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Article

Scaled Agile Methods as Enabler for Digital Transformation: Level of Adoption in the Czech Republic

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1. Introduction

In the recent years, digital transformation (DT) has emerged as an important phenomenon [1]. Digital transformation is defined as "the use of new digital technologies (social media, mobile, analytics or embedded devices) to enable major business improvements (such as enhancing customer experience, streamlining operations or creating new business models)" [2]. Put differently, digital transformation is about adopting disruptive technologies to increase productivity, value creation, and social welfare [3]. As digital transformation impacts increasing complexity and scale of technological solutions and emphasizes time to market, quality, and affordability [3], effective software development methods, techniques, and tools are needed to address these issues of IT systems delivery. While the traditional plan-driven software development methods do not scale to these challenges, agile and lean approaches are a major step in that direction. The key role of the agile methods usage in enabling digital transformation is derived from empirical research [4–6] where agile organizational culture is determined as one of the success factors for accomplishing digital transformation [7–9].

The focus of digital transformation is aimed at the whole enterprise. Therefore, original agile methods, designed to be used in small, single team projects [10], have stopped being sufficient. This has resulted in a birth of Scaled Agile Methods that are nowadays according to global surveys [11,12] broadly adopted.

In contrast to its broad application, data availability of the usage of agile software development methods (ASDMs) and specifically Scaled Agile Methods worldwide is only very limited. There are little data on the up-to-date state of the ASDM adoption in the Czech Republic and no data on the adoption of Scaled Agile Methods in the Czech Republic. To close that gap, we decided to design and conduct a survey among the Czech agile practitioners (ASDS-CZ survey). While the survey was focused on the ASDM adoption in the Czech Republic, in this paper we focus specifically on the Scaled Agile Methods adoption in detail due to a scope limitation. Thus, we analyze only a part of the conducted survey in this paper.

The rest of the paper is organized as follows. Following the Introduction, Section 2 describes Scaled Agile Methods and the state of their adoption worldwide. Next, Section 3 describes our research approach. Section 4 then presents and discusses the survey results. Finally, concluding remarks and research limitations are given.

2. Scaled Agile Methods

Agile methods were formally introduced through a set of four core values and 12 principles laid out in the Agile Manifesto [13]. Its signatories believed that software should be developed differently from the then mainstream norms of software engineering [14]. However, many people put much less emphasis on the ideological dimension of the problem nowadays, while prioritizing the pragmatic benefits of agile methods that lie in avoiding project failures [15]. The risk of project failure is reduced each time a software increment is delivered, since the highest priority requirements are selected for development during each increment and each increment is used to

gather client and user feedback. The increments are delivered regularly, and each comprises a carefully defined fragment of the overall development effort. On these grounds, there is an evidence that agile methods can improve both software development productivity and product quality [16]. These benefits have made agile methods attractive also for larger projects and larger companies [17] even despite a more difficult implementation within larger projects [16]. Compared to small projects, larger ones are characterized by the need for an additional coordination, which makes agile method implementation more difficult [16,18]. Large-scale agile involves additional concerns in handling an inter-team coordination and interfacing with other organizational units, such as human resources, marketing and sales, and product management. In addition, large scale may cause users and other stakeholders to become distant from the development teams [17]. To treat these issues a number of Scaled Agile Methods and frameworks have been developed like the Discipline Agile Delivery (DAD), Large-scale Scrum (LeSS), Scaled Agile Framework (SAFe), Enterprise Scrum, Scrum@Scale, Nexus, and Spotify. Scaled Agile Methods are nowadays both heavily used in practice [12,19] and researched [20–22].

Total of seven Scaled Agile frameworks were selected for our research and are described in the following sections. The procedure of their selection is described in 3.1. These frameworks are categorized based on the Horlach et al. [22] categorization as the Enterprise-focused approaches (Disciplined Agile Delivery, Scaled Agile Framework) and Inter-Team focused frameworks (Scrum of Scrums, Enterprise Scrum, Large-scale Scrum, Nexus, Spotify Model).

2.1. Scrum of Scrums

Scrum of Scrums is the oldest scaled agile method firstly described in 2001 by Jeff Sutherland [23]. It is applicable to large groups of people that are divided into Agile teams of 5-10 people. Each sub-team has its Daily Scrum where one member is designated as an "ambassador" to participate in a daily meeting with the ambassadors from other teams, called the Scrum of Scrums" [24]. At the Scrum of Scrums meeting the ambassadors report the completions, next steps and impediments on behalf of the teams they represent and agree to interfaces between teams, negotiate responsibility boundaries, etc.

2.2. Enterprise Scrum

Enterprise Scrum was developed by Mike Beedle and firstly presented in 2003. Since then it has been tested in practice and evolved. According to the last Enterprise Scrum Definition 4.0 [25] Enterprise Scrum is defined as "a generic, customer-centric, iterative-incremental, all-at-once, scalable, results-oriented, subsumption-based management framework that seeks to quickly deliver the most business value and balanced benefits to all people involved, through autonomous, self-DMOS teams. Self-DMOS means self-directed, self-managed, self-organizing and self-selected".

2.3. Disciplined Agile Delivery

The Disciplined Agile Delivery (DAD) framework is a hybrid of existing methods such as Scrum, Kanban, Agile Modelling, SAFe, Extreme Programming, Agile Data, Unified Process and many others. DAD provides the flexibility to use various approaches and plugs the gaps not addressed by mainstream agile methods [26]. The main characteristics of this framework are that it: is a people first, learning oriented hybrid agile/lean approach; has a risk value delivery lifecycle; is goal-driven; is enterprise aware; is tactically scalable at the team level; and strategically scalable across all of the enterprise [27].

2.4. Scaled Agile Framework

The Scaled Agile Framework (SAFe) is a freely revealed knowledge base of proven, integrated patterns for enterprise-scale Lean-Agile development [28]. The SAFe was created by Dean Leffingwell in 2012 and since then it has continually evolved to a current 5.0 version. The SAFe website [29] provides a guidance for scaling agile development across the Portfolio, Value Stream,

Program, and Team levels that are part of the Big Picture, i.e. a visual overview of the Framework. The Framework is scalable and modular, allowing each organization to adapt it to its own business model. The Framework has four core values that help to make the SAFe effective: Alignment, Built-in Quality, Transparency, and Program Execution. The SAFe's practices are grounded on nine fundamental principles that have evolved from the agile principles and methods, Lean product development, systems thinking, and observation of successful enterprises. The heart of the SAFe is the Program level, which revolves around an organization called the Agile Release Train (ART). Each ART aligns teams to a common mission and vision via a single program backlog and produces valuable and evaluable system-level solutions every two weeks. The Agile teams in an ART have the following choice of methods: Scrum, Kanban, and XP. They also use built-in quality practices. Each SAFe portfolio has the value streams, people, and processes necessary to provide Lean-Agile funding and governance for the products, services, and solutions required to fulfil its business strategy [28].

2.5. Large-scale Scrum

The Large-scale Scrum (LeSS) framework was created by Bas Vodde and Craig Larman in 2013 based on their experiences working with large-scale product development. As both authors state in [30], scaling Scrum starts with understanding and being able to adopt standard one-team Scrum. Large-scale Scrum requires examining the purpose of single-team Scrum elements and figuring out how to reach the same purpose while staying within the constraints of the standard Scrum rules. LeSS provides two different large-scale Scrum frameworks [31], i.e. the basic LeSS applicable up to eight teams (of eight people each) and the LeSS Huge that introduces additional scaling elements for development up to hundreds of developers.

2.6. Nexus

The Nexus framework was developed in 2015 by Ken Schwaber and Scrum.org and is aimed at multiple Scrum Teams (approximately three to nine) working together on a single Product Backlog to create an Integrated Increment [32]. Compared to the general Scrum framework, Nexus introduced a new role, namely the Nexus Integration Team which thereafter consists of Nexus Integration Team members, a Scrum Master and a Product Owner. Altogether they ensure that Nexus is applied with the Scrum approach in mind. The events within the Nexus framework are almost the same as within the Scrum approach. A Nexus Sprint Backlog is added as a new artefact which helps the scrum teams with transparency. Each team has also its own backlog.

2.7. Spotify Model

Spotify is a relatively young company, established in 2008 in Stockholm, Sweden. Spotify has grown very fast - over 3 years from 30 to 250 people. To be able to handle this growth, they developed a scaling model – with Squads, Tribes, Chapters, and Guilds. This model named the Spotify Model is used also in other companies. A Squad is the smallest working unit in Spotify, similar to the Scrum team, and is designed to feel like a mini-startup [33]. A Squad is a small cross-functional self-organizing team with usually less than 8 people sitting together and having end-to-end responsibility to the projects they are building. Each Squad has its own long-term mission and autonomy meaning that each Squad decides what to build, how to build that and how to work together. Squads which are working in related areas are grouped in Tribes. Each Tribe has a Tribe Lead who is responsible for providing the best possible habitat for the Squads within that Tribe. A Chapter is a new organizational structure that groups people by their competencies, e.g. their skills, experience and knowledge. Each Chapter meets regularly to discuss their area of expertise and their specific challenges. A Guild is a more organic and wide-reaching "community of interest", a group of people that want to share knowledge, tools, code, and practices. Chapters are always local to a Tribe, while a Guild usually cuts across the whole organization [33].

2.8. State of Scaled Agile Method Adoption

Since 2006, the state of agile software development methods (ASDM) adoption has been surveyed both by scientists and practitioners. However, some surveys were focused only on specific geographic territories, e.g. Finland [17] or Brazil [34]. In addition, researchers have tried to reach English-speaking populations across the globe by offering them survey instruments in English [35,36]. In the world of business practice, the "State of Agile" survey with a global reach has been conducted by VersionOne (later CollabNet VersionOne) annually since 2006. Since 2013 this well-known practitioner survey has also added a part focused on Scaled Agile Methods. The recent (13th) edition [19] was carried out between August and December 2018.

In contrast to a broad coverage of data on the ASDM usage worldwide, the results that would describe the state of ASDM adoption in the Czech Republic are quite rare [37–40] and do not include Scaled Agile Methods.

3. Research Method

In this section, the construction and execution of the ASDS-CZ survey are described. We focus specifically on the Scaled Agile Methods adoption in the Czech Republic, thus researching the part of the overall survey related to the usage of Scaled Agile Methods. In Section 3.1, a corresponding part of the survey design is described. Then, in Section 3.2, the method of data collection is discussed.

3.1. Survey Design

The main goal of the ASDS-CZ survey was to evaluate how the agile approaches to software delivery are used in the Czech Republic. This goal was decomposed into several objectives and related research questions. Due to the focus and scope of this paper we concentrate only on these selected research questions:

RQ1: What is the level of the Scaled Agile Method adoption in the Czech Republic?
RQ2: To what extent are Scaled Agile Methods tailored to company needs?
RQ3: How are the benefits of using Scaled Agile Methods perceived?
RQ4: Which agile practices are used together with Scaled Agile Methods?

The survey instrument contained 18 questions divided into three logical parts:

- The first part consisted of (i) General demographic characteristics of respondents; (ii) Primary ASDM used by the team; (iii) Estimated level of method tailoring; (iv) Perceived benefits of method use.
- The second part consisted of (i) Used agile practices; (ii) Frequency of their usage within the team; (iii) Respondent's subjective scoring of the practices' importance.
- Concluding demographics questions.

The survey form contained an instruction to relate the answers concerning the methods and practices to a current or quite recent project (run either by their team, or a team that the respondents "work with").

The survey was available in the Czech language. However, for the sake of clarity and respondents' convenience, it contained also English equivalents of the names that commonly characterize the surveyed agile practices. The reason behind was that as part of their jargon, many Czech practitioners commonly use the original English terms instead of their formal Czech equivalents.

To specify a primary ASDM that the team uses, a list of ASDMs derived from the State of Agile survey [11] was offered to the respondents. They were to select just one of these methods. They were instructed that this should be a method on which the practices used by the team are primarily based. Considering the increasing usage of the hybrid waterfall agile approaches [41], the Waterfall/Scrum method as a label for this combination was added. The methods were alphabetically ordered with

the exception of the Other option that was put at the beginning of the list. The list of ASDMs is showed in Table 1.

Table 1. List of agile methods with the indication if the method belongs to Scaled Agile Methods

Agile Method	Indication of Scaled Method
Other	
Crystal Family	
DAD (Disciplined Agile Delivery)	Yes
DSDM	
Enterprise Scrum	Yes
Extreme Programming (XP)	
Kanban	
Lean	
LeSS (Large Scale Scrum)	Yes
Nexus	Yes
SAFe (Scaled Agile Framework)	Yes
Scrum	
Scrum of Scrums	Yes
Scrumban (Scrum + Kanban)	
ScrumXP (Scrum + XP)	
Spotify Model	Yes
Waterfall/Scrum	
Company Methodology	

3.2. Data Collection

The questionnaire was implemented using the LimeSurvey tool and was made available online. The questionnaire was evaluated with several pilot users and after this evaluation some ambiguities were made clear. Given certain pragmatic constraints (e.g. additional costs, current European privacy laws etc.), we opted for convenience sampling [26] in which social networks played a dominant role. While such a strategy suffers from clear drawbacks, it is relatively common in our domain of research.

In two waves, we shared the link to the survey in 17 professional and alumni LinkedIn and Facebook groups containing ca. 20,000 members (who were mostly Czechs or Slovaks) in total. This was followed by sharing the link with our industry contacts (ca. 50), either via LinkedIn messaging or by email. Then, an advertising campaign was conducted through the LinkedIn network in which 1401 users were addressed. In total, we gained 324 responses, 101 not completed, 32 removed and 191 completed. From 191 completed responses, 22 responses were removed as the respondents stated they did not work with any agile team. Thus, 169 relevant responses were further processed with the application of descriptive statistics.

4. Results Analysis and Discussion

This section provides respondent data and background as well as the survey results of the usage of agile methods specifically Scaled Agile Methods among Czech companies and a detailed analysis of their application, tailoring and benefits.

4.1. Respondent Demographics

Table 2 shows the division of the respondents based on the company size.

Table 2. Number of respondents according to company size

Company Size	Number of Respondents
Micro companies – less than 10 employees	40
Small companies – 10 to 49 employees	29
Medium-sized companies – 50 to 249 employees	32
Large enterprises – 250 or more employees	68
Total	169

As to the industry sector, most of the respondents were from the domain of Information Technology/Software Development (40%) and Finance (10%). Other domains were less frequent (from 4 % to 7% each).

Table 3. Respondents' job position and years of experience

Job Position / Experience with ASDMs	No Hands-on Experience	< 1 year	1 to 2 years	3 to 4 years	5 or more years	Total	Percentage
Product owner	0	2	7	7	10	26	15%
Agile Coach / Scrum Master	0	1	6	12	9	28	17%
Member of dev. team	1	14	24	21	13	73	43%
Other mngmt IT role	0	4	4	6	8	22	13%
Other mngmt role	2	1	2	4	1	10	6%
Other business role	0	0	0	1	2	3	2%
Other	1	2	1	0	3	7	4%
Total						169	100%
Total years of experience independent of job position	4	24	44	51	46	169	
Percentage total years independent of job position	2%	14%	26%	30%	27%	100%	

Table 3 provides an overview of the respondents' job position and years of experience. Most respondents act as the members of the development team (43%), other quite balanced groups are represented by the Product Owners (15%) and Agile coach/Scrum Masters (17%). We found out that the managerial IT roles, Product Owners and Scrum Masters have longer experience with agile methods (largely more than 3 years) than the members of development teams (largely less than 3 years). Independently of job position (last row), the experience with agile methods is equally divided to the groups of 1 to 2 years (26%), 3 to 4 years (30%) and more than 5 years (27%) of experience with ASDMs.

Table 4. Length of agile methods usage by teams

Length of Usage	< 1 year	1 to 2 years	3 to 4 years	5 or more years
ASDS-CZ	18%	31%	34%	17%
13 th State of Agile	10%	23%	34%	27%

In Table 4, the length of usage of agile methods by teams is presented. The data show that agile methods are prevalently used from 3 to 4 years and from 1 to 2 years. The results are compared with the results of the 13th State of Agile survey [11]. It is apparent that globally agile methods are used more than 5 years by a greater share than within the Czech companies.

4.2. Usage of Scaled Agile Methods

Figure 1 shows the usage of all the methods examined in the survey. In order to make the graph readable, some methods were aggregated, i.e. all Scaled Agile Methods were aggregated into a group Scaled Agile, then Lean and DSDM with zero usage and XP with 1% usage were aggregated together with the Other group into a group named Other. Looking at Figure 1, it is apparent that the most widely used agile method is Scrum, reported by 44% respondents. Scrum altogether with its agile extensions (i.e. Scrum/XP hybrid and Scrumban) counts for a majority of 63%. In total, Scaled Agile Methods are reported to be used by 15% of the respondents.

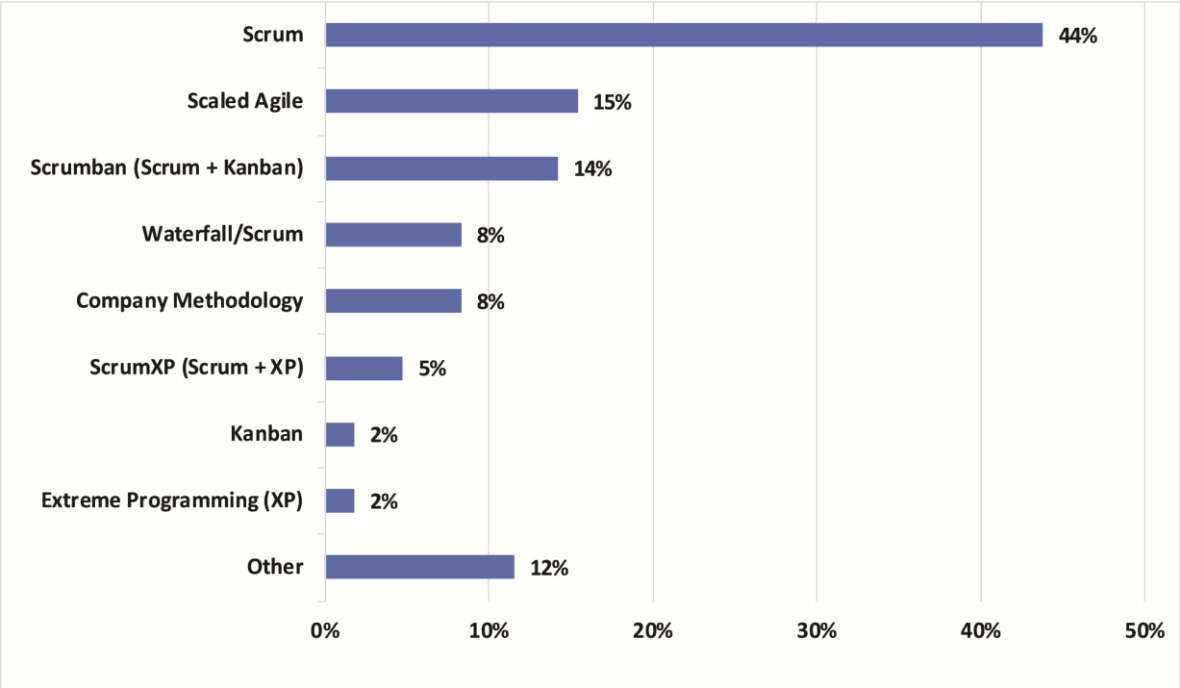

Figure 1. Agile methods usage

Looking specifically on Scaled Agile Methods, the percentage of their usage is shown in Figure 2. The most used method is the SAFe (42%) followed by Less and Scrum of Scrums with the same share (15%). Quite a significant share occupies the Spotify Model and Enterprise Scrum (both 12%). The leading position of the SAFe is in line with the results of the CollabNet VersionOne survey [11], however our results demonstrate even a higher percentage of the SAFe usage (42% compared to 30% worldwide). Similar higher usage is valid for the Spotify Model (12% compared to 5% worldwide) and Enterprise Scrum (12% compared to 3% worldwide).

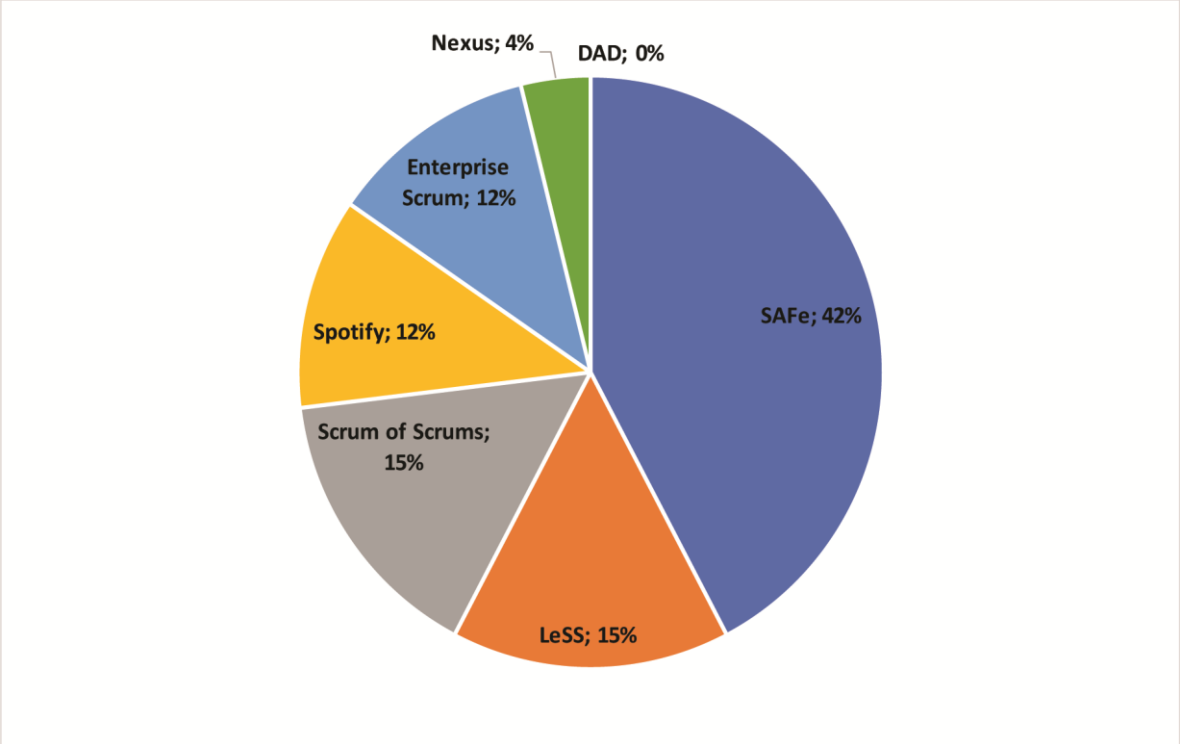

Figure 2. Percentage of Scaled Agile Methods usage (N=26)

Figure 3 portrays which agile methods are used in companies of various sizes. At this point, we aggregated data for Scrum and its hybridized agile methods (i.e. Scrumban and ScrumXP), being represented by the Scrum hybrids category. We also aggregated Scaled Agile Methods (Enterprise Scrum, LeSS, SAFe, Scrum of Scrums, Nexus and Spotify model) into the Scaled Agile category. The leading position of Scrum hybrids continues to be apparent across all company size segments. Scaled Agile Methods are, not surprisingly, implemented especially in larger companies. However, they are used also in small and medium-sized companies.

Figure 3 Agile methods usage per company size (Micro companies – less than 10 employees; Small companies – 10 to 49 employees; Medium-sized companies – 50 to 249 employees; Large enterprises – 250 or more employees)

4.3. Scaled Agile Methods Tailoring

Due to the differences in project characteristics, environmental contexts, and developer characteristics, no particular software development method will ever be a "silver bullet" [42]. As a result, software development methods are rarely implemented in a "by book" manner [43]. Instead of rigidly following the method prescriptions, selecting, adapting and combining software practices comprise a reality labelled as method tailoring.

We wanted to examine to what extent Scaled Agile Methods were tailored to company needs (RQ2). To answer the research question, we restricted the sample only to the responses where only one of the Scaled Agile Methods was selected as the primary used method (N=26). The 5points Likert scale was offered to the respondents with the values: (i) substantially tailored; (ii) partially tailored; (iii) do not know; (iv) barely tailored; (v) not at all tailored. Figure 4 depicts the responses for individual Scaled Agile Methods and in the last row for Scaled Agile Methods in total.

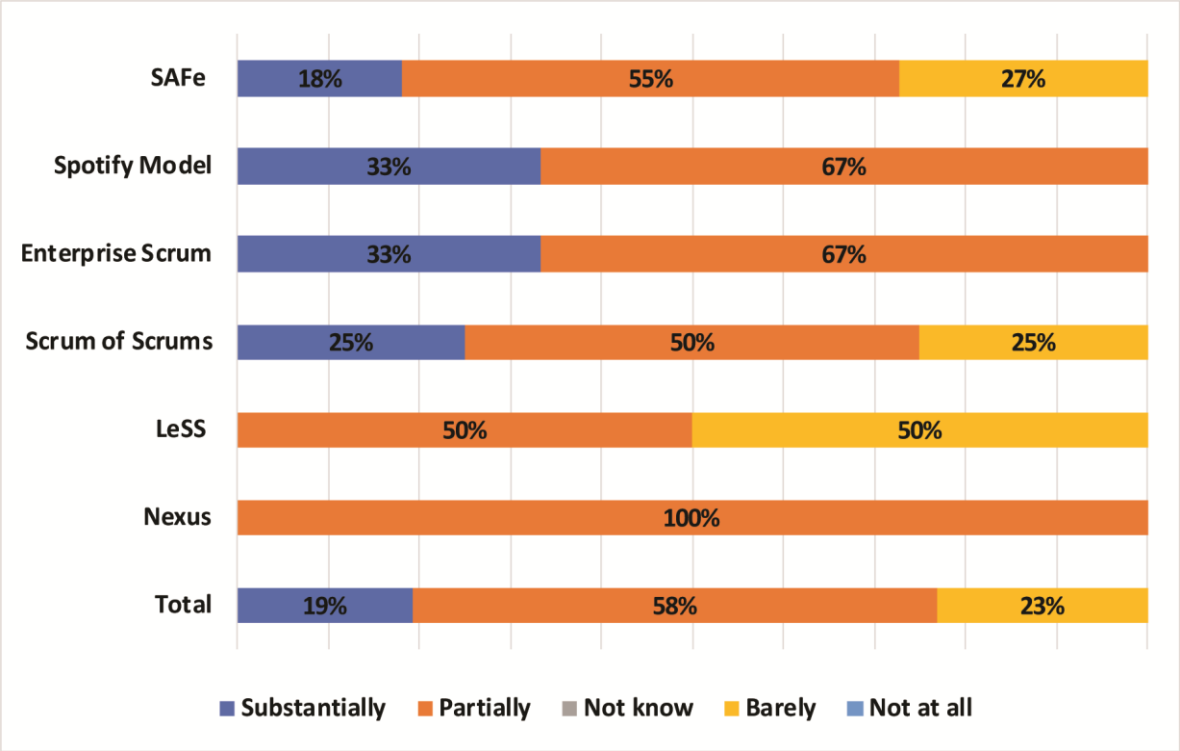

Figure 4. To what extent was the by book Scaled Agile Method tailored to company needs

In total, Scaled Agile Methods were tailored to company needs mostly partially (58%) or substantially (19%). The barely tailored option selected 23% of the respondents. Also, individual Scaled Agile Methods were tailored to company needs mostly partially or substantially. The not at all option was not selected by any respondent. These results confirm the original ideas standing behind the agile approaches that agile methods and frameworks are only a tool for starting the agile transformation and the core of agile is adapting the process to company needs. Further, such pro-tailoring results indicate the fact that existing Scaled Agile Methods (and of course all agile methods) do not encompass all needed practices. This is especially true with Scrum or Kanban, as these are the methods focused predominantly on project management, and thus not encompassing the needed software engineering practices. This is, of course, valid for Scaled Agile Methods as these are based mostly on Scrum. These possible causes shall be further researched which we do plan to examine in a subsequent qualitative research.

4.4. Perceived Benefits

In this section, the responses to the research question RQ3 are analysed. The sample is also restricted only to Scaled Agile Methods (N=26). The respondents were asked to evaluate the level of benefits that brings the method to their team in relation to project success. Project success was

defined based on the Standish Group criteria [44] as on time, on budget and with a satisfactory result. The 5 points Likert scale with the values (i) very beneficial; (ii) rather beneficial; (iii) neutral; (iv) rather unbeneficial; (v) very unbeneficial was complemented by the choice not know. Figure 5 shows the results for individual Scaled Agile methods and in total in the last row.

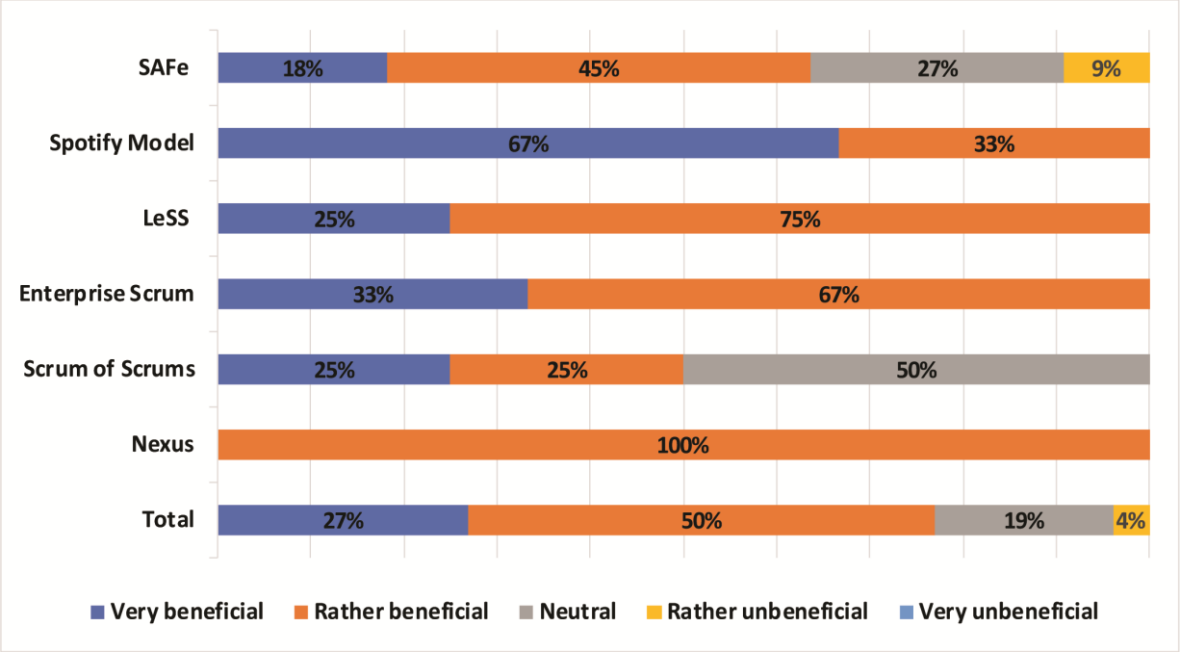

Figure 5. Perceived benefits of individual Scaled Agile Methods to project success

In total, Scaled Agile Methods were evaluated by 50% of the respondents as rather beneficial and by one third very beneficial. These results confirm the need for Scaled Agile Methods as an enabler for digital transformation among the Czech practitioners. None of the Scaled Agile Methods were evaluated as very unbeneficial, only in one case, the SAFe was perceived as rather unbeneficial. The data show a high satisfaction and perceived benefits mainly in the case of the Spotify Model. Thus, we plan to further examine also these results in a subsequent qualitative research.

4.5 Agile Practices Usage

An important part of the ASDS-CZ survey was focused on the usage of various agile practices and the analysis of the relationships among them. We prepared the list of 34 practices, derived from a synthesis of previous research [34,36] and practitioner literature [11]. We put particular attention to the practices introduced by Scrum and XP and giving some extra attention to DevOps, we added certain DevOps practices to the list. We categorized these practices into 3 groups: Organizational practices, Engineering practices and Team tools. The list of practices is presented in Annex. Focusing specifically on Scaled Agile Methods, it must be stated, that these practices represent just the team level practices according to categorization defined in [45] and there are no practices for the scaled level.

The respondents were asked to evaluate the usage of each of 34 agile practices within their team. The 4points Likert scale with the values: (i) used; (ii) used to a certain extent; (iii) not used; (iv) not know was offered. Table 5 shows the results of the usage of agile practices restricted only to the responses where one of the Scaled Agile Methods was selected as the primary used method (N=26). In the table, only values for used and used to a certain extent are shown. The practices are presented in descending order based on total sum of used and used to a certain extent frequencies. Last column shows the percentage share of the sum of the used practices (used + used to a certain extent) among the sample size (N=26).

The results demonstrate that the Organizational practices are mostly used. All teams utilizing Scaled Agile Methods used Product backlog, Short iterations and Dedicated product owner. 96% of

teams used Daily meetings and Scrum/Kanban board. To a positive finding belongs quite a high usage of engineering practices, especially Continuous integration (88%), Collective ownership (88%), Refactoring (81%) and Coding standards (81%). On the other hand, an unfavourable finding comprises quite a low usage of agile measures and estimation and management tools like Team velocity, Planning poker, Burndown chart and Definition of "Done". As alarming, we see a very low usage of testing practices, especially TDD, BDD but also Business oriented automated tests and Test-last unit testing.

Table 5 Practices used by respondents who selected one of Scaled Agile Methods (N=26)

Agile Practice	Used	Used to a Certain Extent	Total	
Dedicated Product Owner	24	2	26	100%
Short iterations	19	7	26	100%
Product backlog	25	1	26	100%
Daily meeting/Stand-up	16	9	25	96%
Scrum/Kanban board	21	4	25	96%
40-hour week / Sustainable pace	11	13	24	92%
Iteration review/demo	17	7	24	92%
Iteration backlog	20	4	24	92%
Continuous integration	17	6	23	88%
Iteration planning	19	4	23	88%
Collective ownership	16	6	22	85%
Open office	20	2	22	85%
Scrum Master	17	5	22	85%
Release planning	16	6	22	85%
Refactoring	9	12	21	81%
Coding standards	14	7	21	81%
Iteration retrospective	17	4	21	81%
Cross-functional team	10	11	21	81%
Definition of "Done"	12	8	20	77%
Continuous delivery	9	10	19	73%
Simple design	6	13	19	73%
Team velocity	6	12	18	69%
Small releases	11	6	17	65%
Planning Poker / Team-based estimation	8	7	15	58%
Customer tests	3	10	13	50%
On-Site customer	6	7	13	50%
Burndown chart	7	5	12	46%
Business oriented automated tests	3	8	11	42%
Test-last unit testing	4	7	11	42%
Continuous deployment	5	6	11	42%
Metaphor	4	4	8	31%
Pair programming	1	6	7	27%
Test-driven development (TDD)	1	5	6	23%
Behaviour-driven development (BDD)	1	1	2	8%

5. Conclusion

As digital transformation increases complexity of technological solutions and puts emphasis on time to market and quality of these solutions, effective software development methods are needed to address these issues. The key role is played by agile software development methods, especially globally used Scaled Agile Methods in the present days. This paper describes the survey conducted among the Czech agile practitioners and focuses specifically on the Scaled Agile Methods adoption.

The results of the survey show a broad the usage of Scaled Agile Methods in the Czech Republic and compare it with the worldwide State of Agile survey. As software development methods are rarely implemented in a "by book" manner, certain part of the survey examines the level of Scaled Agile Methods tailoring. The conclusion of Scaled Agile Methods being tailored to company needs mostly partially or substantially confirms the original ideas that agile methods and frameworks are only a tool for starting the agile transformation and that the need for tailoring is caused by the lack of appropriate practices, especially software engineering practices, within Scaled Agile Methods.

The paper also presents perceived benefits of Scaled Agile Methods to project success. Scaled Agile Methods were in total evaluated by 77% of the respondents as rather or very beneficial. These results confirm the need for Scaled Agile Methods as an enabler for digital transformation among the Czech practitioners. The survey demonstrates that the Organizational practices are mostly used. All teams utilizing Scaled Agile Methods then do use Product backlog, Short iterations and Dedicated product owner.

Prior to concluding, we admit that this paper suffers from several limitations. First, the analytical apparatus employed in this paper is not highly elaborate. Despite this fact, we believe that sharing the results from Czech practice with the community is important. Second, in our survey we employed convenience sampling. While this approach is common in the domain of ASDM surveys [36,46], the sample size is the main limiting factor also in our case [47]. Connected with this, we made use of social networks for the purpose of survey distribution. This certainly introduced a form of bias, limiting the possibility of participation to those who use that media. Third, from the quantitative data, it is hard to understand causes for and details on methods tailoring, details on perceived benefits of the methods usage and the exact reasons behind the "Used to a certain extent" responses. In our subsequent research, we therefore plan to focus on the analysis of the respondents' perceptions by employing a qualitative lens.

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Annex

Category	Practice
Organizational Practices	40-hour week/Sustainable pace
	Cross-functional team
	Daily meeting/Stand-up
	Dedicated Product Owner
	Iteration planning
	Iteration retrospective
	Iteration review/demo

Category	Practice
	Metaphor
	On-Site customer
	Open office
	Release planning
	Scrum Master
	Short iterations
Engineering Practices	Behaviour-driven development (BDD)
	Business oriented automated tests
	Coding standards
	Collective ownership
	Continuous delivery
	Continuous deployment
	Continuous integration
	Customer tests
	Pair programming
	Refactoring
	Simple design
	Small releases
	Test-driven development (TDD)
	Test-last unit testing
Team Tools	Burndown chart
	Definition of "Done"
	Iteration backlog
	Planning Poker/Team-based estimation
	Product backlog
	Scrum/Kanban board
	Team velocity