

Is SAFe Agile Portfolio Management Compatible with COBIT?

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Abstract

Background. Software development companies leverage various agile practices to remain flexible in dynamically developing markets. The iterative nature of Agile introduces new challenges at the portfolio management level. Yet, the research on Agile portfolio management has enjoyed limited research interest. **Aim.** Describe how traditional management approaches can leverage existing agile portfolio management practices and concepts. **Method.** Conceptual Analysis with mapping of SAFe portfolio management concepts and COBIT 2019. **Results.** Portfolio management concepts from SAFe which the COBIT 2019 practitioners can leverage. **Conclusion.** Using the frameworks SAFe and COBIT combined is not yet ready for implementation. **Recommendation.** Introduce new COBIT's focus area so that the agile concepts can be leveraged.

Keywords: SAFe, COBIT 2019, Agile Portfolio Management

1. Introduction

In a dynamically changing and developing environment, especially in software product development, the ability to compete and thrive by quickly responding to market changes and emerging opportunities is a must [13]. Thus, the so-called Agile approach to software development has become a common practice. Despite the original Agile orientation towards small teams, Agile fast became popular in large companies [3][15], and various frameworks for scaling Agile emerged [23]. The adoption of Agile may increase the difficulties of managing the project portfolio [21].

The concept of portfolio management is well established in the project management literature [17]. However, the iterative nature of Agile introduces new challenges [20], such as that the portfolio management has to rapidly respond to changes while linking teams to the strategy [4]. Models that deal with respective agile portfolio management approaches have so far been neglected in the literature [16] and have enjoyed limited research interest [22].

Existing research on agile portfolio management mainly deals with the question of how organizations can adapt their traditional portfolio management approaches to fit in agile environments [22][10]. We decided to take the opposite direction - to analyze and describe how traditional management approaches could leverage existing agile portfolio management practices and concepts. To do so, we evaluated which novelty concepts introduced with Agile could be repurposed in the existing framework for traditional portfolio management.

We selected the well-established framework Control Objectives for Information Technologies (COBIT 2019) [5] as a representative of the traditional approach to governance and management of information and technology and the Scaled Agile Framework (SAFe) [19] as a representative of approaches for applying Agile at scale. While SAFe is the most popular framework

for scaling Agile across large enterprises [2], COBIT has been dominating the IT field for many years. Many countries, including USA, Canada, Australia, India, Japan, Brazil, Poland, Romania, South Africa, and Turkey, facilitate COBIT for their public sectors [14].

The aim of the paper is to evaluate the overall fitness for the use of SAFe portfolio management concepts in COBIT 2019, and recommend specific concepts from SAFe that could be leveraged to support portfolio management objectives in COBIT 2019. This conceptual analysis may help organizations that are considering the adoption of agile portfolio management practices to understand concept differences and better-face associated adoption challenges. Furthermore, our paper contributes to closing the research gap in the area of Agile portfolio management.

2. Background

In this section, we provide a theoretical background to understand the context of the study better. First, we introduce the frameworks COBIT and SAFe. Then, discovered related work is presented.

2.1. COBIT

COBIT is a framework for the governance and management of information and technology aimed at the whole enterprise. COBIT defines the components used to build and sustain a governance system: processes, organizational structures, policies and procedures, information flows, culture and behaviors, skills, and infrastructure [5].

The latest version of COBIT [5], called COBIT 2019, was released at the end of 2018. COBIT has undergone significant changes since its first version was released in 1996. Its latest version claims to provide users with flexible solutions that adapt to the rapidly changing technology of the modern IT landscape. To satisfy governance and management objectives, various components comprising a governance system were defined: processes; organizational structures; principles, policies, procedures; information; culture, ethics and behavior; people, skills and competencies; services, infrastructure, and applications.

All types of components can be generic or can be variants of generic components. Generic components are described in the COBIT core model and apply in principle to any situation. However, generic components typically need customization before being practically implemented. Hence, the concept of variants is introduced. Variants are based on generic components but tailored for a specific purpose or context within a focus area. The focus area describes a certain governance topic, domain, or issue that can be addressed by a collection of governance and management objectives and their components i.e., cyber-security, privacy, or DevOps [5].

The governance and management objectives in COBIT 2019 are grouped in five domains: governance objectives are grouped in the evaluate, direct and monitor (EDM) domain and management objectives are grouped in four domains (align, plan and organize (APO); build, acquire and implement (BAI); deliver, service and support (DSS); monitor, evaluate and assess (MEA).

In total, COBIT 2019 provides a description of 40 governance and management objectives. For each objective, COBIT 2019 provides: description, purpose statement, list of a primary enterprise (EG) and alignment goals (AG) supported by objective and example metrics, and information related to each of the governance components. Portfolio management has its own dedicated management objective APO05 Managed Portfolio in COBIT 2019. During our evaluation of the possible use of SAFe with COBIT 2019, the objective APO05 Managed Portfolio was in focus.

The APO05 domain in COBIT 2019 covers several specific control objectives and management practices, including: APO05.01 Determine the availability and sources of funds, APO05.02 Evaluate and select programs to fund, APO05.03 Monitor, optimize and report on investment

portfolio performance, APO05.04 Maintain portfolios and APO05.05 Manage benefits achievement. Overall, the APO05 domain in COBIT 2019 provides guidance and best practices for performance optimization of the overall portfolio of programs in response to an individual program, product and service performance and changing enterprise priorities and demand.

2.2. SAFe

Knaster & Leffingwell [13] define SAFe as a knowledge base of proven, integrated principles, practices, and guidance that brings the power of Lean, Agile, and DevOps to the people building the world's most important systems. SAFe provides prescriptive guidelines to implement enterprise-scale lean-agile development [19] in large enterprises. Its first version SAFe 1.0 was released in 2011, and the most current version is SAFe 6 [19].

According to the 16th State of Agile Report [2], the Scaled Agile Framework (SAFe) is the most popular framework across large enterprises, as 53% of respondents marked SAFe as the framework they use for scaling Agile. SAFe consists of seven core competencies, each representing a set of related knowledge, skills, and behaviors, the total of which enables enterprises to achieve business agility. The competencies are lean-agile leadership, team and technical agility, agile product delivery, enterprise solution delivery, lean portfolio management, organizational agility, and a continuous learning culture.

Our study focused on the lean portfolio management that aligns strategy and execution by applying lean and system thinking approaches to strategy and investment funding, agile portfolio operations, and governance. The lean portfolio management competency in SAFe consists of three dimensions, and each dimension covers various responsibilities. The decomposition of lean portfolio management to dimensions and respective responsibilities is shown in Fig. 1.

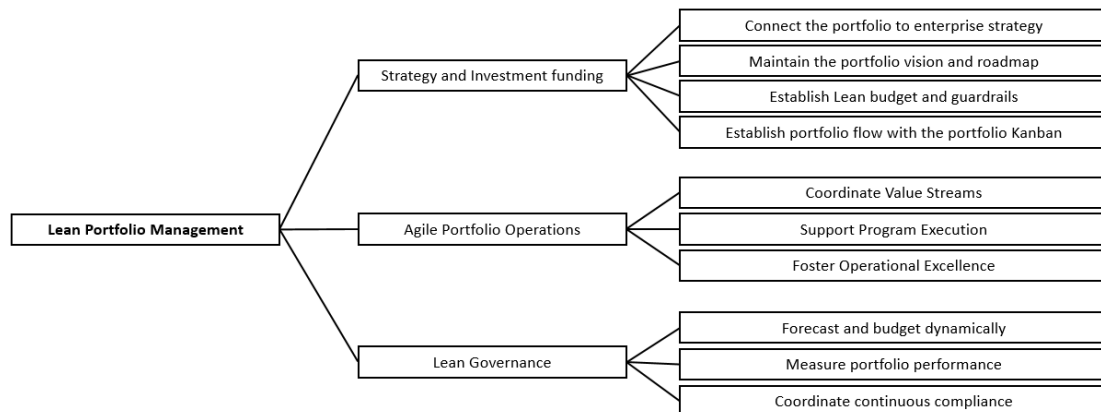


Fig. 1. Decomposition of Lean Portfolio Management in SAFe

2.3. Related work

The content of this sub-section emerged from the study of the existing literature. Rautiainen et al. [17] composed a descriptive case study on how introducing a structured portfolio management process reduced the number of ongoing projects from over 200 to 30, reducing thrashing. They described that listing all projects in priority order provides visibility into current developments and helps coordinate the work of multiple teams.

Stettina & Hörz [20] conducted empirical research in 14 large European organizations and concluded that agile software development evolves into agility in project management. According to their research, experience with Agile in individual projects alone is not sufficient for the appropriate integration of the practice into an agile portfolio. Thus, traditional portfolio

management needs to evolve to overcome this challenge.

Horlach et al. [4] did an empirical study with the intention to design six principles for achieving four design goals to establish effective agile portfolio management. Horlach stated that the best practices for IT governance in COBIT are rather suited for stable environments. He also stated that traditional command-and-control settings and the shift in paradigm also call for portfolio management to enable rapid response to change while linking teams to the strategy. The mentioned shift implies changes to existing project and portfolio practices.

Sweetman & Conboy [21] developed a set of propositions on how project portfolio management can be enacted to manage the complexity and adaptiveness arising from a portfolio of agile projects using adaptive systems theory. It investigates how the interactions between projects within a portfolio influence the overall performance and adaptability of the portfolio. The findings provide insights into the management of agile project portfolios and suggest that a decentralized, self-organizing approach can enhance the agility and performance of the portfolio as a whole.

Uludag et al. [22] conducted a systematic literature review to understand the recent state-of-art of research on large-scale Agile. They concluded that the agile portfolio management research stream mainly deals with the question of how organizations can adapt their traditional portfolio management approaches to fit in agile environments.

Ozkan et al. [14] found that the coexistence of Agile with different IT frameworks is already adopted in organizations. More specifically, the pursuit of being agile in the area of digitalization pushes organizations to go for agile transformation while preserving full compliance with IT frameworks.

Alves et al. [1] created a framework of strategic agile portfolio management based on five case studies that they conducted in Brazil. The framework focuses on the actual adoption of agile project portfolio management rather than the actual portfolio management.

Vazifeh-Noshafagh et al. [24] applied a case study research-based methodology defining a set of procedures to bring about the maturity of a portfolio of a mega-scale software project.

Ploder et al. [16] identified critical success factors for agile project portfolio management based on a literature review and a single case study in Austria.

Janssen et al. [10] focuses on the balance between agility and control, and how SAFe can be implemented in a way that supports effective internal controls while maintaining agility.

The reviewed papers showed that traditional portfolio management must evolve [20] and that analysis of different models for portfolio management to provide value in helping companies choose suitable scaling strategies and practices to do so is needed [17]. The effects of the large-scale adoption of agile methods on portfolio management are not clear [22].

Although the coexistence of Agile with different IT frameworks seems to be adopted in organizations [14]. The main challenge is to ensure compliance with regulations and standards while still maintaining agility [10]. Generally, there has been little research done in the agile portfolio management area, and any described combinations of COBIT and SAFe are scarce.

3. Research Method

To complete the aim of our study, we set the following objectives: 1) Analyse and evaluate the overall fitness for the use of SAFe portfolio management concepts in COBIT 2019, and 2) Identify, list, and recommend specific concepts from SAFe that could be leveraged to support portfolio management objectives in COBIT 2019. Our research is positioned as a conceptual paper. Conceptual papers typically focus on proposing new relationships among constructs rather than testing empirically [9]. The overall process of our study is depicted in Fig. 2.

Literature Review The mapping process as described by Kitchenham et al. [12] was used to find relevant publications. We targeted AMC Digital Library, eResources of the Czech National Library of Technology, which cover multiple databases (i.e., SpringerLink, Wiley Online



Fig. 2. Research Process

Library, Science Direct, IEEE/IET Electronic library) and Google Scholar. The search was conducted using the following keywords: *agile portfolio management*, *agile portfolio*, and *SAFe portfolio*. First, the papers were evaluated by title and abstract, and publications without possible relation to portfolio management were excluded. The rest of the discovered papers were then reviewed using the approach described by Keshav [11]. The publications had the introduction and conclusions reviewed, and those without any focus on portfolio management were excluded. Then, the remaining papers were studied and analyzed in detail. The whole process resulted in the discovery of only 10 relevant papers [4][14][17][20][21][22] [1] [24] [16][10] touching on agile portfolio management. The main purpose of the review was to understand the current state of the art. A distillate of the ideas on portfolio management extracted from the reviewed papers was briefly presented in Section 2.

COBIT 2019 Analysis. We became familiar with the COBIT structure and core model focus area. Then, we searched for existing connections with SAFe, and the Management Objective: APO05 – Managed Portfolio [5] was thoroughly analyzed. The contents of related management practices and activities were transcribed to Microsoft Excel to ease further work on mapping and comparison with SAFe.

SAFe Analysis. The identification and definition started with the analysis of the SAFe website [19] and accompanying publication [13]. The key concepts around agile portfolio management and their descriptions were extracted.

Mapping of COBIT 2019 to SAFe. The transcriptions from COBIT 2019 in Excel were constantly compared with descriptions touching on portfolio management in SAFe. The intention was to find similarities, differences, and impediments, and to identify areas where COBIT 2019 could leverage the knowledge from SAFe. Next, we extracted key concepts related to agile portfolio management. These concepts were then mapped to COBIT's management practices with the intention to identify, list, and recommend specific practices and concepts from SAFe that could be leveraged to support portfolio management objectives in COBIT 2019. This part of the process was conducted manually without any automation or special software tools.

Reporting the Results. As the last step, we summarized the results. The results are presented in section 4 and discussed in the context of recent state of the art in section 5.

4. Results

We started with a thorough search for any reference to SAFe within COBIT 2019. COBIT lists SAFe as related guidance for the culture, ethics, and behavior component under management objective APO02 – Managed Strategy. However, there is no other mention of SAFe in any other management objectives or practices. Next, we focused specifically on portfolio management.

The approach to portfolio management that is covered in the COBIT management objective APO05 – Managed Portfolio works with the traditional decomposition of the portfolio into programs on the strategic level, and programs and projects on the tactical level [18]. SAFe provides descriptions and guidance specifically for portfolio management but expects a different approach to managing portfolios and programs.

The traditional project concept is not present in SAFe. SAFe works with epics that represent the significant investments in a portfolio. Epics are visualized and managed inflow using Kanban and lean principles, such as limiting work-in-process (WIP), small batch sizes, and

short queue lengths. Epics are decomposed into Features; these represent the new functionality built, deployed, and maintained [19]. Even though there is some analogy between programs and projects, epics and features, in relation to different organization layers, see Fig. 3, the basic concepts of a start-stop project versus ongoing operations and maintenance of the features as long-live capabilities are fundamentally different.

| | Traditional | SAFe |
|-----------------|-------------|----------|
| Strategic Level | Programs | Epics |
| Tactical Level | Projects | Features |

Fig. 3. Programs and Epics

The traditional approach expects detailed work planning in advance. SAFe proposes to focus on the value delivered instead of detailed planning. Thus, it promotes shifting from building capabilities through separated projects that manage tasks to a holistic product management paradigm that encompasses all the efforts and resources needed to field and maintain a long-lived capability. The collection of people, systems, information, and material needed to ensure capability is referred to as a value stream. The so-called agile release trains (ARTs) are introduced to scale many teams and individuals in SAFe. An agile release train is a long-lived team of agile teams, which, along with other stakeholders, incrementally develops, delivers, and where applicable, operates one or more solutions in a value stream [19].

Budgeting is an important part of portfolio management. SAFe promotes budgeting based on lean budget guardrails that describe the policies and practices for budgeting, spending, and governance for a portfolio. However, lean budgets are created for value streams instead of projects and programs in COBIT 2019. This makes the approach incompatible with the COBIT 2019 generic process components for a Managed Portfolio management objective and rules out the majority of the concepts from dimensions of agile portfolio operations and lean governance from SAFe.

Table 1. Differences between COBIT 2019 and SAFe.

| Cobit 2019 | SAFe |
|--|--------------------------------------|
| Detailed work planning in advance | Value delivery instead of planning |
| Building capabilities through separated projects that manage tasks | Holistic product management paradigm |
| Budgets for projects and programs | Budgets for value streams |

Despite the major clash in the approaches to portfolio management see Table 1, we see a potential fit for the use of SAFe concepts in COBIT 2019. Discovered concepts to support the COBIT 2019 management practices from the Managed Portfolio objective are described in the following paragraphs.

Implementation of SAFe's **Strategic Theme** and the **Objectives and Key Results** template (OKRs) [19] to the Portfolio Management (APO05) area in COBIT 2019 can support management practice APO05.03 (*Monitor, optimize and report on investment portfolio*) and the individual activities APO05.02-1 (*Identify and classify investment opportunities in line with investment portfolio categories; Specify expected enterprise outcome(s), initiatives required to achieve expected outcome(s), high-level costs, dependencies and risk; Specify methodology for measuring outcomes, cost and risk*) and APO05.02-2 (*Perform detailed assessment of all program business cases; Evaluate strategic alignment, enterprise benefit, risk and availability of resources*) within

management practice APO05.02 (*Evaluate and select programs to fund*). The OKRs template could be used to define strategic themes and tracks their progress through specific, measurable actions over a selected regular reporting period [19]. Thus, the OKRs template helps to ensure that all processes are moving in the same direction with clear priorities in a constant rhythm.

The concept of the **Lean Startup Cycle for Epic Implementation** from SAFe aims to build and evaluate an MVP (Minimum Viable Product) [19]. This concept is able to satisfy activities APO05.02-4 (*Decide which candidate programs should be moved to the active investment portfolio; Decide whether rejected programs should be held for future consideration or provided with seed funding to determine if business case can be improved or discarded*), APO05.04-3 (*Decide which candidate programs should be moved to the active investment portfolio; Decide whether rejected programs should be held for future consideration or provided with seed funding to determine if business case can be improved or discarded*), APO05.05-2 (*Implement corrective action when achieved benefits significantly deviate from expected benefits; Update the business case for new initiatives and implement business process and service improvements as required*) in COBIT 2019, as per their described characteristics.

COBIT 2019 activities APO05.03-1 (*Review portfolio regularly to identify and exploit synergies, eliminate duplication among programs, and identify and mitigate risk*) and APO05.04-2 (*Work with service delivery managers to maintain the service portfolios; Work with operations managers, product managers and architects to maintain the asset portfolios; Prioritize portfolios to support investment decisions*) cover: portfolio control, identification and exploitation of synergies, and elimination of duplication [5]. The **Portfolio Roadmap** serves as a comprehensive summary to view and manage investments and development over a longer time period [19]. Therefore, the roadmap can be leveraged in APO05.03-1 and APO05.04-2 activities.

In Table 2 we summarize concepts originating from SAFe for which we see immediate fit for use in COBIT 2019. In the first column, the SAFe concepts are briefly described. The second column contains COBIT Management practices and/or activities that can be supported by SAFe concepts in the first column.

Table 2. SAFe concepts that could be repurposed with COBIT 2019

| SAFe Concepts | Cobit 2019 Practices and Activities |
|---|---|
| OKRs template defines strategic themes and tracks their progress through specific, measurable actions over a selected regular reporting period. OKRs helps to ensure that all processes are moving in the same direction with clear priorities in a constant rhythm. | Management practice - APO05.03 Activities - APO05.02-1 - APO05.02-2 |
| Concept of the Lean Startup Cycle for Epic Implementation aims to build and evaluate an MVP (Minimum Viable Product). | Activities - APO05.02-4 - APO05.04-3 - APO05.05-2 |
| Portfolio Roadmap serves as a comprehensive summary to view and manage investments and development over a longer time period. | Activities - APO05.03-1 - APO05.04-2 |

5. Discussion

Despite the fact that COBIT 2019 is being periodically updated to reflect on the evolving markets, it is not ready to fully incorporate the agile practices prescribed in SAFe. COBIT 2019

is rather suited for stable environments and traditional command-and-control settings [4]. COBIT 2019 expects rigid definitions of processes, documents, and precise verification of planned projects and their budgets, which does not comply with agile concepts in SAFe. Moving off of that direction requires the introduction of agility into portfolio management [20], which is not yet present in COBIT 2019.

Additionally, SAFe proposes to focus on value delivery instead of projects, thus shifting the mindset from building capabilities through separated projects to the product management paradigm [4]. This inconsistency between COBIT 2019 and SAFe is probably the reason why SAFe is not recommended as a guidance in any of the portfolio management related management objectives or practices in COBIT 2019, even though SAFe is very popular [2] and addresses this topic quite extensively.

Enabling COBIT 2019 to shift towards the product management paradigm would require changes to existing projects and portfolio practices [4]. We also connect the lack of readiness of COBIT 2019 for Agile adoption to COBIT's foundational concepts, which were introduced in the 1990s, that have not yet reflected the trend of Agile transformations that started two decades later [15][22].

Due to the increasing popularity of Agile, the next releases of COBIT could be better positioned for the coexistence with Agile, or SAFe specifically. Even though Ozkan et al. [14] found that the coexistence of the Agile approach with different IT frameworks is already adopted in some organizations. These combinations often come with challenges, mostly related to balancing flexibility resulting from Agile and control related to COBIT 2019 [10]. Thus, to better support the coexistence and enable the benefits of leveraging the Lean-Agile concepts from SAFe, we suggest introducing a new agile portfolio management focus area to COBIT, allowing the tailoring of the generic components from the COBIT-19 core model. That will require creating new variants of the generic components.

Three focus areas have been published so far within COBIT 2019: COBIT Focus Area: Information Security [6], COBIT Focus Area: Information and Technology Risk [7], COBIT Focus Area: DevOps [8]. The new publication could be called COBIT Focus Area: Lean Agile Management and could supplement the relevant generic objectives and their components with principles from this area both in the area of governance (lean agile governance objectives) and in the area of management (lean agile management objectives). A more detailed description of the content of this focus area would require a deeper analysis, which is not the subject of this article, but is one possibility to continue this research.

5.1. Conclusion

Our findings showed that, without COBIT's components' tailoring, the use of SAFe lean portfolio management competency in combination with COBIT 2019 would not be possible. Still, we believe that the introduction of a new focus area may represent a beneficial contribution and enhancement to COBIT 2019.

5.2. Limitations

The main focus of our study was on Portfolio Management in both frameworks, COBIT and SAFe. Thus, a more thorough analysis and assessment of the possible combination of both frameworks could reveal additional relationships, inconsistencies, and propositions on how to better enrich COBIT practices with SAFe. The study was conducted only on the theoretical level. Hence, the results are valid for implementations of the frameworks done "by the book". The three author-peer review does not guarantee the full bias avoidance. However, we believe that the presented results are valuable enough for the short-paper and the ideas are worth sharing with the research community and practice. Still, more empirical research is needed to confirm

that the presented results can meet the real-life settings.

5.3. Future work

The presented conclusion is a hypothesis that will be evaluated in our future research and analysis. More empirical research is needed to confirm that the presented results meet the real-life settings and confirm that concepts to enhance COBIT 2019 are bringing value to organizations. Additionally, we believe that variants of COBIT 2019 and SAFe combinations are unavoidable in practice. Therefore, the full potential, limitations, and possible relaxations of COBIT 2019/SAFe combinations must be researched.

5.4. Acknowledgment

This work was supported by an internal grant funding scheme (F4/35/2022) administered by the Prague University of Economics and Business.

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