Toward Measuring the Success of Communities of Practice in Large-Scale Agile Software Development

Lixun Dai, June 17th, 2024, Master Thesis Kick-off Meeting

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Outline

1. Motivation
2. Research Questions
3. Research Methodology
4. Current State
5. Timeline

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1. Motivation

Rapid Changes Drive the Need for Agility

- Technology, markets, and customers change quickly
- Companies must react agilely to stay competitive

Agile Methodology Rise in Software Development

- Digital world demands agile development methods
- Small teams successfully use agile like Scrum

Scaling Agility Brings New Challenges

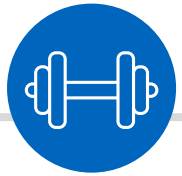
- Increased complexity from multiple teams and programs
- Coordination and knowledge sharing is difficult

I.F. Schlömer (2022), M. Franco, J. Guimarães, M. Rodrigues (2023)
Ö. Uludağ et al. (2022), R. Hoda, N. Salleh, J. Grundy (2018)
K. Hutter et al. (2023), M. Kalenda, P. Hyna, B. Rossi (2018)

1. Motivation

Communities of Practice Proposed as a Solution

- Allow knowledge exchange while preserving agility
- Address cross-team coordination and information siloing



Measuring Success is a Challenge

- Suitable measures are not clear yet in practice
- CoPs sounds useful but not proven in industries

Research Goal for this Thesis

- Identify characteristics that indicate CoPs are successful
- Investigate existing approaches for measuring
- Design a novel approach to measure the success

I. Monte, L. Lins, M.L. Marinho (2022) M. Paasivaara, C. Lassenius (2014)
Monte, L. Lins and M. Marinho (2022), Ö. Uludağ et al. (2022)
K. Hutter et al. (2023), M. Kalenda, P. Hyna, B. Rossi (2018)

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2. Research Questions

RQ1 What are the existing approaches to assessing the success of CoPs* in the context of ***Large-Scale Agile Software Development***, ***Agile Software Development***, and ***General Organizational Setting***?

Structured Literature Review (Scientific & Gray) + Interviews (Coding & Analysis)

RQ2 What traditional group structures within organizations are similar to the CoPs* in the context of ***Large-Scale Agile Software Development*** and how has their success been assessed?

Literature Review (Scientific), not necessarily structured

RQ3 How could a novel approach to assessing the success of the CoPs* in the context of ***Large-Scale Agile Software Development*** be designed?

Design Science Research

**Based on Taxonomy of CoP (from Franziska Tobisch)*

Dimensions	Characteristics							
Purpose	Distribution of information	Knowledge creation	Knowledge sharing	Support	Definition of best practices or standards	Improvement	Creation of solutions	Innovation

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3. Research Methodology - Design Science Research

combined with *Interview Study*, *Expert Evaluation (Survey)*, and *Multivocal Literature Review*

Expert Interview Study

M. Miles , A.M. Hubermann, J. Saldaña (2018)
M. D. Myers, M. Newman (2007)
C.B. Seaman (1999)

39 semi-structured expert interviews (already exist)

Expert Evaluation (Survey)

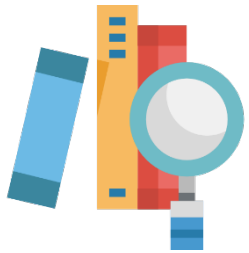
K. Peffers, M. Rothenberger, T. Tuunanen, R. Vaezi (2012)

Future Work

Design Science Research

Hevner et al. (2004), Peffers et al. (2007)

- **Problem Identification and Motivation**
- **Objectives of a Solution**
- **Design and Development**
  - Artifact: Measurement Approach for CoPs Success
- **Demonstration and Evaluation**
- **Communication**



Multivocal Literature Review (Literature and Gray Literature)

V. Garousi, M. Felderer, M. V. Mäntylä (2017)

Investigate related knowledge about success of CoPs / similar approaches in the fields:

1) Large-Scale Agile Software Development
2) Agile Software Development
3) General Organizational Setting

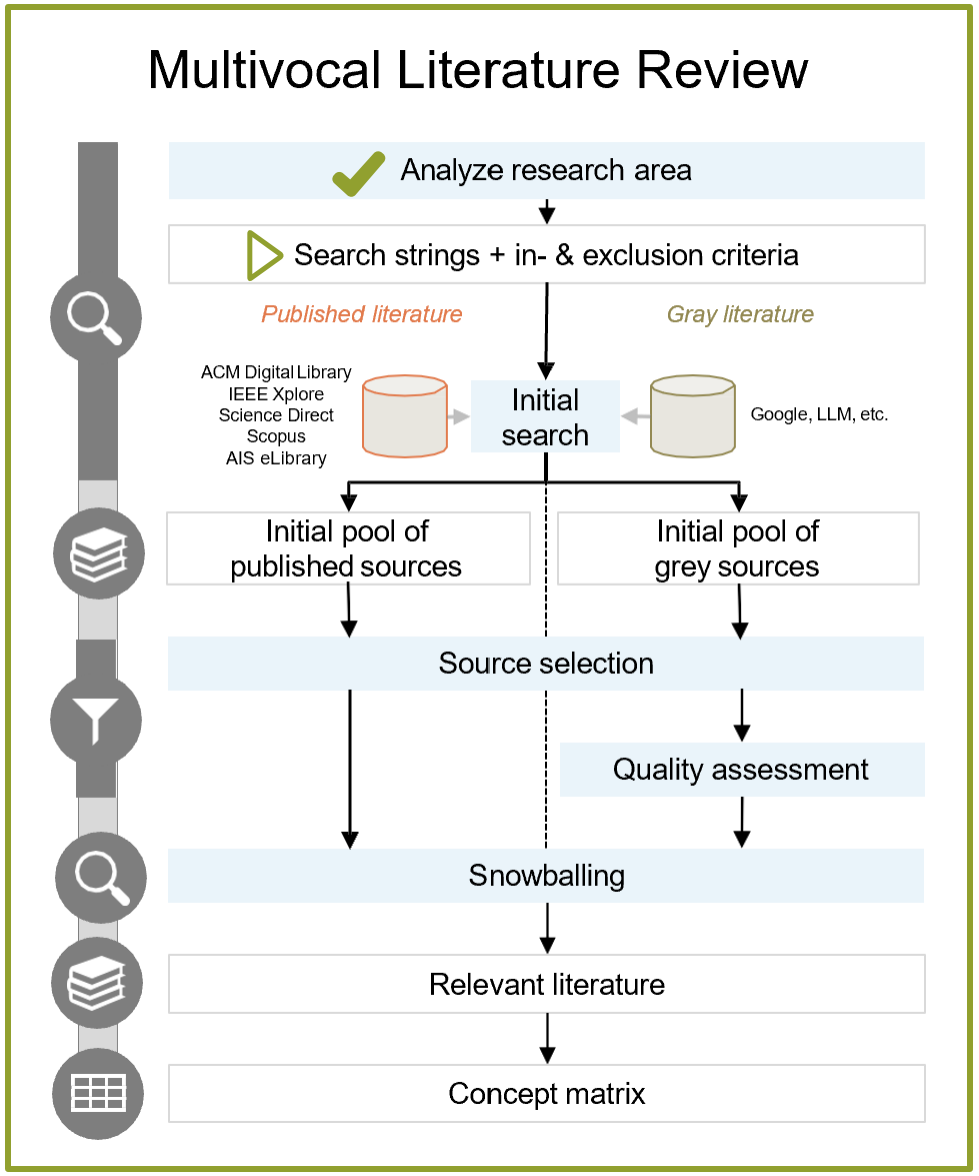
Literature searched from:

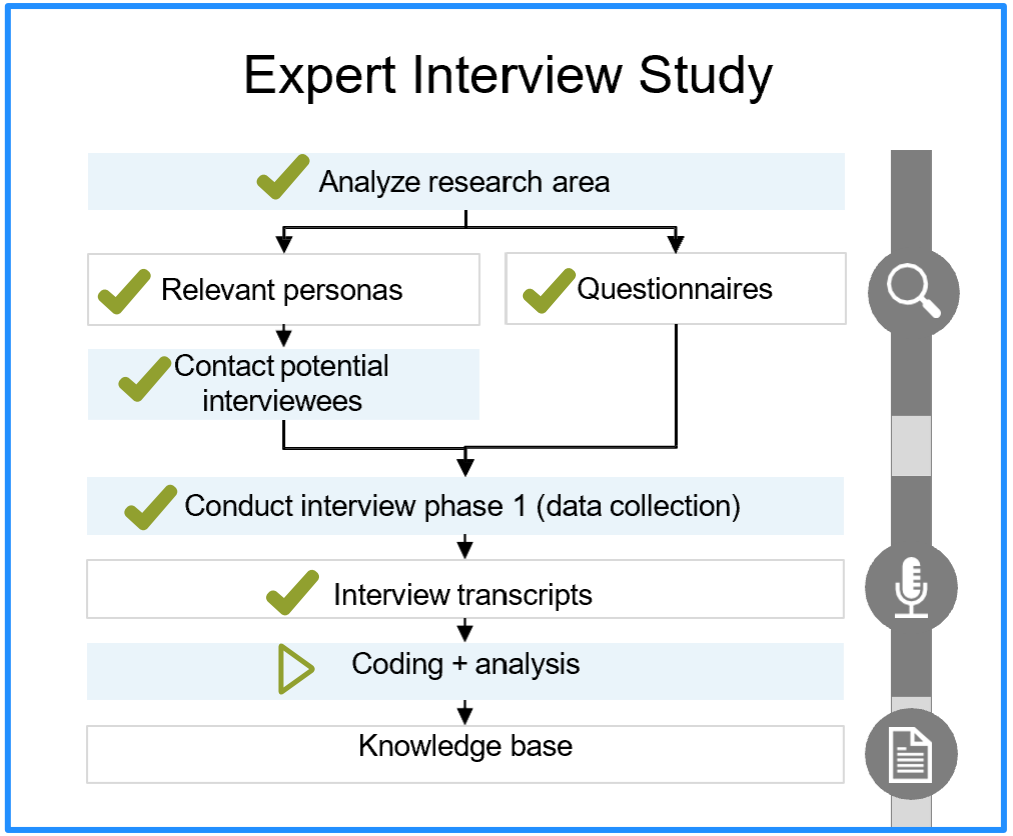
- Selected Academic Databases (IEEE Xplore, Science Direct, etc.)

Gray Literature searched from:

- Search Engines (Google, etc.)
- LLMs (Microsoft Copilot, ChatGPT, etc.)

3. Research Methodology - Multivocal Literature Review & Interview Study





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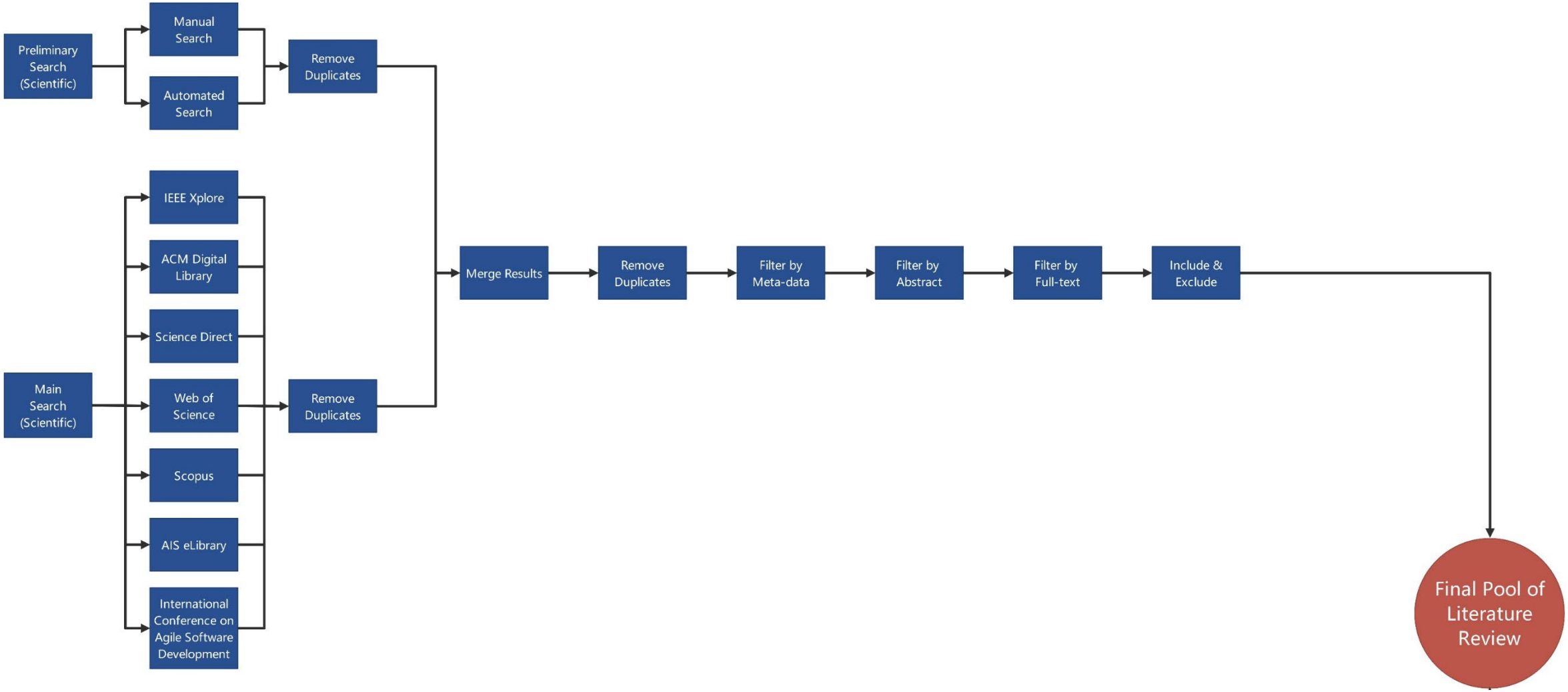
4. Current State - Search Strategy for RQ1

Topic	What are the existing approaches to **assessing the success of CoPs*** in the context of ***1) Large-Scale Agile Software Development*** , ***2) Agile Software Development*** , *and* ***3) General Organizational Setting*** *?* (*Based on taxonomy of CoP)		
Methodology	***Structured Literature Review (Scientific)***	***Structured Literature Review (Gray)***	***Interviews***
1	IEEE Xplore	Google	Coding
2	ACM Digital Library	Microsoft Copilot (Web Search)	Analysis
3	Science Direct	Kimi Chat (Web Search)	
4	Web of Science	ChatGPT (Web Search)	
5	Scopus	PMI - Project Management Institute (Membership Privilege - Community, Learning, Explore, etc.)	
6	AIS eLibrary	ScrumAlliance (Membership Privilege - Resources)	
7	International Conference on Agile Software Development (XP)	*SAFe - ScaledAgileFramework (Blog, etc.)	
		LinkedIn	

4. Current State - Search String for RQ1

Topic	What are the existing approaches to **assessing the success of CoPs*** in the context of ***1) Large-Scale Agile Software Development***, ***2) Agile Software Development***, *and* ***3) General Organizational Setting*** *?* (*Based on taxonomy of CoP)					
	Aspects					
Synonym	**measurement**	**success**	**CoP**	**large-scale agile software development**	**agile software development**	**general organizational setting**
	measurements	successes	CoPs	scaling	agile development	organizational
	metric	*impact	community of practice	*LSASD	agile	organization
	metrics	*outcome	community of practices	*LSAD	agility	organizations
	KPI	*outcomes	communities of practice	scaling agile frameworks	application agility	company
	KPIs	*influence	communities of practices	Crystal Family	continuous integration	companies
	Key Performance Indicator	*effectiveness	CoE	Dynamic Systems Development Method Agile Project Framework for Scrum	iterative development	enterprise
	Key Performance Indicators	start from here, and see in paper	CoEs	Scrum of Scrums	incremental development	enterprises
	performance		community of excellence	Enterprise Scrum	extreme programming	institution
	evaluate		communities of excellence	Agile Software Solution Framework	XP	institutions
	evaluation		community of interest	Large-Scale Scrum	feature driven development	corporation
	criterion		guild	Scaled Agile Framework	FDD	corporations
	criteria		round table	Disciplined Agile	scrum	group
	assess		interest league	Spotify Model	crystal	groups
	assessment			Mega Framework	pair programming	business
	assessments			Enterprise Agile Delivery and Agile Governance Practice	test-driven development	
	diagnostic			Recipes for Agile Governance in the Enterprise	TDD	
	monitor*			Continuous Agile Framework	leanness	
	quantitative model			Scrum at Scale	lean software development	
	reporting			Enterprise Transition Framework	lean development	
				ScALeD Agile Lean Development	LSD	
				eXponential Simple Continuous Autonomous Learning Ecosystem		
				Lean Enterprise Agile Framework		
				Nexus	NOT manufacturing	
				FAST Agile	NOT large-scale agile software development (ALL)	

4. Current State - Process Graph of Structured Literature Review



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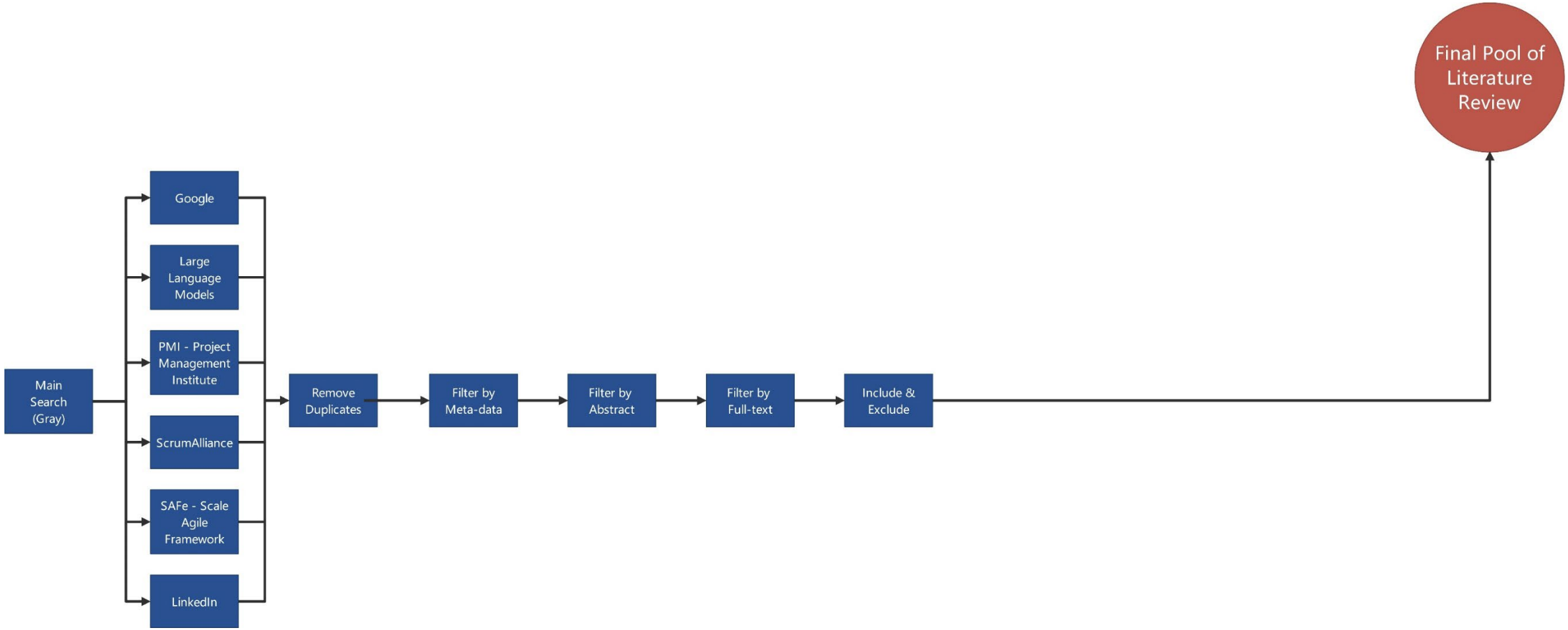

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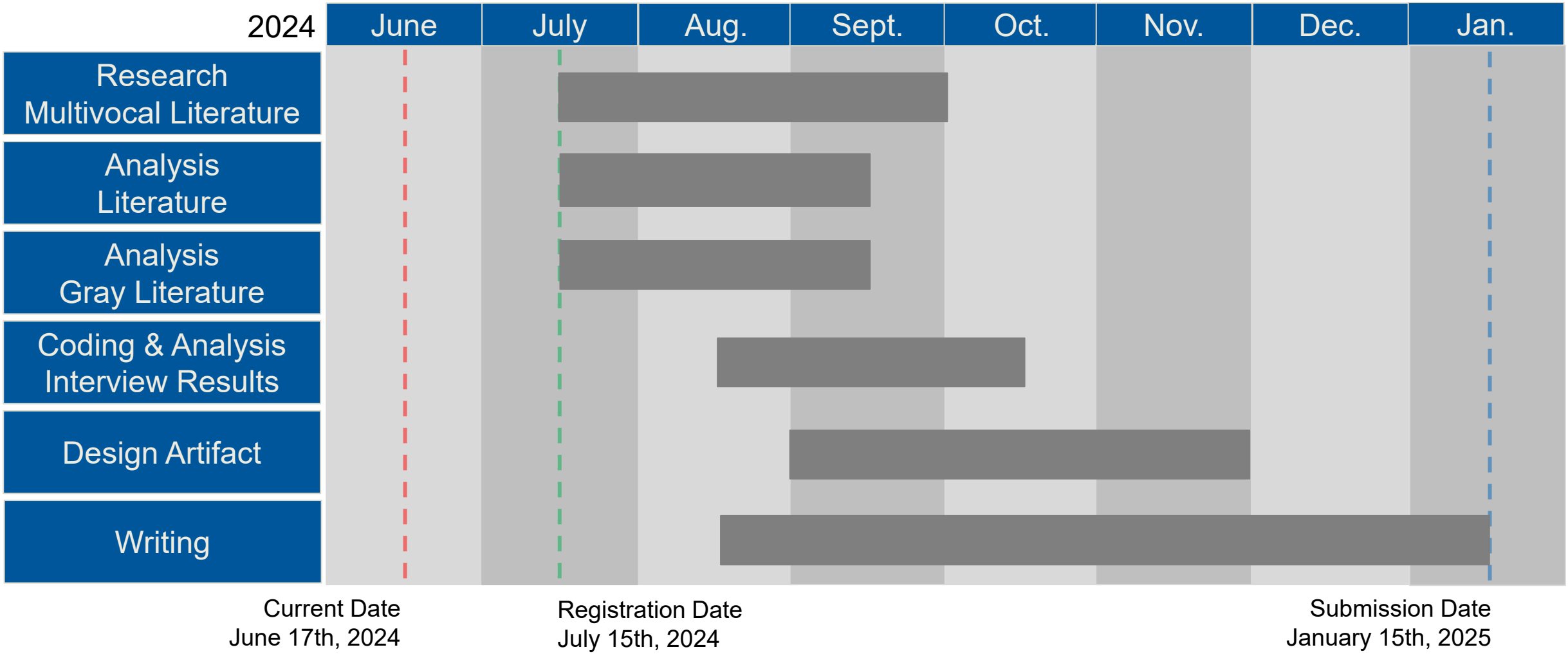
2024
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Research Multivocal Literature
Analysis Literature
Analysis Gray Literature
Coding & Analysis Interview Results
Design Artifact
Writing
Current Date
June 17th, 2024
Registration Date
July 15th, 2024
Submission Date
January 15th, 2025

B.Eng.

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Appendix - Three Distinct Traits for CoPs

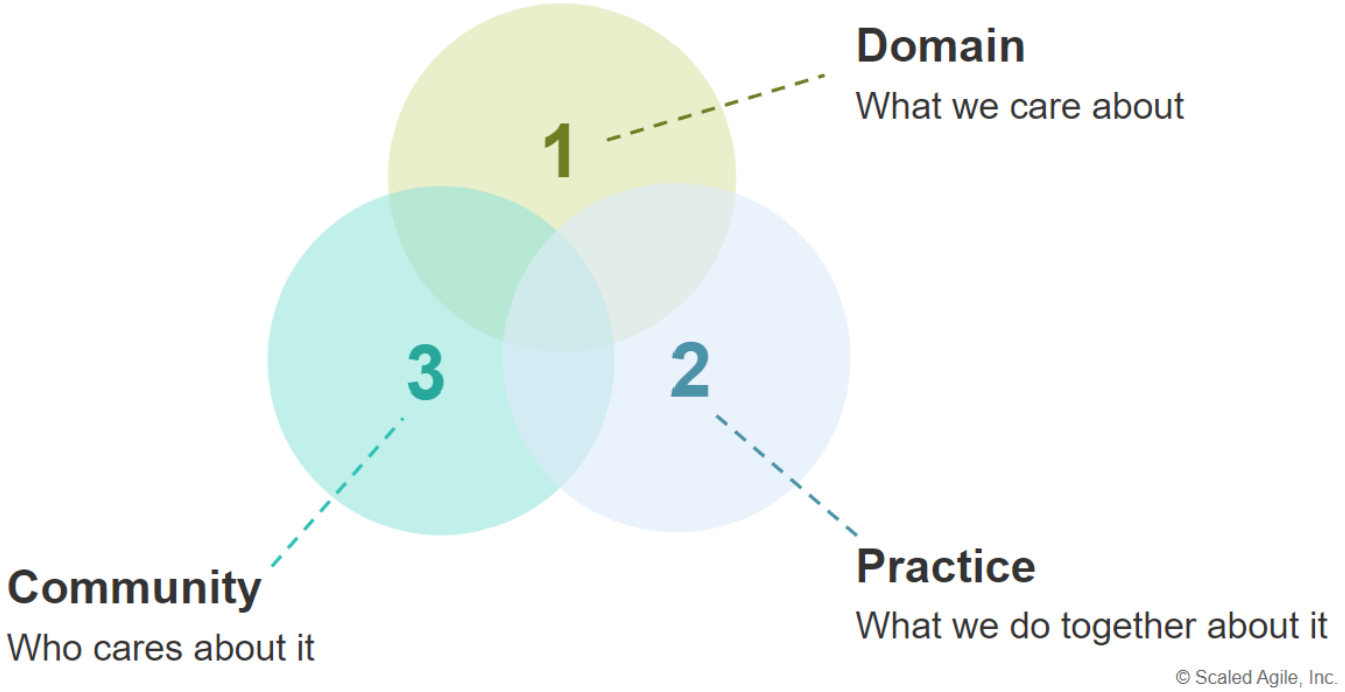

Figure 1. Communities of Practice have three distinct traits

https://scaledagileframework.com/communities-of-practice/
Wenger, Etienne. Communities of Practice: Learning, Meaning, and Identity. Cambridge University Press, 1999.

Appendix - Role-based CoPs

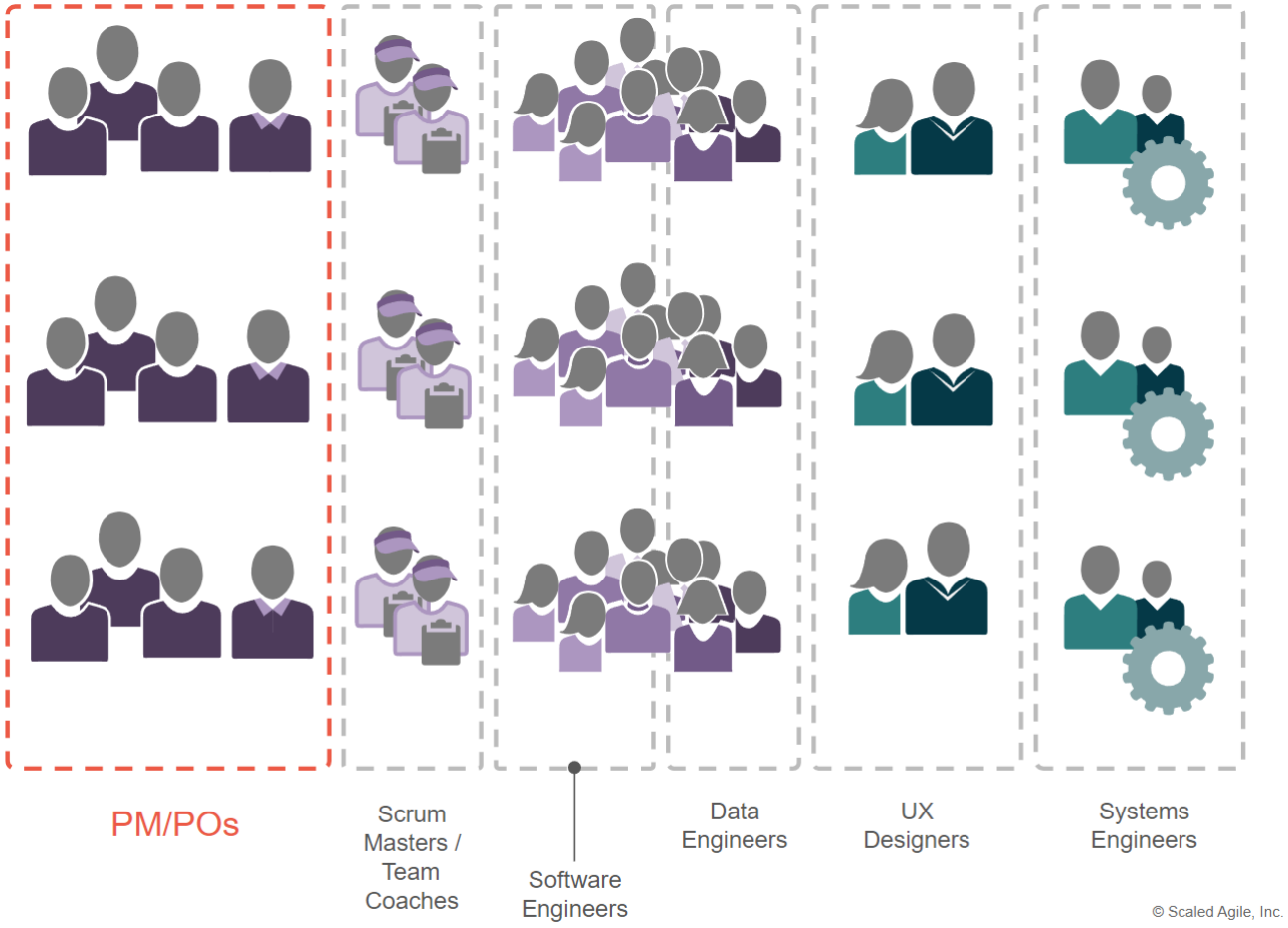

Figure 2. Role-based Communities of Practice

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Wenger, Etienne. Communities of Practice: Learning, Meaning, and Identity. Cambridge University Press, 1999.

Appendix - Topic-based CoPs

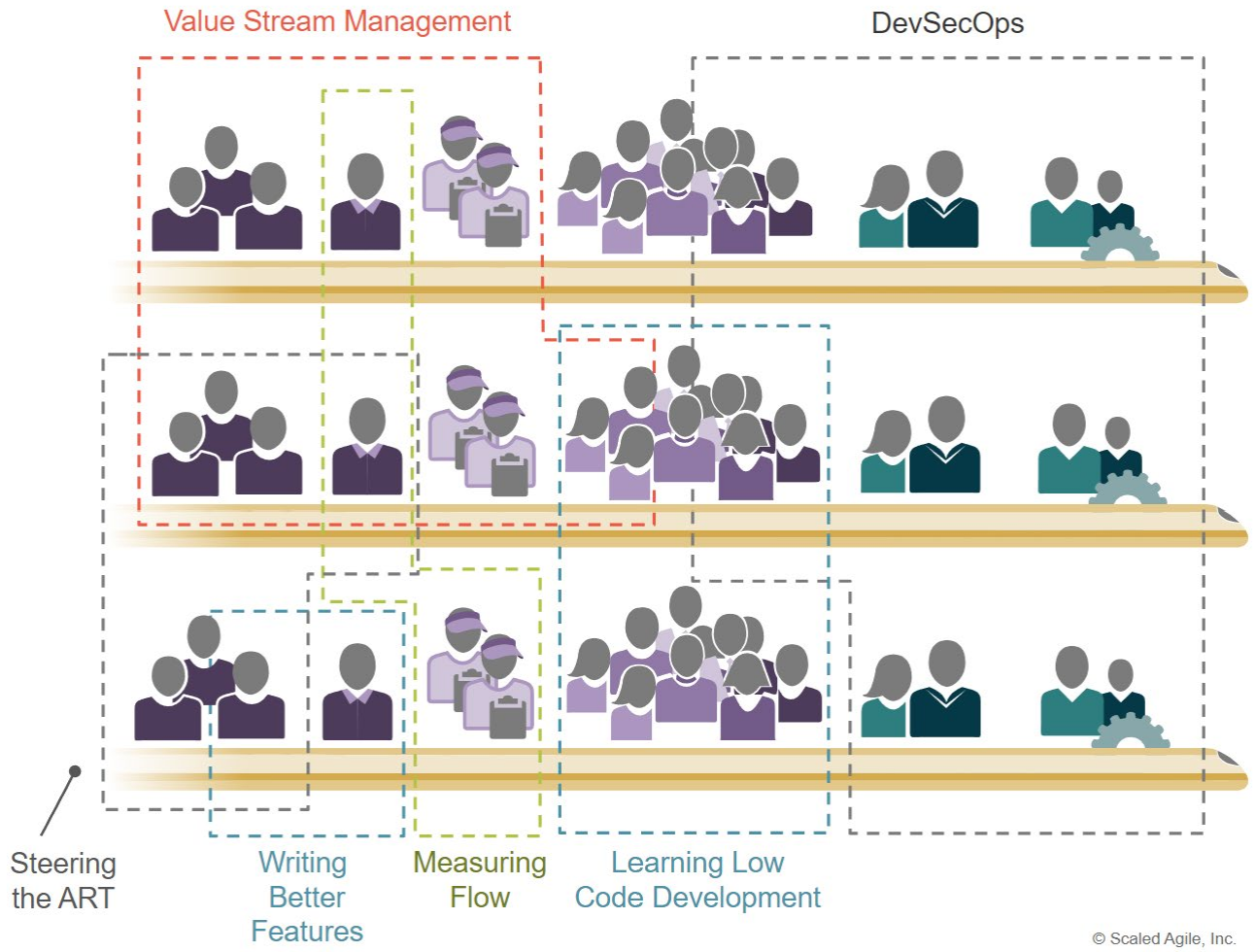

Figure 3. Topic-based Communities of Practice

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Appendix - Organizing a CoP

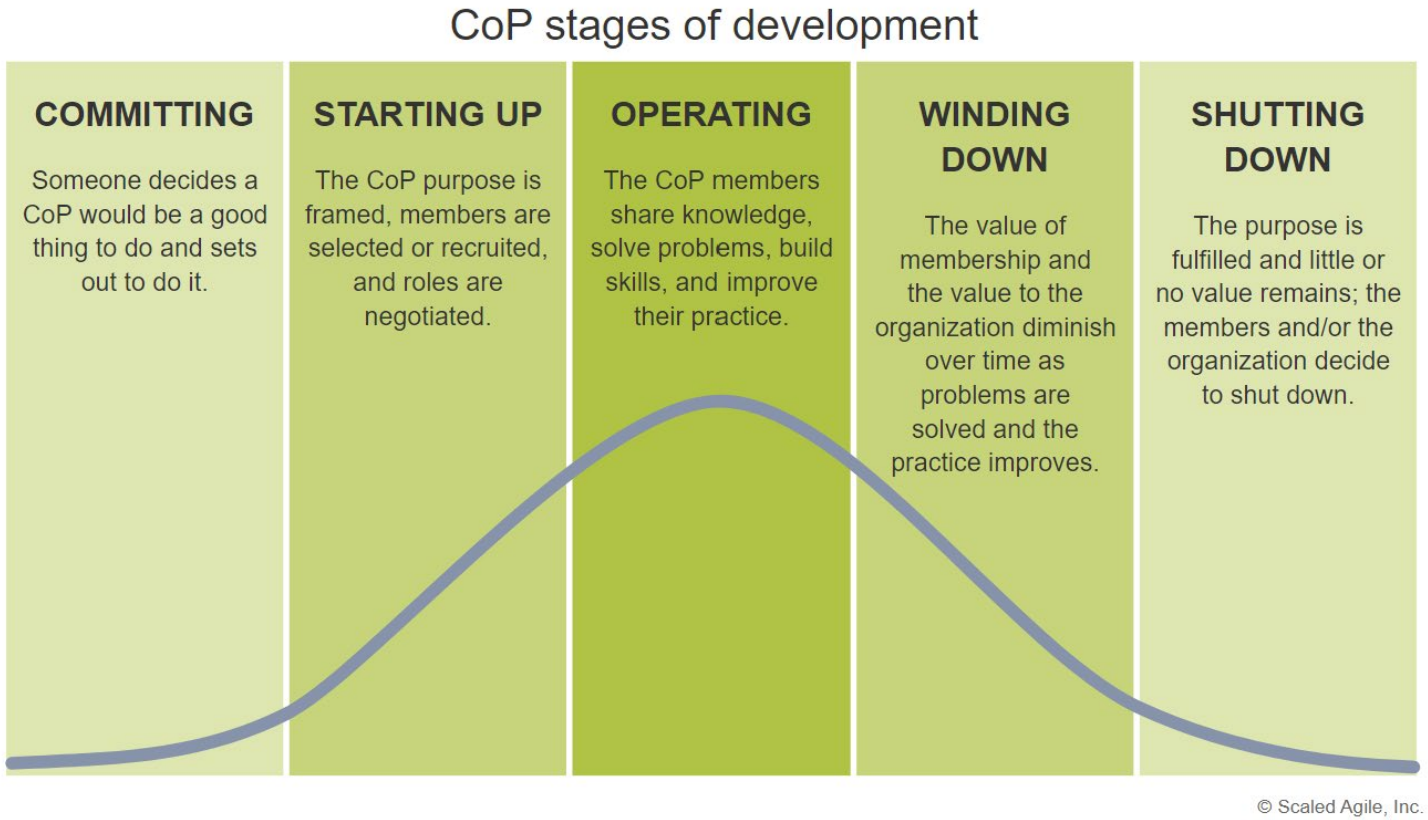

Figure 4. CoPs typically follow a five-stage life cycle, from conceptualization to closure (4)

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