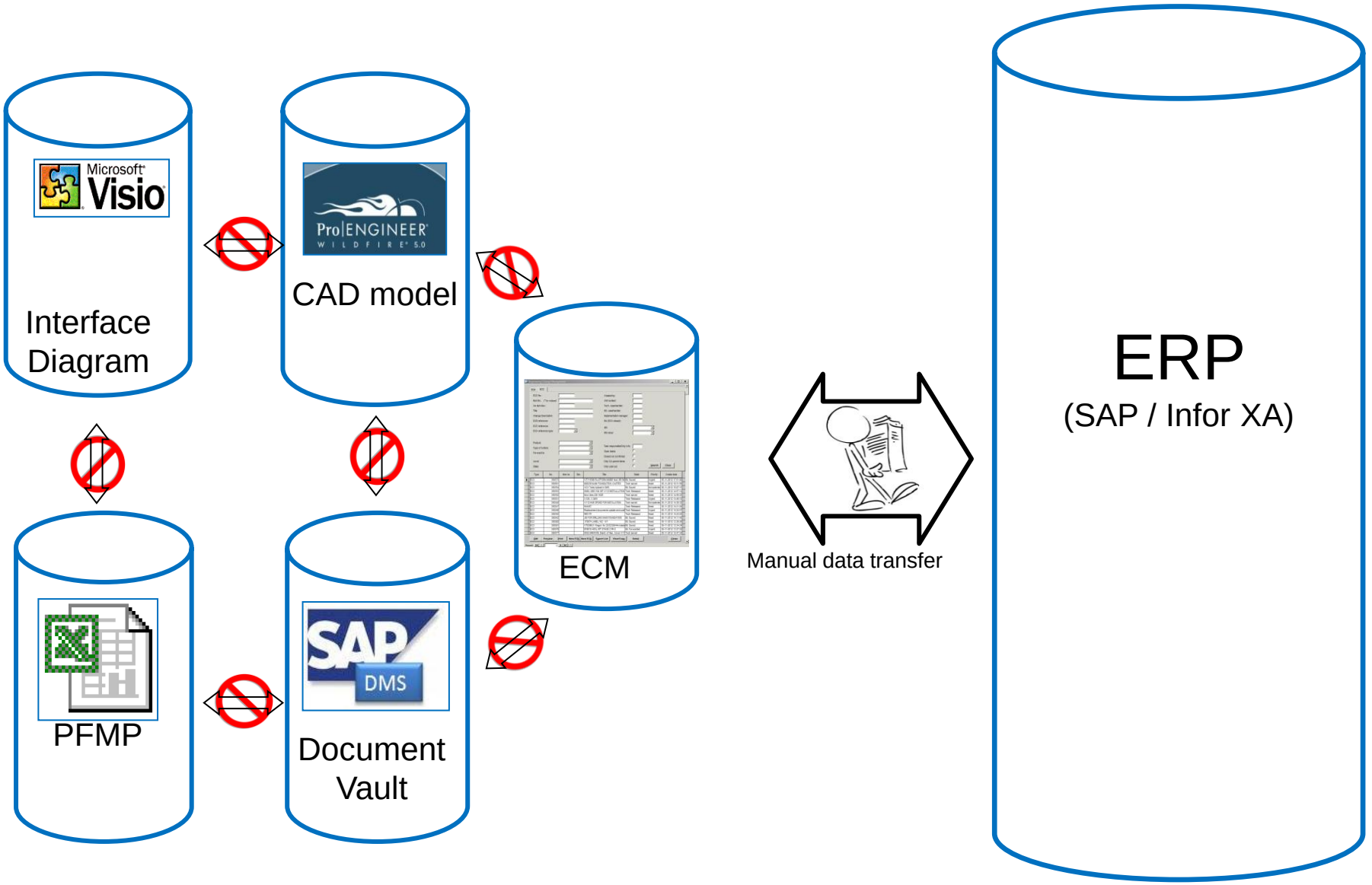
"Changing market demands we respond to by **copy/pasting** existing products and redesigning them into new stand alone products."

"Hereafter we **manually create a documentation** package for the each new product variant whilst the old one remains active."

"Over time we end up creating many different stand alone product and a **massive administrative burden** and **no real coherence** across the set of products that should have been a true family"

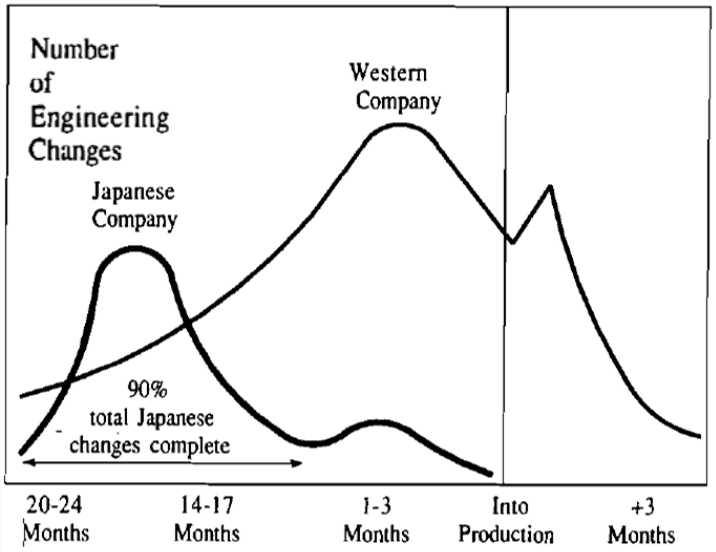
Motivation for the Research Project

Insufficient IT-infrastructure



Motivation for the Research Project

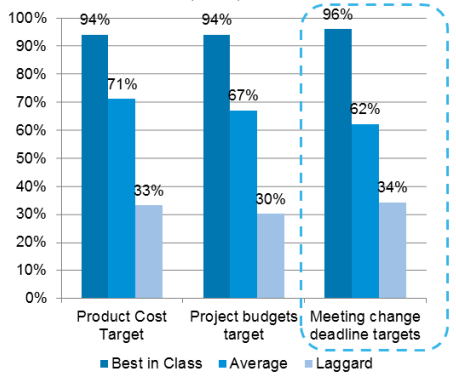
Symptoms: Poor performance on engineering change handling



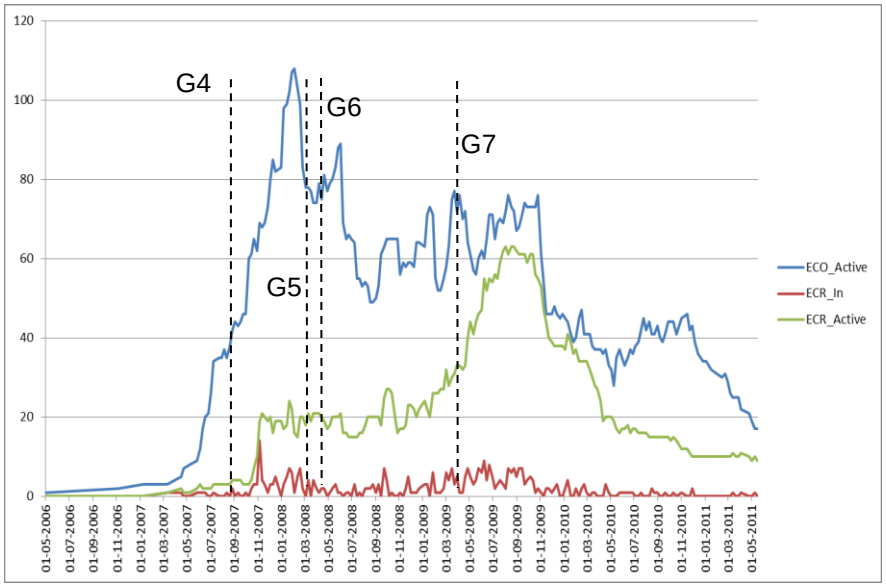
Nichols (1990)

Benchmark: 135 enterprises in aerospace and defense, automotive, high-tech, industrial products, and other manufacturing industries.

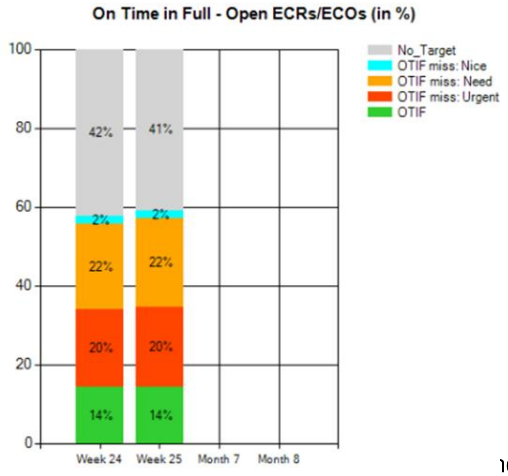
Top performers hit targets,
Source: Aberdeen Group, May 2007



Aberdeen (2007)

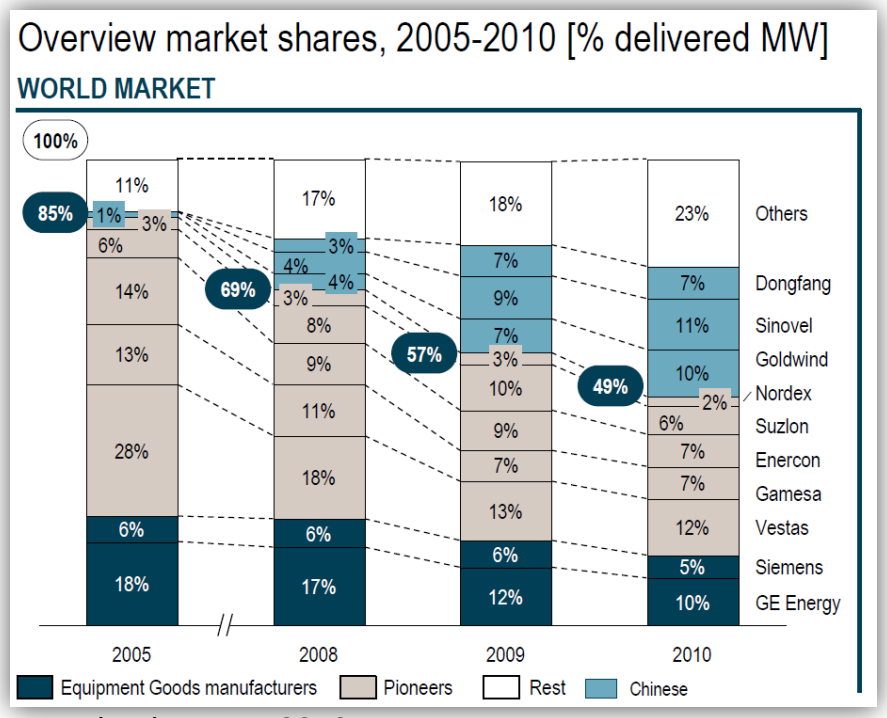


Vestas Current Status:
All open changes, OTIF 14 %

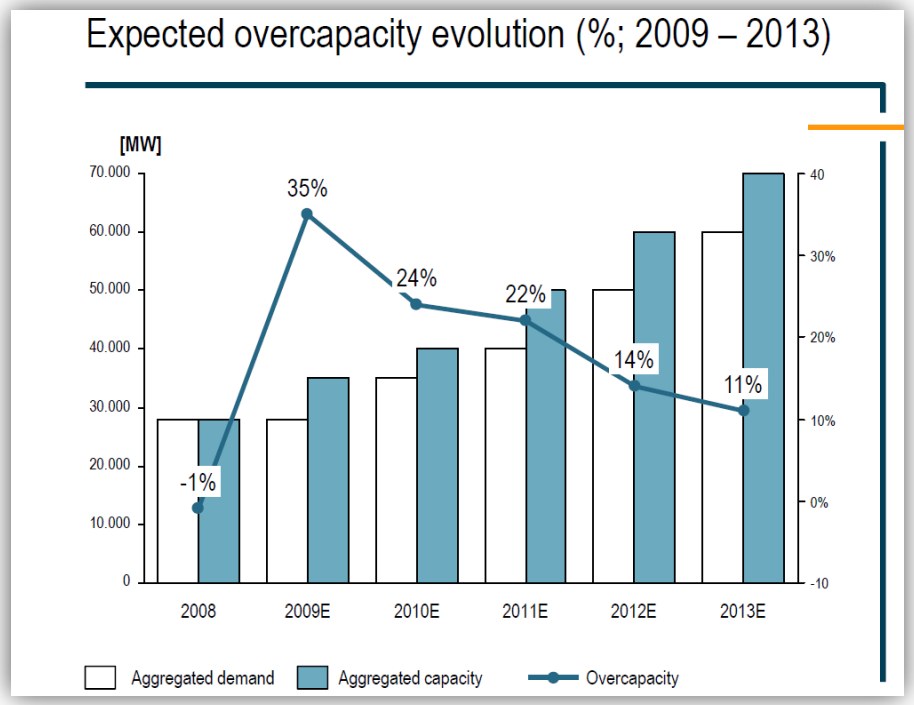


Motivation for the Research Project

A maturing wind industry



Roland Berger, 2010



Roland Berger, 2010

Design of Research Project

Key Design Variables

Company in a maturing industry

Mixed order delivery strategy: ETO, MTO, ATO

Inefficient approach for creating product variance

Insufficient IT-infrastructure

Lack of competencies, culture & routines

Radical Change

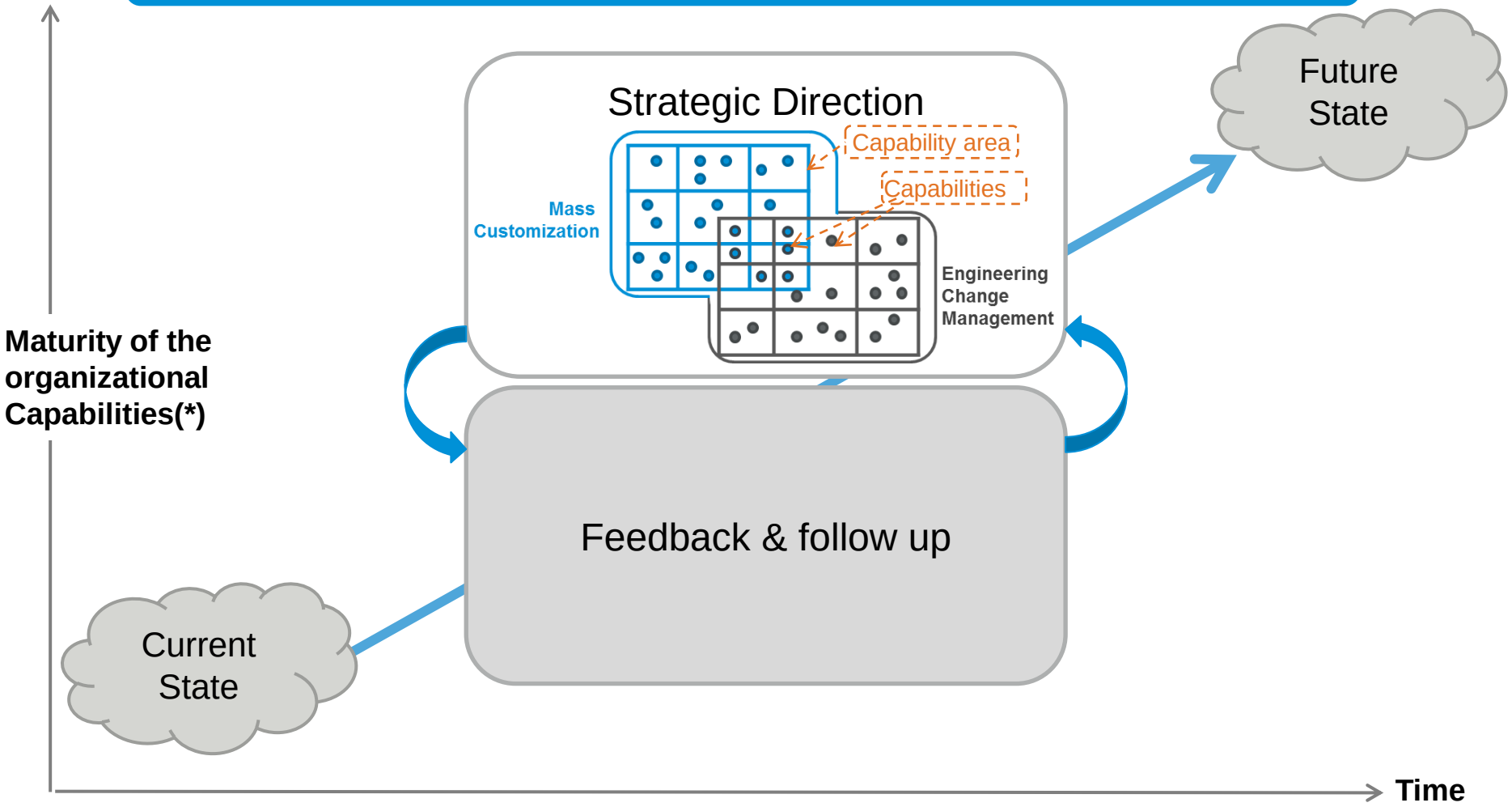
Socio-technical problem

Challenge at strategical, tactical & operational level

Design of Research Project

Target & Approach

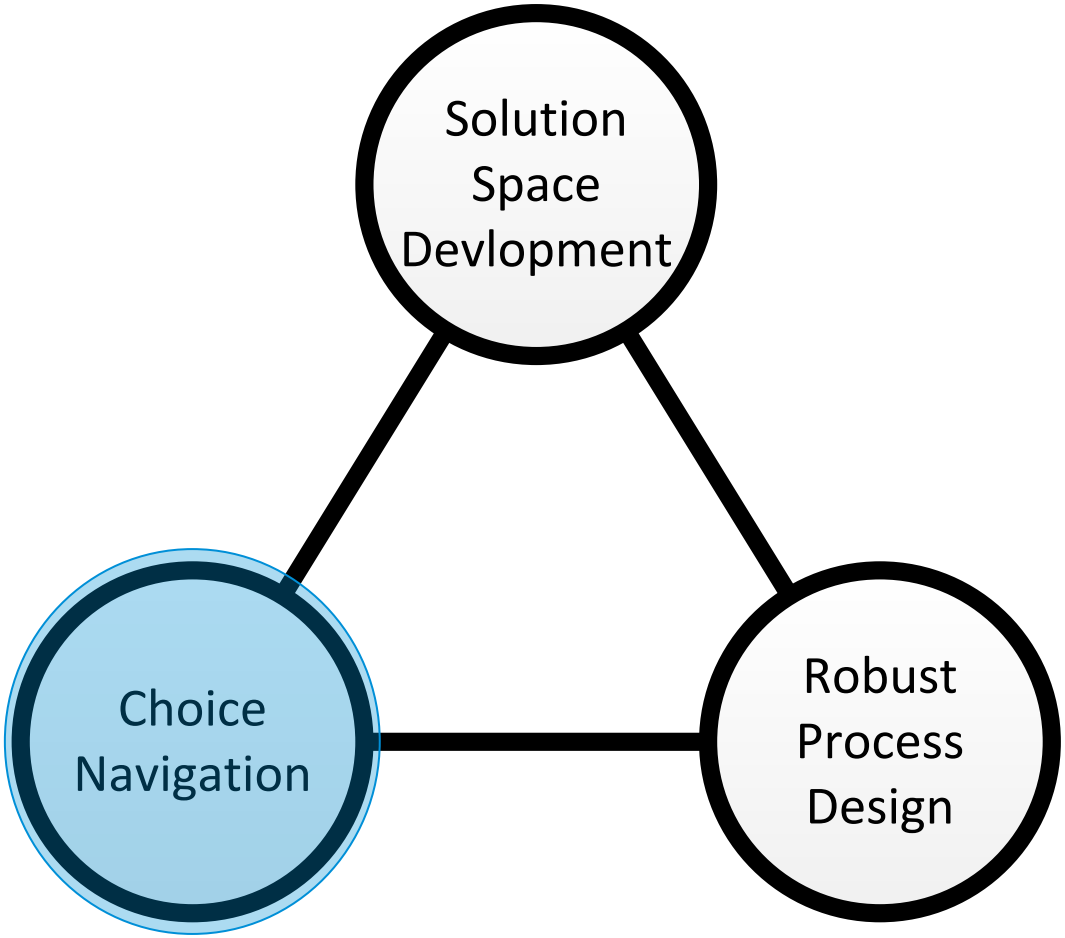
Guide & support EPC companies in the process of building capabilities needed for efficient introduction of new product variants



(*) Ability to introduce new profitable product variants

Capabilities for Efficient introduction of new product variants

The three fundamental Mass Customization capabilities



Design of Research

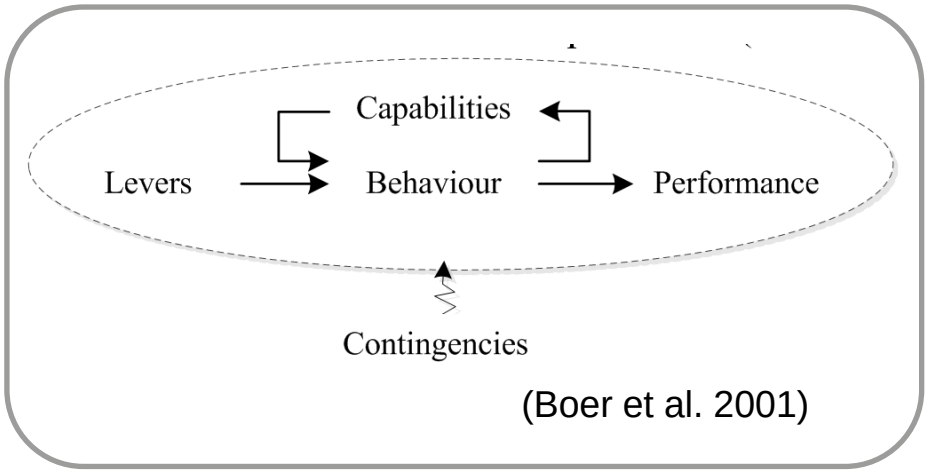
Research Question

How can performance assessment support the implementation of the choice navigation capabilities? What performance assessment methodologies are appropriate?

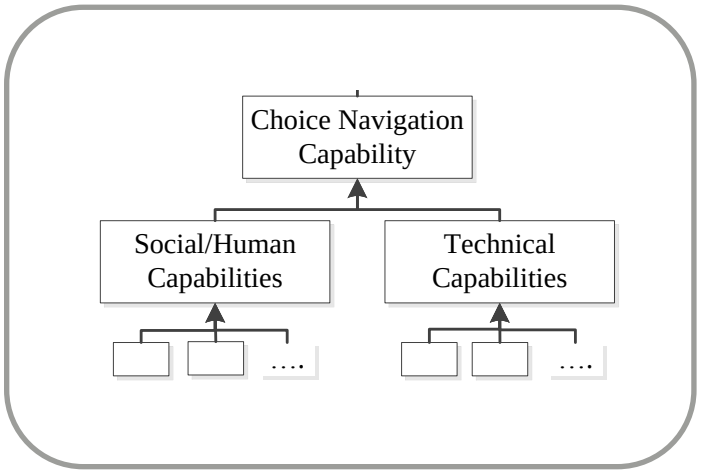
Purpose: clarify performance assessment methodologies, that can give valuable feedback on the implementation of the choice navigation capabilities, so that corrective actions can be taken.

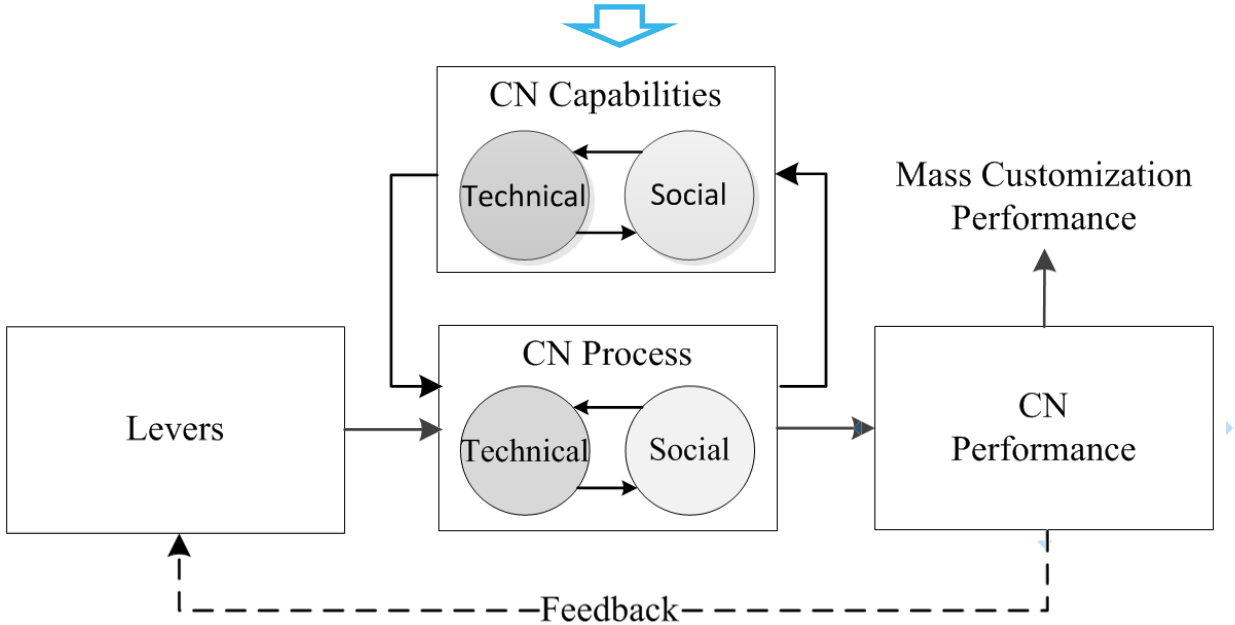
Framework for Performance Assessment

How to model the process of building capabilties as a system?



(Boer et al. 2001)



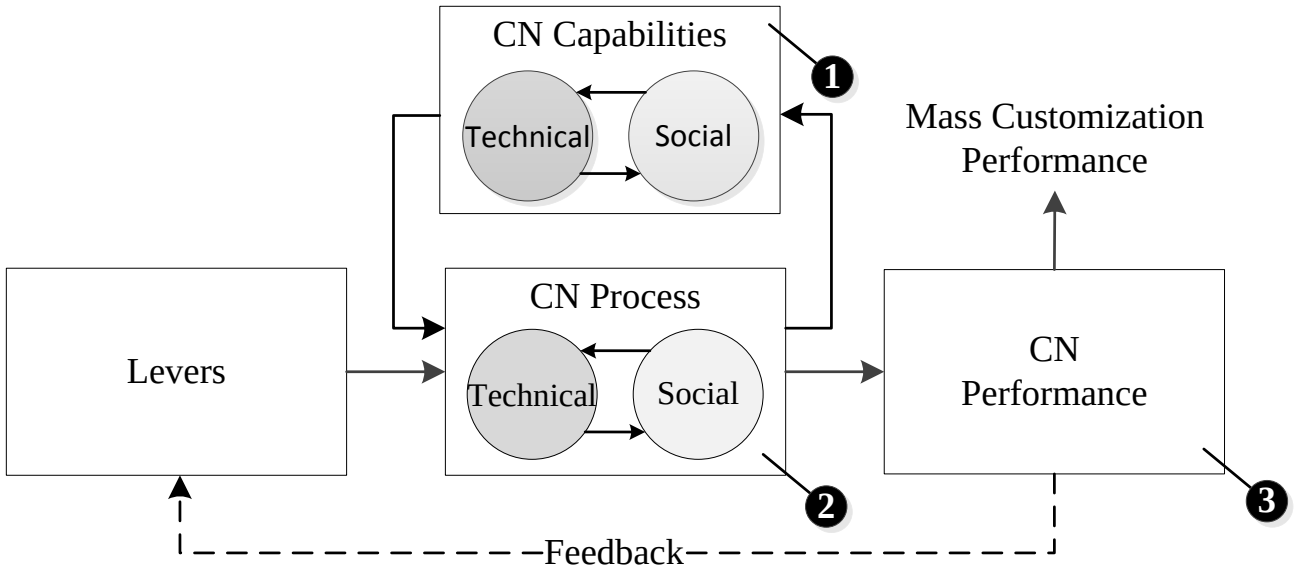


Framework for Performance Assessment

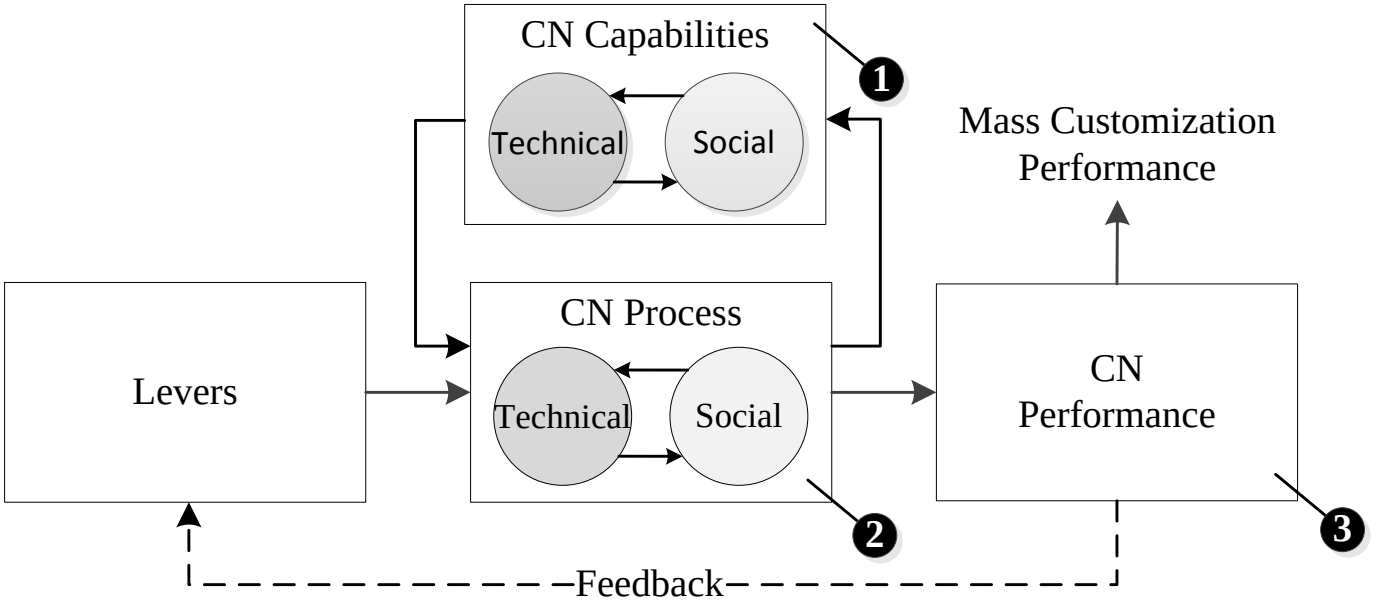
What dimensions of performance can be identified?

Three potential dimensions for performance assessment

1) The degree to which the capabilities have been built
2) The choice navigation process performance
3) The output performance of the choice navigation process



Framework for Performance Assessment



References	Framework	Assessment Dimensions
[Bradley P., 1996]	AMBITE performance cube	2,3
[Kaplan, R. & Norton, D., 1996]	Balanced Scorecard (BSC)	2,3
[Paulk et al.,1993]	Capabiliy Maturity Model Integration (CMMI)	1
[Maier, Eckert & John Clarkson, 2006]	Communication Grid	1
[Kanji, G.K., 1998]	Comparative Business Scorecard (CBS)	2,3
[Gregory, M.J. 1993]	General Motors Integrated Performance Measurement System	2,3
[Medori, D. & Steeple, D. 2000]	Integrated Performance Measurement Framework (IPMF)	2,3
[Chiesa et al., 1996]	Innovation Audit	1
[Szakonyi 1994]	Measuring R&D Effectiveness	1
[Neely et al., 2002]	Performane prism	1,2,3
[Gregory, M.J. 1993]	General Motors Performance measurement and feedback scheme	2,3
[Fitzgerald et al. 1991]	Results and Determinants Matrix (R&DM)	2,3
[Lynch, R.L. & Cross, K.F. 1992]	Strategic Measurement Analysis and Reporting Technique	2,3
[Keegan et al., 1989]	Structural performance measurement matrix	2,3

Ongoing & Future Work

Design Requirements for method/tool to strategic planning & follow up

Maturity of the organizational Capabilities(*)

Performance measures supporting the transition towards MC

Current State

Strategic Direction

Mass Customization

Engineering Change Management

Feedback & follow up

CN Capabilities

Technical

Social

Mass Customization Performance

Levers

CN Process

CN Performance

Feedback

Product Configuration Capability Framework

Future State

CN Capability framework

Framework for performance assessment

Time

(*) Ability to introduce new profitable product variants

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