Scaling Agile Methods: Strategies and Challenges in Large Software Development Organisations



MSc in Computing(Information Systems Processes)

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Karen Ogiugo

# **Abstract**

IT organisations are facing a dynamic business environment. This demands organisations to deliver software at a faster pace and adapt well to changes during the development of a project. Agile methods have become a very popular approach to managing software development processes and there has been a huge increase in the rate of agile method adaption across large organisations. Agile methods were originally designed for small teams. The scaling of agile methods creates many challenges; however, organisations have still shown interest due to the potential benefits. Large development organisations have many levels – it is not beneficial to use agile methods on a certain level, all levels need to change and adopt to the new way of working. Lacking necessary changes leads to challenges, which will be described in this thesis. This thesis examines the problems with scaling Agile methodologies in large organisations. There will be a comparisson of two agile development frameworks: Scaled Agile Framework (SAFe) and Large-Scale Scrum (LeSS). There will be a focus on the success factors, experiences and challenges. Furthermore, there will be suggestions provided for further scaling for the company’s agile adoption.

**Keywords**: Agile, DA, SAFe, LeSS, scum@scale, scaled, framework, software development

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**Chapter 1**

# **Introduction**

Meaningful organisational change comes from scaling Agile – teams are enabled to use Agile frameworks and techniques to change the way the work gets done in a way that allows improved products and services to be delivered to the end user. Agile is involved in software development teams, aiming to add more value to the customer, quickly. The goal of agile methods is to improve management and execution of software development projects with an increase of flexibility. Originally, the focus of agile methods was for small and one team projects. The process of building software has evolved and the increase in complexity is shown in larger organisations. Larger software development organisations are required to design, deploy, develop, and maintain at large scale. Over the years, many methodologies have been developed in order to provide quality and productivity in software development (Applebaum, 2024).

In business management, agile methodologies have shown to be useful in large companies and their projects. A few of the largest companies that have benefited from agile are Sony, Lego, Yahoo!, and Mitsubishi. Introducing agile methods in large organisations is challenging because it is difficult to introduce changes. Before implementing the methodology there needs to be discussions on what the company wants. This involves talking to executives who have experience in this field. Software development companies use agile to improve their collaboration, increase flexibility, and deliver high-quality software growth. Software development teams have proven that implementing agile frameworks allows them to deliver solutions to customers faster and the ability to react quickly to new information. Scaling agile methods has caused many challenges, such as the communication between teams and departments (gitscrum, 2024).

Software development in IT organisations has become more relevant and complex. The simpler and more basic methods have evolved into more complicated processed. The complexity is noticeable on large companies that need to create, run, and manage large projects and processes. To handle this, different frameworks for developing software have been created over the years.

The waterfall approach is an old-fashioned method that used to be very common. It is a step-by-step method used to plan everything in advance. This is beneficial to a team as everyone will know exactly what they need to do. But nowadays, changes are becoming more common during development. Also, companies want to provide good software and systems quickly due to competition. Therefore, agile is becoming more popular and the methods accept that requirements will change with a focus on working closely with customers to create useful software. These days, software development methods have changed from being very planned out (waterfall) to more flexible and adaptable (agile). Most of these new methods were originally meant for small teams, instead of large companies with several teams and organisation units (projectmanagement, 2022).

As companies view success in small groups, they will also want to replicate it at a larger team or department. Scaled agile frameworks are established methodologies used to address any challenges with implementing agile at large scale. The methodologies provide a guide to scaling agile effectively. The most common frameworks that help organisations with scaling agile are Scaled Agile Framework (SAFe), Disciplined Agile (DA), Large-Scale Scrum (LeSS), Scrum@Scale. The best framework depends on the company needs, background and personality of the teams, departments and business and each framework must be approached in a different way. It is important to recognise the challenges that may occur in the organisation: transforming how an entire organisation thinks and executes its projects and operations will always have setbacks when choosing to scale agile.

# **Need for analysing scaled agile methods**

This research dissertation contributes to the field of software development. It provides knowledge about the adoption of scaling agile methods in large companies. The primary research will provide insights into real-world experiences of large-scale agile implementation. It also gives a comparison of different experiences with the general Agile scaling methods and frameworks.

Scaled Agile Framework (SAFe), was primarily developed for organising and managing agile practices in large organisations. In large companies, there are is currently a lack of well-structured gradual adoption of scaling SAFe. Also, the benefits of implementing SAFe are rarely documented in many cases. This is the same for many of the other scaled agile methods, therefore, the main problems that are addressed in this dissertation are the challenges of scaling agile methods such as SAFe, and the potential benefits of such usage. These problems have not been studied in great depth. The growth of the different frameworks in this industry requires academic investigation, which will address the current challenges and benefits of the framework adoption.

It is difficult to introduce agile methodology in large software development organisations. Large projects that take place within the organisation require reliable coordination and communication between teams, departments, units, etc. Traditional agile methods were originally designed for small, one team projects, implying they did not face these challenges. This caused the creation of several different methods, frameworks, and practices

# **Research Questions**

The research questions chosen for this study are listed below:

1. How can the Scaled Agile Framework be implemented in larger organisations>

2. How can Agile Methods be implemented in large-scale software development organisations?

3. *RQ1: Which Agile methods large companies used?*

2. *RQ2: Which Agile scaling practices large companies used?*

3. *RQ3: Which challenges large companies faced when they adopted and scaled Agile development?*

4. *RQ4: Which success factors helped large companies to adopt and scale Agile development?*

# **Scope**

The main goal of this research project is to figure out the challenges of scaling Agile methods in large software development organisations. The following goals are the focus of the research:

* Review the existing Agile scaling frameworks comparing their characteristics.
* Discover the prevailing challenges and success factors of scaling agile software development processes.
* Analyse common scaling practices in real companies.
* Determine a set of common scaling practices out of the reviewed frameworks.

# **1.4 Research Approach**

This four-phases research approach will be used in the process of answering the research questions and following the scope.

The literature review is the first part of the study. Readings coming from studies, journals, books, and articles will be examined and used to provide information on different topics. The most important readings will be chosen from the available information to analyse the scaling of scaling agile methods in large software development organisations. Based on the literature review, a conceptual model will be created for graphical presentation. This is followed by creating a survey questionnaire – this research method is scalable and cost-efficient as questionnaires can be presented in built-in tools, making the interpretation process faster (cint, 2022). This primary research method is done by analysing the statistical results from the questionnaire.

# **1.5 Dissertation Structure**

The concept of scaling agile in large software development organisations was introduced in Chapter 1, as well as the goals and objectives for this research.

Chapter 2

# **Background**

# **2.1 Evolution of Agile Methodologies**

Agile methods were direct development methods since the 80s, and during the 90s is when software development practices were going through transformation. This chapter discusses the roots in the history of software development, as well as the iterative and incremental approaches that have been used since 1957. This section evaluates the reasons behind the introduction of Agile methods. Within organisations, it was common for teams to frustrated with the limitations of plan-driven driven methods, which often caused missed deadlines, failed projects, and dissatisfied customers. People who criticised the traditional methods suggested agile ideas as a response to change, customer interaction, and working on software systems rather than documents.

Alternative methods that were agile were not taken seriously for the first 30 years before its effectiveness to software development were recognised. Larman and Basili wrote the paper “Iterative and Incremental Development: A Brief History”, and they mentioned that