Agile Leadership Unveiled: Essential Traits

Julija Steinhart
Business Management
BA School of Business and Finance
Riga, Latvia
julja.steinhart@gmx.ch

Abstract— **The expectation on becoming agile is rising. Businesses implement agile values in the last 20 years, especially in the software and product development, and in the fast-changing and often unforeseen environment, agility may sound as a solution to fast adaptation and flexibility. At the hard of this adaptability lies the agile leader, driving the organizational resilience and innovation. While micro and macro levels of corporate hierarchy have been widely studied, meso level and hierarchical interplay between individual and leader are so far being neglected. The aim of this study is to spot key attributes that define agile leadership excellence. To achieve this aim, a qualitative study based on interviews has been performed. In total, 40 Chief Technology Officers (CTO) who apply agile values and methods in their daily businesses have been interviewed during July-August 2024. In addition, a systematic literature review and bibliometric analysis have been applied to elaborate on academic research in this field. The bibliometric analysis is based on a literature review of publications obtained from Scopus using an inclusive search strategy. To visualize the data, Bibliometrix and VOSviewer have been used. This article aims to enhance research on agile leadership by identifying key traits of agile leader to manage complexity, reciprocate team capabilities and enhance outcome. By examining these traits, author is uncovering the role of leader regarding all stakeholders. The study comes with the conclusion and recommendations for both business and academia.**

Keywords— *Agile leadership, agility, traits, trends, business*

I. Introduction

To survive as a corporation nowadays a fundamental transformation to become more agile is being crucial. The corporation is viewed as living systems that is stable and dynamic at the same time. According to De Smet [1], the transformation of every corporation starts with its leadership that drive successful change while adopting new mindsets and capabilities.

As per meta-analysis performed by Porkodi [2], agile leader impacts efficiency, employee performance, team effectiveness and various organizational outcomes. How to achieve agility and what is meant by that towards leadership practices is an important topic for contemporary research. Agile leadership deployment is impacting also internal processes while offering the opportunities for employees to feel part of the broader decision-making process according to Rialti et. Filieri [3]. Leaders are catalysts for change, identifying rearrangements in the outside environment and adapting business structures accordingly as has been stated by Malik et al. [4].

Consequently, agile values lived by leaders as role models may become not only a challenge but a stimulant for organizational transformation.

Several authors contributed to the study of agile leadership and highlighted its importance for businesses; however, our knowledge on the role of agile leader and its characteristics is still very limited. Especially, there is a lack of understanding on the leadership styles that are most suitable for the C-level management. Understanding the specific actions must take and personal attributes of senior management to ensure strategic development of businesses in the specific industry is equally important.

To address these research gaps, this study investigates the role of emergent leadership style, agile leadership in banking industry. Rigby et al. assert that product-oriented businesses can adopt an agile test-and-learn approach to foster incremental thinking across the company. However, this approach remains challenging for service-oriented businesses like banking [5]. In addition to agile leader incremental, author is building up and expanding three core principles of agile practices defined by Denning. Several authors confirms that agile leadership differs from traditional leadership styles. Thus, with this study, author attempt to answer the following research question:

RQ: What are the main traits and characteristics of agile leader?

To answer this research question and achieve the aim of this study, a qualitative study of an interpretive nature to be considered [6]. The typical leadership study is usually assessed thru a questionnaire that is filled in by subordinates or supervisory, however as stated by Hunter et al [7], since leadership is a process and typical leadership study often fails to consider the situation. Further research also was proving that assessments thru questionnaire can be substantially biased as shown by Hansbrough et al [8]. In addition to that, leadership questionnaires tend to be too generic as

shown by Yukl [9]. Taking the above into account, author has decided to proceed with the structured interview given that these are established and more context sensitive as confirmed by Liden et Antonakis [10] and Zaccaro et al. [11].

A systematic literature review, a commonly used bibliometric methodology, has been conducted to assess the literature on agile leadership and its role within a specific industry, providing a comprehensive overview of existing research in the specific field as Kraus has shown it [12].

The search period analysed was from July to Augst 2024. Data has been extracted from Scopus in June 2024 to conduct bibliometric analysis to map dominant knowledge gaps in the literature on agile leadership and agile leader. By leveraging the systematic nature of bibliometric methods, tis study pinpoints key areas of research and highlights the underexplored topics on future investigation of leadership characteristics, also independent of leadership styles. This analysis is based on structured method to quantitatively review the volume and evolution of research on agile leadership. The bibliometric analysis also facilitated summarizing the current state of knowledge as proposed by Bolbot [13]. This was summarised from a bibliometric perspective using Scopus and VOSviewer.

The aim of the study is review and integrate situational and context-based parameters into a conceptual framing of agile leader traits. This includes broader scope of leader attributes such as social skills, values and inter-personal capabilities

In that sense, the article is divided into four sections: i) this introduction, ii) tools and methods, iii) results and discussion and v) discussions and final remarks.

II. MATERIALS AND METHODS

A. Tools and data synthesis

Author processed with two-step approach while initially working with the bibliometric analysis to establish the research body and, consequently, while preparing, conducting and assessing the interview results.

The bibliometric analysis on agile leadership has been performed by using Scopus, a leading academic database with extensive research data coverage as well as open-access content [14]. Bibliometric overview provided an understanding on previous research contributions and gaps related to specific leadership style such as agile leadership.

SCOPUS has been used to keep the dataset consistent relying to one database only, ensuring the findings remain comparable. Data from different databases may content biased variations.

Especially the possibility to filter and refine results by specification has been important for usability of Scopus search. To keep align with business practices on agility and considering the introduction of Agile Manifesto in 2001, the search period has been chosen accordingly. For the period of 2001-2024, 706 relevant articles were retrieved on the 'agile leader' and 988 relevant articles on 'agile leadership' and this data has been analysed using bibliometric approach. Out of these only 114 publications have been touching on the criteria *"agile AND (leader OR leadership) AND (traits OR characteristics)"*. None of these has established traits model as main premise of research gap. Titles, keywords and abstracts have been reviewed to make sure that they are consistent with the specified search and to avoid result overlap on both search criteria's (leader and leadership). Hence, manual data cleaning has been performed on the identified results to make sure

the data extracted is stable and accurate. Following, a detailed analysis has been conducted on 110 articles that fully met the search criteria, using precise systematic techniques. To proceed with data synthesis and prepare the interview questions, methodical and exacting techniques have been used.

Filters have been set for the language, access type, research period, document type, publication stage.

B. Methods

a) Data selection

The initial collection of the data has been performed based on data within Scopus database and enriched with visualization to graphically represent the bibliometric maps as confirmed by Eck & Waltman [15]. In addition, the research has been formalized while combining both qualitative and quantitative components as identified by Syhyda [16].

It was supplemented by findings from Nielsen [17], that bibliometric analysis identifies emerging trends while building on various statistical methods to analyse large data set.

While analysing the extracted dataset of 114 publications in total, keyword analysis has been performed to understand dependencies and identify coherency of leader characteristics. Hence, co-occurrence within the network of relationships between keywords has been conducted.

A double combination of the pre-defined words has been used within Scopus search ("agile leadership" and "agile leader") for the assessment of the overall results in the first part of this article. Based on applied dataset, further analysis has been conducted based on bibliometrix and overlap visualization in VOSviewer. As a result significant co-occurrences have been identified. On top, cluster analysis was conducted to identify data patterns and findings have been summarized in this article.

Since the defined dataset has been extracted for the period of 2001-2024, this article is based on the analysis covering the specific period and may not reflect most current publications. Since the analysis of author is based during this stage of research on keyword analysis only, a comprehensive examination of sentences and context has been not covered in a full extent. Author, however, bearing this dependency in mind, mitigated the limitation while using VOSviewer to visualize trend analysis.

b) Structured inteview

Based on the initital colleaction of data regard agile leadership characteristics and traits, structured interview questions have been established.

Interviewing is a commonly used research method that allows researchers to explore how individuals subjectively interpret social phenomena around them as been confirmed by Kvale . Thus, interviews allow participants to share their emorions, biases, opinions and attitudes towards organisational contexts.

In comparison to quantitative research that focuses on examining cause-and-effect relationships, qualitative interview uncover how individuals value their social experiences and offers holistic understanding of unexplored phenomena beyond predefined hypotheses and variable relationships as identified by Denzin & Licnoln [18].

Based on the above epistemological stances adopted by researchers, author aligned with the relational nature of private and professional experience of the interviewee, engaged with

them while deepening or rephrasing questions and evaluations as well interpreted interviewees subjective core part within the interview process.

Main aim of interviews was to expand the research practice and establish body of knowledge confirmed by management experiences. The established approached mitigate the biase of approaching leaders that are not in scope of the research question. With other words, the one who are holding C-level position but not fall under the definition of being agile leader or are not applicate agile principes, or rather ones who are make use of agility but not holding leader position.

Before approaching C-level leaders, author created an overview of 236 banks and its management in Switzerland based on data from Statista [19]. Following, CTO (Chief technology officer) position holders have been identified. It must be mentioned that Swiss banking sector is quite fragmented and in addition to large international banks, there are also 24 cantonal banks and 59 institutions in total are rather small banks with up to 200 employees and offering retail banking solutions. Hence, for the research 46 CTOs have been approached with request on interview. Out of these, 46 CTOs confirmed their participation, leading to 40 successful interviews in total. 6 CTOs declined due to timeslot overlaps or business reasons.

In total, 32 questions have been established based on identified elements applied to agile leader within bibliometric analysis, these have been split into 3 categories: stakeholder focus, empowered ownership, collaborative excellence.

Prior each interview, specific personal data has been collected with each interviewee such as size of bank CTO is working with, years of professional experience, years in the leadership position, highest educational qualification, gender.

Each interview has been conducted on site and longed for 30-45 minutes each, leading to approx. 1500 minutes being analysed during the post-interview assessment.

Concluding on the above main parts, the research has been determined with the findings as well as practical and research implications.

III. RESULTS AND DISCUSSIONS ON AGILE LEADER TRAITS

A. *Systematic literature evaluation based on Scopus dataset*

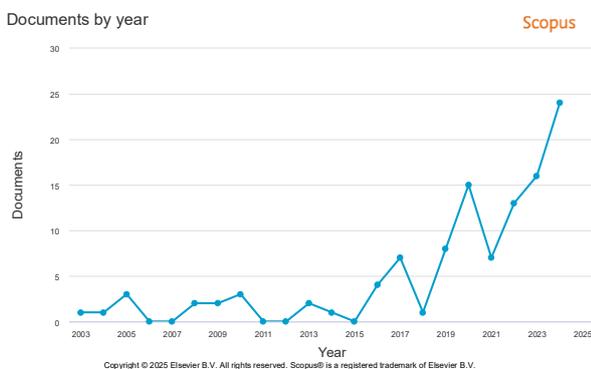Documents by year   Scopus

Fig. 1. Number of *publications* and citations on agile leadership traits (2001-2024) [20]

As part of the bibliometric analysis, citations and publication trends have been assessed. The assessment of documents has been ongoing since 2003, with an average of 2 to 3 documents per year. Since 2016, there has been a linear growth in the number of documents, reaching up to 25 documents per year. However, there was a notable drawdown in 2021. Despite this dip, the overall trend indicates a significant increase in document assessments over the years.

General trends indicate a relatively low level of interest in agile leadership traits during the early research years (2012-2017), with a significant surge in publications beginning in 2018. This trend may be attributed to the concept of "governance through goals" and the heightened pressure exerted by Sustainable Development Goals on companies, as noted by Biermann [19]. From 2012 to 2023, the number of published works on this topic has increased elevenfold.

Regarding citation trends, it, in general, proceeding similarly to the publication trends, showing exponential growth since 2012.

A clear correlation trend between published and cited publications is observed.

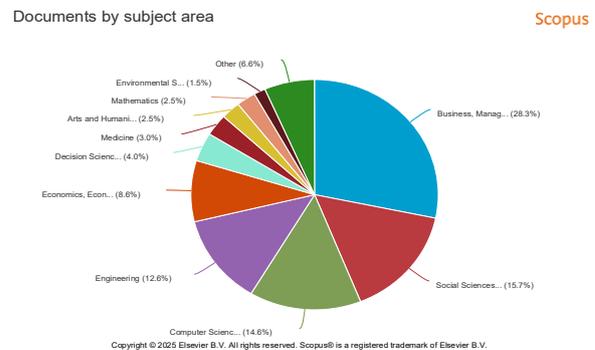Documents by subject area   Scopus

Fig. 2. Number of *publications* and citations on agile leadership traits (2001-2024) [20]

Bibliometric results summarizing raw data output out of Scopus dataset for the research area are presented in Fig 2. Research fields in the Scopus dataset were used to determine the subject areas. The ranking results show that the research area is carried out in several scientific disciplines. Looking at the results, the top 5 fields have been identified: business, management, and accounting (28.3%), social sciences (15.7%), computer science (14.6%), engineering (12.6%), and economics, econometrics, and finance (8.6%). Since a publication may cover and refer to more than one field, there are more results than publications in total. An evaluation of disciplines and source groups revealed that the most popular research topic is sustainable development. Nevertheless, a strong fragmentation of subject areas should have been mentioned.
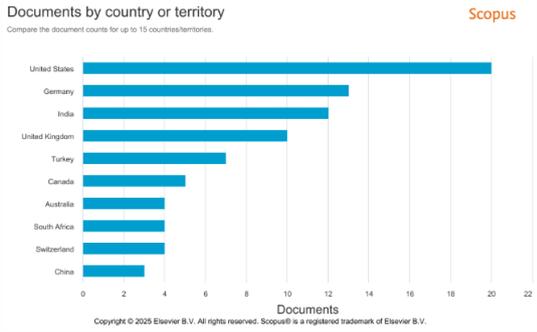
C. EFA Discussion

Factor Loads	1	2	3	4	5	6	7	1 - Com-monal-ity
I continuously pay attention to excellence and good results					0.556			0.3257
I set clear expectations for team performance.	0.802							0.2030
I track and measure customer satisfaction and use this feedback in order to Improving products/services have an impact on my efforts has a positive impact on the overall performance of the team.	0.751							0.2449
I regularly moderate retrospectives, in order to continuously improve the team's performance, I take steps to resolve any discrepancies between the team members and deliver highquality results, I set high standards for the	0.513		0.317		0.574			0.0614
quality of our work and expect us to exceed these standards, I give our teams clear and	0.360			-0.379	0.326			0.3727
in order to achieve a high quality of work, I make sure that the team focused on the provision of quality work.	0.331	0.399						0.5425
I am transparent with stakeholders when it comes to		0.499			0.391			0.3650
Challenges or setbacks that could have an impact on expectations. I involve stakeholders in the		0.482						0.6232
expectation formation process and include their feedback. I manage the expectations of the					0.354		0.582	0.3987
stakeholders through direct communication.							0.994	0.0366
I attach great importance to personal conversations				0.901				0.2074
If I am not afraid to talk directly to myself about failures, I provide the team members with the resources and support to			0.376	0.488				0.4616
that they need to organize themselves and thus contribute to the team's success.			0.467	0.560				0.2318
I promote a culture of Responsibility and Personal responsibility by being a role model with my own actions.				0.409				0.4261
I balance the autonomy well with collaboration within team members.	0.489							0.4481
I promote the exchange of knowledge between team members.						0.445		0.5052
I always promote cooperation with different stakeholders.						0.972		0.0829
I create meaning and purpose in the team.						0.504		0.4318
I acknowledge and reward Team members who are responsible for take over their work and show responsibility.		0.661						0.3898
I ensure the timely recognition of successes.		0.433		0.379				0.4060
I clearly communicate the future direction of organizational development.	0.548							0.4372
I welcome changed requirements, even in the late Phase	-0.300		0.613					0.5315
I balance well between short-term goals and long-term strategy.		0.624						0.5400
I adapt to changing circumstances during the project and change the strategies accordingly		0.667						0.4878
I promote continuous learning and development.		0.345		0.410				0.5441
When making decisions, I take the needs and preferences of the Putting customers first	-0.416	0.452	0.405					0.4170
I ensure that our products/services meet or exceed our customers' expectations.			0.459	-0.328			0.382	0.4147
Factor Loads	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1 - Com-monal-ity**
I encourage the team to collect feedback from customers and use it to Improving our products/services.			0.769					0.2768
I promote cooperation in the team in order to identify and respond to customer needs	0.363		0.570					0.3858
I enable the team to make decisions that prioritize the value and satisfaction of the customer.			0.417		-0.390			0.4169

Note. "Factorization of the main axis" extraction was used together with an "Oblimin" rotation

Fig. 5. EFA Page

The exploratory factor analysis (EFA) assessed is based on survey data collected from Chief Technology Officers (CTOs) in the Swiss banking sector, as part of a qualitative and quantitative investigation into agile leadership traits. A total of 40 survey responses were analyzed, representing a diverse range of banks, including both large international institutions and smaller regional banks. The survey comprised 32 items designed to assess various leadership behaviors aligned with agile principles.

The factor analysis was conducted using the principal axis factoring method, which is suitable for identifying latent constructs within datasets that may not exhibit normal distribution and appropriate for studies within banking sector as per Rodriguez- Calderon [23]. An oblimin rotation has been applied, allowing for bootstrapping correlations between factors, which aligns with the understanding that agile leadership traits are often interconnected to figure out personality traits as per Branca et al [24]. Items with factor loadings below 0.3 were removed to ensure the robustness and clarity of the identified factors.

This analysis resulted in the extraction of seven distinct factors, representing core dimensions of agile leadership. These factors reflect different but complementary aspects of leadership personality that contribute sustainably to team and organizational agility, resilience as well as performance. The results of the factor analysis are integrated with qualitative insights from interviews with banking CTOs and a systematic literature review.

a) Factor 1: Performance-oriented leadership

This factor underscores the importance of setting clear performance expectations and measuring outcomes according to Granger et al [25] Agile leaders scoring high on this factor focus on establishing performance benchmarks and tracking key performance indicators, ensuring that teams underpin success criteria and work toward delivering measurable results. Such leaders foster a culture of accountability and drive continuous improvement through regular feedback loops and assessment of customer satisfaction and work quality. Performance-oriented leadership is vital in agile settings due to increase autonomy of a team, necessitating clear goals and performance feedback to maintain alignment. Key survey questions related to this factor included: 'I set clear expectations for team performance.' and 'I track and measure customer satisfaction.'

b) Factor 2: Directive clarity

Directive clarity leads to a leader's ability to reduce ambiguity by providing explicit goals and ensuring that team members understand their roles and responsibilities. Due to dynamics of agile environments, often confusion on expectations appears. Leaders exhibiting directive clarity prevent misalignment by articulating precise objectives and establishing structured processes. While agile principles emphasize flexibility and adaptability, clarity serves as an anchor, ensuring that teams pivot within a shared understanding of their core objectives. Key survey questions related to this factor included: 'I give our teams clear and concrete goals.' and 'I create clear responsibilities and accountabilities.'

c) Factor 3: Embracing change

Change-embracing leaders demonstrate a proactive attitude toward shifting requirements and evolving project scopes according to Jun et Lee [26]. Leaders view changes as opportunities rather than disruptions, fostering a mindset that promotes innovation and responsiveness. This factor aligns closely with the agile manifesto's core value of welcoming changing requirements, even

late in development. Leaders remain flexible and adaptive, enabling rapid iterations and adjustments based on emerging insights or market demands. Key survey questions related to this factor included: 'I welcome changing requirements, even in late project stages.' and 'I adapt our plans flexibly to new insights.'

d) Factor 4: Relationship-oriented communication

Core basis of agility is communication as per Hummel et al [27]. Relationship-oriented leaders prioritize building strong interpersonal connections with their stakeholders and within their teams. Hence, open dialogue, personal conversations and trust through transparency are initial. In agile settings, cross-functional collaboration is essential, and the ability to nurture effective communication channels reduces misunderstandings and strengthens team cohesion. Leaders excelling in this dimension create a safe environment where team members feel valued and heard. Key survey questions related to this factor included: 'I place great value on personal conversations and open exchange.' and 'I promote transparent communication in our team.'

e) Factor 5: Excellence and quality focus

A focus on excellence and quality distinguishes leaders committed to delivering high-standard outcomes. This factor reflects a leader's dedication to continuously monitoring work quality, refining processes, and striving for superior performance. Agile methodologies emphasize iterative development and regular feedback loops, making quality assurance a critical component. Leaders emphasizing quality focus instill a culture where teams take pride in their outputs, minimizing defects and enhancing customer satisfaction. Key survey questions related to this factor included: 'I continuously strive for excellence and good results.' and 'I regularly review the quality of our work results.'

f) Factor 6: Knowledge sharing and synergy

This factor emphasizes the collective intelligence within agile teams. Leaders championing this factor ensure free information flow, enabling team members to make informed decisions. The culture of learning and knowledge exchange is promoted, which is especially valuable in agile environments where cross-disciplinary collaboration drives innovation. By fostering team synergy, leaders enhance problem-solving capacity and ensure that teams leverage their collective expertise. Key survey questions related to this factor included: 'I encourage knowledge exchange between team members.' and 'I ensure all team members have access to key information.'

g) Factor 7: Stakeholder engagement

Lastly, stakeholder engagement has been identified as completing factor. Leaders actively involve stakeholders in decision-making processes, gather feedback and manage expectations while creating transparency. Agile leaders understand that value delivery extends beyond internal teams to clients and partners. Maintaining a dialogue with stakeholders ensures that team efforts remain customer-centric and responsive to evolving needs, ultimately fostering trust and enhancing long-term partnerships. Key survey questions related to this factor included: 'I involve stakeholders in the expectation-setting process.' and 'I regularly seek feedback from stakeholders.'

The above identified seven factors derived from the EFA analysis offer a comprehensive framework to understanding the multifaceted nature of agile leadership and contribute sustainably

to further studies. Performance-oriented leadership, directive clarity, change embracing, relationship-oriented communication, excellence and quality focus, knowledge sharing and team synergy, and stakeholder engagement collectively form the foundation of personality traits of the agile leader. By cultivating these dimensions, leaders can better navigate the complexities of agile environments, empowering teams to thrive amidst uncertainty and driving sustainable organizational success.

IV. FINAL REMARKS

This article explored current research body and practically proven personality traits of agile leader. The article shows biases and enlarges research as well provided proposals for further studies.

It aligned the observations in publications on agile leader since creation of Agile Manifesto in 2001. Interest on agility and agile leadership has been absolved since then in academia.

Notably, 110 articles have been analysed to distinguish research trends, keyword analysis while using VOSviewer. Further research could be performed considering all limitations mentioned, foremost the research period of the article being 2001-2024.

In summary, bibliometric analysis primarily examines past publications; however, it also highlights general research trends and interests that can shape future studies on agile leadership and its traits. This study reveals insights on specific client-centric industry.

The contributions of this paper are multifaceted:

Firstly, a comprehensive synthesis of current knowledge on agile leader has been established, offering a valuable reference professionals, academics and decision-makers within banking industry.

Secondly, by revealing several angles on agile leadership, building on systematic literature review and analysis of survey of CTOs while applying EFA, seven factors has been discovered.

This multifaceted analysis emerged trends and identified personality traits of agile leader in practice.

Further studies of 7 factors identified with EFA could significantly enlarge the research body on agile leader. Future research could investigate the interplay between these factors and explore how agile leadership traits evolve across diverse industries. On a business side, integrating these factors into leadership development programs may offer practical pathways for organizations seeking to enhance their agility and striving for agile leadership.

In addition, empirical validation of these factors across different organizational contexts and situational contingencies could enhance the generalizability of the established framework. Understanding the dependencies which specific agile leadership traits are most effective would offer valuable insights for both practitioners and researchers.

In addition, development of quantitative scales to measure these seven factors may enable more rigorous testing and facilitate benchmarking of agile leadership capabilities across industries.

Hence, future studies, building upon the limitations and findings of this study, are poised to delve deeper into studies on agile leader in several industries by exploring real cases. This may lead to further robust and comprehensive research outcomes.

Author is a PhD Scholar at BA School of Business and Finance, Latvia. She is researching in the field of agile leadership and sustainable organizational performance as well as private banking. ORCID ID: https://orcid.org/0000-0001-6012-7749

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