

Identifying recurring Challenges and Best Practices of Agile Coaches and Scrum Masters and Documenting them as a part of a Large-Scale Agile Development Pattern Language

Nina-Mareike Harders, 13.05.2019, Final Presentation Master's Thesis

Chair of Software Engineering for Business Information Systems (sebis)
Faculty of Informatics
Technische Universität München
www.matthes.in.tum.de

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Motivation and Research Questions

2

Scientific Approach

3

A Pattern Language for Large-Scale Agile Development

4

Identification of recurring Concerns and Best Practices

5

Exemplary Patterns

6

Conclusion



AGILE

... promises better products and higher customer satisfaction by continuous delivery and active customer involvement, deals better with changing requirements [5]



LARGE-SCALE

Companies are inspired by the success of agile methods for small, co-located teams and apply them to large-scale projects [1,3]



CHALLENGES

... arise on different levels for different stakeholders, making it hard to obtain success at large-scale agile development [1,2,3]



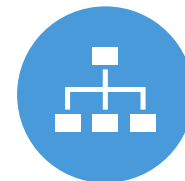
RESEARCH

Existing research at sebis found 14 stakeholders having 79 challenges [3]



PATTERNS

... provide a structured solution to a recurring problem [4]



LANGUAGE

... guides the user through the patterns based on his characteristics

1

What are recurring challenges of Agile Coaches and Scrum Masters in large-scale agile development?

2

What are best practices for addressing recurring challenges of Agile Coaches and Scrum Masters in large-scale agile development?

3

How can these best practices be documented as part of a large-scale agile development pattern language?

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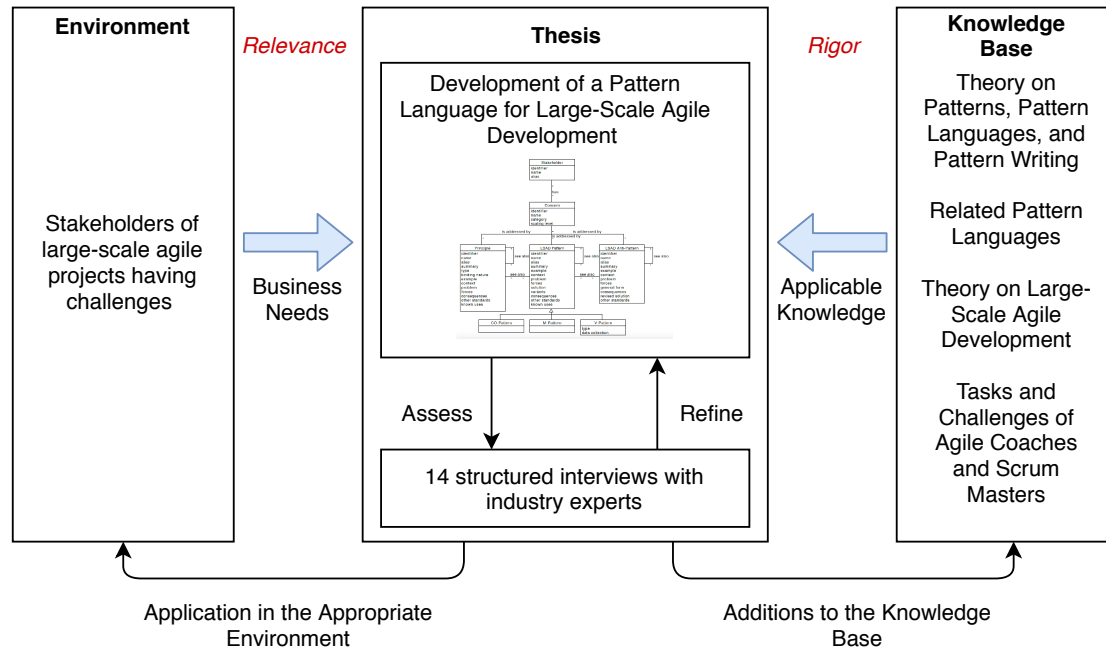
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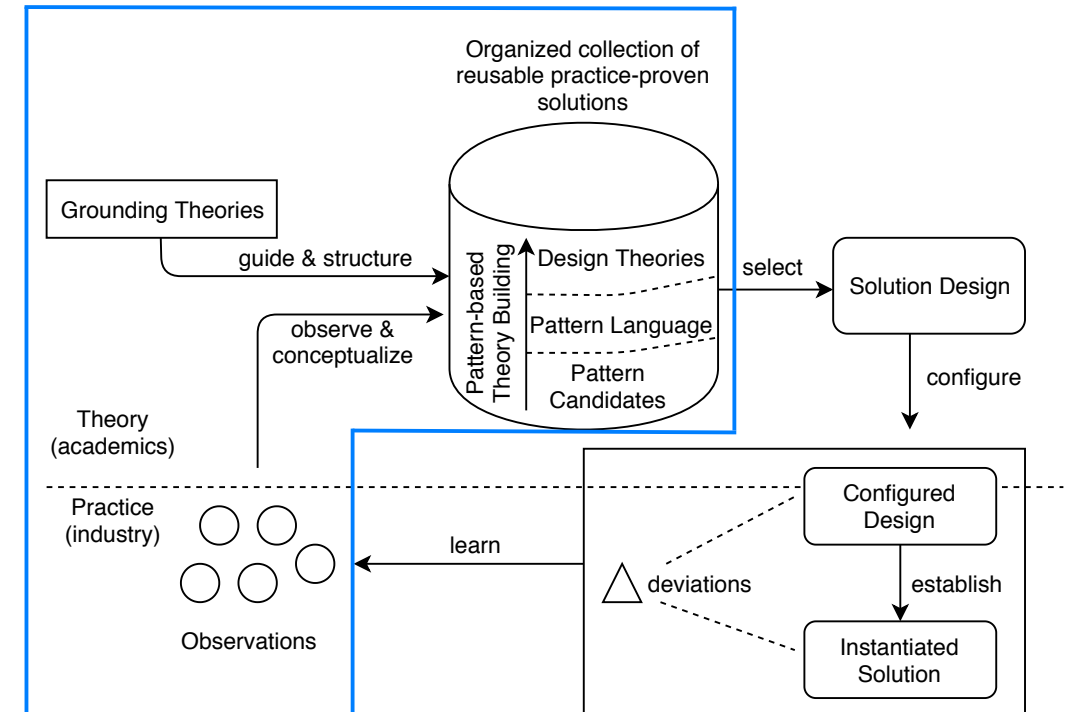
1

Design Science Approach [6]



2

Pattern-Based Research Design [7]



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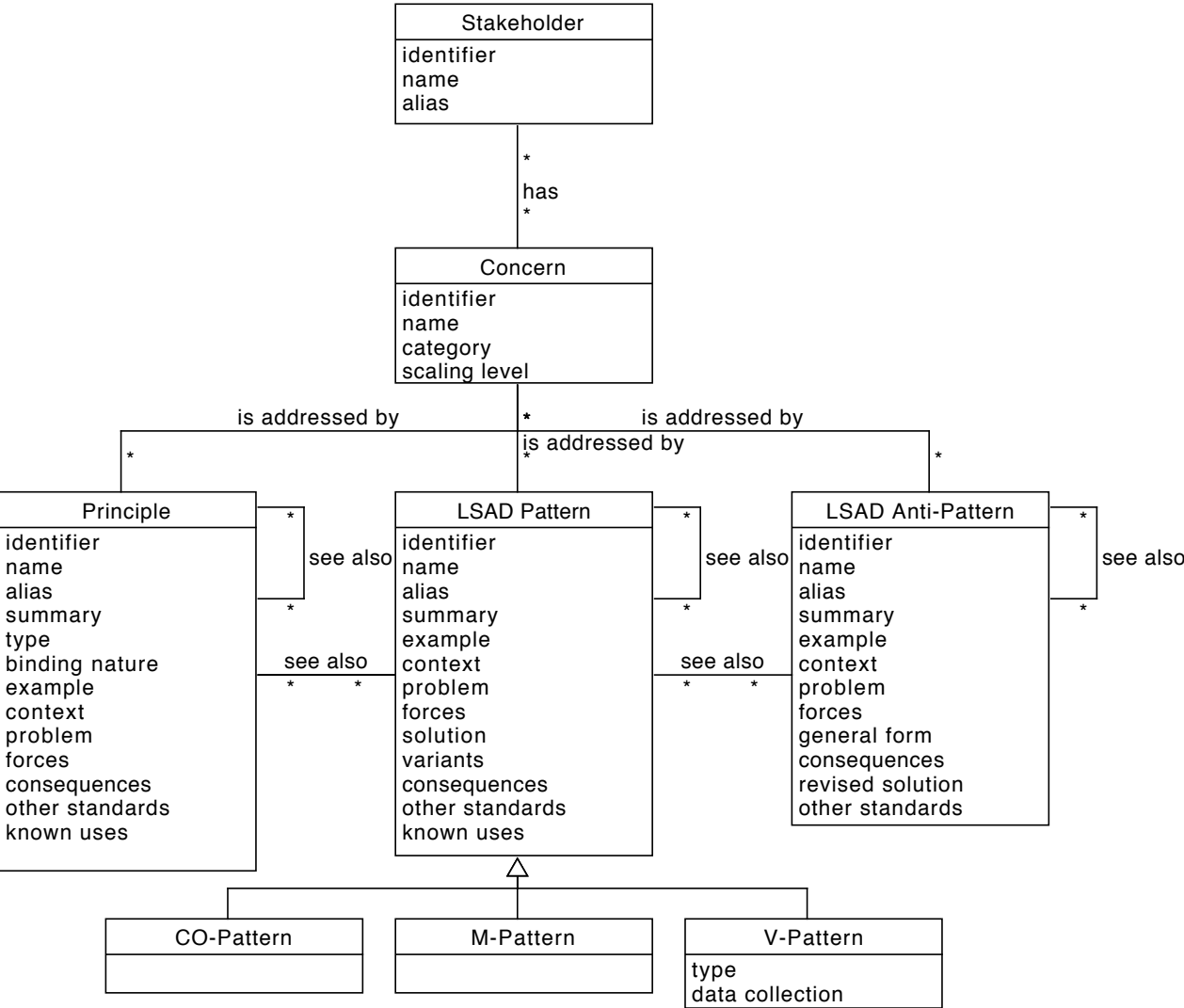
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Stakeholder

all people, who are actively involved in, have an interest in, or are in some way affected by large-scale agile development

Concern

everything that hinders the stakeholders in performing tasks

Principle

general rules and guidelines that stakeholders should comply with

Coordination Pattern

solution consists of a coordination mechanism, which can either be digitally or in person

Methodology Pattern

solution describes concrete processes, practices or methods

Viewpoint Pattern

defines ways to visualize information in the form of documents, boards, metrics, models, or reports

Anti-Pattern

common practice that has negative consequences while providing a revised solution

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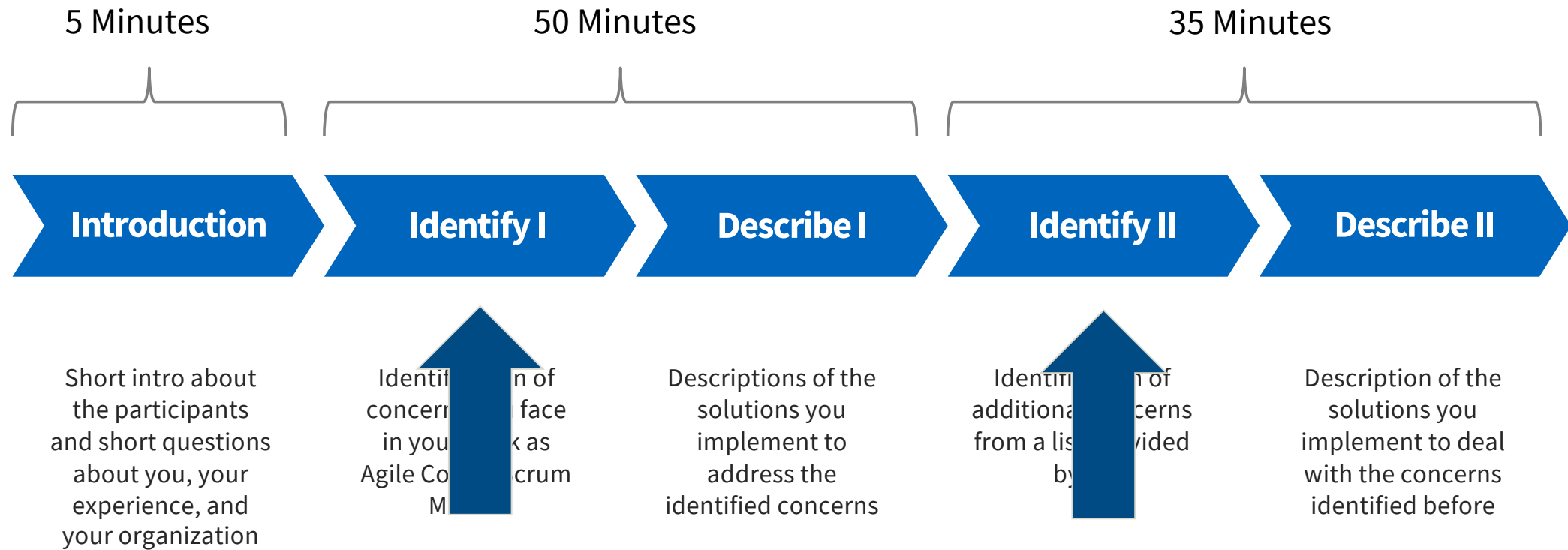
Conclusion

Identification of Recurring Concerns and Best Practices – Participants

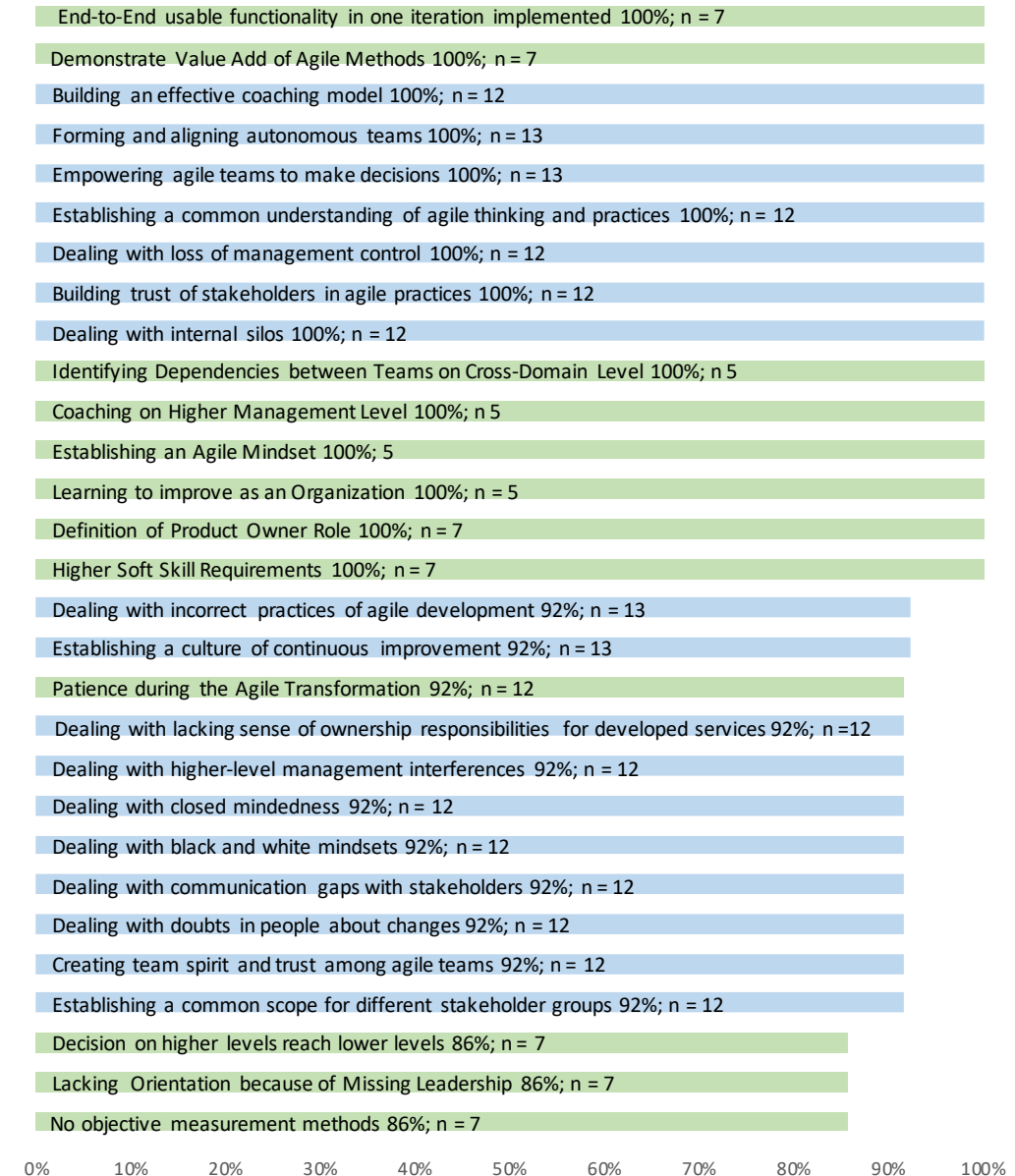
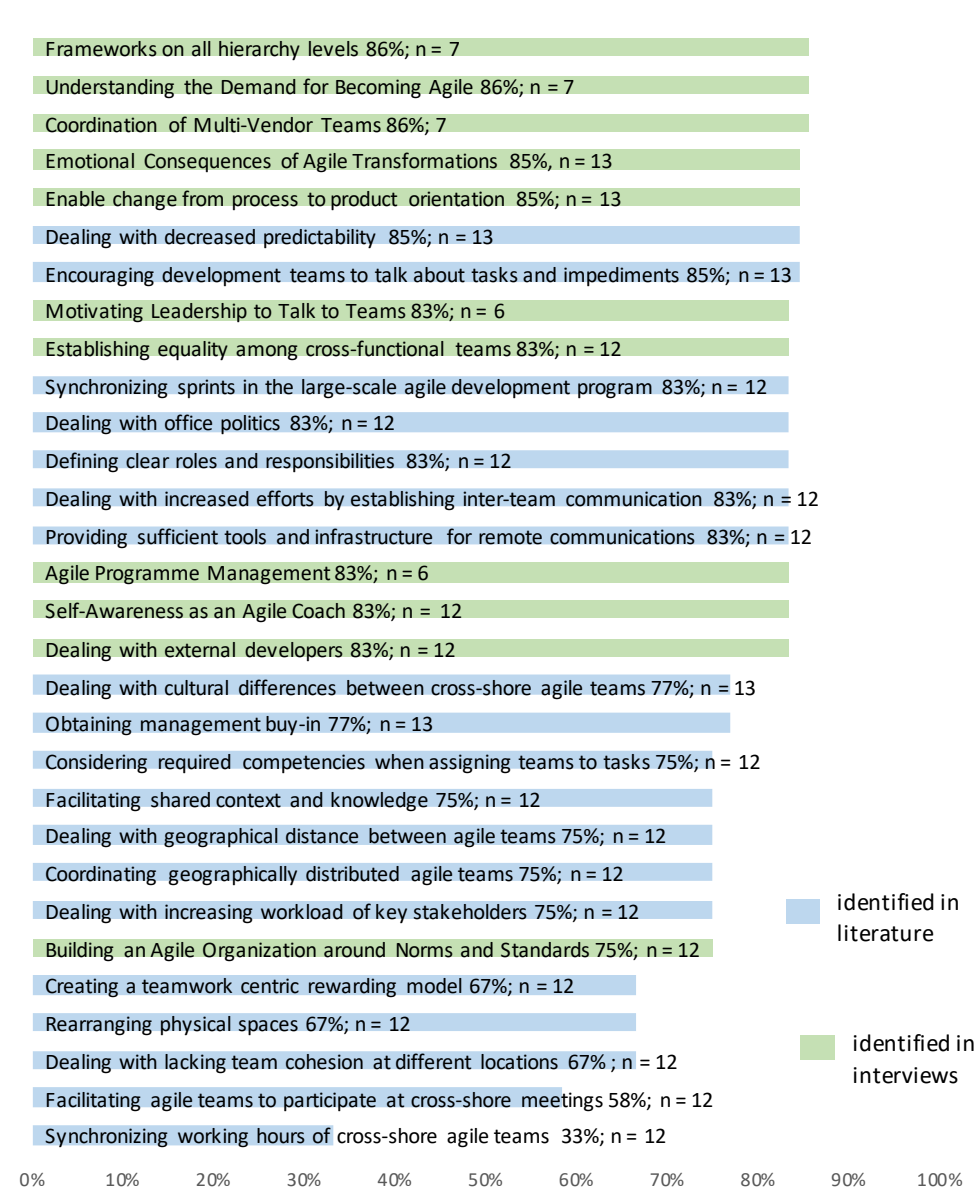
- 13 semi-structured interviews with 11 companies between February 2019 and April 2019

No.	Role	Own Experience	Company's Experience
1	Agile Coach	3 – 6 years	1 – 3 years
2	Agile Coach	3 – 6 years	1 – 3 years
3	Agile Coach	1 – 3 years	3 – 6 years
4	Agile Coach	> 6 years	1 – 3 years
5	Agile Coach	3 – 6 years	< 1 year
6	Agile Coach and Scrum Master	> 6 years	3 – 6 years
7	Agile Coach	3 – 6 years	3 – 6 years
8	Agile Coach	1 – 3 years	1 – 3 years
9	Agile Coach	1 – 3 years	1 – 3 years
10	Agile Coach and Scrum Master	> 6 years	1 – 3 years
11	Agile Coach	3 – 6 years	1 – 3 years
12	Agile Coach	3 – 6 years	3 – 6 years
13	Agile Coach	3 – 6 years	3 – 6 years

Identification of Recurring Concerns and Best Practices – Research Design

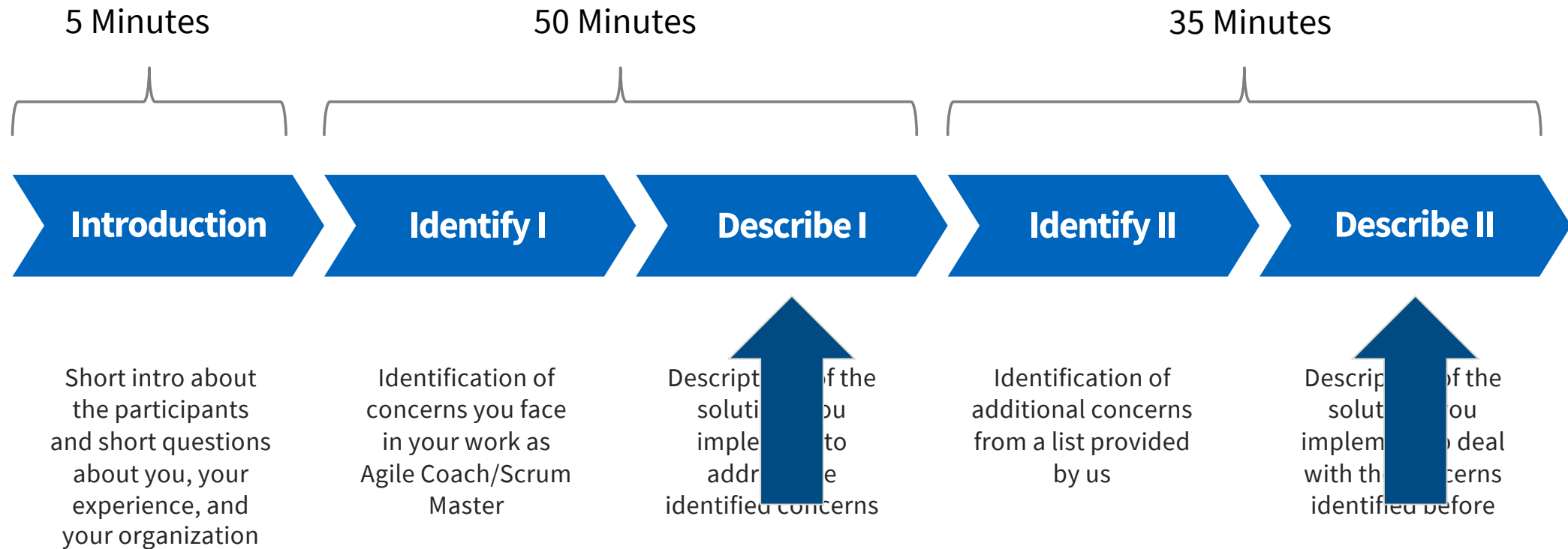


Recurring Concerns

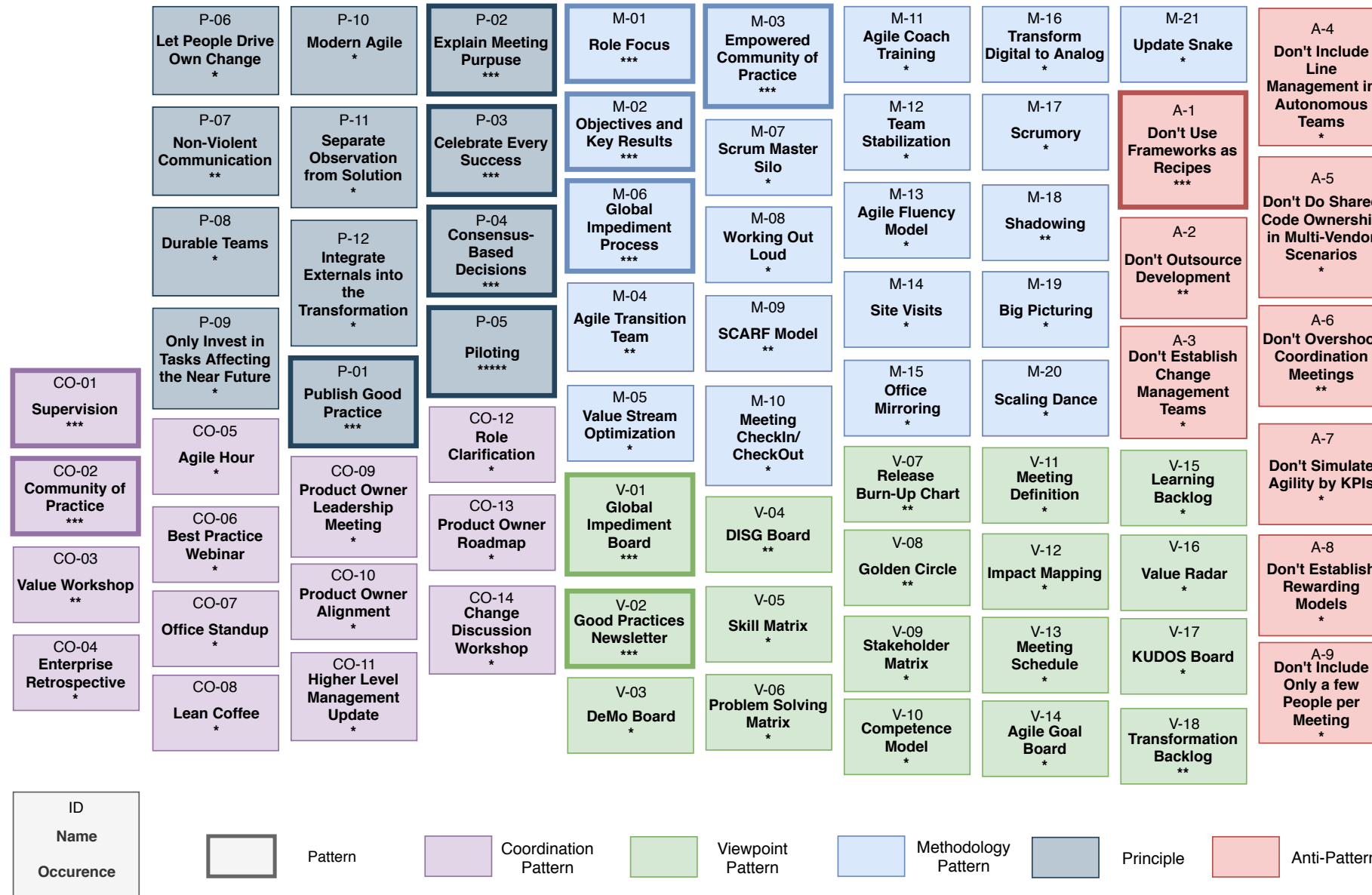


Identification of Recurring Concerns and Best Practices – Research Design

- 13 semi-structured interviews between February 2019 and April 2019



Identification of Best Practices



14 Identified Patterns, Anti-Patterns, and Principles

P-01	Publish Good Practice	M-01	Role Focus
P-02	Explain Meeting Purpose	M-02	Objectives and Key Results
P-03	Celebrate Every Success	M-03	Empowered Community of Practice
P-04	Consensus-Based Decisions	M-06	Global Impediment Process
P-05	Piloting	CO-01	Supervision
V-01	Global Impediment Board	CO-02	Community of Practice
V-02	Good Practice Newsletter	A-01	Don't use Frameworks as Recipes

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M-06: Global Impediment Process

Pattern Overview	
ID	M-06
Name	Global Impediment Process
Alias	
Summary	This process describes how to identify and solve global impediments, after the team fails to solve them on their own.

Example

A team complained that they can't involve the customer at early development stages due to a restriction that prohibits customer access to the development environment. The team submits this topic as a new impediment to the Global Impediment Board. A workshop has been set up to evaluate the impact of this impediment as well as to find solutions. They identified a colleague from the IT security department and contact him. He eventually could grant their customer access to the development environment.

Context

The organization is currently transforming from traditional to agile approaches or has successfully transformed.

Problem

- C-39: Establishing a Culture of Continuous Improvement
- C-67: Encouraging Development Teams to Talk About Tasks and Impediments

M-06: Global Impediment Process

Forces

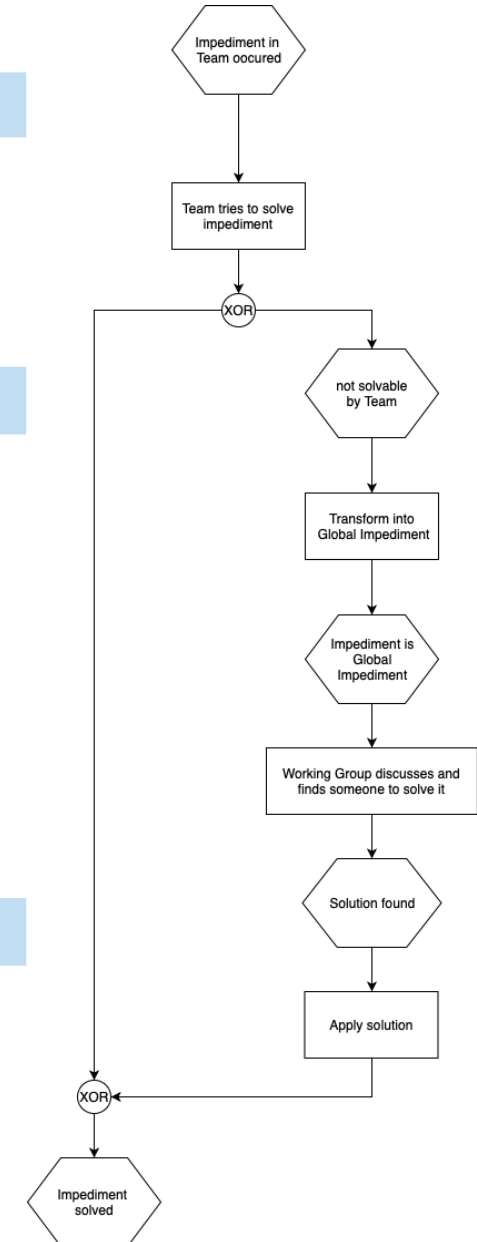
There are obstructions within the development process that require action. Whenever people notice their impediments are not being targeted, they lose motivation to talk about problems. Instead of resolving an impediment, teams find workarounds or create isolated applications. An agile team constantly tries to improve its process.

Solution

Implement a Global Impediment Process to solve impediments that teams cannot solve on their own. An impediment of a team will be included within the Global Impediment Process if a team fails to solve it on its own. The process includes a Global Impediment Working Group, which consists of people, who know the company well, therefore knowing the right people to solve an impediment. The Global Impediment Working Group meets every two weeks and discusses and prioritize new impediments. They add them to the Global Impediment Board and try to solve the impediments. Because of their knowledge about the company, the probability that they know people, who can solve the impediment, is very high.

Variants

1. Each impediment has an 'Owner', who is someone from the Working Group who also knows about the difficulty of the impediment.
2. Each impediment has a 'Supporter', who is someone who as a major influence of the solution of the impediment.
3. The submission of an impediment requires the A3 format.



Consequences

Benefits:

- Impediments get solved.
- Prioritization enables calculation of real cost caused by an impediment. This may increase resolution speed
- The process minimize local applications and workarounds
- Development teams can work more efficient.
- The more impediments get solved, the more encouraged are teams to openly talk about impediments.

Liabilities:

- The process requires increased efforts for the participants of the Global Impediment Working Group.

See Also

V-01: Global Impediment Board

Other Standards

-

Known Uses

1. Autonomous Cars Group
2. Software Inc
3. IT Business Consultancy
4. Retail Corp

V-01: Global Impediment Board

Pattern Overview

ID	V-01
Name	Global Impediment Board
Alias	Global Impediment Backlog
Summary	This board displays all impediments of an organization, which could not be solved by teams themselves.
Type	Board

Example

RetailCo has established a Global Impediment Process to handle impediments that teams cannot solve on their own. However, the submitted impediments are only stored on a shared cloud drive. There is no way to detect the status of an impediment without opening its document.

Context

The organization has implemented a Global Impediment Process to manage impediments that teams cannot solve on their own.

Problem

C-39: Establishing a Culture of Continuous Improvement

C-67: Encouraging Development Teams to Talk About Tasks and Impediments

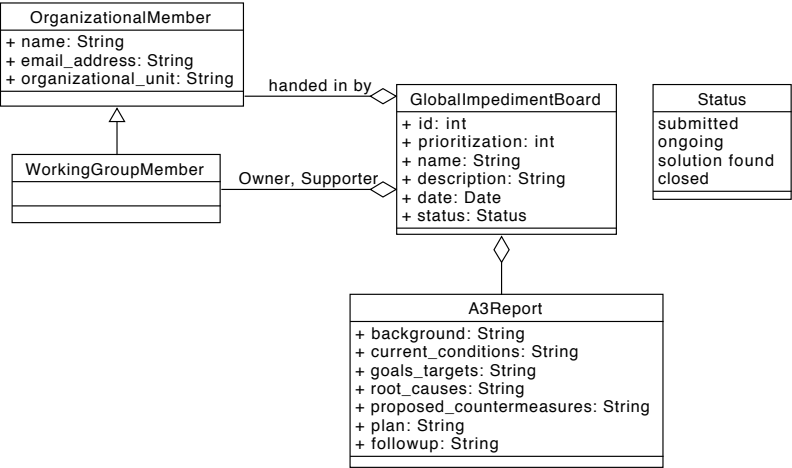
Forces

Global Impediments need to be managed and tracked.

Solution

Set up a global impediment board to manage all global impediments throughout the Global Impediment Process. In large-scale agile development, a list with the following structure is frequently used:

Global Impediment Board								
ID	Prioritization	Name	Handed in by	Description	Date	Owner	A3	Status
...	...	...	...	...	...	...	...	...
100	3	Dev Access	Team A	Customer cannot access development environment due to security guidelines	06/05/2019	John Doe	Link to A3	Ongoing
...	...	...	...	...	...	...	...	...



The ID is a consecutive, unique integer value that is used to identify an impediment. The prioritization is done by the Global Impediment Working Group and indicates the urgency of the impediment. Impediments with higher prioritization should be solved first. 'Handed in by' refers to the team or individual who handed in the impediment. The owner is someone from the Working Group, who is responsible for solving the impediment. The 'A3'-attribute is optional if the Global Impediment Process requires the submission of an impediment in the A3 format.

Variants

Depending on the organization's implementation of the Global Impediment Process, different attributes can be added or removed.

Consequences

Benefits:

- Everyone can view current global impediments and see if anyone else has a similar problem.
- Prioritization enables faster solving of emerging impediments that have a large impact on teams or the organization.
- The current status of all global impediments is always visible.
- All global impediments are stored in one place.

Liabilities:

- The board requires additional managing effort.

See Also

M-06: Global Impediment Process

Other Standards

-

Data Collection

The board can be digitally administrated in any digital collaboration tool by the Global Impediment Working Group. It is updated whenever an impediment occurs by a member of the Working Group. Only these members have writing permissions. It depends on the organization if the board should be public or kept private to the Working

Known Uses

1. Autonomous Cars Group
2. Software Inc
3. IT Business Consultancy
4. Retail Corp

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Key Artifacts

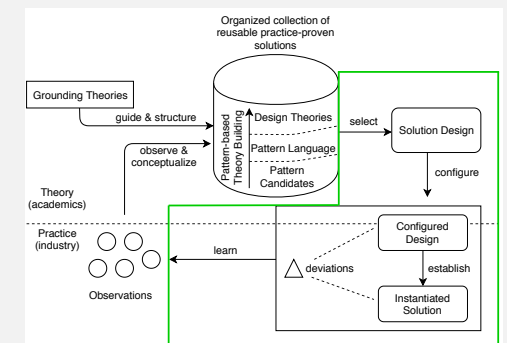
LSADPL, 23 Concerns, 76 Pattern Candidates, 1 Anti-Pattern, 5 Principles, 2 V-Patterns, 2 CO-Patterns, 4 M-Patterns

Key Findings

- Patterns are a suitable mean to document best practices in large-scale agile development.
- Creating the pattern language first lead to much more structured interviews.
- Literature misses a great number of concerns.
- It is often easier to explain what not to do.

Future Work

- Identification of recurring concerns and best practices for other stakeholders
- Validation of identified patterns in practice



- [1] Dingsøyr, T., & Moe, N. B. (2014). Towards Principles of Large-Scale Agile Development. In *Agile Methods. Large-Scale Development, Refactoring, Testing, and Estimation* (Vol. 199, pp. 1–8). Cham: Springer International Publishing.
http://doi.org/10.1007/978-3-319-14358-3_1
- [2] Dikert, Kim, Paasivaara, Maria & Lassenius, Casper (2016). Challenges and success factors for large-scale agile transformations: A systematic literature review. (2016). Challenges and success factors for large-scale agile transformations: A systematic literature review. *Journal of Systems and Software*, 119, 87–108. <http://doi.org/10.1016/j.jss.2016.06.013>
- [3] Uludag, Ömer & Kleehaus, Martin & Caprano, Christoph & Matthes, Florian. (2018). Identifying and Structuring Challenges in Large-Scale Agile Development Based on a Structured Literature Review. 10.1109/EDOC.2018.00032.
- [4] vom Brocke, Jan, Fettke, Peter Loos, Junginger, Stephan, Moser, Christoph, Keller, Wolfgang, Matthes, Florian, Ernst, Alexander & Winter, R. (2009). Patterns in der Wirtschaftsinformatik. *Wirtschaftsinformatik*, 51(6), 535–542.
<http://doi.org/10.1007/s11576-009-0195-5>
- [5] Dingsøyr, T., Nerur, S. P., 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. <http://doi.org/10.1016/j.jss.2012.02.033>
- [6] Alan R Hevner, Salvatore T March, Jinsoo Park, and Sudha Ram. Design Science in Information Systems Research. *MIS Quarterly*, 28(1):75–105, March 2004.
- [7] Sabine Buckl, Florian Matthes, Alexander W. Schneider, and Christian M. Schweda. Pattern-based design research - an iterative research method balancing rigor and relevance. In DESRIST, 2013.
- [8] Brown, S. A., & Sullivan, Y. W. (2016). Guidelines for Conducting Mixed-methods Research: An Extension and Illustration. *Journal of the Association for Information Systems*, 27(7), 435–494.



B.Sc.

Nina-Mareike Harders

Technische Universität München
Faculty of Informatics
Chair of Software Engineering for Business
Information Systems

Boltzmannstraße 3
85748 Garching bei München

Tel +49.89.289.
Fax +49.89.289.17136

nina.harders@tum.de
www.matthes.in.tum.de



BACKUP SLIDES

Chair of Software Engineering for Business Information Systems (sebis)
Faculty of Informatics
Technische Universität München
www.matthes.in.tum.de

Responsibilities and Challenges of Scrum Masters and Agile Coaches



Agile Coach

- Not part of the agile team
- Company-internal or external consultant
- Create a productive, self-organized, agile team
- Supports, gives feedback, trains
- Create mindsets and methods
- Manage meetings
- Shape and support agile transformation

Responsibilities

1. Dealing with doubts in people about changes
2. Dealing with incorrect practices of agile development
3. Dealing with black and white mindsets
4. Dealing with closed mindedness
5. Establishing a common understanding of agile thinking and practices
6. Encouraging development teams to talk about tasks and impediments
7. Building an effective coaching model

Challenges



Scrum Master

- Part of the agile team
- Always company-internal
- Enable development process
- Promote agile values and practices, gives feedback, trains
- Create mindsets and use methods
- Manage meetings
- Remove impediments

Responsibilities

1. Coordinating geographically distributed agile teams
2. Facilitating agile teams to participate at cross-shore meetings
3. Synchronizing working hours of cross-shore agile teams
4. Dealing with lacking team cohesion at different locations
5. Building trust of stakeholders in agile practices
6. Establishing a culture of continuous improvement
7. Rearranging physical spaces
8. Dealing with higher-level management interferences
9. Dealing with cultural differences between cross-shore agile teams
10. Encouraging development teams to talk about tasks and impediments
11. Synchronizing sprints in the large-scale agile development program

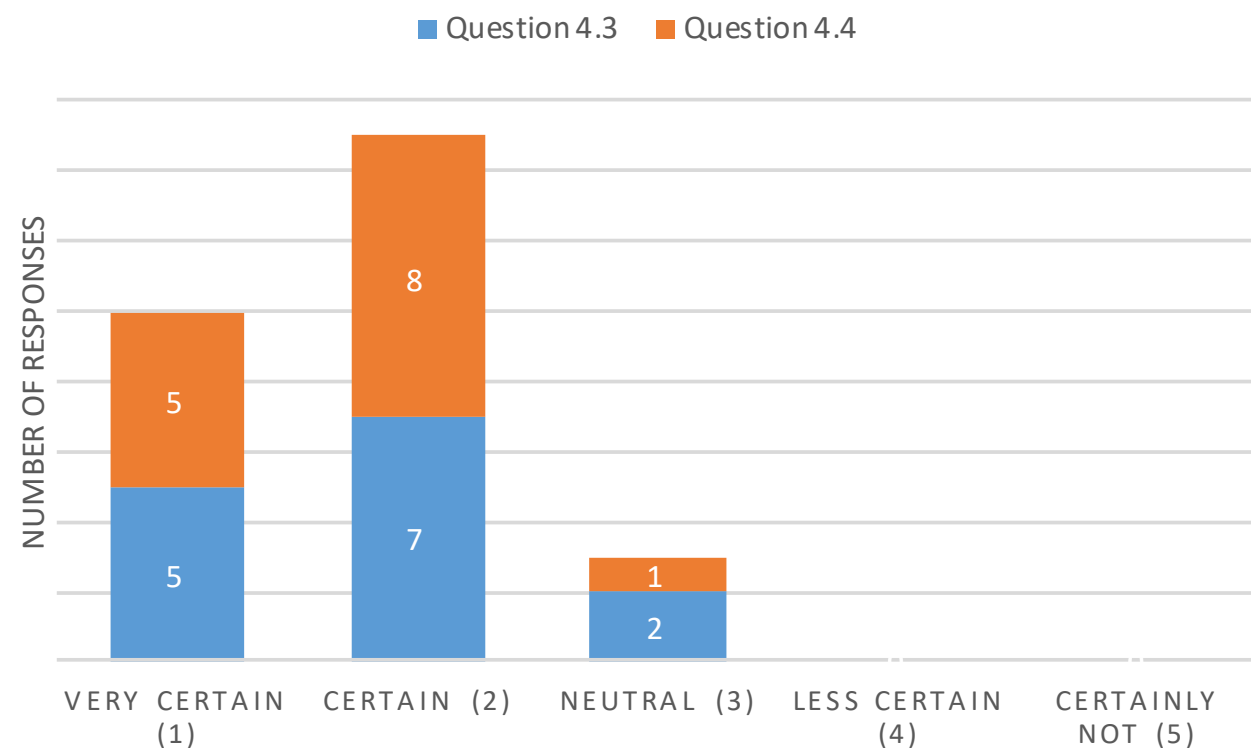
Challenges

EVALUATION METHODOLOGY AND RESULTS

Evaluation

- 14 semi-structured interviews from Dezember 2018 to January 2019
- Is the Pattern Language relevant to the industry?
- Do the elements provide value to the user?
- Is the structure logical and understandable?
- Is the Pattern Language complete?

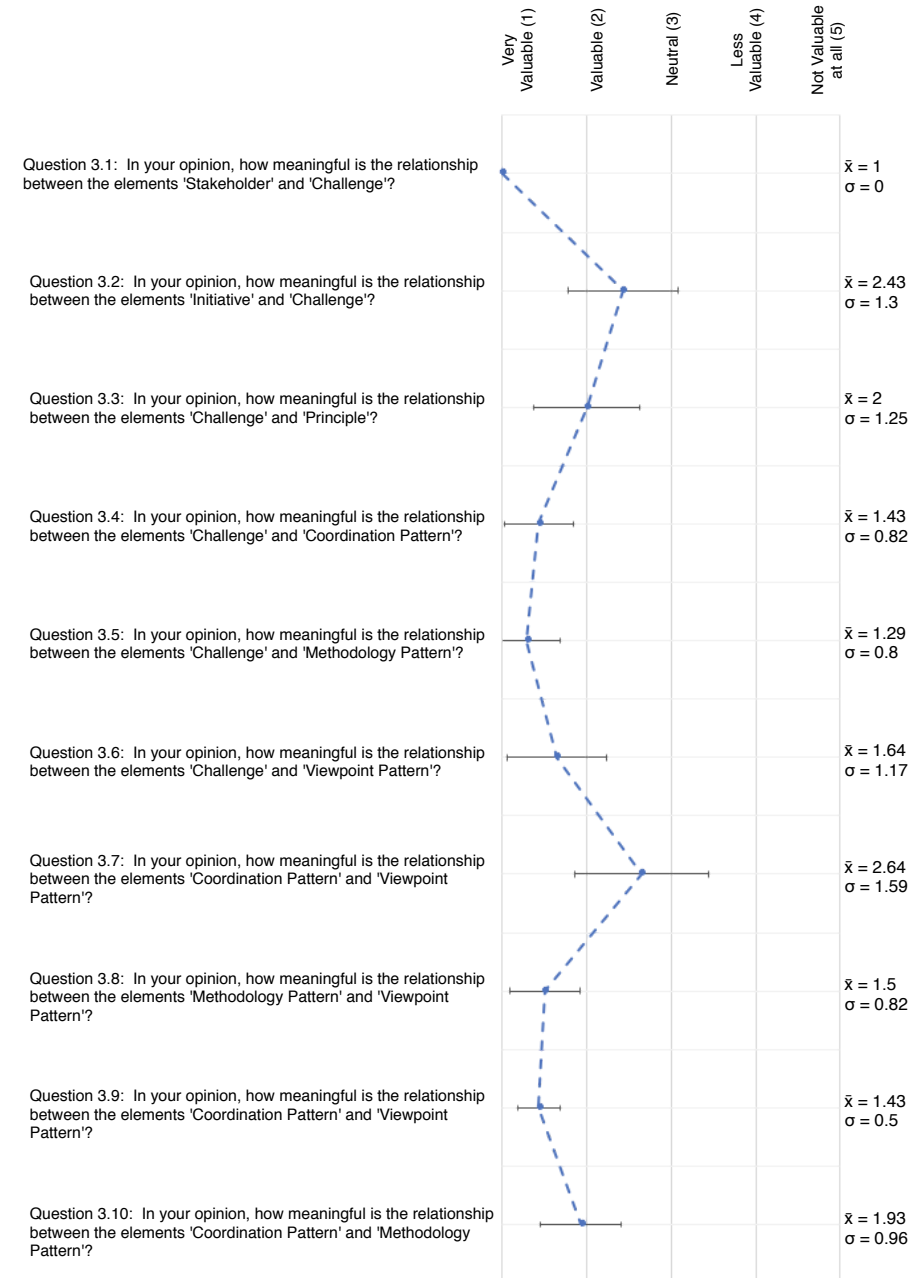
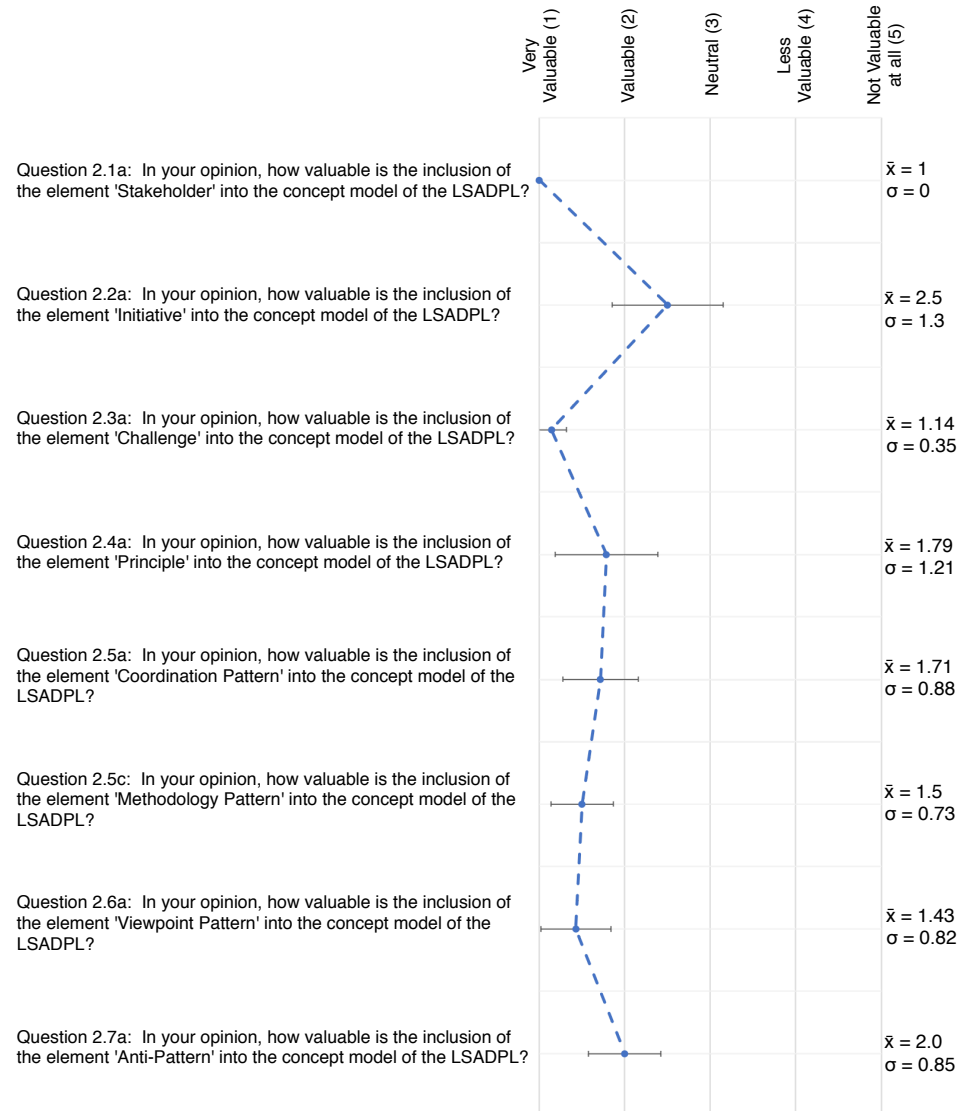
N o.	Role	Own Experience	Company's Experience	Company Sector	No. Of Employees
1	Enterprise Architect	1 – 3 years	3 – 6 years		
2	Project Manager	1 - 3 years	3 – 6 years		
3	Developer	3 – 6 years	3 – 6 years		
4	Agile Coach	3 – 6 years	1 – 3 years		
5	Enterprise Architect	3 – 6 years	1 – 3 years		
6	Enterprise Architect	3 – 6 years	3 – 6 years		
7	Solution Architect	3 – 6 years	3 – 6 years		
8	Platform Architect	> 6 years	3 – 6 years		
9	Solution Architect	3 – 6 years	> 6 years		
10	Agile Coach	3 – 6 years	3 – 6 years		
11	Agile Coach	> 6 years	3 – 6 years		
12	Product Owner	> 6 years	1 – 3 years		
13	Enterprise Architect	3 – 6 years	1 – 3 years		
14	Developer	< 1 year	1 – 3 years		



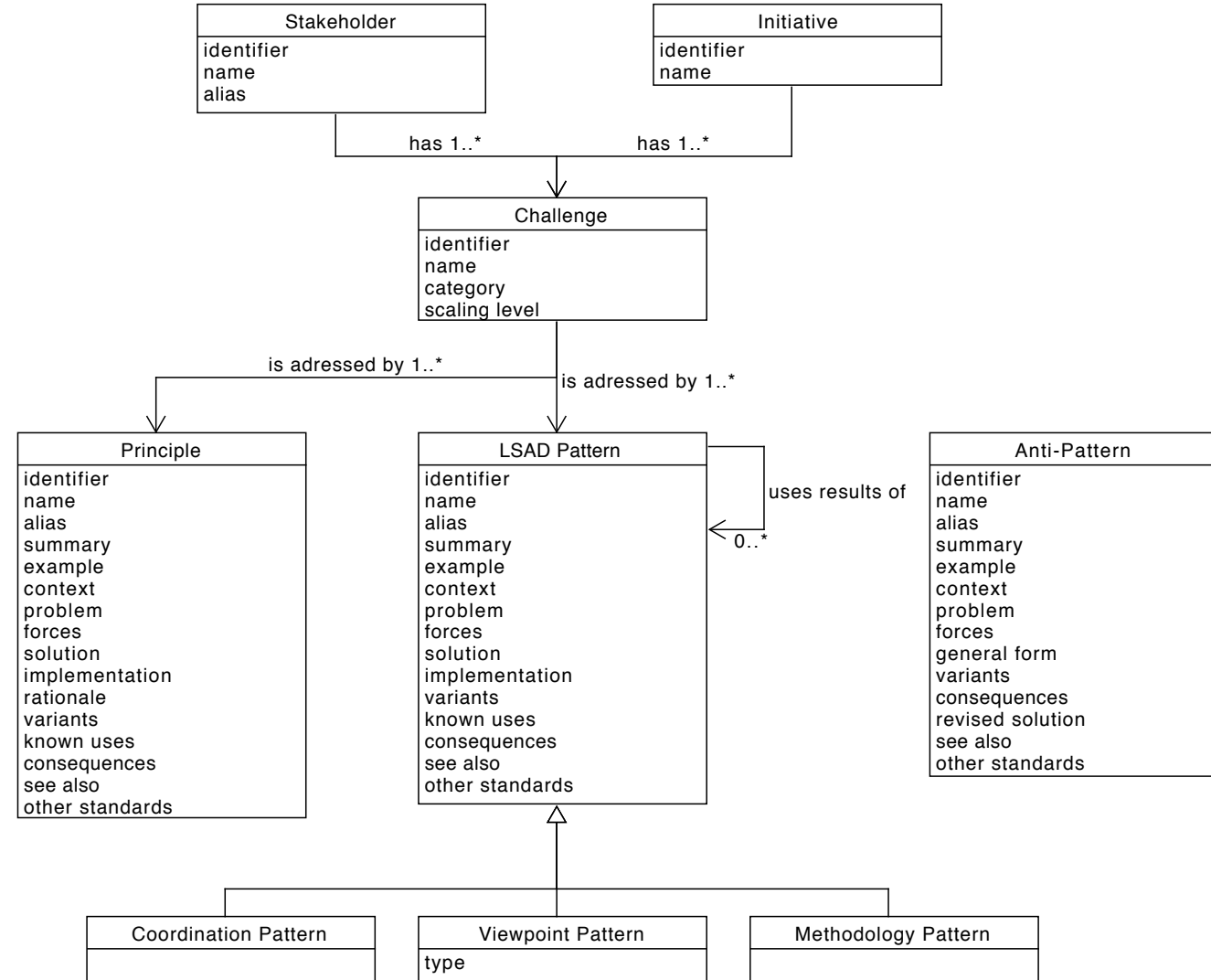
Question 4.3: Would you use patterns for addressing recurring challenges in large-scale agile development?

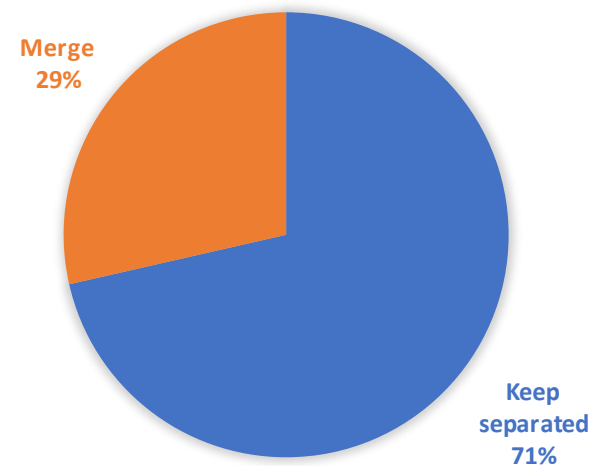
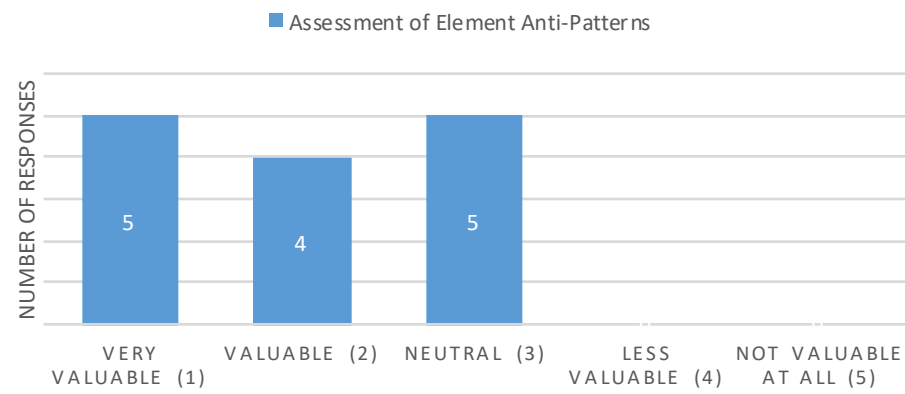
Question 4.4: Would patterns regarding scaled agile development help you in your job?

Evaluation of the Elements and Connections within the Pattern Language

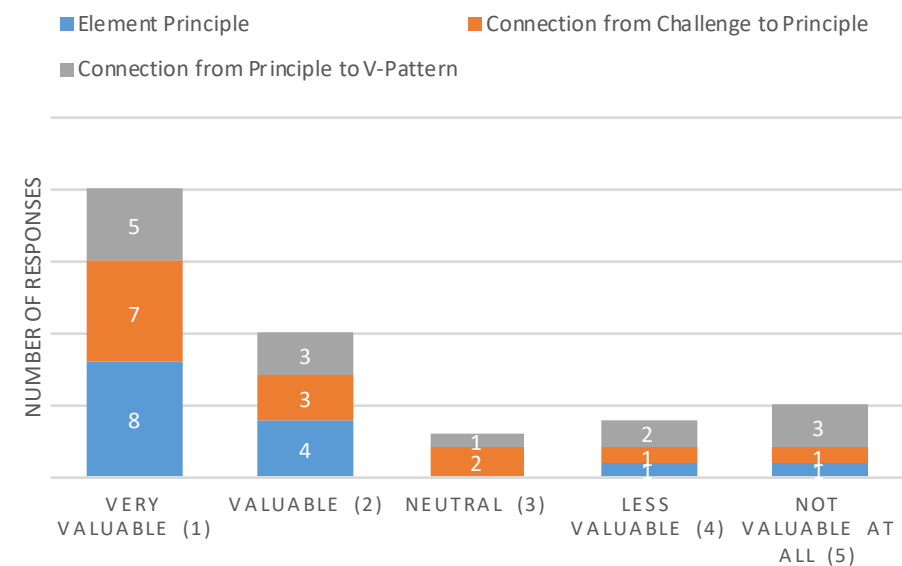
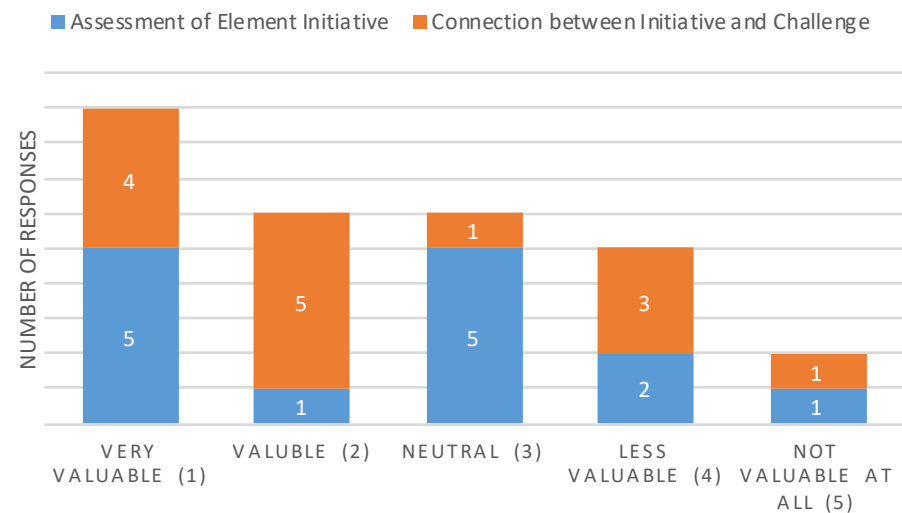


1. Removal of ,Initiative‘
2. Extending ,Principle‘ by ,Binding Nature‘
3. Removing ,Solution‘ from Principle
4. Renaming ,Challenge‘ to ,Concern‘
5. Connecting ,Anti-Pattern‘ to all other elements
6. Removing ‘Implementatin‘ from ,Principle‘ and Patterns



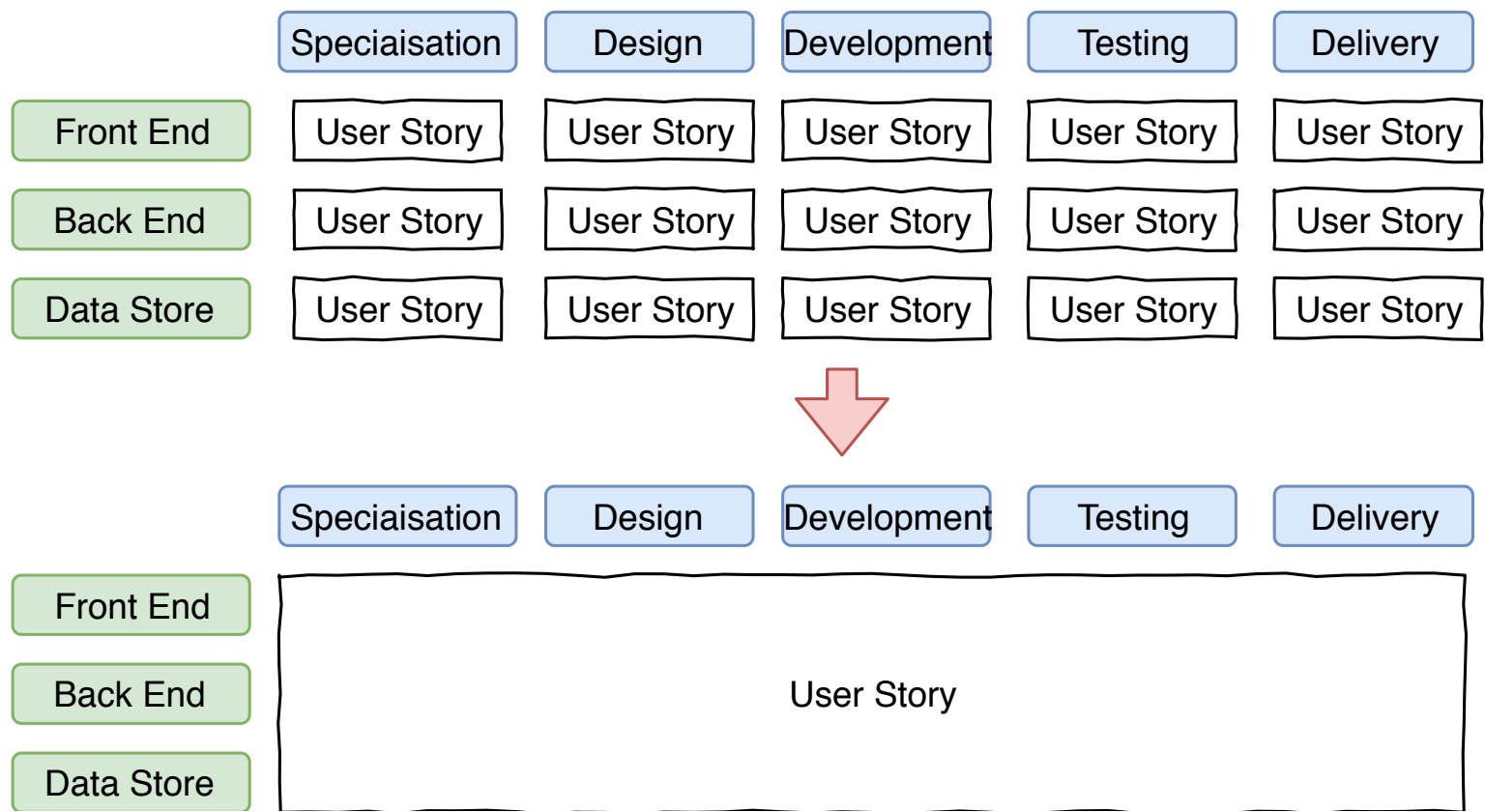


Evaluation of Initiatives and Principles

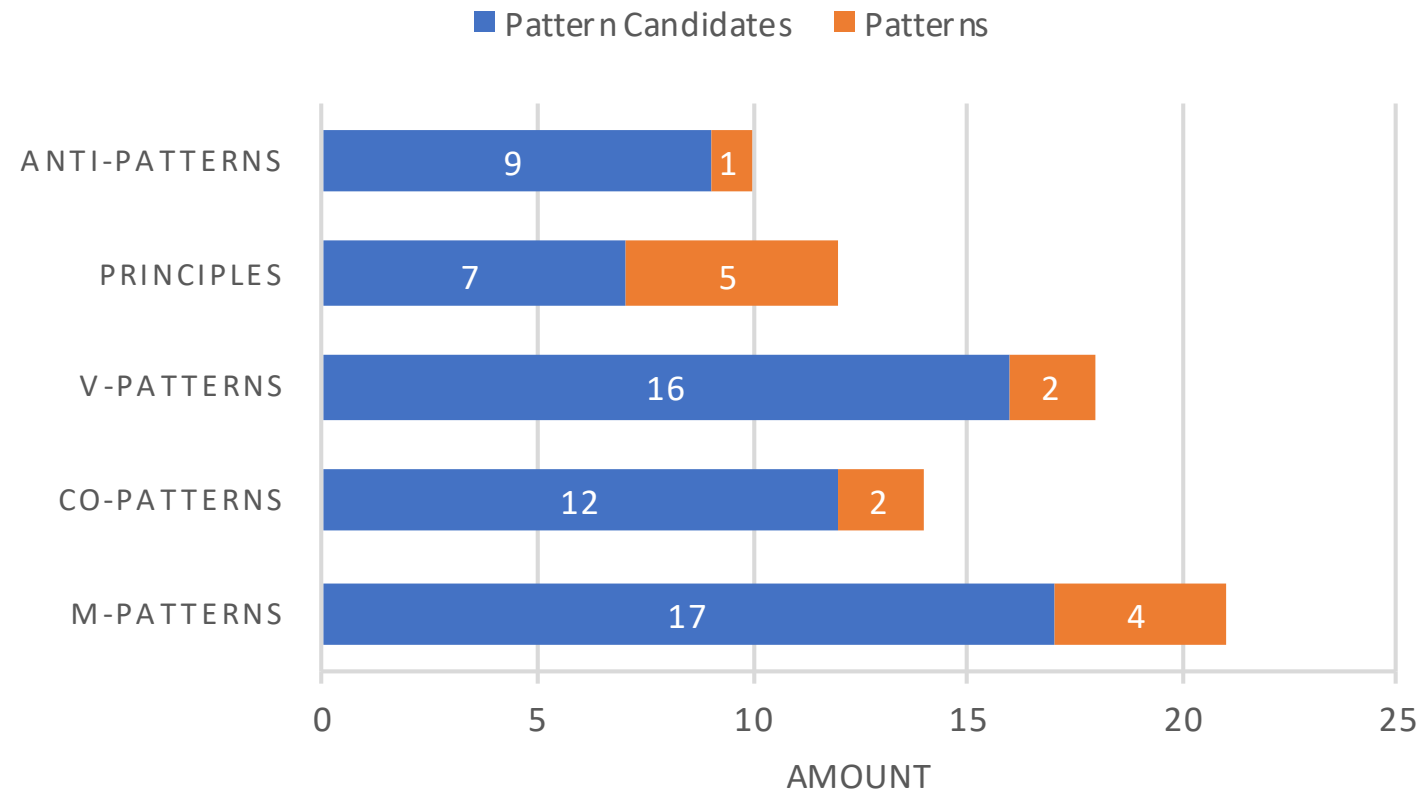


STATISTICS ON CONCERNS AND PATTERNS

Concern: End-To-End usable Functionality implemented in one iteration



Total Pattern Count



Classification of Concerns

