Investigating the Reasons and Expectations for Adopting Scaling Agile Frameworks

Shun Long Hong, 21.10.2019, Final Presentation Guided Research

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Introduction and Related Work

Increasing speed of changing business requirements coming from competition, technology advantage, and customers [1], [2], [3]

Small, co-located teams use agile methods to max. customer value, increase software quality and responsiveness to change [4], [5], [6], [7]

Challenges arise when scaling agile to large scale, such as communication, inter-team coordination, dependencies among existing environments, or general change resistance [8], [9], [10]

Organizations choose scaling agile frameworks to overcome challenges, such as Scaled Agile Framework (SAFe), and Large Scale Scrum (LeSS)

Status quo

- Existing research either consist of in-depth case studies or literature research
- Lack of empirical research on scaling agile frameworks

Adoption reasons
- 9 relevant research papers, all implicitly reference adoption reasons

Expectations
- 1 relevant research paper, implicitly assess framework adoption satisfaction

Research gap

1. Lack of literature investigating scaling agile framework selection process
2. Lack of research analyzing the satisfaction with scaling agile frameworks
3. Lack of literature comparing different scaling framework adoptions with each other

Motivation and Research Questions

Goal

- Conduct study on global scale to collect data from scaling agile framework practitioners
- Contribute findings from empirical study towards scaling agile framework research
- Investigate scaling agile framework selection process and relevant adoption reasons
- Understand how framework selection influences satisfaction

Research questions

1. How do organizational characteristics influence the selection process of scaling agile framework?
2. How do organizational characteristics influence the satisfaction with scaling agile framework?
3. How do different frameworks such as LeSS, internally created ones, SAFe, and Spotify affect selection process and satisfaction with scaling agile frameworks?

Research Hypotheses (extract)

Hypothesis

Statement	Theoretical framework
Documentation (H1.3), support (H1.4), and scaling (H1.5) is more relevant for large development organizations than smaller ones.	• Organizations must solve the challenge of scaling agile development [11] • Number of business units and complex structures increases dependency complexity → good communication and documentation required [12], [13] • Little guidance on how to successfully scale agile to large projects and agile transformations in large organizations [8], [14], [15] • Training is important for successful adoption [9] → external experts [8], [16]
H2.1: Organizations with more scaling agile experience agree more with the statement *"The framework met the expectations of my organization"* such with less experience.	• Scaling agile can take up to several years [11], [12], [15] • Many organization start agile journey with pilots [8], [17] • Amount of realized benefits is limited, satisfaction comes with time
Organizations that use SAFe agree significantly more with documentation (H3.1) and support (H3.2) than organizations that use Spotify or Internal frameworks.	• SAFe is extensively documented [18] • SAFe supported by multiple companies for coaching and training [19], [20] • Trainings were perceived as very helpful [15] • Spotify supported by little documentation [18]

Research Project Setup

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Research Method

1 Sampling

- Targeted scaling agile framework practitioners with different backgrounds
- Convenient sampling (non-probabilistic)
- Challenge: no singular list without risk of bias

2 Survey design

- Investigated: agile transformation background, reasons for framework adoption, framework evaluation, benefits, challenges, technical background, general background, closing
- Likert scale questions with six reply options
- Based on Version One [16], Uludağ et al. [18], Putta et al. [21]

3 Survey validation

- Preliminary validation by two domain experts to check adherence to survey best practices
- Understandability, effectiveness, and technical details validated by subject matter expert

4 Data collection

- Two researchers promoted survey at three international conferences: XP 2019, Agile 2019, and ICGSE 2019
- Agile Meetups in Denmark and Finland
- Global LinkedIn group
- Snowballing

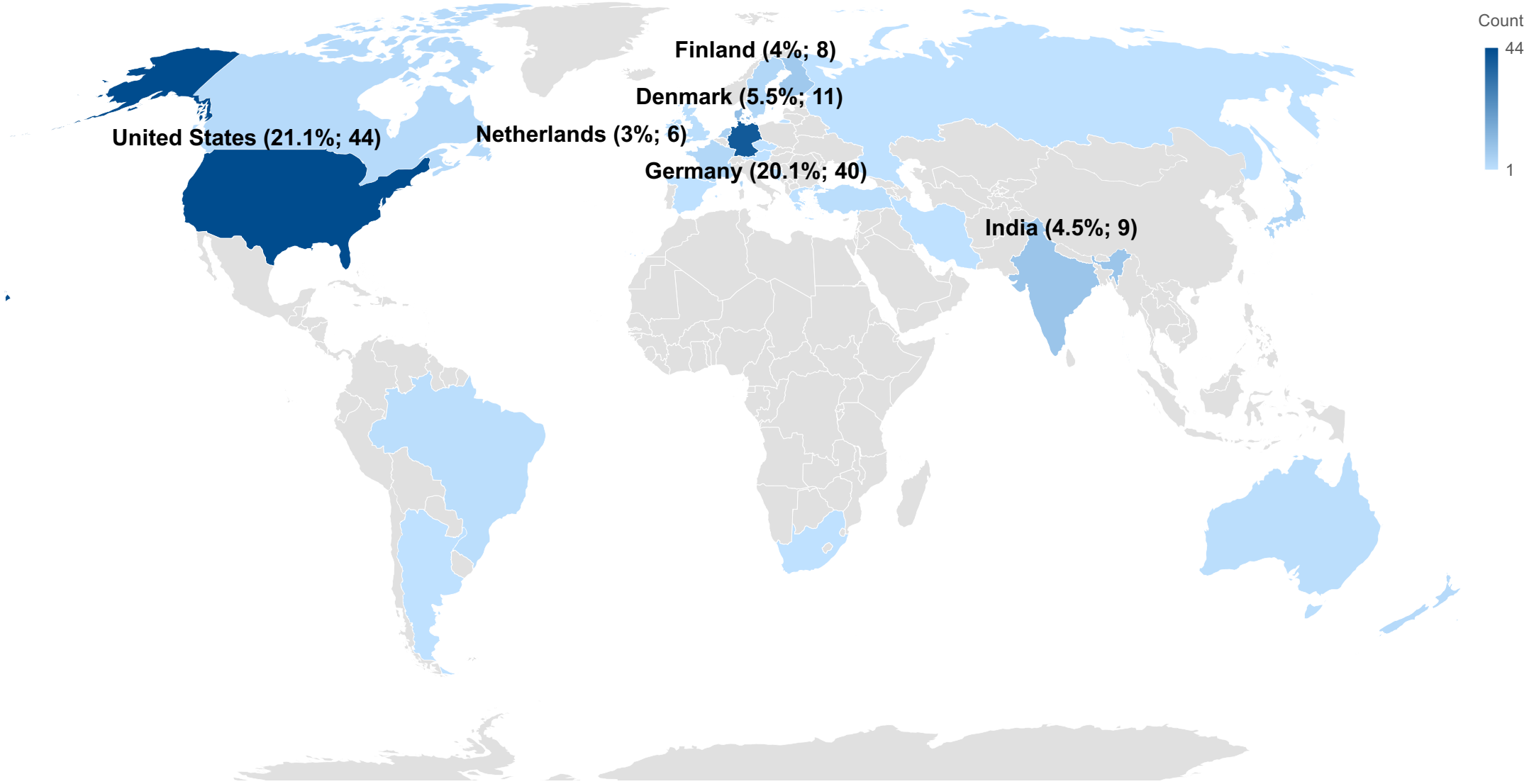
5 Data preparation

- Deletion: removed unnecessary variables
- Completion: complement missing information
- Transformation: convert DV from nominal into ordinal
- Creation: generate additional variables
- Testing: validate encoding

6 Data analysis

- Used SPSS to conduct descriptive / inferentioal analysis
- Used non-parametric Mann-Whitney U test to determine differences in medians of two independent groups
- Calculate correlation coefficient to determine effect size of groupings [22], [23]

Worldwide Distribution of Survey Participants – Top 6 Countries



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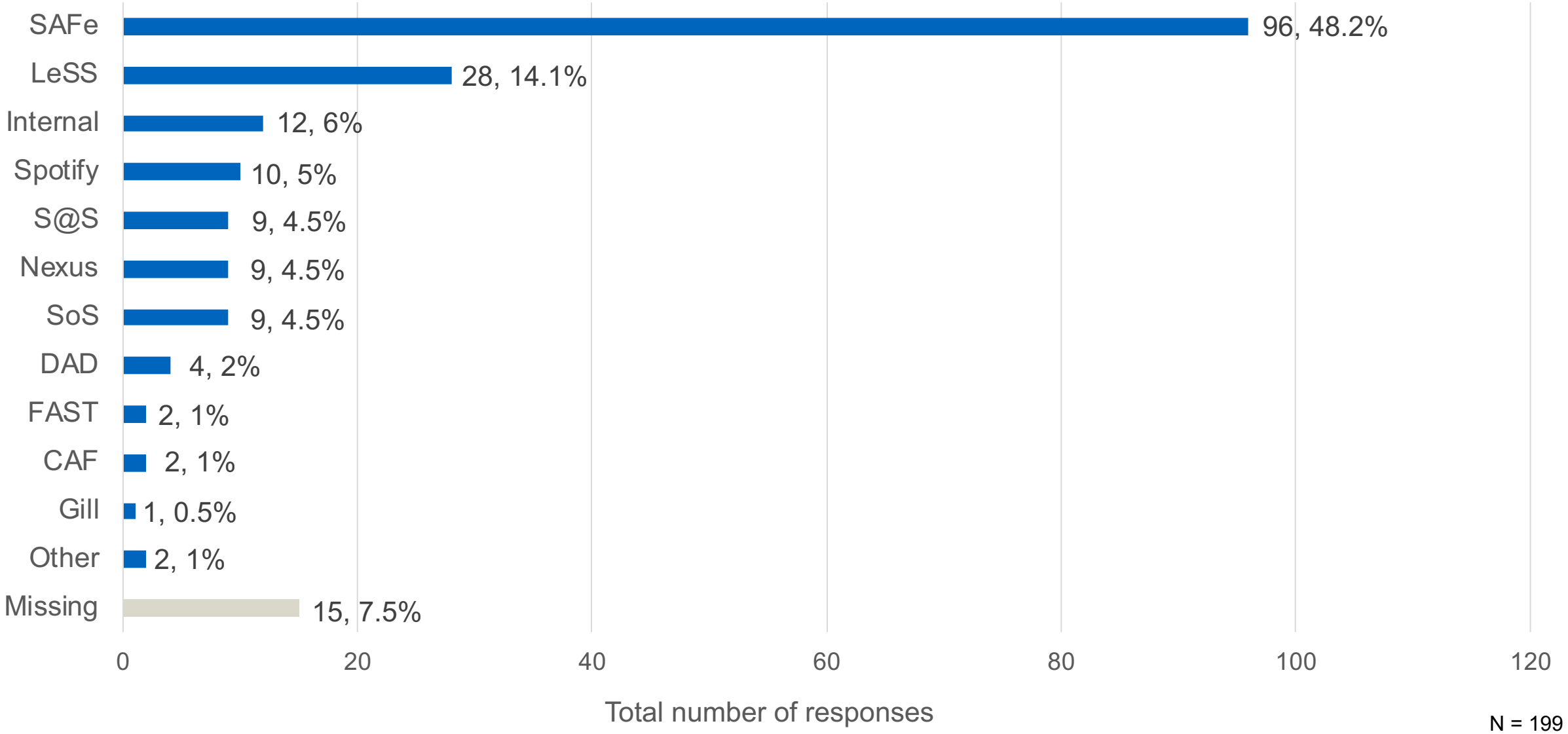
Primary Framework Distribution of Survey Participants

SAFe was the dominant scaling agile framework used by survey participants



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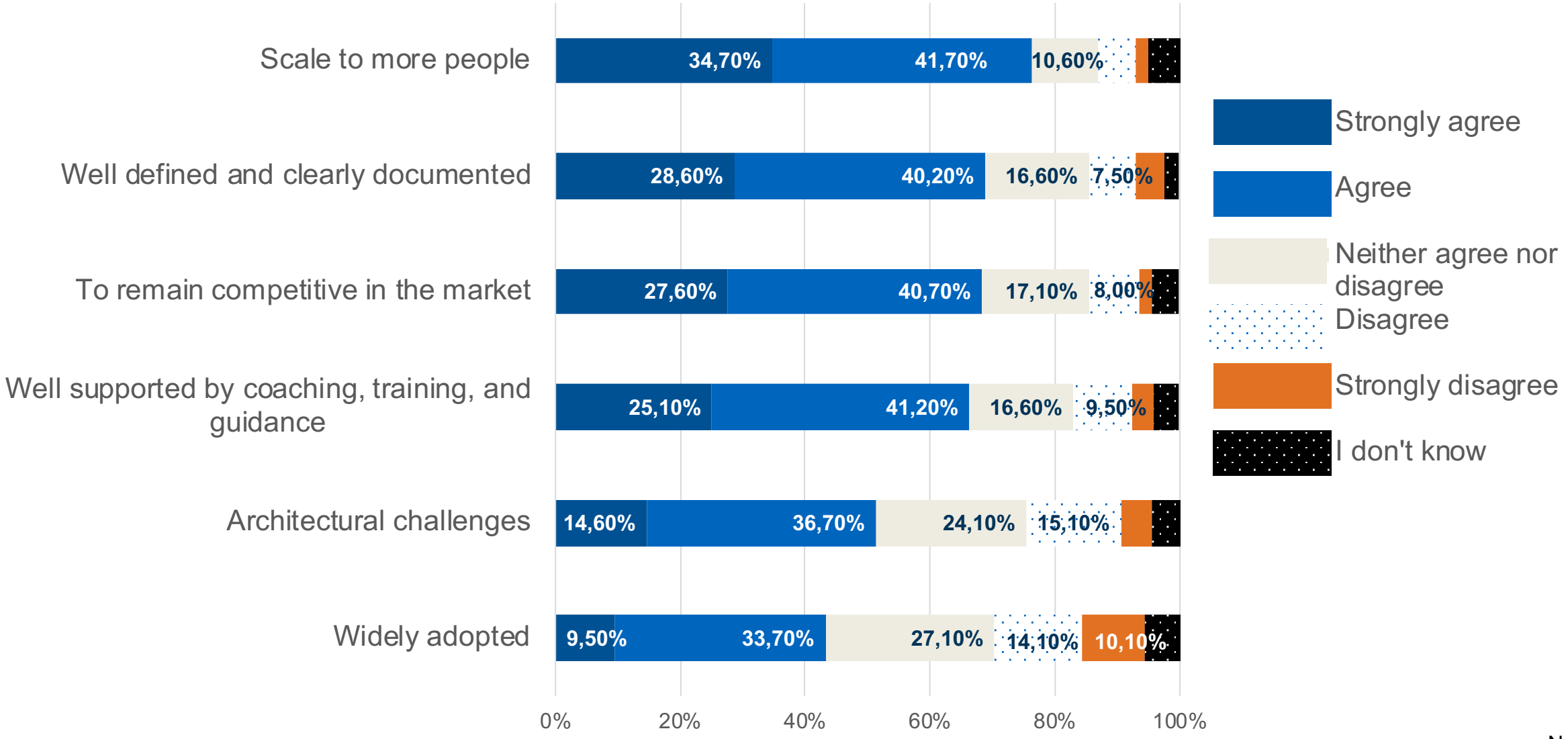
Adoption Reasons of Survey Participants

Scaling more people was the top adoption reason and popularity was the least agreed one



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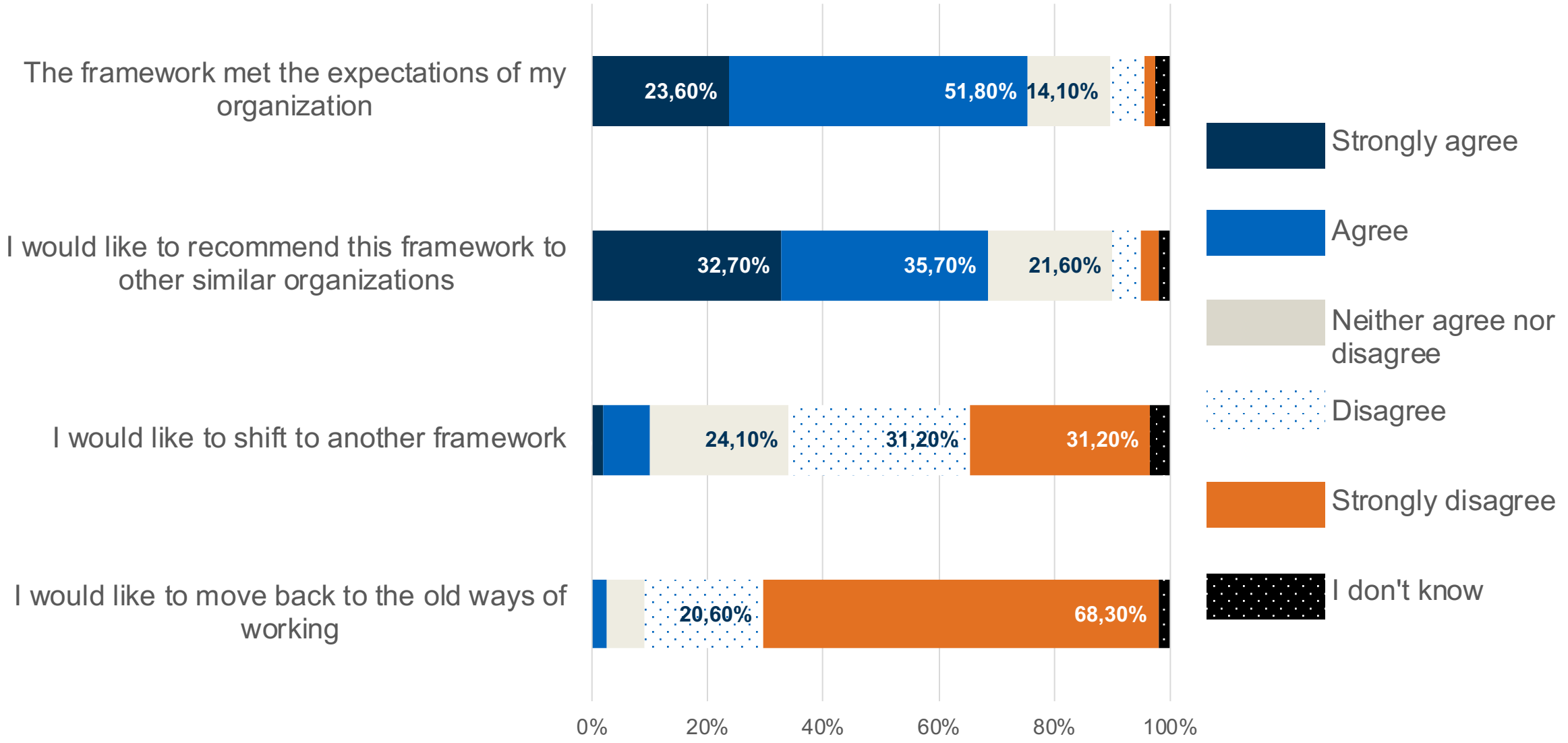
Expectations of Survey Participants

75.4% of survey participants were satisfied with their framework adoption



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Inferential Statistics – Size of Development Organizations

Hypothesis	Check
Documentation (H1.3), support (H1.4), and scaling (H1.5) is more relevant for large development organizations (L; n = 57) than smaller ones (S; n = 70).	H1.3 H1.4 H1.5

	U	Z	p	Median S	Median L	Avg. S	Avg. L	Mean rank S	Mean rank L	Effect size
Adoption reasons										
Because it is widely adopted	**1620.000**	**-1.878**	**0.060**	**3.00**	**4.00**	**2.79**	**3.19**	**58.64**	**70.58**	
Because the framework is well defined and clearly documented	1899.500	-0.484	0.628	4.00	4.00	3.70	3.72	62.64	65.68	
Because the framework addresses architectural challenges	1965.000	-0.150	0.881	4.00	3.00	3.29	3.23	64.43	63.47	
Because it is well supported by coaching, training, and guidance	1921.000	-0.374	0.708	4.00	4.00	3.54	3.51	65.06	62.70	
To remain competitive in the market	1746.000	-1.285	0.199	4.00	4.00	3.64	3.91	60.44	68.73	
Scale to more people	1887.500	-0.559	0.576	4.00	4.00	3.77	3.93	62.46	65.89	
Expectations										
The framework met the expectations of my organization	1869.000	-0.663	0.507	4.00	4.00	3.79	3.88	62.20	66.21	
I would like to move back to the old ways of working	1911.000	-0.498	0.618	1.00	1.00	1.33	1.46	62.80	65.47	
I would like to shift to another framework	1716.500	-1.405	0.160	2.00	2.00	1.89	2.19	60.02	68.89	
I would like to recommend this framework to other similar organizations	1886.000	-0.556	0.579	4.00	4.00	3.94	3.72	65.56	62.09	

Inferential Statistics – Framework Adoption Experience

Hypothesis	Check
H2.1: Organizations that have more experience (M-E; n = 22) with scaling agile frameworks significantly agree more with the statement *"The framework met the expectations of my organization"* than organizations with less experience (L-E; n = 30).	H2.1

	U	Z	p	Median L-E	Median M-E	Avg. L-E	Avg. M-E	Mean rank L-E	Mean rank M-E	Effect size
Adoption reasons										
Because it is widely adopted	313.000	-0.322	0.747	3.00	3.00	2.93	2.77	27.07	25.73	
Because the framework is well defined and clearly documented	276.000	-1.030	0.303	4.00	4.00	3.27	3.59	24.70	28.95	
Because the framework addresses architectural challenges	**185.000**	**-2.764**	**0.006**	**3.00**	**4.00**	**2.77**	**3.73**	**21.67**	**33.09**	**0.383**
Because it is well supported by coaching, training, and guidance	**215.500**	**-2.208**	**0.027**	**4.00**	**4.00**	**2.93**	**3.68**	**22.68**	**31.70**	**0.306**
To remain competitive in the market	241.500	-1.703	0.089	4.00	4.00	3.40	3.82	23.55	30.52	
Scale to more people	284.000	-0.891	0.373	4.00	4.00	3.43	3.95	24.97	28.59	
Expectations										
The framework met the expectations of my organization	**186.500**	**-2.787**	**0.005**	**4.00**	**4.00**	**3.30**	**4.14**	**21.72**	**33.02**	**0.386**
I would like to move back to the old ways of working	254.500	-1.592	0.111	1.00	1.00	1.60	1.27	29.02	23.07	
I would like to shift to another framework	**212.000**	**-2.262**	**0.024**	**3.00**	**1.50**	**2.53**	**1.68**	**30.43**	**21.14**	**0.313**
I would like to recommend this framework to other similar organizations	**166.000**	**-3.142**	**0.002**	**3.00**	**4.00**	**2.97**	**4.05**	**21.03**	**33.95**	**0.435**

Inferential Statistics – SAFe vs. Spotify / Internal

Hypothesis	Check
Organizations that use SAFe (SAFe; n = 96) agree significantly more with documentation (H3.1) and support (H3.2) as important for framework selection than organizations that use Spotify or Internal frameworks (S / I; n = 10 and n = 12).	H3.1 H3.2

	U	Z	p	Median SAFe	Median S/ I	Avg. SAFe	Avg. S / I	Mean rank SAFe	Mean rank S / I	Effect size
Adoption reasons										
SAFe vs. Spotify										
Because the framework is well defined and clearly documented	**112.000**	**-4.262**	**0.000**	**4.00**	**2.00**	**4.14**	**2.30**	**57.33**	**16.70**	**0.413**
Because it is well supported by coaching, training, and guidance	**207.000**	**-3.154**	**0.002**	**4.00**	**3.00**	**3.99**	**2.70**	**56.34**	**26.20**	**0.306**
SAFe vs. Internal										
Because it is widely adopted	**154.000**	**-4.348**	**0.000**	**4.00**	**1.50**	**3.56**	**1.83**	**58.90**	**19.33**	**0.418**
Because the framework is well defined and clearly documented	**101.000**	**-4.945**	**0.000**	**4.00**	**2.50**	**4.14**	**2.08**	**59.45**	**14.92**	**0.475**
Because it is well supported by coaching, training, and guidance	**206.500**	**-3.846**	**0.000**	**4.00**	**2.00**	**3.99**	**2.33**	**58.35**	**23.71**	**0.370**
Expectations										
SAFe vs. Spotify										
I would like to shift to another framework	**470.500**	**-0.107**	**0.915**	**2.00**	**2.00**	**2.23**	**2.50**	**53.40**	**54.45**	
I would like to recommend this framework to other similar organizations	**194.500**	**-3.222**	**0.001**	**4.00**	**3.00**	**3.90**	**2.60**	**56.47**	**24.95**	**0.312**
SAFe vs. Internal										
The framework met the expectations of my organization	**571.000**	**-0.054**	**0.957**	**4.00**	**4.00**	**3.76**	**3.83**	**54.55**	**54.08**	
I would like to recommend this framework to other similar organizations	**353.000**	**-2.280**	**0.023**	**4.00**	**3.00**	**3.90**	**3.08**	**56.82**	**35.92**	**0.219**

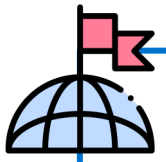
Test Summary

Hypothesis

Statement	Test result
Plan-driven organizations have a stronger preference for good documentation (H1.1) and available support (H1.2) as a relevant adoption reason than agile organizations.	
Documentation (H1.3), support (H1.4), and scaling (H1.5) is more relevant for large development organizations than smaller ones.	
H2.1: Organizations that used have more experience with scaling agile frameworks agree more with the statement *"The framework met the expectations of my organization"* than organizations with less experience.	
H2.2: Organizations that included more corporate areas into scaling agile framework adoption are more satisfied with the respective adoption than organizations which included less areas in the adoption scope.	

Statement	Test result
Organizations without distributed teams (H2.3) or sites (H2.4) are significantly more satisfied with their framework adoption than such with distributed teams or sites.	
Organizations that use SAFe agree significantly more with documentation (H3.1) and support (H3.2) than organizations that use Spotify or Internal frameworks.	
Organizations that use LeSS agree significantly more with documentation (H3.3) and support (H3.4) than organizations that use Spotify or Internal frameworks.	

Discussion



Key findings

- Data comparable to Agile One survey result
- Most agreed with adoption reason: scaling more people (76.4%)
- Most disagreed adoption reason: wide adoption (24.2%)
- 75.4% agree with expectations being met
- No significant finding that supports the assumption that plan-driven prefer documentation and support over agile organizations
- Geographical distributed teams and sites had no significant preference for documentation and support
- Large organization had no significant preference for documentation, support and scaling
- Organizations with broad adoption are significant more satisfied than such with narrow adoption
- SAFe and LeSS organizations agree more sign. With documentation and support as relevant criterion than Spotify / Internal framework organizations

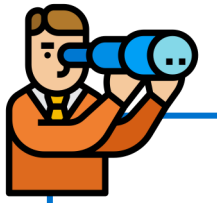
Limitations

- Construct validity
- Internal validity
- External validity
- Acquiescence bias
- Limited geographical representation

Conclusion

Conclusion

- Conducted global survey to investigate adoption reasons and satisfaction with scaling agile frameworks
- Organizations that include more areas are significantly more satisfied with framework adoption
- Organizations that have more framework experience agree sign. More with being satisfied and willing to recommend their framework
- Existing literature lacks on guidance about relevant adoption reasons



Future work

- Encourage researchers to conduct in-depth analysis on satisfaction factors
- Investigate more cases and focus on the selection process
- Continue research collaboration
- Refine resulting manuscript for submission

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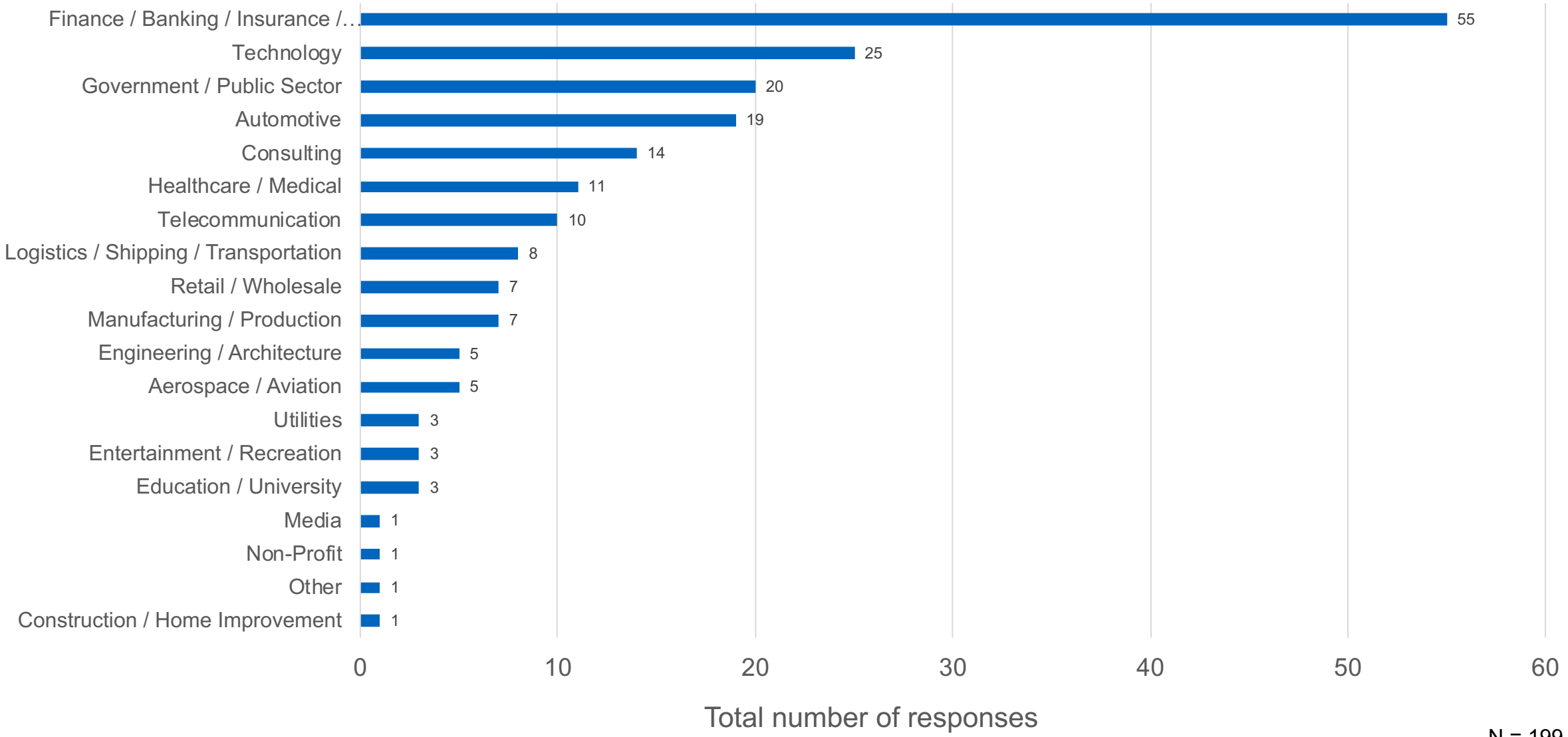
Backup

Inferential Statistics – Previous Development Model

Hypothesis	Check
Plan-driven organizations (P) have a stronger preference for good documentation (H1.1) and available support (H1.2) as a relevant adoption reason than agile organizations (A).	H1.1 H1.2

	U	Z	p	Median A	Median P	Avg. A	Avg. P	Mean rank A	Mean rank P	Effect size
Adoption reasons										
Because it is widely adopted	**1874.000**	**-2.266**	**0.023**	**3.00**	**3.00**	**2.56**	**3.19**	**62.44**	**78.56**	**0.188**
Because the framework is well defined and clearly documented	2145.500	-1.002	0.316	4.00	4.00	3.48	3.81	68.41	75.42	
Because the framework addresses architectural challenges	2071.000	-1.310	0.190	4.00	3.00	3.40	3.17	79.08	69.80	
Because it is well supported by coaching, training, and guidance	**1943.000**	**-1.882**	**0.060**	**4.00**	**4.00**	**3.30**	**3.77**	**64.36**	**77.55**	
To remain competitive in the market	2245.000	-0.565	0.572	4.00	4.00	3.48	3.73	70.40	74.37	
Scale to more people	2299.500	-0.332	0.740	4.00	4.00	3.70	3.82	71.49	73.79	
Expectations										
The framework met the expectations of my organization	2116.500	-1.179	0.238	4.00	4.00	3.92	3.69	78.17	70.28	
I would like to move back to the old ways of working	2105.000	-1.336	0.182	1.00	1.00	1.52	1.35	78.40	70.16	
I would like to shift to another framework	2145.000	-0.993	0.321	2.00	2.00	2.00	2.18	68.40	75.42	
I would like to recommend this framework to other similar organizations	2252.500	-0.533	0.594	4.00	4.00	3.60	3.80	70.55	74.29	

Industry distribution of survey participants



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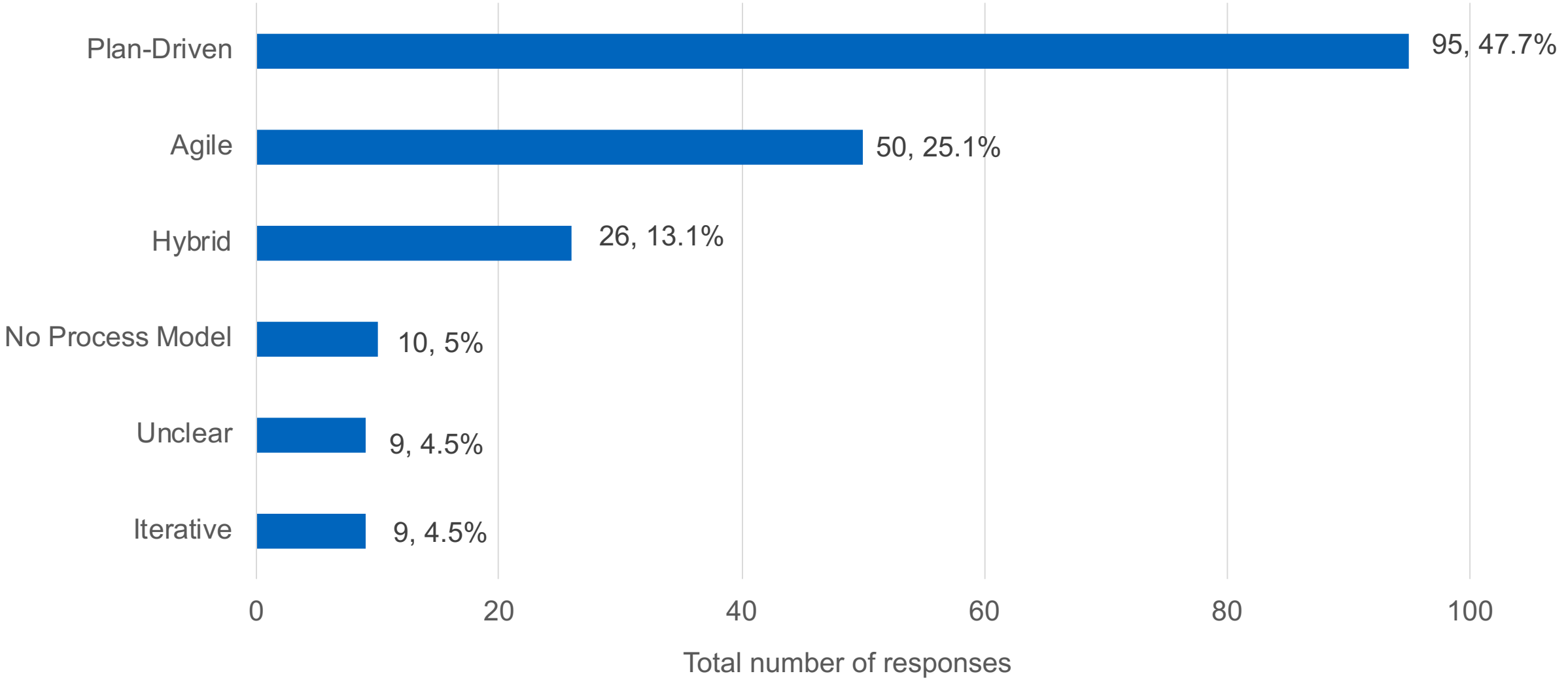
Previous development model of survey participants



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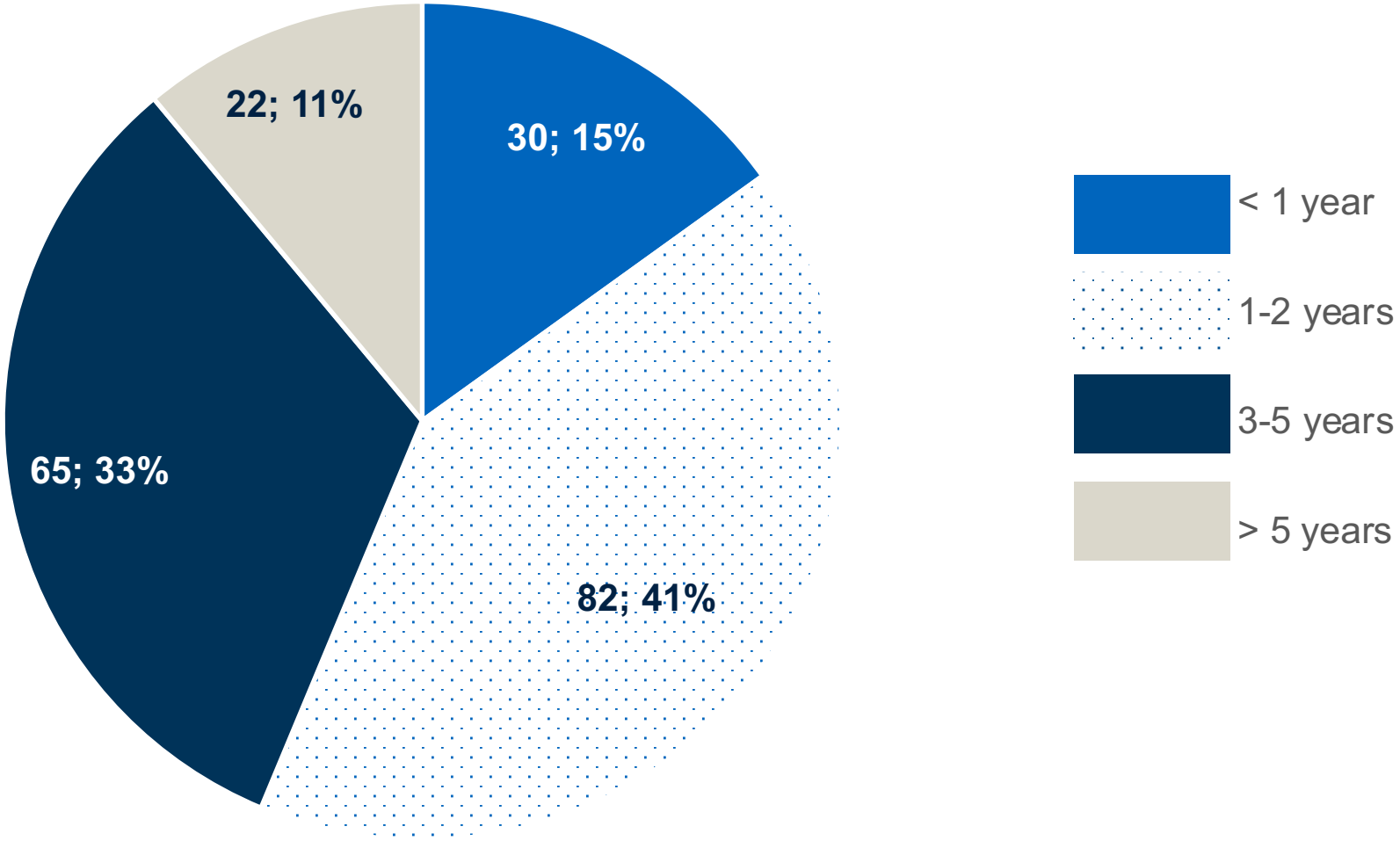
Framework experience of survey participants



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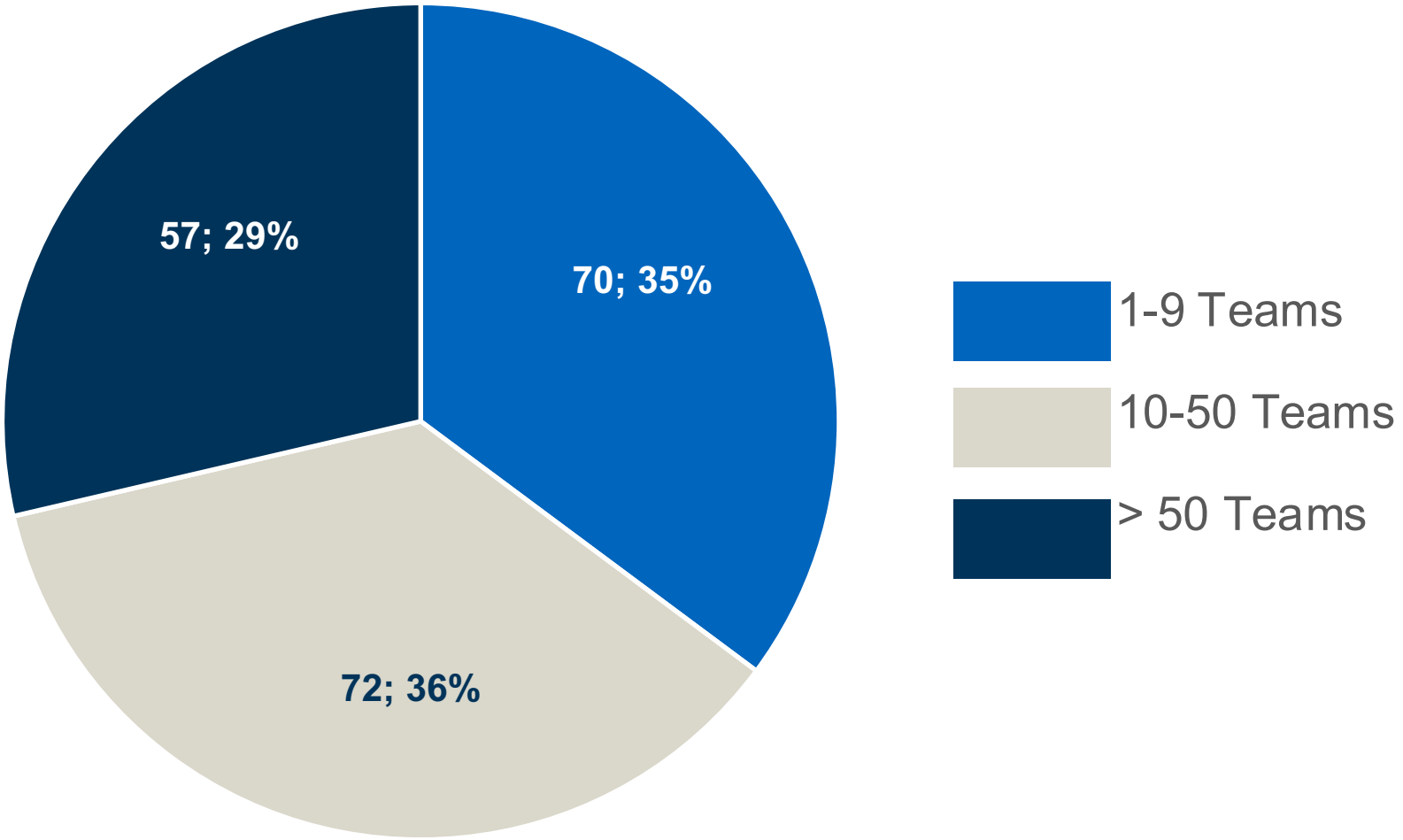
Number of development teams



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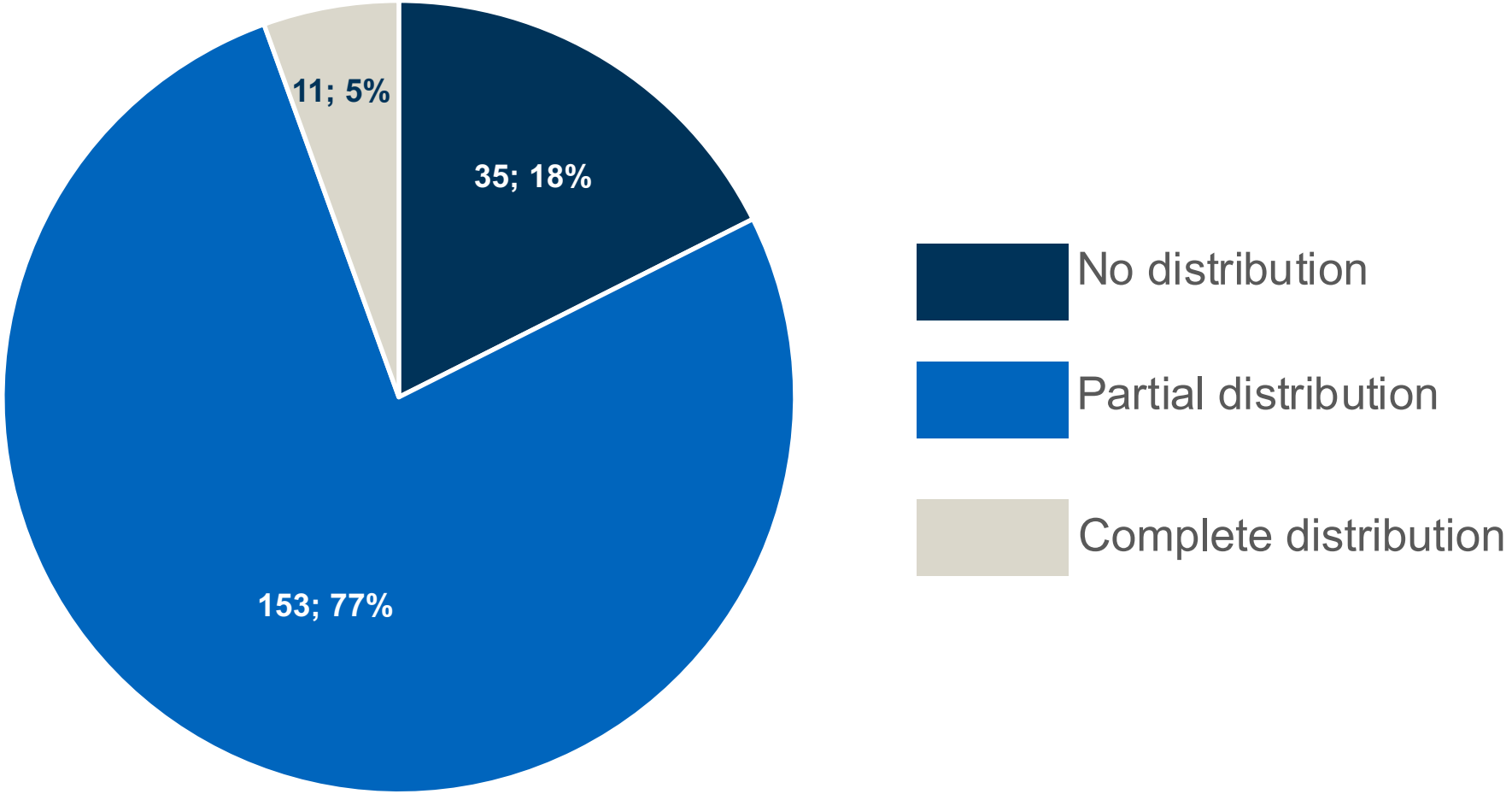
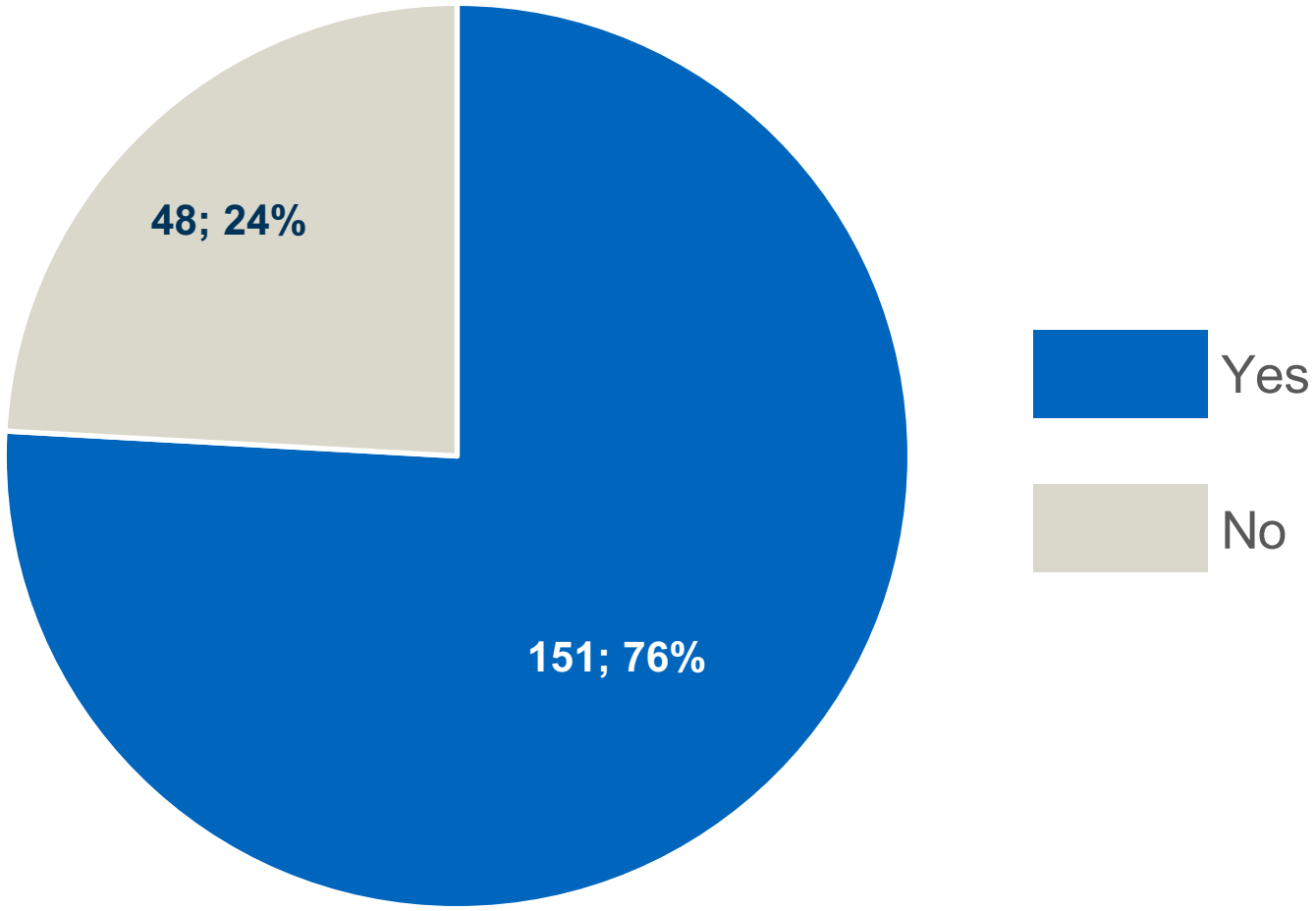
Team distribution



N = 199

Distributed sites



N = 199