

Assessing the Adoption of Large Scale Agile in an Industrial Setting

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Motivation

Methodology

The Proposed Maturity Model

Evaluation

Key Findings & Outlook

Motivation – I (Recap)



Agile is proven to be working for small teams.



Before adopting a framework, a uniform model for identifying the current state is essential.[1]



There is lack of research on how frameworks are adopted in practice.[2]

¹ Turetken et al. (2016): Assessing the adoption level of scaled agile development: a maturity model for Scaled Agile Framework

² Paasivaara (2017): Adopting SAFe to Scale Agile on a Globally Distributed Organization

Motivation – II (Recap)



 Initial scaling approaches degrade development flexibility, increase dependencies between development teams which conflicts with the core agile development values.[3]



Assessing the status of units' scaled agile adoption



Identifying challenges and success patterns in early – late adopters



Establishing a shared vocabulary

Motivation – III (Recap)

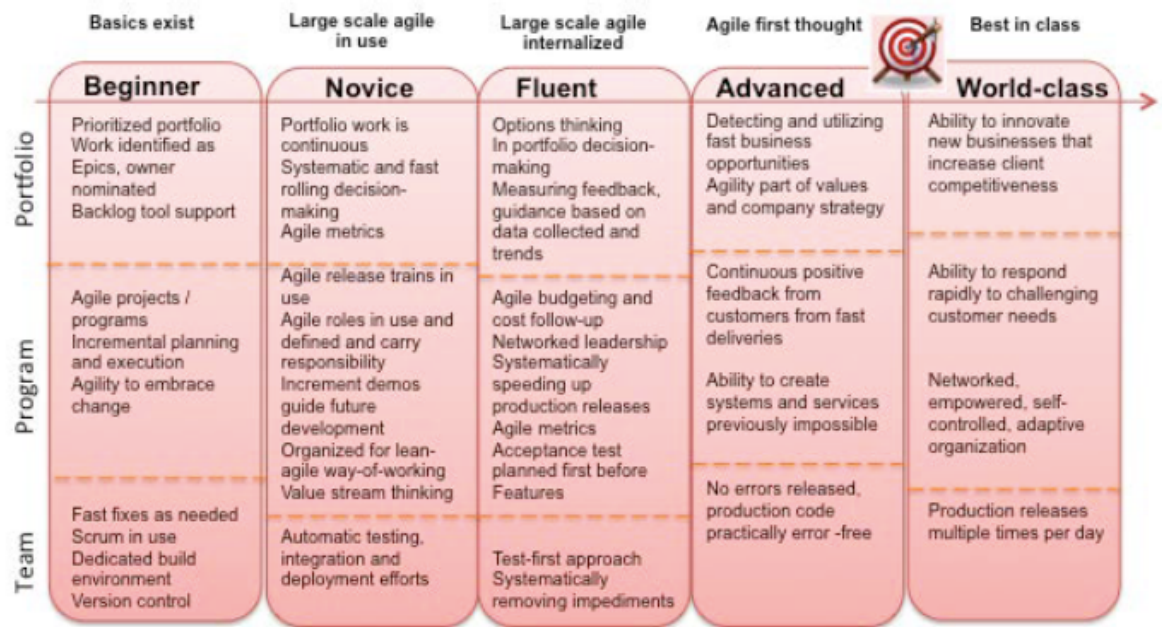


Figure 1: Agile Transformation Model [5]

Level 5 Encompassing	L5P3 (L)		L5P5* (L)		L5P7 (L)		L5P2* (P)		L5P4 (P)		L5P6 (P)		L5P8* (P)		L5P9 (P)		L5P1 (N)											
Level 4 Adaptive	L4P2 (L)		L4P5 (L)		L4P6* (L)		L4P7* (L)		L4P8* (L)		L4P9 (L)		L4P10 (L)		L4P1 (P)		L4P3* (P)		L4P4 (P)		L4P11 (N)							
Level 3 Effective	L3P7* (F)	L3P1* (L)	L3P5* (L)	L3P15 (L)	L3P2 (P)	L3P3 (P)	L3P4* (P)	L3P8* (P)	L3P9 (P)	L3P10 (P)	L3P11* (P)	L3P12 (P)	L3P13 (P)	L3P14 (P)	L3P17* (P)	L3P18* (P)	L3P6* (N)	L3P16* (N)										
Level 2 Evolutionary	L2P6* (F)		L2P8* (F)		L2P9 (F)		L2P4 (L)		L2P11 (L)		L2P1 (P)		L2P3* (P)		L2P5** (P)		L2P10* (P)		L2P12 (P)		L2P13** (P)		L2P14 (P)		L2P2* (N)		L2P7* (N)	
Level 1 Collaborative	L1P4 (F)		L1P6 (F)		L1P9** (F)		L1P10 (F)		L1P3 (L)		L1P5 (L)		L1P8* (L)		L1P1 (P)		L1P7 (P)		L1P2 (N)									

* SAFe practices that scale to enterprise level and that have been introduced with the Delphi study (pure SAFe Practices)
** SAMI practices that were changed and adopted

	(F) → Fully achieved	(L) → Largely achieved	(P) → Partially Achieved	(N) → Not Achieved	Total # of practices
Original SAMI practices	11%	31%	49%	9%	35
(Pure) SAFe Practices*	13%	29%	42%	17%	24
Adopted SAMI practices**	33%	0%	67%	0%	3
Total	13%	29%	47%	11%	62

Figure 2: SAFe Maturity Model [6]

- ! Assessment of different categories are not represented
- ! Framework specific

- ! “We were able to involve only two members of the company”
- ! Framework specific

5 Laanti (2017): Agile Transformation Model for Large Software Development Organizations
6 Stojanov, Turetken, (2015): A Maturity Model for Scaling Agile Development)



RQ1: What are important categories for assessing the success level of scaled agility adoption?



RQ2: How to design a maturity model that can be used as a guideline by large organizations to adopt scaled agility and assess the success level of their scaled agility adoptions?



RQ3: What are the characteristics of mature and successful scaled agility adoptions at the corporate level?

Motivation

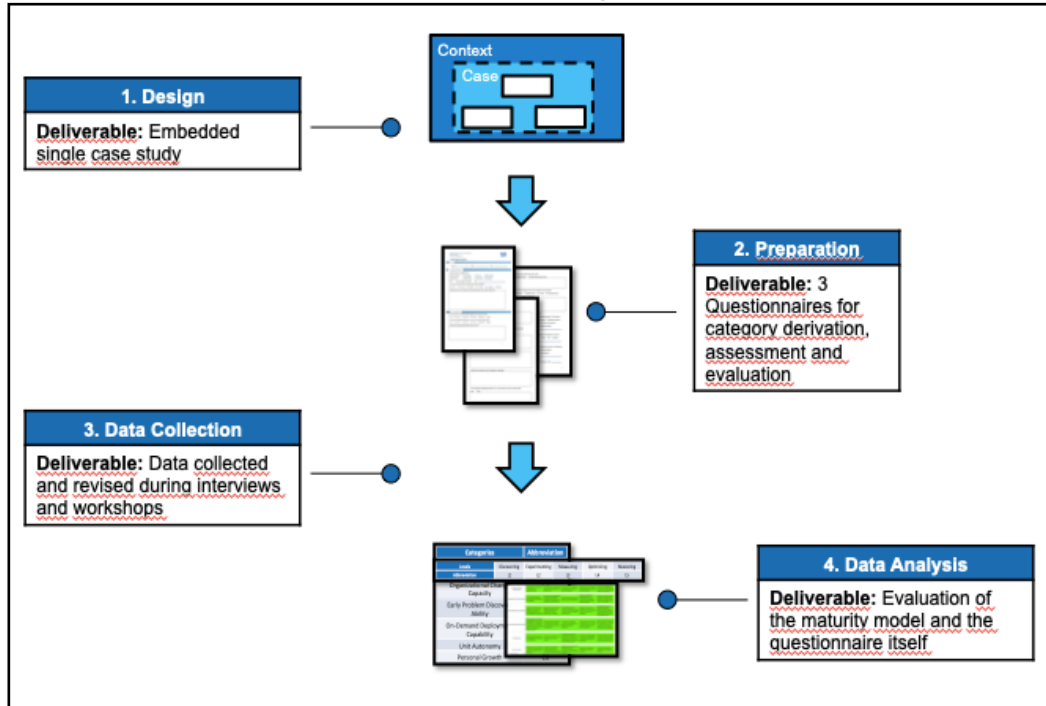
Methodology

The Proposed Maturity Model

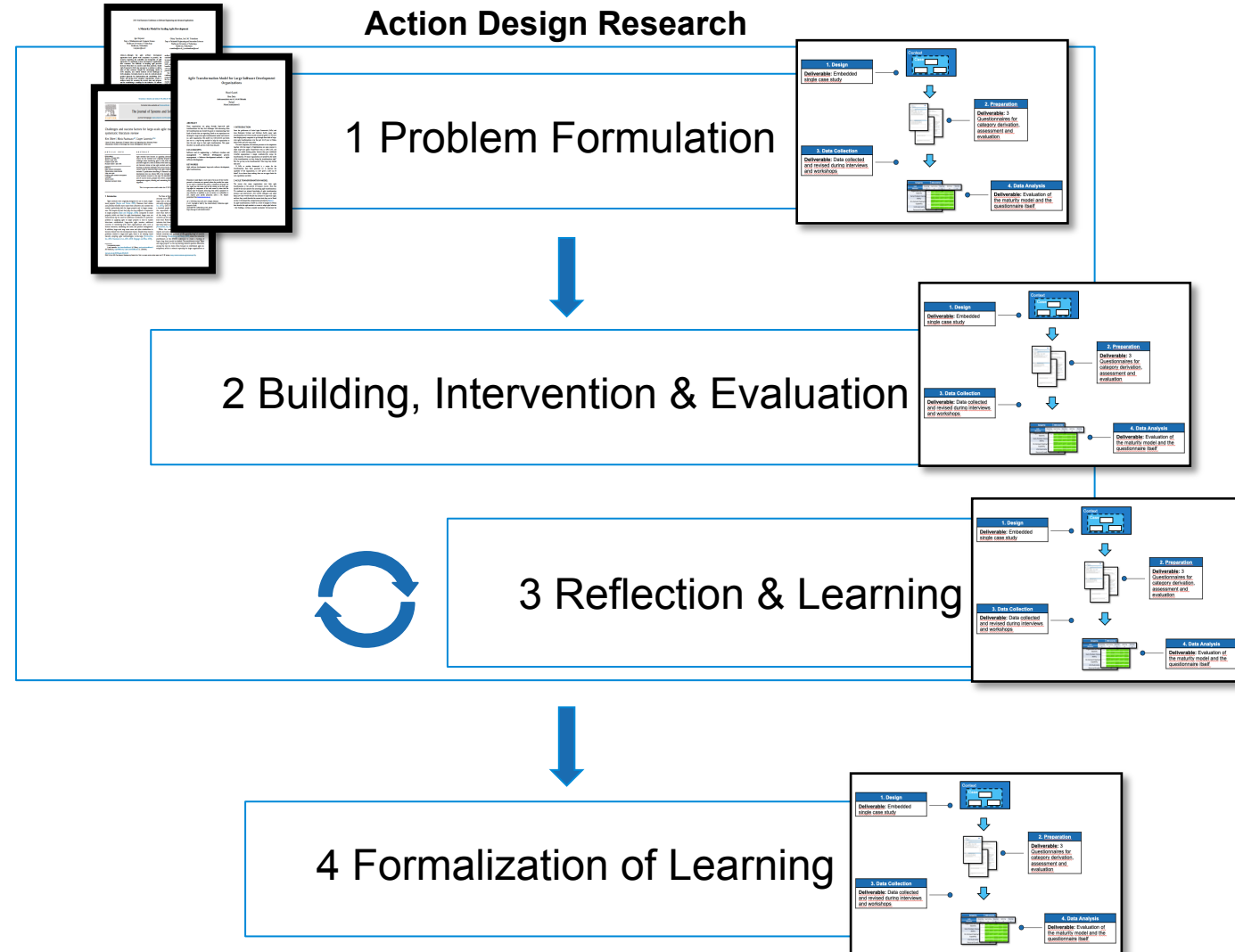
Evaluation

Key Findings & Outlook

Case Study



Action Design Research



7 Runeson and Höst, (2007): Guidelines for conducting and reporting case study research in software engineering

8 Sein et al. (2011): Action Design Research

Agenda



Motivation

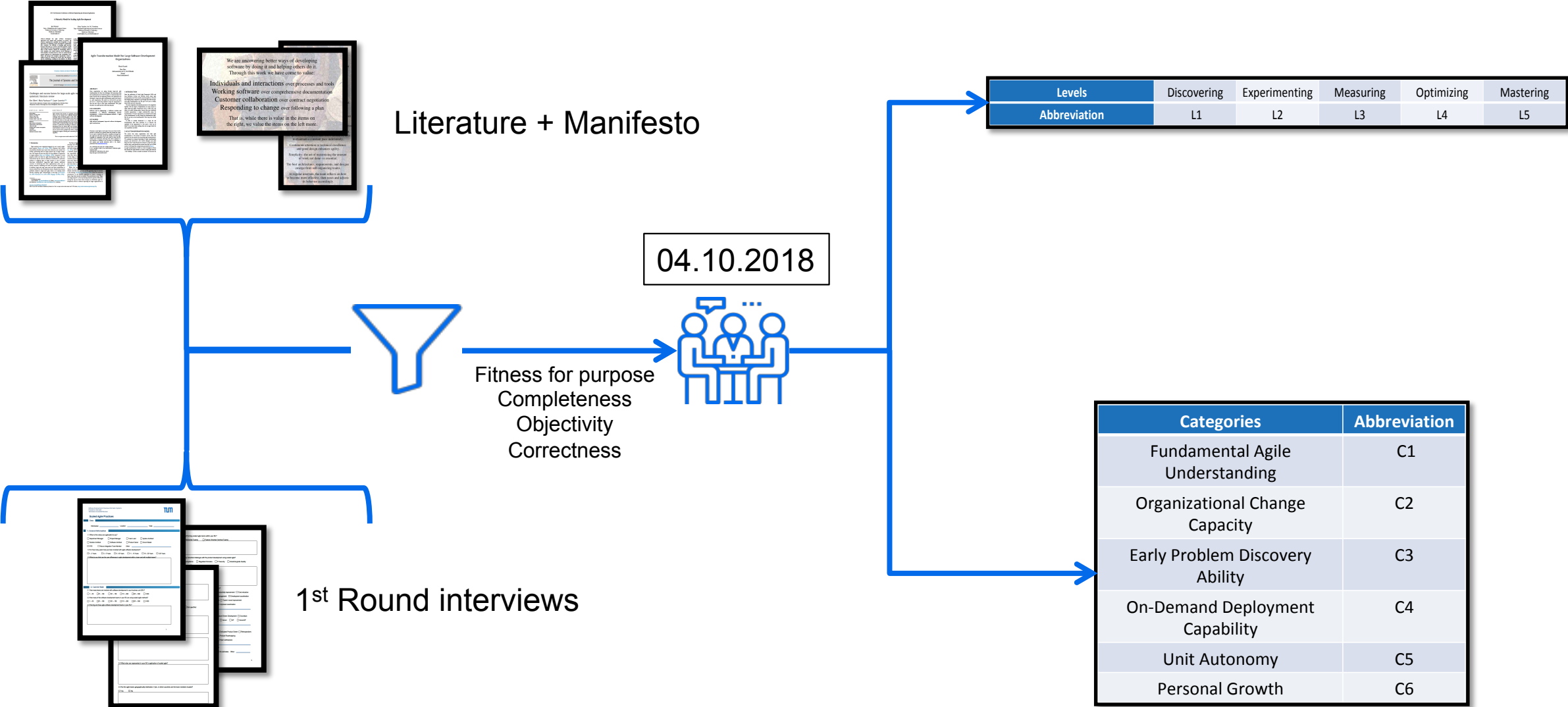
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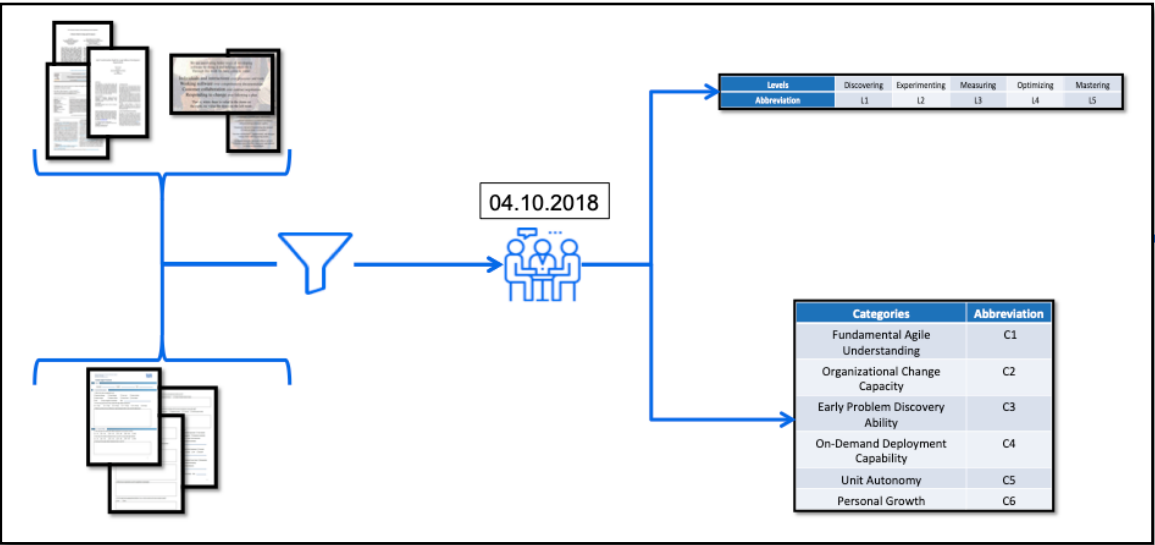
Evaluation

Key Findings & Outlook

Maturity Model Development



Maturity Model Development



13.11.2018



Fundamental Agile Understanding	The need for agile is understood at an organizational level. Agile practices are started to be used within the organization in different units. The outcomes and impact of agile practices are evaluated based on feedback.	Agile practices are continuously being improved with respect to the business results.	It is clear for an organization that becoming agile is a real matter and the ultimate goal is continuous improvement.
Organizational Change Capacity	Change is understood as a challenge across the organization. Results of embracing change is visible within the organization.	Change is supported as a challenge across the organization. Results of embracing change is visible within the organization.	Change is supported as a challenge across the organization. Results of embracing change is visible within the organization.
Early Problem Discovery Ability	Customer commitment and understanding is the important. Agile practices as well as the feedback mechanisms are implemented to be important.	Close collaboration with customer is ensured with the requirements and identify deviations early.	Problems are used to be identified in order to be resolved in time. The process to become more predictable.
On-Demand Deployment Ability	Ability to release on demand is demonstrated to the market. Agile practices as well as the feedback mechanisms are implemented to be important.	The outcomes of practice alternative practices enable effective and efficient deployment.	Control loops are established in the organization. The process to become more predictable.
Unit Autonomy	Empowering self-organizing teams is demonstrated to the market. Agile practices as well as the feedback mechanisms are implemented to be important.	Individuals are enabled in terms of their autonomy. They are motivated.	Units become self-organizing and decision-making ability is demonstrated within the organization.
Personal Growth	The importance of commitment is demonstrated to the market. Agile practices as well as the feedback mechanisms are implemented to be important.	Coaching and training are implemented to the market. Agile practices as well as the feedback mechanisms are implemented to be important.	Coaching and training are implemented to the market. Agile practices as well as the feedback mechanisms are implemented to be important.

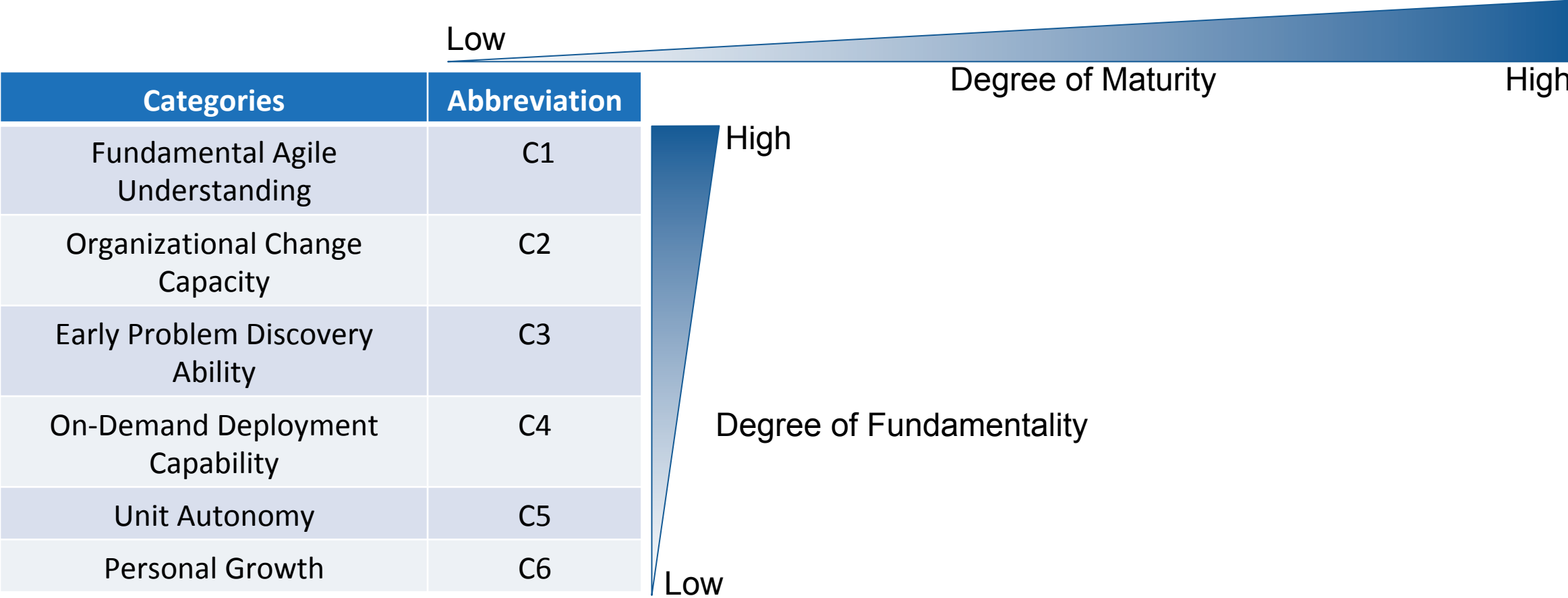
Maturity Model Level Descriptions

Fundamental Agile Understanding	Organizational Change Capacity	Early Problem Discovery Ability	On-Demand Deployment Ability	Unit Autonomy	Personal Growth
Organizational Change Capacity	Early Problem Discovery Ability	On-Demand Deployment Ability	Unit Autonomy	Personal Growth	
Early Problem Discovery Ability	On-Demand Deployment Ability	Unit Autonomy	Personal Growth		
On-Demand Deployment Ability	Unit Autonomy	Personal Growth			
Unit Autonomy	Personal Growth				
Personal Growth					

Maturity Model Artifacts

The Proposed Maturity Model

Levels	Discovering	Experimenting	Measuring	Optimizing	Mastering
Abbreviation	L1	L2	L3	L4	L5



Level Elicitation

	Discovering	Experimenting	Measuring	Optimizing	Mastering
Fundamental Agile Understanding	The need/intention for agile is clearly stated on an organizational level	Agile practices are started to be used within the organization in different units	The outcomes and impacts of agile practices are evaluated based on feedbacks	Agile practices are continuously being improved with respect to the business needs	It is clear for an organization that becoming fully Agile is not realistic and the ultimate goal is continuous improvement
Organizational Change Capacity	The essential role(need) of change in agile methodology is acknowledged	Change embracing (practices) starts gaining importance throughout the organization as opposed to avoiding change	Results of embracing change is visible within the organization	Change is supported as a facilitating element for becoming a vision-aligned organization with a change embracing mindset	Servant and transformational leadership is carried out to facilitate trust-based change within the organization
Early Problem Discovery Ability	Customer commitment and collaboration as well as the feedback mechanisms are acknowledged to be important	Agile practices as well as the feedback mechanisms are actively used for early identification of problems	Close collaboration with customer is existing to evaluate the requirements and identify deviations early	Problems are aimed to be identified in order for the entire process to become more predictable	Early problem discovery is enabled through short feedback cycles resulting in predictive quality levels in all stages (Production cycle or in the organization level)
On-Demand Deployment Ability	Ability to deliver on-demand is acknowledged to be crucial for scaling agile in an organization and commitment to integrate and deliver into close-to-reality systems as defined in the strategy, is visible	Pipeline automation practices are integrated into multiple units and continuous X is part of the deployment	The outcomes of pipeline automation practices enable effective and efficient deployment	Control loops are evolved into multi level and non - dev tasks are differentiated from dev tasks in deployment	Ability to release on demand is being achieved, non-dev tasks are understood to be part of deployment and multi-level control loops are established
Unit Autonomy	Having self-organizing teams is acknowledged to be important in an organization	Individuals are enabled in terms of the processes they are involved	The degree of autonomy is measured, dependencies to the other teams are understood and integrated in the process to evaluate and guide units	Units become self-organizing and decision making ability is percolated down within the organization	Control and decision-making is within the unit and the entity for decision-making is the one closest to the value creation
Personal Growth	The importance of commitment to individual and organizational growth w.r.t Agile Principles is emphasized	Coaching and trainings are conducted among units towards personal growth and to empower agile methodology	Feedbacks from individuals are attributed with high importance to create basis for efficient and effective learning experience	Coaching and trainings are adapted to the needs of individuals	Coaching and trainings are reduced down to essentials (Shuhari)

Level Elicitation

	Discovering	Experimenting	Measuring	Optimizing	Mastering
Fundamental Agile Understanding	•Renamed rooms •Posters •Townhall meetings •Presentations	•Pair programming •Daily standups •Retrospectives •Cross functional teams •User stories	•Impediment boards •Evaluated feedbacks •Discarded feedbacks •Feedbacks put in the backlog	•Evidence of improvement for visible problems •Employee Satisfaction surveys •Customer satisfaction surveys	•Evidence for discontinued practices •Introduced new practices •<u>Description, introduction and experimentation</u> reasonings
Organizational Change Capacity	•Vision and Mission statements highlighting change, •Organization states it is open to change for finding new domains, new markets	•Existing incentives •Introduced change instruments •Mindset shift to embracing change •Complete change attempts	•Before/After states are visualized as snapshots	•Product oriented budgeting •Value streams	•Spin-offs •Transformational leadership •Shared management roles within the organization •Shared management roles of the organization
Early Problem Discovery Ability	•Defined Product Owner role is as a proxy to the customer	•System demos •Dashboards •Use-cases •PO is integrated in the team •Close customer collaboration •In use testing pyramid	•Co-located development team & business stakeholders •Development team meets the business stakeholders with certain intervals •Testing pyramid is structured	•Quality assurance, •Testing pyramid is being improved (Ideally with more/better unit tests) •Reducing necessary system tests	•Mutation testing •Evidence of defined new ways for discovering problems early •Quality prediction
On-Demand Deployment Ability	•Potentially shippable product is mentioned •Continuous deployment is strategically mentioned	•Evident CI, CD, CTesting tools & technologies •Definition for releases exist •Product releases •Delivering as frequent as defined in the strategy is being	•Infrastructure as code •Value stream analysis •Deployment footprint is decreased •Practices are reliable, feasible, sustainable, cost-efficient	•Maximizing the customer value as a goal •Multi platform deployments •Deployments to heterogeneous environments	•Integration into higher - level systems •Systematically looking for new deployment challenges such as security •Systematically addressing new
Unit Autonomy	•Strategies toward non-silo teams are reflected and visible •Org-chart reflects intention toward product / value stream / flow oriented unit structures	•Feature teams •Value stream oriented units •Concrete unit purpose •Visible outcomes of dependency reductions	•Well defined role-skill pairs •Units have their own value stream / delivery pipeline •Dependencies regarding the product (architecture), infrastructure (pipeline), people(skills) are clear	•Automated boundary checks •Enabling independent teams •Quality models are represented with code •Systematically covering all dependencies and reducing them, handling complexity	•Decentral decision making •Capability for forging a new value stream •Highly independent system, ideally only one unit •Changing architecture •Proactive complexity avoid-
Personal Growth	•Strategy papers •Trainings are mentioned •Coaching is discussed, planned	•Needed crafts are being identified •Ongoing certificate •Ongoing coachings	•People become teachers by example •Key senior education programs •Monitoring education	•People become teachers based on systematic and efficient methods •Technologies are continuously adopted	•Methods for creating new methods are evaluated •Teachings for creating new crafts •Preparations for teachings and

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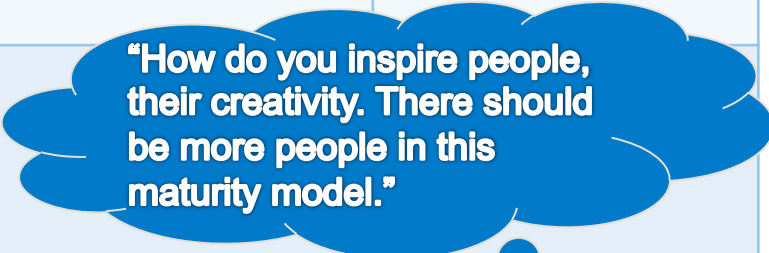
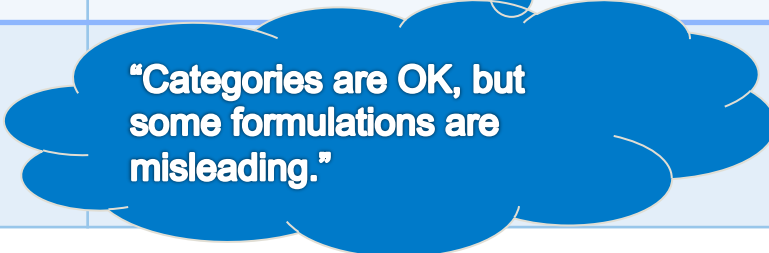
Evaluation

Key Findings & Outlook

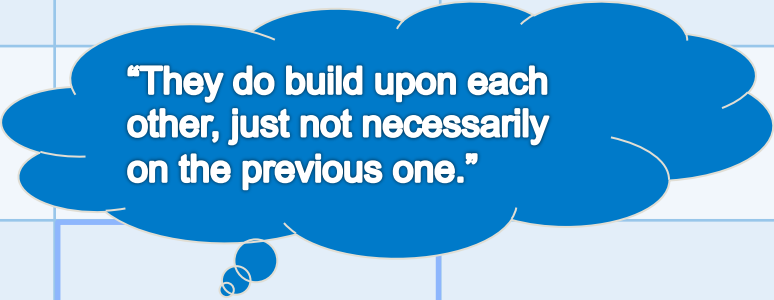
Evaluation - Categories

Questions	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
In my opinion, categories are easy to understand.	Strongly Agree	Agree	Agree	Agree
How would you evaluate the <u>relevance</u> of the categories, to agile software development at large scale ?	Highly Relevant	Highly Relevant	Relevant	Relevant
How would you evaluate the <u>completeness</u> of the categories?	Very Complete	Very Complete	Neither - Nor	Rather Complete
Do you think that there is an important concept missing?	Yes	No	Yes	Yes
Do you agree that, each category builds upon the previous one?	Agree	Disagree	Disagree	Agree

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Questions	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
In my opinion, categories are easy to understand.	Strongly Agree	Agree	Agree	Agree
How would you evaluate the <u>relevance</u> of the categories, to agile software development at large scale ?	Highly Relevant	Highly Relevant	Relevant	Relevant
How would you evaluate the <u>completeness</u> of the categories?		Very Complete		
Do you think that there is an important concept missing?	Yes	No	Yes	Yes
Do you agree that, each category builds upon the previous one?	Agree			Agree

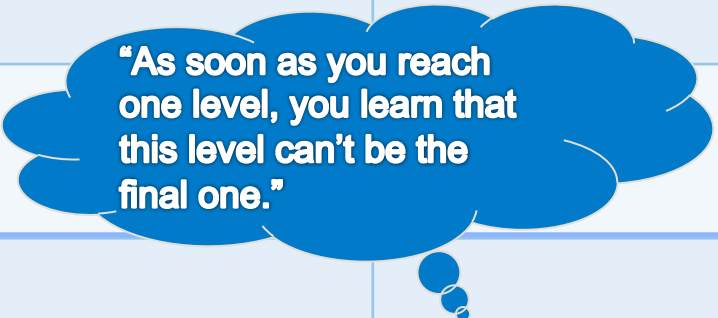
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How would you evaluate the <u>relevance</u> of the categories, to agile software development at large scale ?	Highly Relevant	Highly Relevant	Relevant	Relevant
How would you evaluate the <u>completeness</u> of the categories?	Very Complete	Very Complete	Neither - Nor	Rather Complete
Do you think that there is an important concept missing?	Yes			Yes
Do you agree that, each category builds upon the previous one?	Agree			Agree

Evaluation - Levels

Questions	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
In my opinion, levels are <u>easy to understand</u> .	Agree	Disagree	Agree	Disagree
How would you evaluate the <u>relevance</u> of the levels, to agile software development at large scale ?	Highly Relevant	Neither - Nor	Relevant	Relevant
How would you evaluate the <u>completeness</u> of the levels?	Rather Complete	Neither - Nor	Neither - Nor	Neither - Nor
How satisfied are you with the transition of the levels?	Satisfied	Neither - Nor	Neither - Nor	Neither - Nor
Do you agree that, each level builds upon the previous one?	Agree	Agree	Agree	Agree

Questions	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
In my opinion, levels are <u>easy to understand</u> .	Agree	Disagree	Agree	Disagree
How would you evaluate the <u>relevance</u> of the levels, to agile software development at large scale ?	Highly Relevant	Neither - Nor	Relevant	Relevant
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How satisfied are you with the transition of the levels?	Satisfied	Neither - Nor	Neither - Nor	Neither - Nor
Do you agree that, each level builds upon the previous one?	Agree	Agree	Agree	Agree

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How would you evaluate the <u>relevance</u> of the levels, to agile software development at large scale ?	Highly Relevant	Neither - Nor	Relevant	Relevant
How would you evaluate the <u>completeness</u> of the levels?	Rather Complete	Neither - Nor	Neither - Nor	Neither - Nor
How satisfied are you with the transition of the levels?	Satisfied	Neither - Nor		
Do you agree that, each level builds upon the previous one?	Agree	Agree	Agree	Agree

Evaluation - General

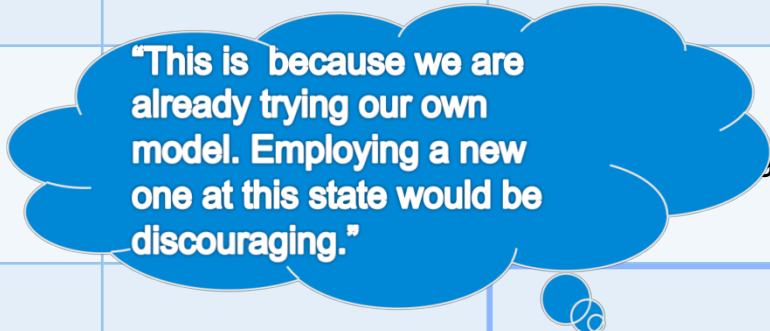
Questions	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
Have you noticed any inconsistencies in the maturity model?	No	No	Yes	No
In my opinion, the questionnaire was unnecessarily complex?	Neither - Nor	Disagree	Agree	Agree
Would you be willing to use this model for assessing the scaled agility in your business unit?	Yes	Yes	No	No
Do you think an evaluation based on this model would help your unit identify necessary points for improvement?	Yes	Yes	No	Yes

"The questions are not enough for a real clarification of the maturity level."

"Too many theoretical topics, instead of real life examples."

Questions	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
Have you noticed any inconsistencies in the maturity model?	No	No	Yes	No
In my opinion, the questionnaire was unnecessarily complex?	Neither - Nor	Disagree	Disagree	Strongly Disagree
Would you be willing to use this model for assessing the scaled agility in your business unit?	Yes	Yes	No	No
Do you think an evaluation based on this model would help your unit identify necessary points for improvement?	Yes	Yes	No	Yes

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Do you think an evaluation based on this model would help your unit identify necessary points for improvement?	Yes	Yes	No	Yes

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- End-to-end teams (Feature teams) are significant identifiers for the maturity of scaled agile adoption.
- Having decision making ability as close as possible to the value creation enhances unit autonomy.
- There is no one best way of adopting scaled agility, the success comes from proactively experimenting and adapting the process to the specific needs.
- In practice, Lean and Agile are considered as a tuple.
- Nobody wants to go back to waterfall methodology, however, having the competencies for plan driven setups and being able to employ the appropriate methodology when necessary is important for units.

Key Findings – II (*Maturity Model Specific*)

- Levels of the proposed maturity model require more clear description for better understandability.
- The case is virtually always to have a certain amount of competence in each category. Meaning, categories don't necessarily function as a prerequisite to their successor.
- Measuring level is fundamentally important because you can not improve on something you can not or do not measure.

Research

- There exists a lack of case study research in the literature. [9] It would be valuable to further validate the elements of the proposed maturity model with the help of different organizations or different units within the same organization.
- Level descriptions were not easy to understand according to our evaluations. Even though such feedback can be subjective, as the ultimate goal is to propose a maturity model that has high understandability, re-evaluation of level descriptions can improve the understandability and applicability of the maturity model.
- The collected data is not necessarily giving us confidence regarding if categories follow an evolutionary path. This is another aspect that can be evaluated with further studies.

Organization

- It might be valuable for our case organization to define action items for level transitions. So that units can define a roadmap once they assess their state of scaled agile adoption.
- Artifacts and their mappings to the levels require further discussion. This is important because artifact classifications are tend to be subjective. Reaching to a saturation point by increasing the number of interviews can be useful. Introducing unit specific artifacts can also be a valuable addition.

- 1 Research Partner (2018): Scaled Agility Whitepaper
- 2 Turetken et al. (2016): Assessing the adoption level of scaled agile development: a maturity model for Scaled Agile Framework
- 3 Paasivaara (2017): Adopting SAFe to Scale Agile on a Globally Distributed Organization
- 4 SEI, Carnegie Mellon University (2010): CMMI for Development (CMMI-DEV)
- 5 Laanti (2017): Agile Transformation Model for Large Software Development Organizations
- 6 Stojanov, Turetken, (2015): A Maturity Model for Scaling Agile Development
- 7 Runeson and Höst, (2007): Guidelines for conducting and reporting case study research in software engineering
- 8 Sein et al. (2011): Action Design Research
- 9 Dingsøyr et al. (2013): Research challenges in large-scale agile software development