

Empirical studies to identify challenges and probe good practices in the adoption of scaled agile methods in the field of vehicle dynamics development of an OEM

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Outline



Motivation

Research Questions

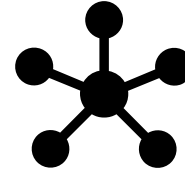
Approach

Case Study

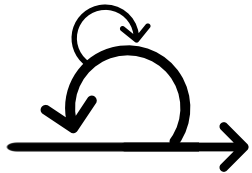
Roadmap



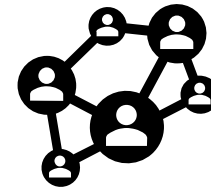
Inflexible traditional software development methods [1]



Agile methods were initially designed for small, individual & co-located teams [3]



Agility & Flexibility [2]



Large scaled Agile IT Organizations [1]



Quickly changing business environment [1]



Challenges [4]

[1] Papadopoulos, G. (2015). [2] Highsmith, J. A. (2002). [3] Dingsøyr, T., Nerur, S., Balijepally, V., & Moe, N. B. (2012). [4] Uludag, O., Kleehaus, M., Caprano, C., & Matthes, F. (2018).

1

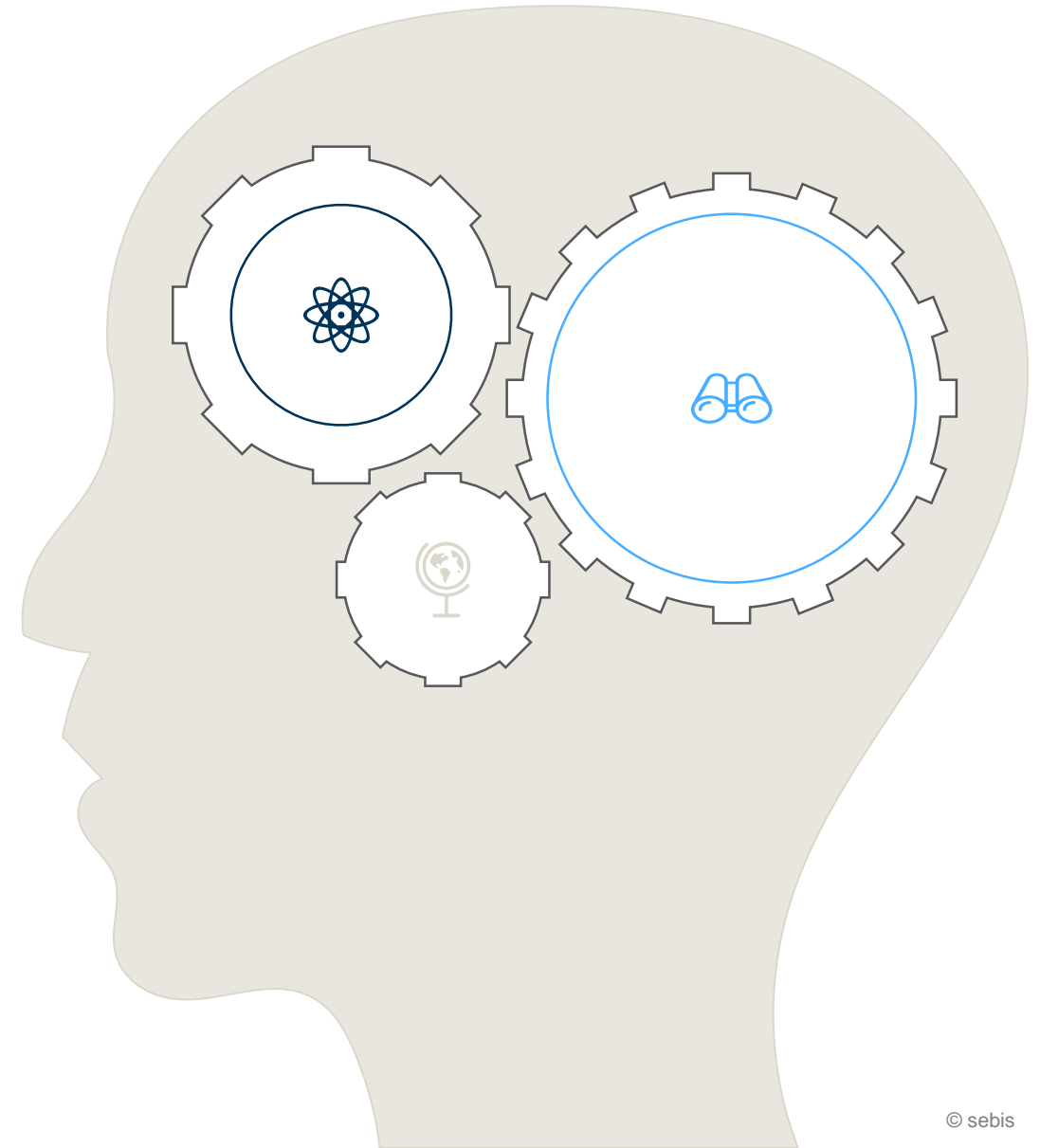
How does the large-scale agile transformation take place at the case organization?

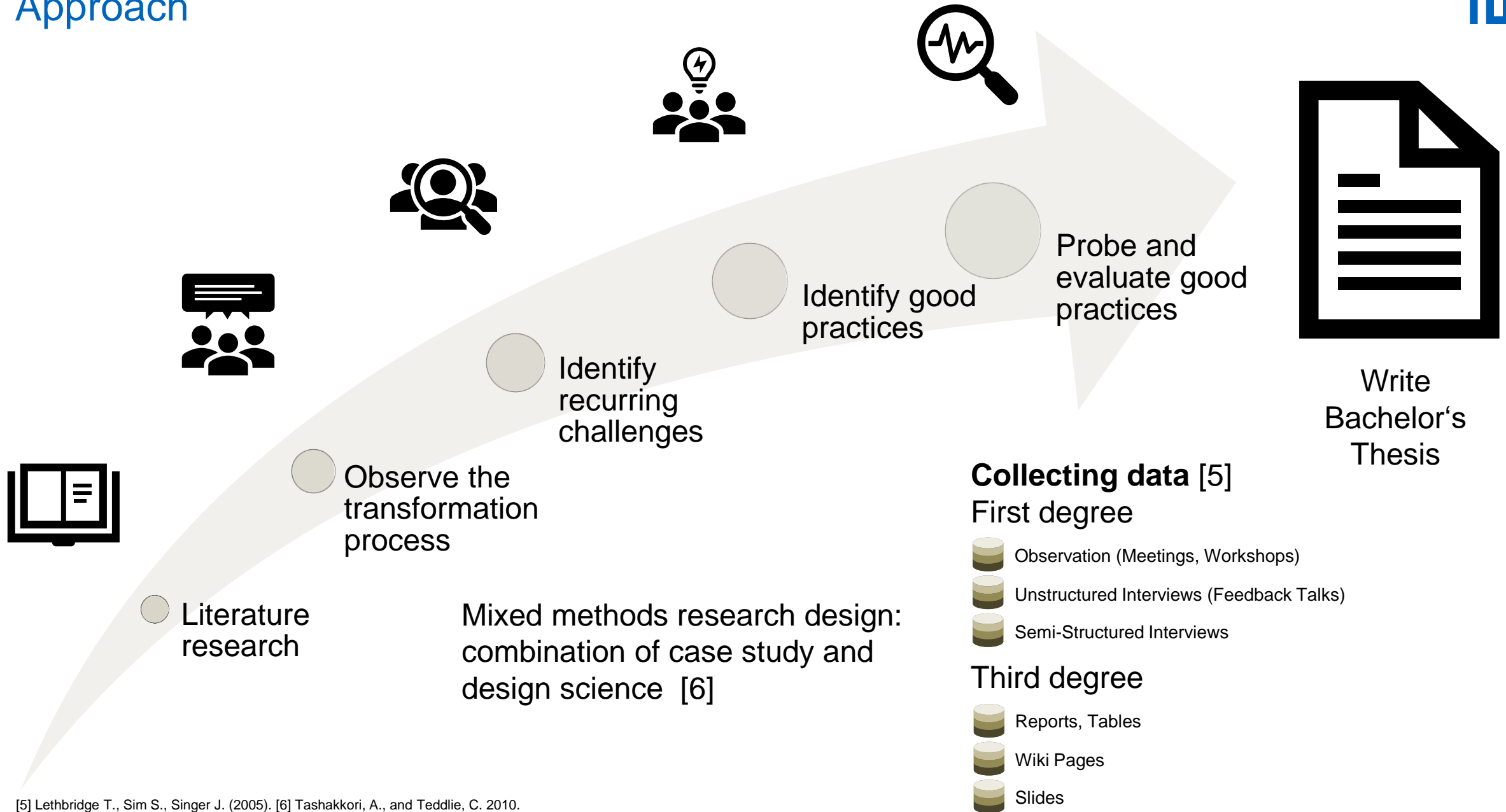
2

What are challenges and success factors within the large scale agile transformation at the OEM?

3

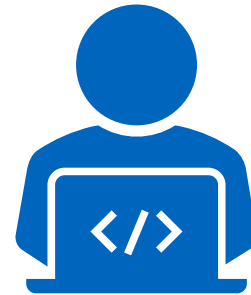
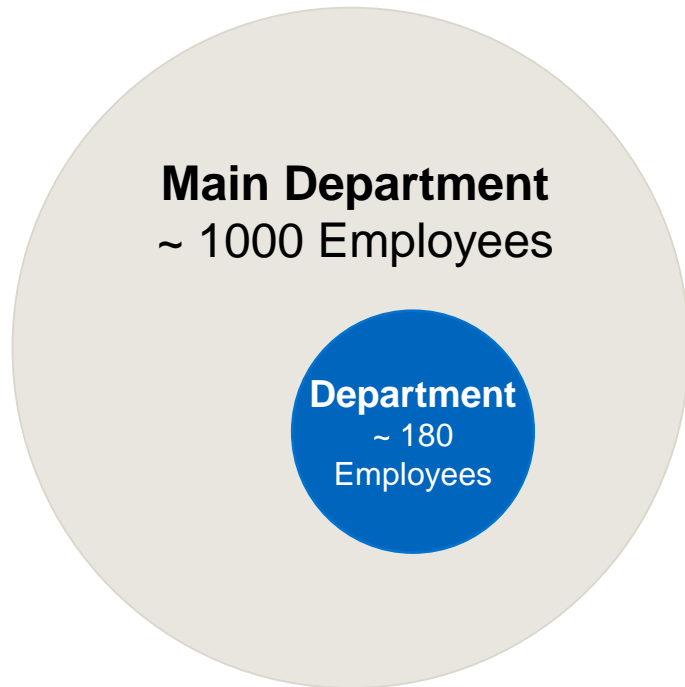
What are good practices to address the observed challenges within the large scale agile transformation at the OEM?



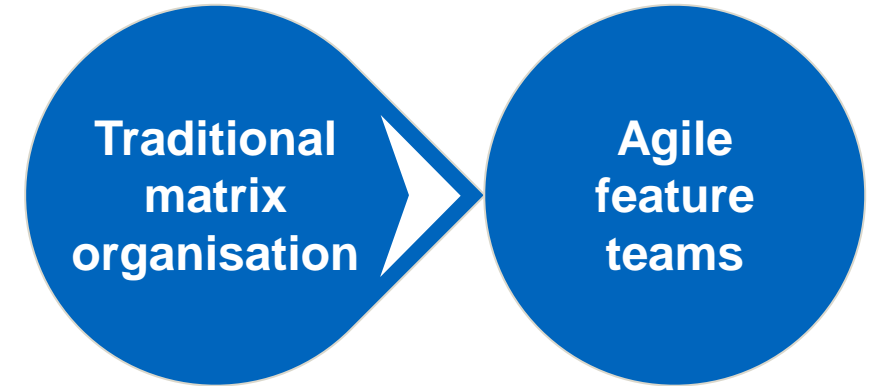


[5] Lethbridge T., Sim S., Singer J. (2005). [6] Tashakkori, A., and Teddlie, C. 2010.

Case Study - Vehicle dynamics development



Mainly producing software for intern stakeholders

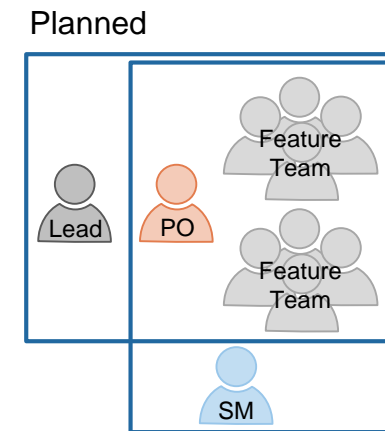
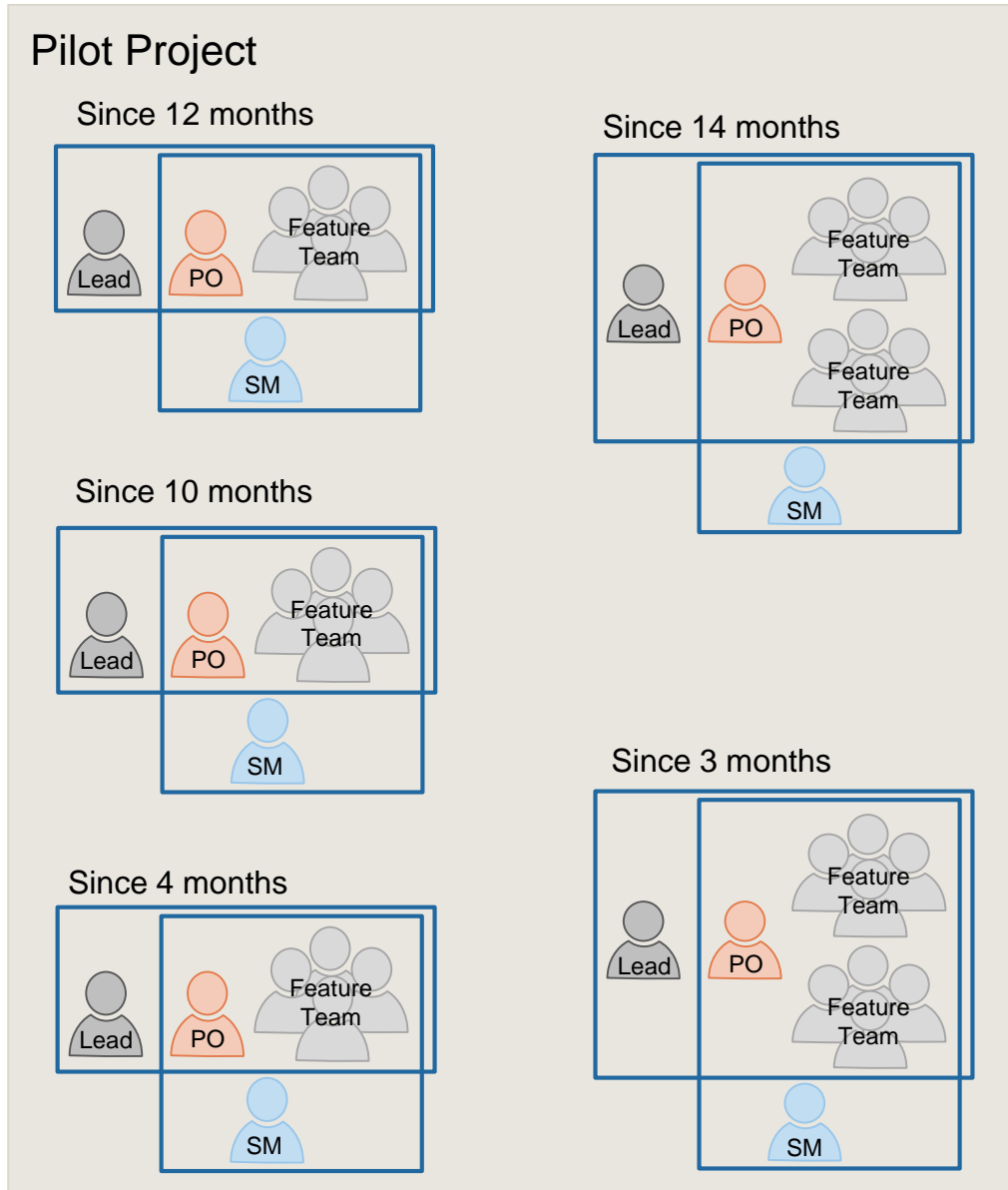


Transformation

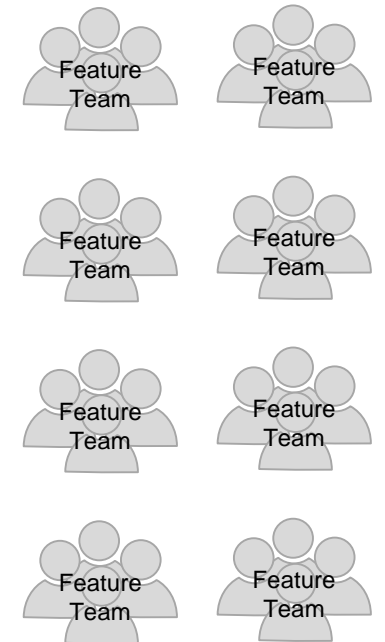
Goal: 100% agile

Case Study - Transformation

- Goal:
- 17 Feature Teams
- 9 Leads
- 9 Product Owner
- 8 Scrum Master



In Planning



Case Study - Current Challenges [4]

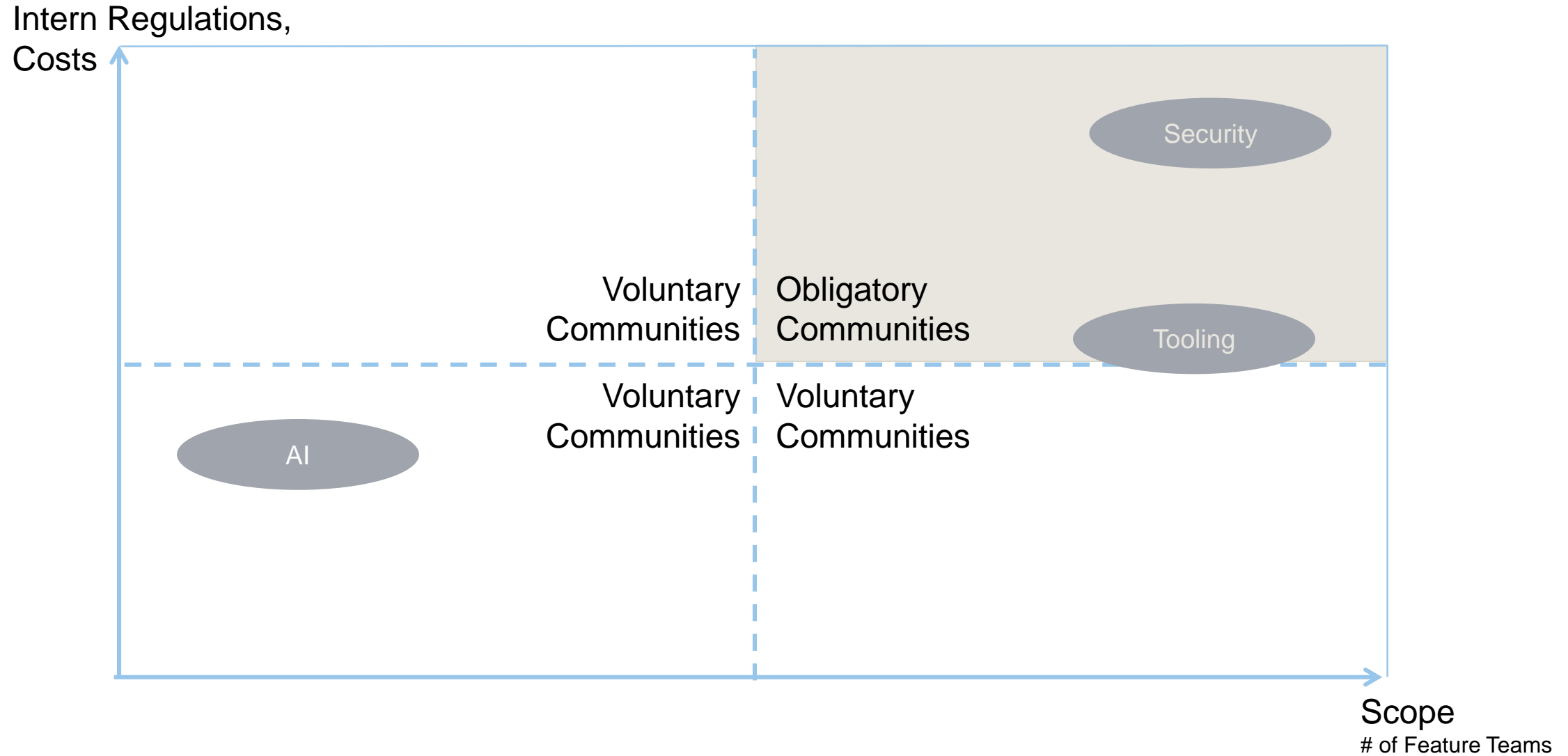
Id	Name	Category
C-2	Considering integration issues and dependencies with other subsystems and teams	Software-Architecture
C-4	Dealing with doubts in people about changes	Culture & Mindset
C-5	Facilitating shared context and knowledge	Knowledge Management
C-7	Dealing with incorrect practices of agile development	Methodology
C-10	Creating precise requirement specifications for the development team	Requirements Engineering
C-13	Sharing common vision	Knowledge Management
C-18	Splitting large and complex requirements into smaller requirements	Requirements Engineering
C-20	Facilitating communication between agile teams and other teams using traditional practices	Communication & Coordination
C-21	Managing dependencies to other existing environments	Enterprise Architecture
C-24	Creating team spirit and trust among agile teams	Culture & Mindset
C-26	Aligning and communicating architectural decisions	Software-Architecture
C-27	Managing and sharing knowledge about system components and their dependencies with stakeholders	Enterprise Architecture
C-28	Communicating business requirements to development teams	Requirements Engineering
C-38	Facilitating standardization across agile teams	Enterprise Architecture
C-45	Dealing with black and white mindsets	Culture & Mindset
C-46	Dealing with closed mindedness	Culture & Mindset
C-52	Providing agile teams appropriate automation and scalable infrastructure	Tooling
C-58	Dealing with loss of management control	Culture & Mindset
C-59	Establishing a common understanding of agile thinking and practices	Methodology
C-60	Creating and estimating user stories	Requirements Engineering
C-65	Dealing with office politics	Culture & Mindset
C-71	Measuring the success of the large-scale agile development program	Project Management
C-76	Coordinating tests and deployment with external parties	Quality Assurance

Best Practice:
Communities of
Practice [7]

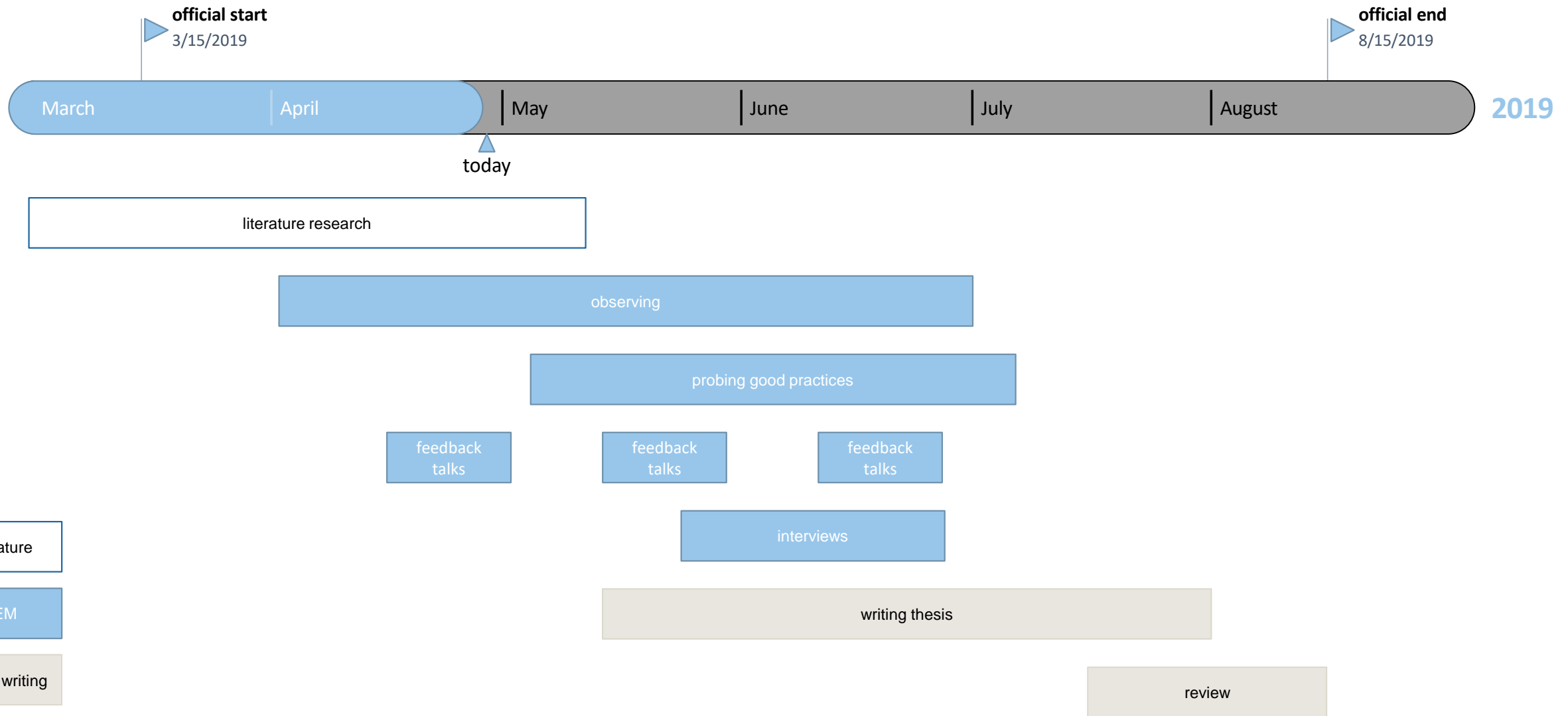
Good Practice:
Change the
mindset through
trainings &
workshops
[8]

[4] Uludag, O., Kleehaus, M., Caprano, C., & Matthes, F. (2018). [7] Paasivaara, M., & Lassenius, C. (2014). [8] Dikert, K., Paasivaara, M., & Lassenius, C. (2016).

Case Study - Communities of Practice in the Agile Architecture Decision-Making Model [9]



Roadmap



- [1] Papadopoulos, G. (2015). Moving from Traditional to Agile Software Development Methodologies Also on Large, Distributed Projects. *Procedia - Social and Behavioral Sciences*, 175, 455–463.
- [2] Highsmith, J. A. (2002). *Agile Software Development Ecosystems*.
- [3] Dingsøyr, T., Nerur, S., Balijepally, V., & Moe, N. B. (2012). A decade of agile methodologies: Towards explaining agile software development. *Journal of Systems and Software*, 85(6), 1213–1221.
- [4] Uludag, O., Kleehaus, M., Caprano, C., & Matthes, F. (2018). Identifying and Structuring Challenges in Large-Scale Agile Development Based on a Structured Literature Review. *2018 IEEE 22nd International Enterprise Distributed Object Computing Conference (EDOC)*, 191–197.
- [5] Lethbridge TC, Sim SE, Singer J (2005). Studying software engineers: data collection techniques for software field studies. *Empir Softw Eng* 10(3):311–341.
- [6] Tashakkori, A., and Teddlie, C. 2010. *Sage Handbook of Mixed Methods in Social & Behavioral Research*, Thousand Oaks: Sage Publications.
- [7] Paasivaara, M., & Lassenius, C. (2014). *Communities of practice in large distribution agile software development organizations*. *Information and Software Technology*, 56(12), 1556-1577.
- [8] Dikert, K., Paasivaara, M., & Lassenius, C. (2016). Challenges and success factors for large-scale agile transformations: A systematic literature review. *Journal of Systems and Software*, 119, 87–108.
- [9] Uludag, Ö.; Reiter, N.; Matthes, F. (2020): Improving the Collaboration between Enterprise Architects and Agile Teams: A Multiple-Case Study. In: Zimmermann, A.; Schmidt, R.; Lakhmi, C. J. (eds) *Architecting the Digital Transformation*, Springer-Verlag.



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