THE BENEFITS AND CHALLENGES OF SCALED AGILE FRAMEWORK IN FINANCIAL INSTITUTIONS

Abstract: The research paper focuses on the benefits and challenges of scaled agile in financial institutions. The objective of this research is to analyse and understand the SAFe framework, in terms of its adoption in financial institutions. In addition to the above objective, to the study seeks to identify the benefits and challenges which financial institutions experience whilst adopting and using the SAFe framework. Subsequently, data were collected through a survey that was distributed through social media platforms such as LinkedIn. The researcher received 206 responses, whereby 108 were valid responses and this was the sample used for the research. In relation to the valid responses, it was responses received from participants whom managed to complete the entire questionnaire and these valid responses were enough to fulfill the statistical analysis that was required to be done on the data. The data were analysed using quantitative research methods such as IBM SPSS. The techniques used to analyse the data were: exploratory factor analysis, frequencies and descriptives which was used to indicate the means and standard deviations of the results that were analysed. Furthermore, the validity and reliability of the results were also tested in the research. Moreover, the results indicated the top 3 benefits and challenges of SAFe adoption and usage in financial institutions. The empirical evidence indicated "Increased alignment between teams and business units", "Improved visibility" and "Increase in release frequency" as the top three (3) benefits. Lastly the top three (3) challenges, as per the empirical evidence, were: "Challenges with change of roles", "Struggle to shift from the traditional waterfall culture" and "Resistance towards accepting change".

Keywords: SAFe; Benefits; Challenges; Financial Institutions

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1. Introduction

Initially, agile methods were designed to be used in small projects and the more they were being used, the more there were indications that they were not suitable for projects that had more than ten (10) people, for instance Extreme Programming (XP) (Batra, 2020). This led to practitioners and researchers calling for an enhanced methodology that could be suitably implemented in larger projects. However, the envisaged enhanced methodology had to be based on agile concepts. Based on the calls of the researchers and practitioners, research culminated in the Large-Scale Agile Methodology (LSAM), which spawned new large agile methods such as Large-Scale Scrum (LeSS) and Scaled Agile Framework (SAFe) (Batra, 2020). Furthermore, literature indicates that Scaled Agile Framework (SAFe) is the most widely adopted agile framework and it is highly popular amongst practitioners (Noll et al., 2016). Consequently, SAFe is being scaled to other industries such as manufacturing or financial institutions, however, there is a lack of scientific research on the benefits and challenges of its adoption and usage, as literature also indicates that there is a lack of in-depth primary studies. This indicates that there is so much grey literature, which has

neither been tested scientifically nor included in systematic literature reviews on large-scale agile (Putta, Paasivaara, & Lassenius, 2018). Moreover, extant literature indicates the need to understand the adoption and usage, as well as the benefits and challenges of SAFe by large organisations, especially those in the financial sector. This will counter the lack of scientific research and create conditions for the testing of grey literature, thereby bringing better understanding of the role of SAFe, particularly when it is adopted and used by large financial organisations.

The paper also addressed the following research question:

- What are the benefits and challenges of adopting SAFe in financial institutions?

The ultimate objective of this paper is to contribute to the scientific literature and, where possible, test the grey literature on the issue of SAFe adoption and usage. The first objective of this research is to analyse and understand the SAFe framework, in terms of its adoption in financial institutions. Secondly, the research seeks to identify the benefits and challenges that financial institutions experience whilst adopting and using the SAFe framework. The third

objective is to develop and test a conceptual framework that will guide or assist financial institutions on how to adopt and use the SAFe framework.

Literature indicates that Scaled Agile Framework (SAFe) is the most widely adopted agile framework and it is highly popular amongst practitioners (Razzak et al., 2018). SAFe is being scaled to industries such as manufacturing and financial institutions, however, there is a lack of scientific research on the benefits and challenges of its adoption and usage. Literature also indicates that there is a lack of in-depth primary studies, however, there is so much grey literature which has neither been tested scientifically nor included in systematic literature reviews on large-scale agile (Razzak et al., 2018). Extant literature indicates the need to understand the adoption and usage, as well as the benefits and challenges of SAFe by large organisations, especially in the financial sector. This will counter the lack of scientific research and create conditions for the testing of grey literature, thereby bringing better understanding of the role of SAFe, particularly when it is adopted and used by large financial organisations.

The article is structured as follows: Section 2 deals with 'Literature Review', which explores the theoretical evidence and literature that deals with the benefits and challenges of SAFe, as well as the adoption and usage of SAFe by large organisations, specifically in other industries such as financial institutions. Section 3 elaborates on the research design and data collection methods used in the research. The section further discussed the validity and reliability of the study. Section 4 is the presentation of the results of the data that were collected and analysed. Section 5 is the 'Discussion of Results' and it provides meaning to the results that were presented in Section 4. Lastly, Section 6 is the 'Conclusion'. The section presents conclusions on the research conducted.

2. Literature Work

2.1 Background on Agile
Agile practices have been consistently evolving since their inception in the '90s. According to Ebert and Paasivaara (2017), what is called agile today was mostly invented by Microsoft during the early '90s, through its fast-growing complexity of office product suites and Windows. This happened through Microsoft's implementation of concepts such as feature-driven teams, continuous builds, and the close connection of business needs with architecture flexibility and requirements. In the late '90s, Microsoft fully redeveloped Internet Explorer, which became a key milestone for the company, as it allowed for flexible and scalable evolution (Ebert & Paasivaara, 2017).

The origins of scaled agile frameworks date as far back as 1992, courtesy of the Crystal family (Uludağ et al., 2017). These frameworks have gained much traction since then. Moreover, scaling agile frameworks were designed to address large agile teams of fifty (50) or more developers scattered across numerous geographical sites in an agile way (Uludağ et al., 2017). To elaborate further on scaling agile frameworks, the distribution of work without a defined architecture, inter-team coordination and properly defined requirements are some of the problems that creep up when adopting scaled agile frameworks and this attests to why the introduction of agile methods comes with a huge difficulty, which proportionately increases with the organisation's size (Uludağ et al., 2017).

The Scaled Agile Framework (SAFe) and Scrum of Scrums are identified as some of the mainly used agile methods that are being implemented in large scale projects and organisations (Bass, 2016). The other methods, which are also known to be used in large-scale agile development, include Disciplined Agile Delivery (DAD) and Large-Scale Scrum (LeSS) (Turetken, Stojanov, & Trienekens, 2017). In respect to scaling agile frameworks, it is confirmed that Large Scale Scrum (LeSS), Disciplined Agile 2.0 and Scaled Agile Framework (SAFe) are the most popular, as they are the most cited frameworks in literature, with numerous unfolding real-world use cases (Uludağ et al., 2017). In concurrence, the SAFe framework is mentioned as the most predominant framework adopted by large enterprises that develop software (Putta, 2018). The Agile Version One Survey adds that SAFe has been adopted by 28% of organisations.

2.2 Related Work on SAFe
SAFe 4.0 is an older framework version that offered four levels namely: Team, Program, Portfolio and Value Stream, of which the latter was optional (Razzak et al., 2018). However, grey literature and experience reports indicate that post-SAFe 4.0, SAFe 4.5 and SAFe 4.6 were released. Currently, SAFe 5.0, which was released in January 2020, is the latest framework and its newest version is built on the seven (7) core competencies of the Lean Enterprises (Scaled Agile Framework, 2019).

SAFe 5.0 illustrates the seven (7) core competencies that enterprises need to master in order to gain business agility, which enables them to respond much quicker to changing customer needs, volatile market conditions and emerging technologies. The SAFe 5.0 framework also has a measuring and evaluating feature called "Measure & Grow", whose sole purpose is to determine the next steps of improvement, by elaborating on how portfolios should actually assess the performance and progress of the competencies that are required to improve and achieve business agility (Scaled Agile Framework, 2019). Figure 1 depicts SAFe 5.0.
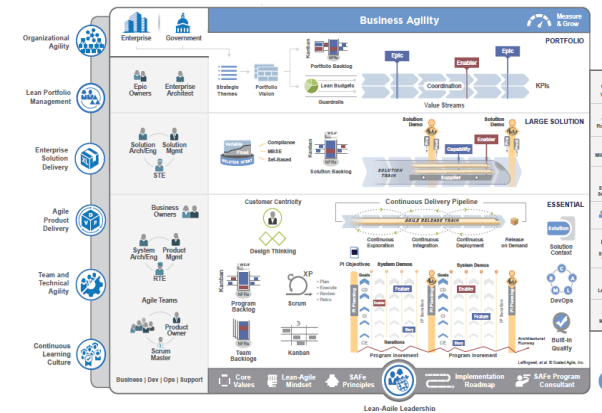

Figure 1: SAFe 5.0 [Sources: (Scaled Agile Framework, 2019, 2020)]

The SAFe 5.0 Figure 1 illustrated above indicates the full SAFe configuration, which was taken from grey literature and experience reports. According to Scaled Agile Framework (2019) and Scaled Agile Framework (2020), the current Framework is made up of seven (7) competencies and four (4) configurations, which are as follows:

- Essential SAFe – is the most basic configuration of the framework. It is also the simplest in terms of being the starting point for implementation. This framework provides only the minimal elements required for SAFe to be a success. These minimal elements include the following core competencies: Agile Product Delivery, Team and Technical Agility and Lean-Agile Leadership to the enterprise.

- Large Solution SAFe – this configuration does not require the portfolio level constructs and it is mainly for enterprises which are focused on building large and complex solutions. This configuration level also brings the Enterprise Solution Delivery competency.

- Portfolio SAFe – this configuration level provides portfolio strategy and investment funding, as well as Lean governance and Agile portfolio operations. The incorporation of Lean Portfolio Management competency occurs on this configuration level and it provides the necessary alignment between portfolio execution and enterprise strategy. In addition, this configuration is actually the simplest, since it was designed to solely assist organisations to achieve business agility.

- Full SAFe - this level is a comprehensive version or configuration on which all the aforesaid seven (7) competencies are integrated to provide support to enterprises that are building and maintaining portfolios of large integrated solutions, which usually require hundreds and thousands of people.

SAFe is essentially developed for managing and organising agile practices, mainly in large enterprises. An indication of companies that adopted the framework early has led to major quality and productivity improvements, through their application of the framework. The adoption of SAFe is not limited to one industry; it is widespread and can be implemented in sectors such as software, financial services and manufacturing, just to name a few (Noll et al., 2016).

2.3 Benefits of Adopting SAFe
A research conducted on the benefits and challenges of adopting Scaled Agile Framework (SAFe) identified fifty-two (52) unique organisations that adopted SAFe (Putta et al., 2018). Forty-seven (47) of these companies were from the grey literature and five (5) from scientific literature. The forty-seven (47) organisations in the first category included: financial services organisations such as Standard Bank, electronics organisations such as Thales, software organisations such as Accenture, telecommunications organisations such as Amdocs, retail and distribution organisations such as Kantar Retail, medical and pharmaceutical organisations such as Elekta and an aviation organisation named Air France KLM.

The abovementioned research indicates that peer-reviewed studies are less inclined to presenting more information on the benefits of the SAFe framework, as compared to the non-peer reviewed studies, which are more inclined to presenting the benefits. The common benefits, which could be seen in both the peer-reviewed and non-peer reviewed studies include: productivity and predictability, time to market, transparency, alignment and quality (Putta et al., 2018). In addition, the research identified some core values of SAFe, which include: programme execution and transparency, built-in quality and alignment.

Literature indicates that there is improvement on team morale, which leads to more organisations experiencing elevated flexibility and reduced development lead times, all due to Agile adoption (Khoza & Marnewick, 2021).

Furthermore, studies conducted by CollabNet VersionOne (2019) indicate that agile enables team members to engage

with project stakeholders with ease. This is still deemed as the most important benefit of adopting agile (CollabNet VersionOne, 2019; Khoza & Marnewick, 2021).

One research, which used general industrial experience reports, reported common or similar benefits of adopting SAFe in large organisations (Laanti & Kettunen, 2019). The findings of the study indicated that there were 25 – 75% reductions in defects, 20 – 50% increases in productivity, 10 – 50% improvements in employee motivation, and 30 – 75% faster times-to-market (Laanti & Kettunen, 2019). An industry-wide survey conducted in Finland indicated that the three (3) biggest benefits of using agile were rhythm or common cadence, transparency and co-operation. Although there were other benefits, these three (3) were the commonest and most mentioned by the respondents.

However, research found that there was lack of scientific or empirical research that could support and validate the above results, which were taken from a general industrial experiences report (Laanti & Kettunen, 2019). This argument validates the observation that most of the benefits that were identified were attributed more to grey literature than to peer-reviewed sources (Putta et al., 2018). Nevertheless, these benefits provide organisations with the opportunity to manage teams from the portfolio level. Through portfolio management, organisations will be able to achieve the alignment of programmes and projects, leading to the achievement of business value, as well as mitigating possible risks (Mucambe et al., 2019).

2.4 Challenges of Adopting SAFe

Research identified thirty-five (35) challenges, which they grouped into nine (9) categories (Dikert, Paasivaara, & Lassenius, 2016). However, from the thirty-five (35) challenges, only nineteen (19) of the most mentioned ones were chosen. The aforementioned nine (9) categories of challenges are depicted in Table 1.

Table 1: Challenges Categories [Source: (Dikert et al., 2016)]

9 Challenge Categories
1. Change resistance
2. Lack of investment
3. Agile difficult to implement
4. Coordination challenges in multi-team environment
5. Different approaches emerge in a multi-team environment
6. Hierarchical management and organisational boundaries
7. Engineering challenges
8. Quality assurance challenges
9. Integrating non-development functions in the transformation

In addition to the above categories of challenges, other researchers mention distributed environment, organisational structure misalignment and rolling-out too fast, just to name a few (Kalenda, Hyna, & Rossi, 2018). The other challenges are more or less the same as those that are listed in Table 1 above.

Consequently, the adoption of agile practices has its own set of challenges, from which one can draw some implications to an enterprise's work system, such as processes, people, technology, products and structure. The adoption of agile practices such as SAFe or LeSS Frameworks is also usually introduced "mechanically", either by following the recommendations of agile coaches, but, at the same time, neglecting the company specifics, which eventually leads to challenges such as having the need for collaboration between existing non-agile and agile units, which also eventually leads to the adopted framework not operating efficiently and effectively, hence; these mechanical approaches (such as SAFe and LeSS) end up unsustainable due to the changes in the environment (Gerster, Dremel, & Kelker, 2018).

Furthermore, research indicates the impact of the challenges on the adoption and scaling of agile in large organisations (Kalenda et al., 2018). For instance, resistance to change is one of the challenges that is faced upon the adoption of scaled agile frameworks such as SAFe. This challenge impacts all levels of organisations, whereby in large organisations there could be lack of support from higher, middle and upper management levels in terms of embracing the new change namely: the adoption of scaled agile frameworks. Also, the process of persuading team members takes time because some would be very sceptical and weary of new responsibilities that arise due to the new ways of work brought about by the scaling frameworks.

Moreover, middle managers can be extremely sceptical and very protective of their jobs, because, upon the adoption of a scaled agile framework, teams are required to be self-managed. This causes tension amongst the members, especially the middle managers, as they fear that they might become redundant. Consequently, the adoption of agile practices has been found to have an impact on people, as job-profiles and roles are highly impacted, leading to changes in roles and the emergence of new responsibilities, while older roles are changed or removed (Gerster et al., 2018). The adoption of agile practices also creates an environment where new different skills are required and new jobs are created.

3. Research Methods

3.1 Research Design and Methodology

The researchers collected data using a survey questionnaire, which was sent out using social media platforms namely: LinkedIn, WhatsApp etc. The respondents were drawn from a diverse set of individuals from different financial institutions that had adopted and were using SAFe.

The target population for this research were individuals who were working for financial institutions that had adopted and were using the SAFe framework in its entirety or partially. Furthermore, the researcher targeted SAFe groups that included SAFe experts on LinkedIn, whereby these SAFe groups consisted of various participants from different parts of the world.

The research made use of a probability sampling method called the multi-stage sampling. Through this multi-stage sampling, we divided the responses into two and took a smaller sample which met all the requirements for being declared as valid responses. As such, a total of 206 responses were received, but only 108 responses were valid to be used as a sample because the participants for these 108 valid responses completed the entire questionnaire and these valid responses were enough to fulfil the statistical analysis that was required to be done on the data.

The questionnaire was made up of 20 questions, excluding the screening questionnaire, which was a mandatory question that determined if the participants could carry on or not. Subsequently, an online survey tool, Survey Monkey, was used to collect the quantitative data. The survey was a structured questionnaire containing 6 sections. Section A focused on the participants' demographic details. This section was made up of 7 questions, while Section B, which was made up of 3 questions, focused on the Scaled Agile Framework (SAFe) Adoption and Usage. Section C focused on the benefits of SAFe adoption and was made up of only 1 question. Section D, the "Challenges of SAFe Adoption", also had 1 question. Section E, the "SAFe Adoption Conceptual Framework", consisted of 4 questions and, lastly, Section F, which had 3 questions, focused on the "SAFe Usage Conceptual Framework".

The research adopted the research process onion which provides guidelines that ensure that the research follows all the stages of the research process namely: research philosophy, research approach, research strategy, techniques and procedures (Saunders, Lewis, & Thornhill, 2003).

The research made use of the quantitative research method.

The researchers adopted the positivist research philosophy, which is mostly associated with quantitative research and experiments (Ryan, 2018). The chosen research approach was the deductive approach, because it is suitable for a researcher who is solely focused on working from the 'top down' (Creswell & Clark, 2017). Furthermore, the survey research strategy chosen for the research, as it is mostly associated with the deductive research approach (Saunders, Thornhill, & Lewis, 2019).

As indicated earlier, from the 206 responses that were received, only 108 (52%) valid ones were realised and these were subsequently used for data analysis. The other 98 (48%) responses were partially completed, so they were not included as they were deemed to be invalid. The results were analysed using the SPSS Version 27, whereby Principal Axis Factoring (PAF) method was used. Also, in order to validate if the data were appropriate for the factor analysis, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy method was applied to validate the data.

3.2 Reliability and Validity

The content validity of this research was achieved via the applied literature, thus, indicating that the study covered all the research results. The reliability of the results was valid, as was determined by the Cronbach's Alpha. Therefore, all the results had a Cronbach's Alpha value that was higher than the recommended 0.7, thus, indicating reliability.

Reliability was conducted on the benefits of SAFe adoption factors derived from the Exploratory Factor Analysis (EFA) that was conducted, which identified five (5) groups/factors from the theoretical evidence provided. Table 2 depicts the results.

Table 2: Benefits of SAFe Adoption Factors

Reliability Statistics		
Empirical Factor(s)	Cronbach's Alpha	N of Items
Software Product Benefits (Factor 1)	0,903	7
Project Benefits (Factor 2)	0,884	6
Customer Service Benefits (Factor 3)	0,871	5
Business Benefits (Factor 4)	0,868	5
Employee Benefits (Factor 5)	0,868	3

The results indicate that all the factors are higher than the recommended Cronbach's Value of 0.7, confirming that the factors have reliability. Furthermore, since EFA identified more than 3 factors, a 2nd Order Factor Analysis was then done for the five (5) factors identified above. Due to the 2nd Order Factor Analysis being conducted, only one factor was identified, as Table 3 depicts.

Table 3: Benefits of SAFe Adoption – 2nd Order Factor Analysis

Reliability Statistics		
Theoretical Factor(s)	Cronbach's Alpha	N of Items
Benefits of SAFe Adoption (Factor 1)	0,959	26

The results indicate that the identified factor is higher than the recommended Cronbach's Value of 0.7, therefore, confirming that the factors have reliability.

Moreover, a reliability analysis was conducted on the challenges of the SAFe adoption factors derived from the Exploratory Factor Analysis (EFA), which identified two groups/factors from the theoretical evidence provided, as depicted in Table 4.

Table 4: Challenges of SAFe Adoption

Reliability Statistics		
Empirical Factor(s)	Cronbach's Alpha	N of Items
Team Collaboration Challenges (Factor 1)	0,960	13
Organisational and Cultural (Factor 2)	0,923	9

The results indicate that all the factors were higher than the recommended Cronbach's Value of 0.7, thus, confirming that they have reliability.

Reliability analysis was further conducted on the SAFe Adoption Conceptual Framework. The analysis specifically looked at the discontinuation factors. An EFA was conducted and it identified one group/factor from the theoretical evidence provided. Table 5 depicts these results.

Table 5: Discontinuation Factors

Reliability Statistics		
Theoretical Factor(s)	Cronbach's Alpha	N of Items
Discontinuation Factors (Factor 1)	0,841	3

The results indicate that the identified factor is higher than the recommended Cronbach's Value of 0.7, therefore, confirming that they are reliable.

Furthermore, reliability analysis was conducted on SAFe's Usage Conceptual Framework and it looked at the activities included in the implementation plan. The EFA identified only one (1) group/factor from the theoretical evidence provided. Table 6 depicts these results.

Table 6: Activities included in the implementation plan

Reliability Statistics		
Theoretical Factor(s)	Cronbach's Alpha	N of Items
Activities included in the implementation plan (Factor 1)	0,904	5

The results indicate that the identified factor is higher than the recommended Cronbach's Value of 0.7, therefore, confirming that the results are reliable.

4. Research results

4.1 Biographical Details Information

The results indicate that from the 108 (52%) valid responses that were received, 61 (56.5%) were from male respondents, and 41 (38%) from females. Only 6 (5.6%) preferred not to disclose their gender. The empirical evidence illustrates that the participation rate of males in SAFe projects at financial institutions was higher than that of females and this shows that the former have more dominant roles than the latter. However, the results also indicate that female participation is still fairly represented in SAFe projects. According to literature, a recent research study on SAFe indicated that 81% of the participants were males and 19% were females (Mishra, 2018). As per the empirical evidence, it is evident that the results are in agreement with literature, and the empirical evidence is indicative of the fact that more males than females are participating in SAFe projects in financial institutions. However, in contrast to literature, empirical evidence indicates that there is a huge improvement in female participation.

In relation to the highest completed level of education, the results indicate that, of the 108 participants whose responses were valid, 23 (21.3%) had undergraduate degrees and another 23 (21.3%) had diplomas. 21 (19.4%) had honours degrees, followed by 20 (18.5%) with master's degrees, 10 (9.3%) with postgraduate diplomas, 5 (4.6%) with higher certificates, 4 (3.7%) with doctorates and, finally, only 2 (1.9%) had Matric certificates. Empirical evidence indicates that a large majority of the SAFe participants in financial institutions are highly educated.

The results looked into the organisational size, which indicated that 43 (39.8%) of the respondents stated that their organisations consisted of 10 000+ employees, followed by 22 (20.4%) and 15 (13.9%) whose institutions had staff complements of 501 – 1 000 and 5 001 – 10 000, respectively. In relation to a study cited in the 15th State of Agile Report, 25% of the participants indicated that they were working for companies that had over 20 000 employees, followed by

17% who stated that their companies had between 5 001 and 20 000 employees, as well as 19% who indicated that their institutions had between 1 001 – 5 000 employees (Knaster, 2021).

A survey study indicated that a very large organisation consists of more than 5 000 employees (Laanti & Kettunen, 2019). In contrast to the literature review, the empirical evidence is in agreement with this study, given that the majority of the participants were working for financial institutions with 10 000 or more employees.

Furthermore, the evidence looked into the financial institutions' departments, which showed that most IT Departments (44.2%) adopted agile principles and practices. The other departments that adopted agile principles and practices were finance (14.4%), followed by operations (12.2%), HR (6.6%), marketing (6.6%) and sales (5%). The results are in line with another study, which indicated software development, IT, operations, marketing, human resources, sales and finance departments were leading in terms of adopting agile principles and practices (Knaster, 2021).

The study also looked at the job roles of the respondents. As per the evidence, 28 (25.9%) respondents indicated that they were scrum masters, while 24 (22.2%) indicated their job roles as other. 9 (8.3%) of the respondents were agile product managers, another 9 (8.3%) were agile software engineers, 8 (7.4%) were certified SAFe programme consultants and another 8 (7.4%) were release train engineers. 7 (6.5%) were IT managers, with 6 (5.6%) and 3 (2.8%) playing the roles of product owners and architects, respectively. 3 (2.8%) of the respondents were DevOps practitioners, 2 (1.9%) were lean portfolio managers and only 1 (0.9%) played the Government practitioner role.

With regards to the 24 (22.2%) respondents who indicated their job roles as other, 5 (4.6%) were agile coaches, another 5 (4.6%) worked as business analysts, whereas 14 (12.6%) had various roles namely: agile consultant, agile practice leader, analyst, COE leader, data analyst, IT support specialist, people manager, platform engineer, scaled agile coach, software license specialist, software tester, system engineer, test engineer and user.

In relation to the 15th State of Agile Report, this survey indicated that the most occupied job role described by the respondents was scrum master or internal coach (38%), while the least subscribed was DevOps (2%) (Knaster, 2021). The empirical evidence above is in agreement with the results of the 15th State of Agile Report, which also shows the scrum

master role as the most occupied. However, in relation to the least subscribed role, there is a significant difference between the results of the empirical evidence and those of the 15th State of Agile Report study.

Moreover, the study looked at the respondents' levels of experience and durations of service in the financial services industry. Based on the evidence, 31 (28.7%) respondents indicated that they had 6 – 10 years of experience, 30 (27.8%) had 2 – 5 years, 17 (15.7%) had 11 – 15 years, 16 (14.8%) had 16 – 20 years, and 9 (8.3%) had more than 20 years. Only 5 (4.6%) of respondents indicated that they had 0 – 1 years working experience. Based on the above results, the empirical evidence showed that the number of respondents increased in proportion to the years of experience, particularly in the 2 to 10 years range. However, from the 11th to the 20th year of experience category, the number of respondents started dropping gradually, and one probable cause of this is that, due to their vast experience in the sector, some senior employees might have decided on moving over to other interests or industries. Finally, the number of respondents started to drop exponentially in the 20+ years of experience category, probably because some would have reached retirement age, while others would have moved to other industries.

In addition, the evidence also looked into the length of time that the financial institutions that the respondents worked for had been practising agile development methods. 43 (39.8%) of the respondents indicated that their organisations had 2 – 5 years of experience, followed by 25 (23.1%), who indicated 6 – 10 years, and 13 (12%), who indicated 16 – 20 years. 10 (9.3%) of the respondents indicated that their companies had used agile development methods for more than 20 years, followed by 10 (9.3%) who indicated 0 – 1 years. Lastly, 7 (6.5%) respondents indicated that their organisations had 11 – 15 years' agile experience.

In comparison to the 15th State of Agile Report, this survey showed that 32% of companies had 5+ years of agile experience and only 7% had less than 1 year of practising agile (Knaster, 2021). Even though the empirical evidence was looking at financial institutions, it is well in line with the aforementioned state of agile report.

4.2 Benefits of SAFe Adoption

The results of this section indicated the benefits of SAFe adoption for financial institutions. From these benefits, the researchers selected three (3), which were most agreed to by the respondents. A Likert scale was used to determine the level of agreement with the different benefits, as per

the respondents' participation in the survey, whose scale is defined as: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree.

The first most agreed benefit was: "C11.5 Increased alignment between teams and business units", where the results indicated a mean of 4.18, which was closer to the agree scale (4) and the standard deviation for this benefit was 0.708. This benefit received 32 (29.6%) strongly agree responses, followed by 68 (63%) for agree, 4 (3.7%) for neutral, 3 (2.8%) for disagree and only 1 (0.9%) for strongly disagree. The second most agreed benefit was: "C11.11 Improved visibility", where the mean was 4.18, illustrating that it was closer to the agree scale (4) and the standard deviation for this benefit was 0.759. This benefit received 35 (32.4%) strongly agree responses, 62 (57.4%) for agree, followed by 8 (7.4%) that were neutral, 1 (0.9%) for disagree and only 2 (1.9%) for strongly disagree. The third most agreed benefit was: "C11.23 Increase in release frequency", with a mean of 4.18, indicating that was closer to the agree scale (4) and its standard deviation was 0.841. The benefit received 39 (36.1%) strongly agree responses, followed by 56 (51.9%) for agree, 9 (8.3%) for neutral, 1 (0.9%) for disagree and only 3 (2.8%) for strongly disagree.

According to literature, the top three benefits of agile were: "Visibility/overview/transparency", "Requirements/goals/planning/prioritising" and "Productivity/focus/efficiency" (Gustavsson & Bergkvist, 2019). This also aligns with literature from a study by Laanti, Salo, and Abrahamsson (2011). Moreover, literature identifies the three biggest benefits that were reported through an industry-wide survey that was conducted by Laanti and Kettunen (2019). These benefits are: "Rhythm or common cadence", "Transparency" and "Co-operation". However, the empirical evidence is only in alignment with literature on 1 benefit.

There were 3 least agreed benefits, as per the evidence and the responses received, with the first being: "C11.21 Reduced delivery costs", which obtained a mean of 3.73, which was closer to the agree scale (4) and its standard deviation was 1.038. The benefit received 24 (22.2%) strongly agree responses, followed by 49 (45.4%) for agree, 22 (20.4%) for neutral, 8 (7.4%) for disagree and 3 (2.8%) for strongly disagree. The second least agreed benefit was: "C11.17 Improved employee retention", with a mean of 3.57, indicating that it was between the neutral (3) and agree scales (4) and the standard deviation for the benefit was 1.007. The responses received were: 17 (15.7%) for strongly agree, 47 (43.5%) for agree, 30 (27.8%) for neutral, 9 (8.3%) for disagree and only 5 (4.6%) for strongly disagree. The third

least agreed benefit was: "C11.22 Reduced infrastructure costs", with a mean of 3.56, showing that it was between the neutral (3) and agree scales (4) and the standard deviation was 0.998. The responses received were: 16 (14.8%) for strongly agree, 48 (44.4%) for agree, 28 (25.9%) for neutral, 12 (11.1%) for disagree and 4 (3.7%) for strongly disagree. Table 7 summarises the above-stated results.

Table 7: Benefits of SAFe adoption

	N Valid	Mean	Median	Std. Deviation
C11.5 Increased alignment between teams and business units	108	4,18	4,00	0,708
C11.11 Improved visibility	108	4,18	4,00	0,759
C11.23 Increase in release frequency	108	4,18	4,00	0,841
C11.21 Reduced delivery costs	108	3,73	4,00	1,038
C11.17 Improved employee retention	108	3,57	4,00	1,007
C11.22 Reduced infrastructure costs	108	3,56	4,00	0,998

4.3 Challenges of SAFe Adoption

In this section, the evidence illustrated the challenges of SAFe adoption faced by financial institutions. There were 23 challenges which the respondents had to choose from by selecting relevant Likert scale options. The Likert scale indicated the challenges the respondents were most or least in agreement with, as illustrated in Table 8.

The first most agreed challenge was: "D12.5 Challenges with change of roles". The evidence indicated a mean of 3.96 for this challenge, meaning that it fell more to the agree scale (4) with a standard deviation of 0.937. There were 30 (27.8%) respondents who strongly agreed, followed by 56 (51.9%) who agreed, 13 (12%) who were neutral, 6 (5.6%) who disagreed and 3 (2.8%) who strongly disagreed. The second most agreed to challenge was: "D12.4 Struggle to shift from the traditional waterfall culture", whereby the mean was 3.95, illustrating that it fell more to the agree scale (4), and the standard deviation was 0.990. The challenge received 34 (31.5%) strongly agree responses, 48 (44.4%) agree, followed by 16 (14.8%) neutral, 7 (6.5%) disagree and 3 (2.8%) strongly disagree.

The third most agreed to challenge was: "D12.1 Resistance towards accepting change", whose mean was 3.80, which was closer to the agree scale (4). The standard deviation for this challenge was 0.984. The received responses were as follows: 27 (25%) strongly agree, 47 (43.5%) agree, 20

(18.5%) neutral, 13 (12%) disagree and 1 (0.9%) strongly disagree. Literature indicated 3 most common challenges namely: "'Resistance to change", "Distributed environment" and "Quality Assurance issues", that companies faced when transforming to large-scale agile developments (Kalenda et al., 2018). Literature indicates that resistance to change by the middle management is a serious challenge, as the managers can be very sceptical and insecure with regards to the adoption of SAFe, hence; they tend to be over-protective of their jobs and become highly resentful of any changes that threaten their roles (Kalenda et al., 2018).

Furthermore, literature indicates that the adoption of SAFe is challenging in instances where an integration has to happen between agile and non-agile teams within an organisation. Non-agile teams generally neither want to work with nor rely on agile teams. More often than not, non-agile teams have no clue about how agile ways or teams work or operate, therefore, they tend to resist moving to new ways of work (Kalenda et al., 2018).

Moreover, literature shows that the most critical impact of agile adoption and usage is on people and, especially, corporate culture, which both present a huge hurdle for agile transformation (Gerster et al., 2018). The empirical evidence is in agreement with literature, thus, indicating that the challenges that the sampled financial institutions are facing are the same as those alluded to in literature.

In contrast to the above, the research identified 3 least agreed challenges, of which was: "D12.21 Release planning challenges due to distributed teams", which had a mean of 3.41, indicating that it was closer to the neutral scale (3) and the standard deviation was 1.176. Of the responses received, 19 (17.6%) strongly agree, followed by 40 (37%) agree, 23 (21.3%) neutral, 18 (16.7%) disagree and 8 (7.4%) strongly disagree.

The second least agreed challenge was: "D12.22 Collaborative planning meetings and critical gatherings were difficult due to distributed teams", with a mean of 3.38, indicating that it was closer to the neutral scale (3) than to the agree scale (4) and the standard deviation for this challenge was 1.166. The responses received included: 18 (16.7%) strongly agree, 40 (37%) agree, followed by 22 (20.4%) neutral, 21 (19.4%) disagree and 7 (6.5%) strongly disagree.

The third least agreed challenge was: "D12.20 Rearrangement of ARTs was challenging due to geographic distribution". The evidence indicated that the mean for this challenge was 3.37, which leaned more to the neutral scale (3) than to the agree scale (4) and the standard deviation was 1.149. The

responses received were: 19 (17.6%) strongly agree, followed by 36 (33.3%) agree, along with 24 (22.2%) neutral, as well as 24 (22.2%) disagree and only 5 (4.6%) strongly disagree.

Table 8: Challenges of SAFe adoption

	N Valid	Mean	Median	Std. Deviation
D12.5 Challenges with change of roles	108	3,96	4,00	0,937
D12.4 Struggle to shift from the traditional waterfall culture	108	3,95	4,00	0,990
D12.1 Resistance towards accepting change	108	3,80	4,00	0,984
D12.21 Release planning challenges due to distributed teams	108	3,41	4,00	1,176
D12.22 Collaborative planning meetings and critical gatherings were difficult due to distributed teams	108	3,38	4,00	1,166
D12.20 Rearrangement of ARTs was challenging due to geographic distribution	108	3,37	4,00	1,149

5. Discussion of Results

The first research question is: "What are the benefits and challenges of adopting SAFe in financial institutions?" The following results from the empirical evidence answered the above question as follows:

5.1 Benefits of Adopting SAFe

As per the empirical evidence, the three most agreed to benefits which financial institutions experience as a result of adopting SAFe are: "Increased alignment between teams and business units", "Improved visibility" and "Increase in release frequency". The results indicated that only one of the benefits realised from the empirical evidence namely: "Improved visibility" was in alignment with literature. However, the 2 other most agreed to benefits were not in agreement with literature and are different from the benefits indicated in the industry wide survey (Laanti & Kettunen, 2019). The results for the benefits were also not in agreement with the 15th State of Agile Report, which indicates the benefits as per the responses of the participants (Knaster, 2021). Furthermore, the results grouped the benefits differently in the same number of groups that the theoretical evidence provided and this resulted in the new groupings being given empirical evidence names, which were different from the theoretical evidence names. These new groupings were created on the basis of their probable meaning, since the benefits were grouped

differently from the theoretical groupings. Moreover, this led to the groups being named: "Software Product Benefits", "Project Benefits", Customer Service Benefits", "Business Benefits" and "Employee Benefits". The naming of the new groups was done after subjecting the benefits to empirical factor analysis. As a result, both the empirical evidence and the results showed that the group that most respondents agreed to the most was the "Project Benefits".

5.2 Challenges of Adopting SAFe

The results looked at the challenges of SAFe adoption. One of the research questions that the researchers looked into is: "What are the benefits and challenges of adopting SAFe in financial institutions?" The researchers sought to identify the challenges that financial institutions experience when adopting SAFe. The results indicated the top 3 most agreed to challenges. As per the empirical evidence, the first most agreed challenge is: "Challenges with change of roles", while the second is: "Struggle to shift from the traditional waterfall culture" and the third is: "Resistance towards accepting change".

The above challenges are indicative of what financial institutions experience when adopting SAFe, as per the empirical evidence, which, in contrast to literature, indicated that the top 3 reasons were different, whereby the former named: "Resistance to change", "Distributed environment" and "Quality Assurance Issues" (Kalenda et al., 2018). Moreover, the theoretical evidence grouped these challenges into 4 main challenges, contrary to what the empirical evidence showed, as the results grouped the challenges under 2 main groups, which are: "Team Collaboration Challenges" and "Organisational and Cultural". Based on the empirical evidence, the group with the most agreed to challenges was "Organisational and Cultural".

6. Research Limitations

The research only used 2 social platforms for distributing their survey. Even though through LinkedIn the reach was far and wide, the distribution was limited. Moreover, Whatsapp can be a powerful tool to send out messages to a number of people through chain messaging. However, it is not an effective tool if it is only 1 of just 2 platforms that one has used to distribute the survey. Furthermore, even though there was a controlling/screening mechanism (question) on the survey, the researcher could only test the data through the statistical data analysis techniques to ensure that the data received was valid and reliable. Lastly, the closing limitation is that one of the components of SAFe usage conceptual framework were not tested. The study couldn't provide any data analysis and review on it.

7. Conclusion

The study looked at the adoption and usage of SAFe in financial institutions, with a view to identify and understand the attendant benefits and challenges that they experience whilst adopting and using the SAFe framework.

The ultimate goal of this research was to test the grey literature on the benefits and challenges of SAFe adoption and usage to see if the adoption and usage of SAFe in financial institutions realises the same results.

The research indicated that the end results of the empirical evidence for the benefits was only in partial agreement with literature. Due to this, the empirical evidence indicated that there was a difference, while new evidence indicated that further research needed to be done to test the newly indicated benefits.

Furthermore, with regards to the challenges, the empirical evidence was in complete agreement with literature, indicating that nothing had changed in this regard with the challenges for SAFe adoption.

The aim of the study was to identify and analyse the benefits and challenges of the adoption and usage of scaled agile in financial institutions. The study focused on the Scaled Agile Framework (SAFe) large-scale agile framework. The motivation for this study was derived from literature, which indicated that there were limited scientific research studies that focused on the Scaled Agile Framework (SAFe), with regards to the benefits and challenges associated with the adoption of SAFe (Putta et al., 2018).

Furthermore, in addition to the stated motivation, literature showed that the SAFe framework could be scaled in other industries such as financial institutions and the manufacturing sector. Literature also indicated a dire lack of in-depth primary studies on the adoption and usage of the SAFe framework (Putta et al., 2018). The abovementioned motivations ultimately culminated in this study, which will contribute to literature regarding the study of SAFe adoption and usage, particularly in financial institutions.

Also, due to the above motivation, the research will immensely benefit financial institutions, because more and more of them are adopting SAFe as a framework. Initially, this framework was designed to be implemented in software development industries and literature indicates that this practice has been changing over time. However, literature also illustrates that there is a lack of scientific literature pertaining to the implementation of SAFe in other industries. There is also so much grey literature on the SAFe framework implementation in other industries.

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