

Rise of Agile in Automotive R&D?

Expert Study

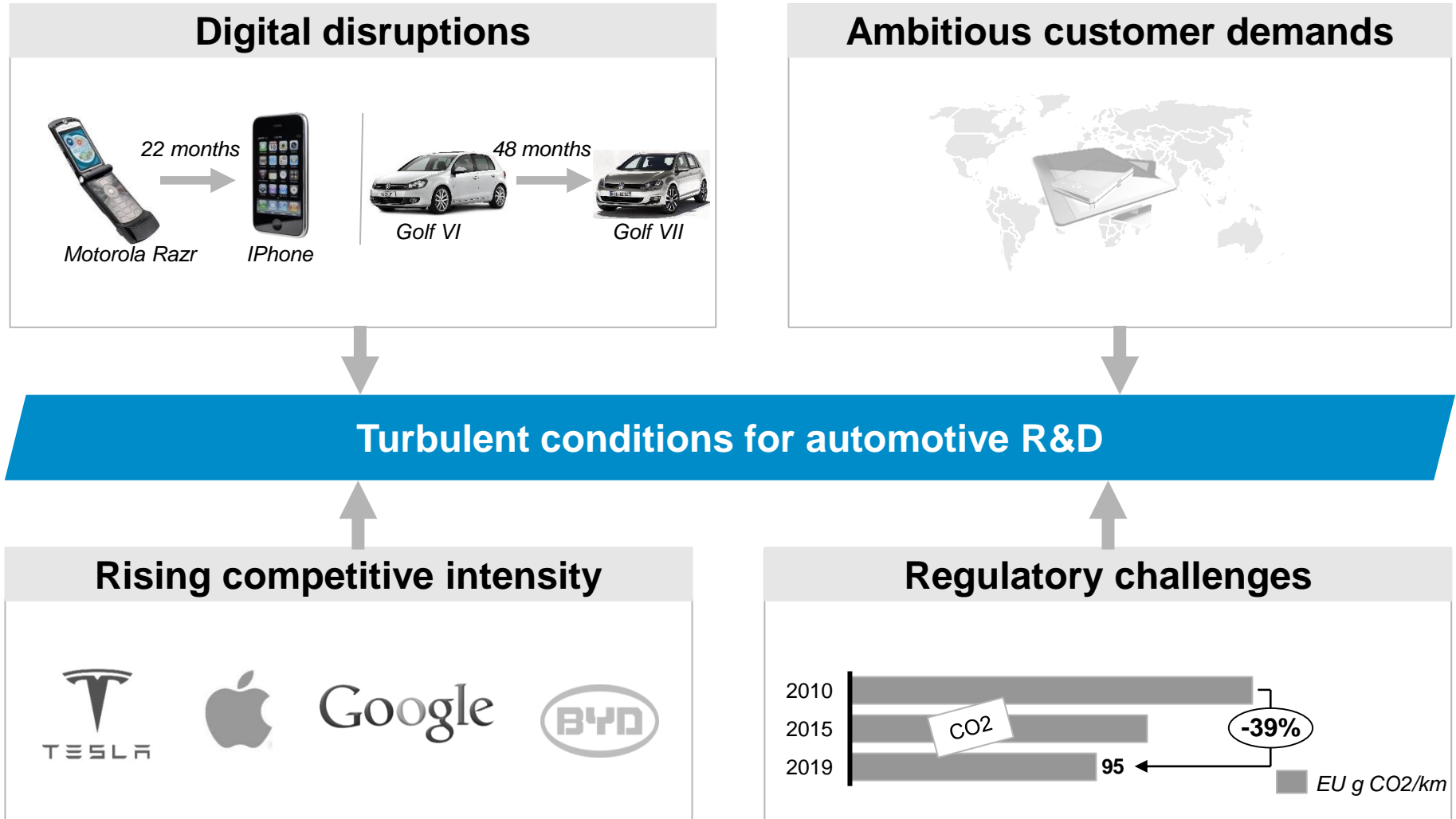
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Achim Kostron
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Paderborn, 6th October 2016

Agenda

- **Our understanding of Agile in Automotive R&D**
 - Study Objectives and Methodology
 - Results of the Study
 - Implications for the Corporate Journey to Agile Mastery

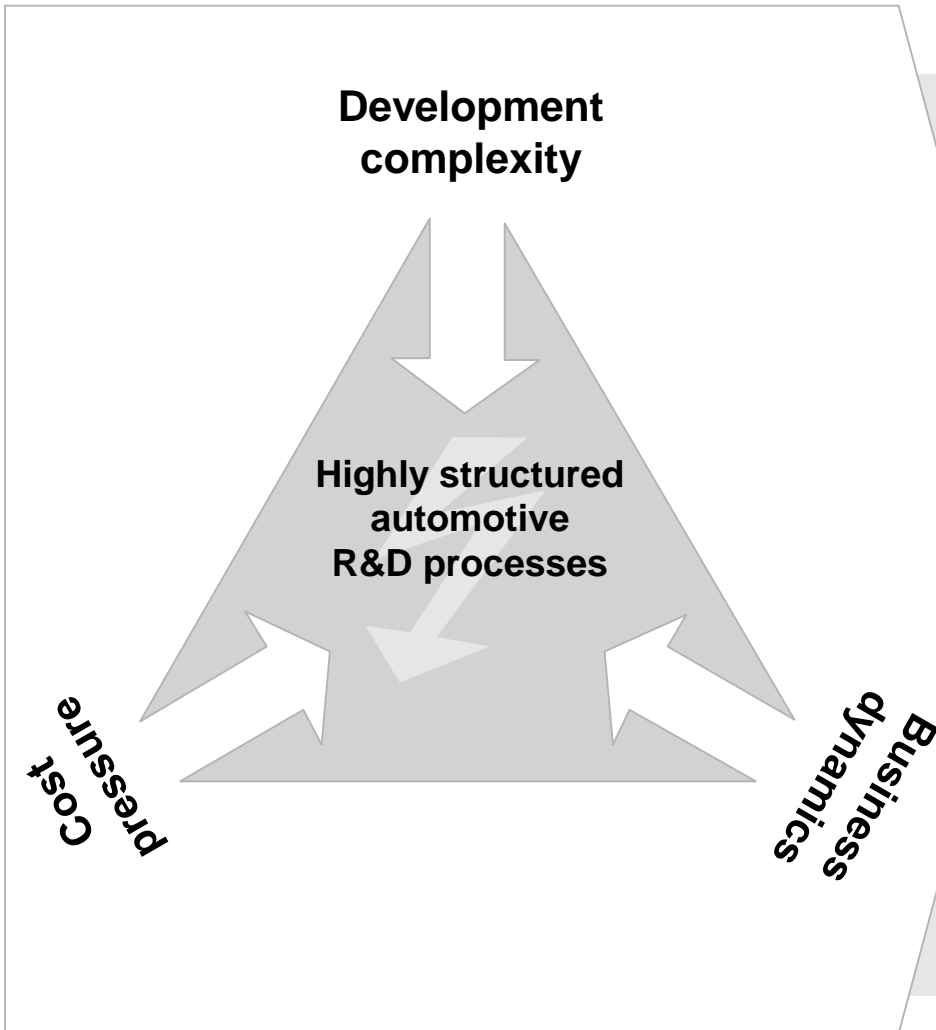
Automotive R&D faces turbulent conditions



Source: Trend Report 2013, Association of German Automotive Industry (VDA)

Turbulent R&D conditions trigger the need for agility

Turbulent conditions create R&D challenges



Do auto executive want to become agile?

“Bosch embraces agility by introducing Agile methods.”
Bosch, Denner, 2015

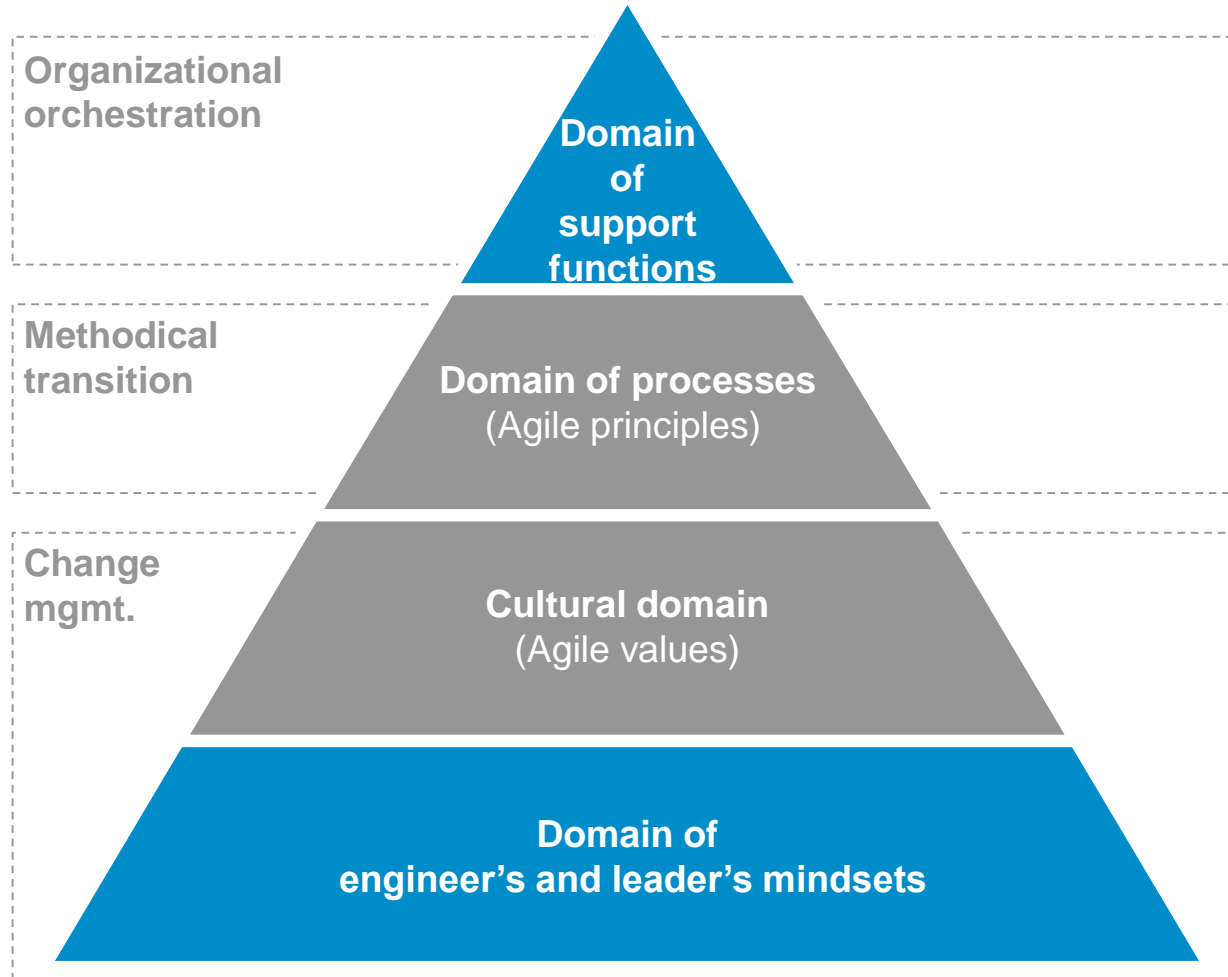
“New competitors keep us Agile.”
Daimler, Zetsche, 2013

“There is a significant opportunity to increase agility.”
Johnson Controls, Molinaroli, 2015

“We know that Tesla is Agile in updating their software and the car at regular intervals.”
Jeff Sutherland (on Tesla), 2013

Agile requires a holistic approach

Four organizational domains to be addressed for the transition to Agile



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Our study evaluates the state of Agile in automotive and derives imperatives for implementation

Study objectives

- **Evaluation of state of Agile** approaches in automotive R&D (incl. beyond software development)
- **Identification of ways for successful implementation and rollout**

Interview partners*

15 Practitioners** (R&D managers)

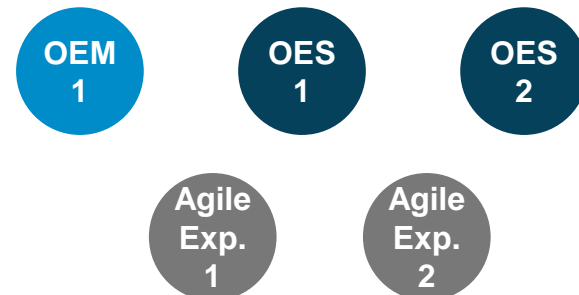
"The ones under whose responsibility Agile practices are applied"



major Tier-1 suppliers

5 Conceptionists (Process mgrs. & Agile experts)

"The ones who design and support to implement Agile practices"

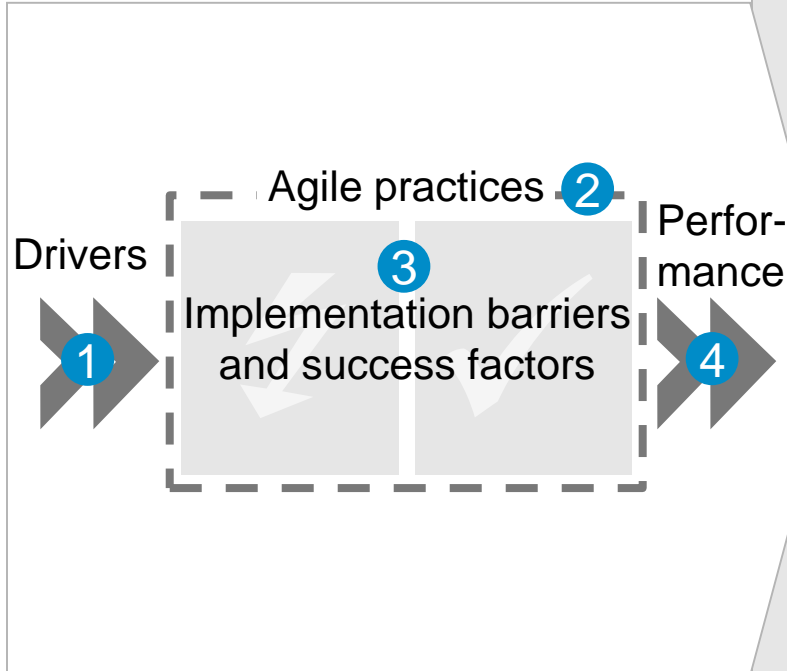


* In the following, the company logos do not necessarily represent the overall company but the view of the interviewee(s) about the company

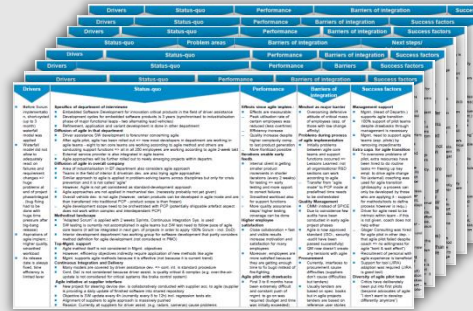
**In some companies two/three interviews have been conducted with different R&D managers. In these cases, the most representative case has been chosen for the following quantitative study results and the remaining interviews served as validation (sample size for quantitative analyses, n=14)

The study includes findings concerning drivers, Agile practices, barriers/ success factors and performance outcomes

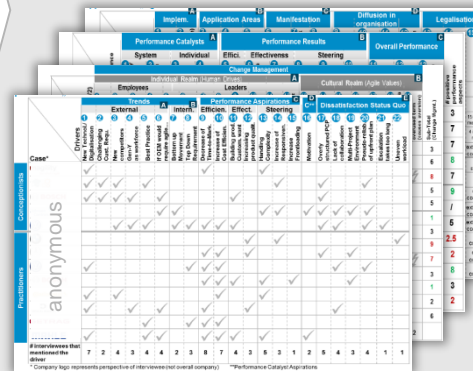
Open interview questions



Interview analysis



Interview summaries



Cross-interview matrices for every dimension

Study results

- 1 Drivers for Agile**
 - Interviewed R&D mgrs. see drivers in the fields market trends, performance aspirations & dissatisfaction with status quo.

Driver category 1: Market trends	Driver category 2: Performance aspirations	Driver category 3: Dissatisfaction with status quo
Digitization	Increase time-to-market	Overly structured R&D process landscape
New competitors	Increase cost efficiency	Lack of collaboration
Gen-Y as future workforce	Handling development complexity	Low reliability of long-term planning
- 2 Agile practices/ st.-quo**
 - Examples of agile practices and their impact on organizational agility.
- 3 Barriers/ success factors**
 - Quantitative comparison of barriers and success factors.

Barrier	Success Factor
15	8
8	4
12	7
- 4 Performance**
 - Which performance outcomes did you achieve through agile approaches?

Performance Outcome	Negative impact	Positive impact
Transparency	Low	High
Collaboration	Low	High
Innovation	Low	High
Efficiency	Low	High
Effectiveness	Low	High
Product quality	Low	High
Responsiveness	Low	High
Reduced steering effort	Low	High
Steady performance	Low	High
Overall performance	Low	High

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1 Drivers for Agile

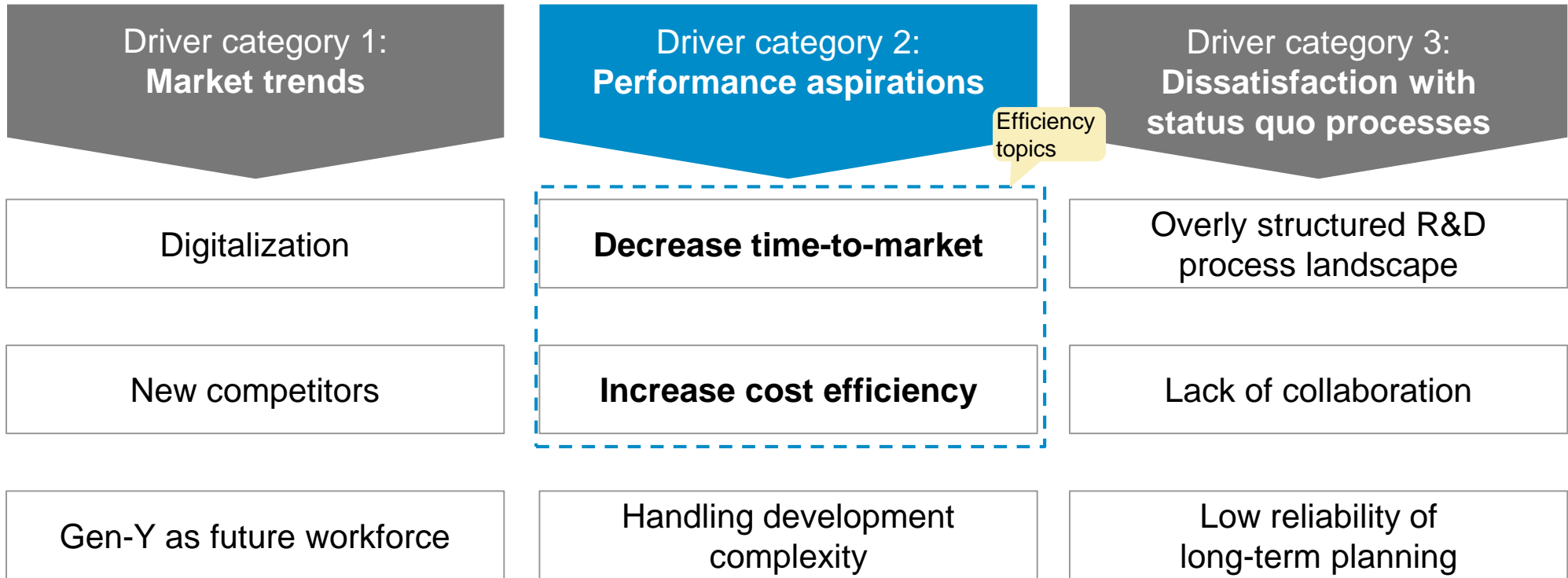
- 2 Agile practices and status quo
- 3 Implementation barriers and success factors
- 4 Performance of Agile projects
- Implications for the Corporate Journey to Agile Mastery

1 Drivers for implementation of Agile in automotive R&D

“Performance aspirations” is the most prevalent driver category - mainly efficiency instead effectiveness issues drive Agile

“What drives the consideration of implementing Agile approaches in the R&D landscape of your company?”

Top 3 drivers mentioned in each category, based on number of references by interviewees (n=15, practioners n=10; conceptionists n=5)



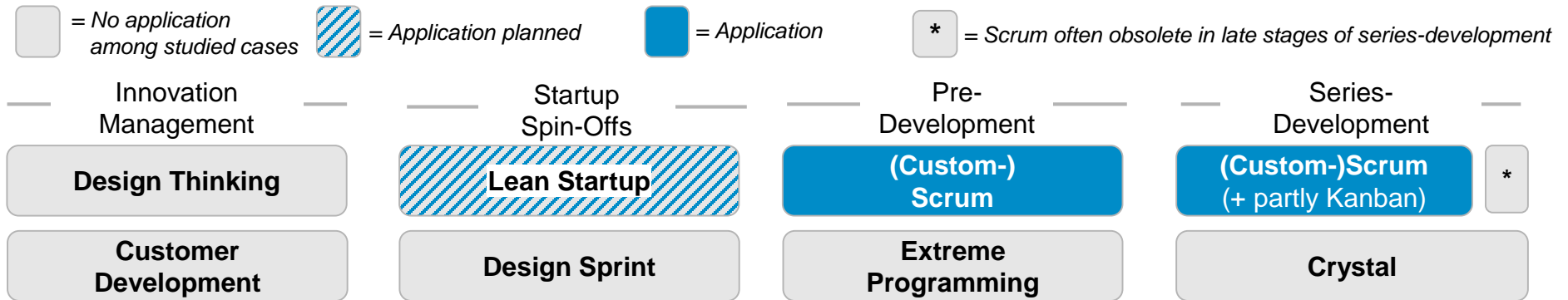
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2 Agile practices in automotive R&D value chain

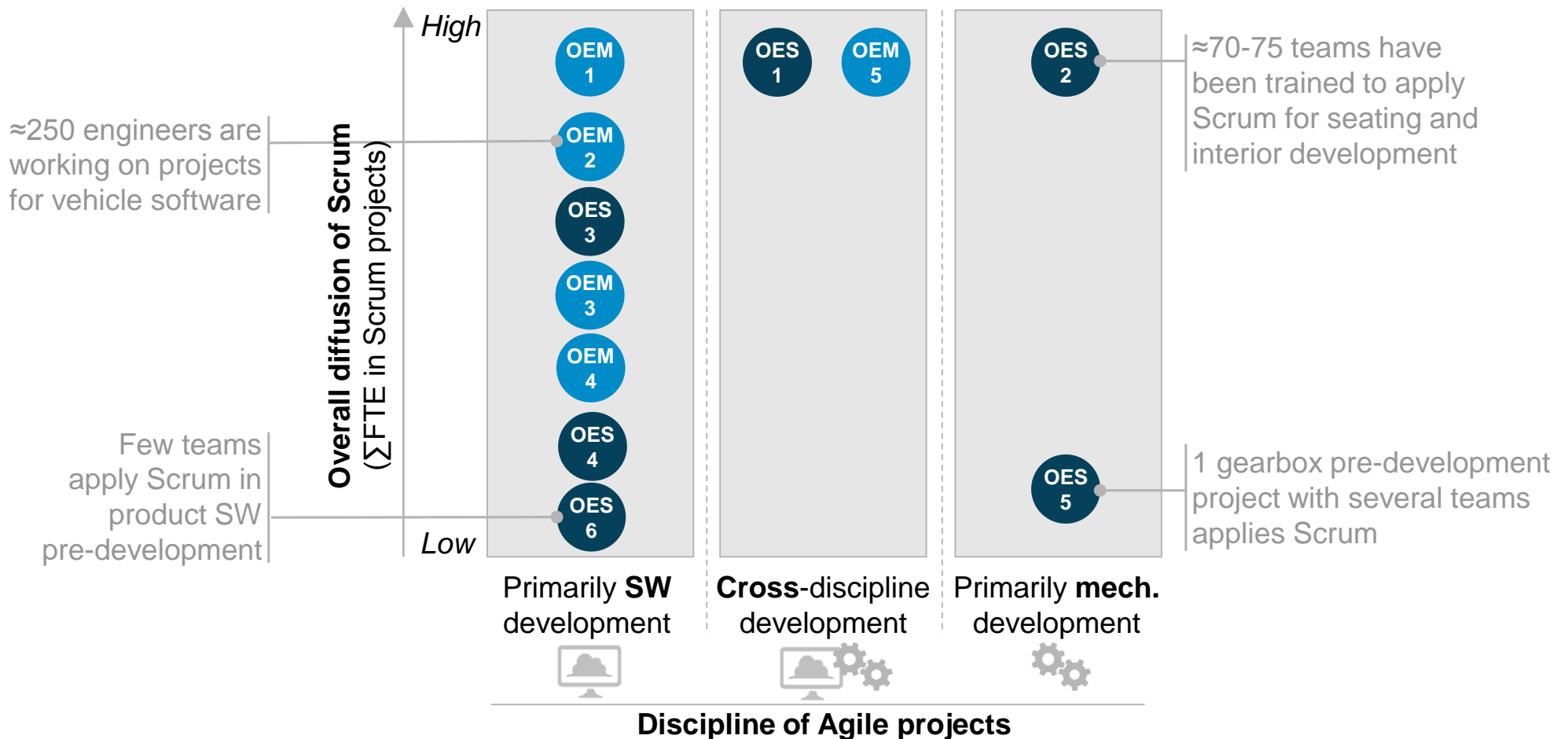
Scrum is the only diffused Agile method and is applied majorly to pre- but also series-development - plans for Lean Startup exist

“Which Agile practices are currently applied in which development cycle?”



Scrum is mostly applied for software/IT – rarely for mechanics

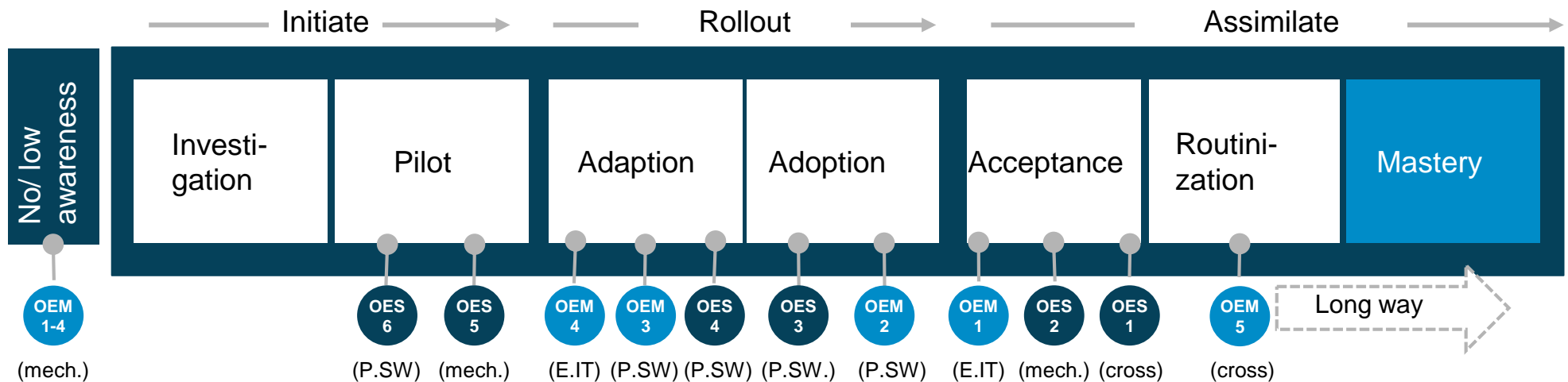
“How far is Scrum diffused in the R&D system?” & “In which disciplines is Scrum applied?”



2 Agile practices: Stages of adoption

Most companies are beyond the Agile pilot phase, however for all of them it's a long way to Agile mastery

Questions in fields like Agile awareness, mgmt.-support, standardization, organizational experience, diffusion



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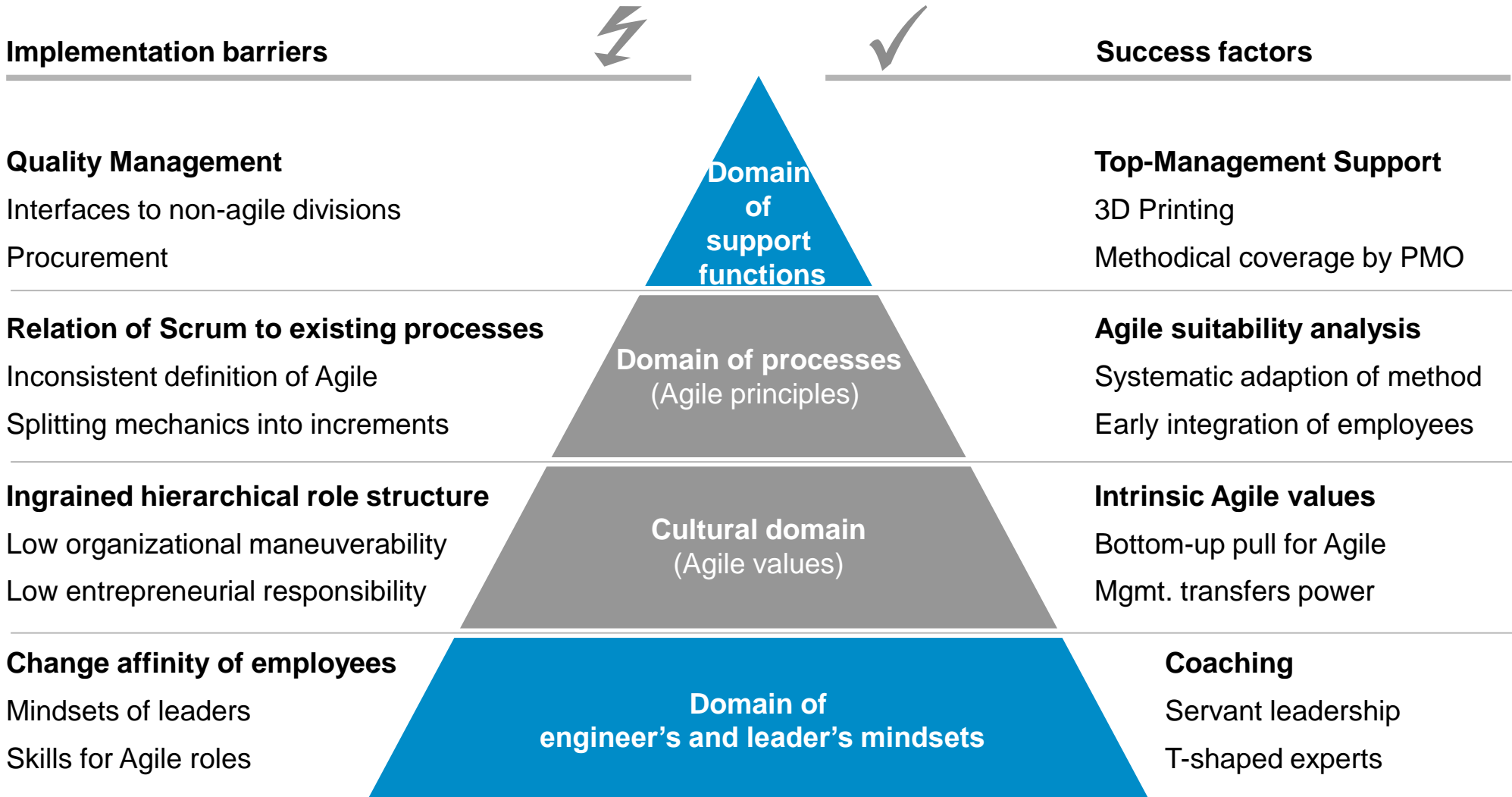
P.SW= Product software; E.IT. = Enterprise IT; cross = cross disciplinary development (mech.+software); mech. = mechanics development

Source: Phase model adopted from Christensen (2001), Strategic Management of Innovation

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Barriers and success factors in four domains to be considered



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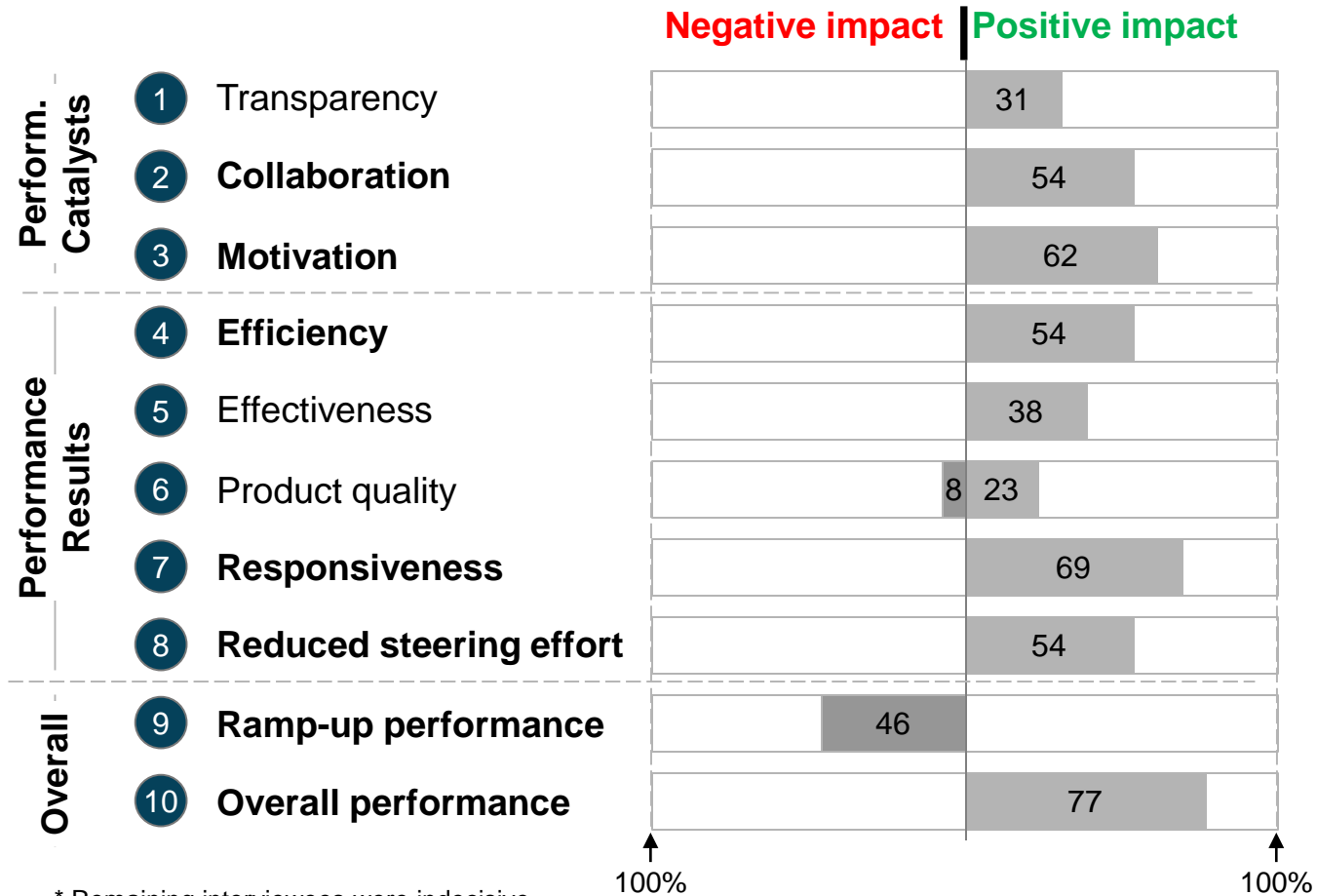
4 Performance outcomes of Agile projects

Improved transparency, collaboration & motivation enable positive performance results - often only after an incubation time

“Which performance outcomes did you achieve through Agile approaches?”

10 performance outcomes have been mentioned and were assigned to three categories

% of interviewees that mentioned negative/positive impact on performance outcome*, n=14

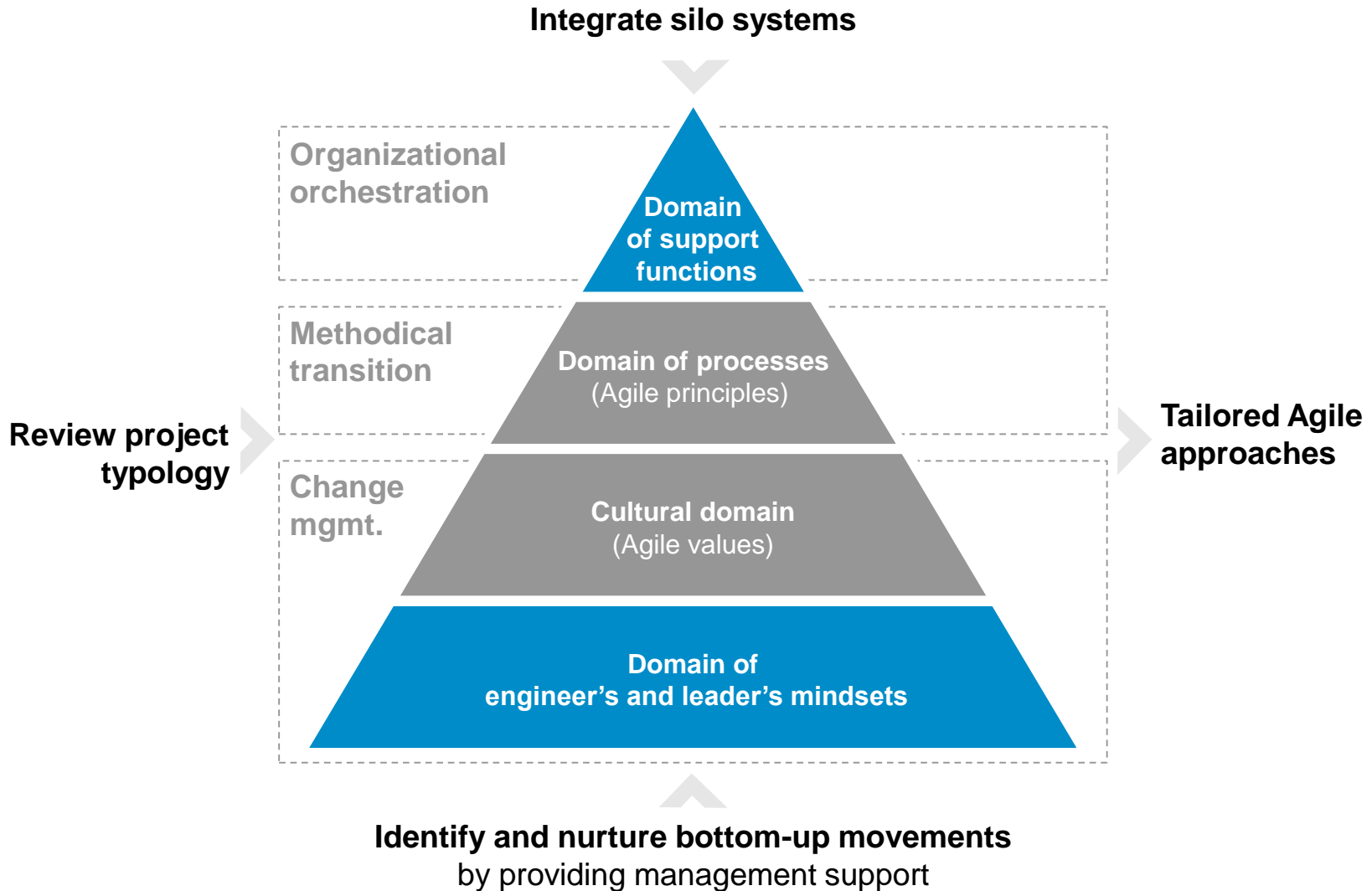


* Remaining interviewees were indecisive

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The study confirmed that Agile mastery requires a holistic approach that considers initiatives in the four domains



Our study depicts the state of Agile in automotive R&D and derives implications for the corporate journey to Agile mastery

1

Digitalization, efficiency aspirations and inflexible process landscapes drive Agile practices

2

The automotive industry is on the verge of rolling Agile approaches out into larger parts of R&D

3

First players successfully apply Scrum beyond the team level and outside software development

4

Many barriers like quality mgmt., procurement, strong hierarchies & employee`s mindsets remain

5

We have developed an implementation framework to facilitate Agile mastery on a corporate level

