

Barriers to Agile Project Management Implementation: Findings from a Systematic Literature Review

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Abstract

This study aims to discuss the barriers of Agile Project Management, considering the increase of utilization of Agile Methods worldwide specially because it has helped companies get better productivity and reduce their wastes. And, because agility (adaptability to need) has become an advantage for companies into a highly competitive business world. According to Erhun et al. (2021) agility describes a company's ability to respond to short-term changes in market demand or supply quickly and handle external disruptions smoothly. The analysis of the literature has been conducted using the Web of Science and Scopus databases as well as the VOS viewer software for a deeper analysis of 26 articles selected. It is important to remember the Agile manifesto was born and developed oriented to the world of software, seeking to generate tangible value to the customer at the expense of the vast documentation less experimental and due its good results, these methods have also been integrated into other sectors. On the other hand, Agile Methods often face some barriers to its implementation particularly from someone who has been taught on Traditional ways of Project Management. Considering so the advantages of Agile and the existence of barriers to implementing, this paper intend to list the main barriers to the Agile trough a systematic literature review.

Keywords

Agile, Barriers, Project, Productivity, Waste

1. Introduction

Project management experiences volatility and uncertainty potentially never seen in the global context. Customers increasingly aware and demanding, business opportunities appear and disappear quickly, economic instability in various parts of the globalized world affecting the Supply Chain in a forceful way. Added to this is the multidimensional competitiveness that products face competing and with other products from different segments. In this unstable scenario it becomes a survival factor for companies that they develop agility as a mechanism of responsiveness and adaptability to customer needs. According to Erhun et al. (2021), agility describes a company's ability to respond to short-term changes in market demand or supply quickly and handle external disruptions seamlessly. Influenced by this volatility, companies began to adopt more frequently the Agile form of project management.

Agile methods had their origin in the development environment of computer programs after findings of several failures in projects in terms of cost and time. Scholars gathered and described the so-called Agile Manifesto containing twelve principles, listed here after: Our highest priority is to satisfy the customer through early and continuous delivery of valuable software; welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage; deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.; business people and developers must work together daily throughout the project; build projects around motivated individuals; give them the environment and support they need, and trust them to get the job done; the most efficient and effective method of conveying information to and within a development team is face-to-face conversation; working software is the primary measure of progress; agile processes promote sustainable development; the sponsors, developers, and users should be able to maintain a constant pace indefinitely; continuous attention to technical excellence and

good design enhances agility; simplicity--the art of maximizing the amount of work not done--is essential; the best architectures, requirements, and designs emerge from self-organizing teams; at regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly. Additionally, to the twelve principles there are also the four values, also listed here: individuals and interactions over processes and tools; working software over comprehensive documentation; customer collaboration over contract negotiation; responding to change over following a plan (Agile Manifesto 2023).

Adaptability is a primary requirement in the current world competitiveness situation and agile methods bring this characteristic from its origin. However, agile methods are not like a foolproof way of working because they do not provide the big picture, agile is not universally adopted, and incremental deliveries do not translate into immediate deliveries of benefits (Reich and Peppard 2022).

So, the Agile Project Management as a whole faces several challenges to keep itself as a good way of managing specially when into the companies where traditional ways like waterfall have been followed through many years. Even tough Agile has proven its value as a countermeasure to the market volatility and clients' needs and yet indeed it has inevitable many barriers to overcome. Based on this, it has finally arrived at the research question as: *“What are the main barriers for Agile Project Management?”*

1.1 Purpose

This study aims to find the main barriers to Agile Project Management knowing this way of management often faces resistance to its implementation (Srinivas et al. 2022). These barriers were obtained through a systematic literature review onto the databases Web of Science and Scopus and the analyses were performed using the VOS Viewer for bibliometric analyses of keyword density as well as their occurrences.

2. Literature Review

The literature review was conducted in order to obtain the main constructs of the theoretical approach related to the barriers of agile methods, their implementation, and eventual gaps. The research focused on two research bases, the Web of Science and Scopus, following the research protocol illustrated in Figure 1.

The literature review followed the process proposed by (Tranfield et al. 2003), in this process the following steps should be followed: plan, conduct and disseminate. For the dissemination stage (Table 2) it was adopted the concept of the author-concept matrix proposed by (Watson and Webster, 2020).

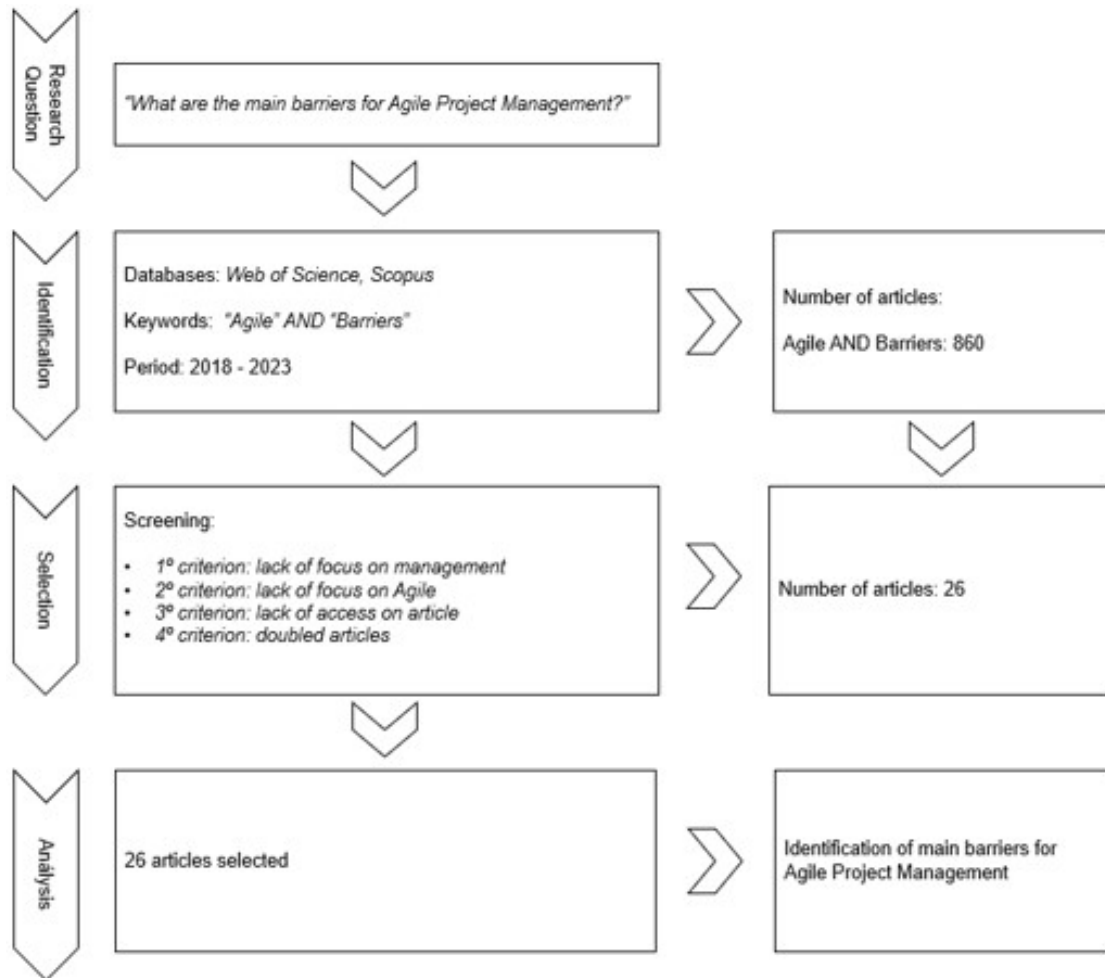


Figure 1: Research protocol

2.1 Planning the review

The planning of the literature review included the establishment of the search criteria for "Agile" AND "Barriers" and for this research the fields "title, abstract and keywords" of the articles were selected in the search. The two databases selected were Web of Science and Scopus to go for research.

2.2 Conducting the review

In the conducting phase, the exclusion criteria shown in Figure 1 were applied. In the first search without temporal limitation and without application of any exclusion criteria, 860 works were found among articles, journals, conference records. Then there was the application of the temporal criterion (2018-2023) and focus on the area of Management, in this way the number of works fell to 120 and after the application of the other exclusion criteria, 26 works with adherence to the research in question were obtained. The Figure 2 shows the density of keywords there it can noticed barriers, human resource management, agile manufacturing system and performance stood out as keywords. And, only (35) keywords with at least two occurrences in the sample of articles were identified as shows Figure 2.

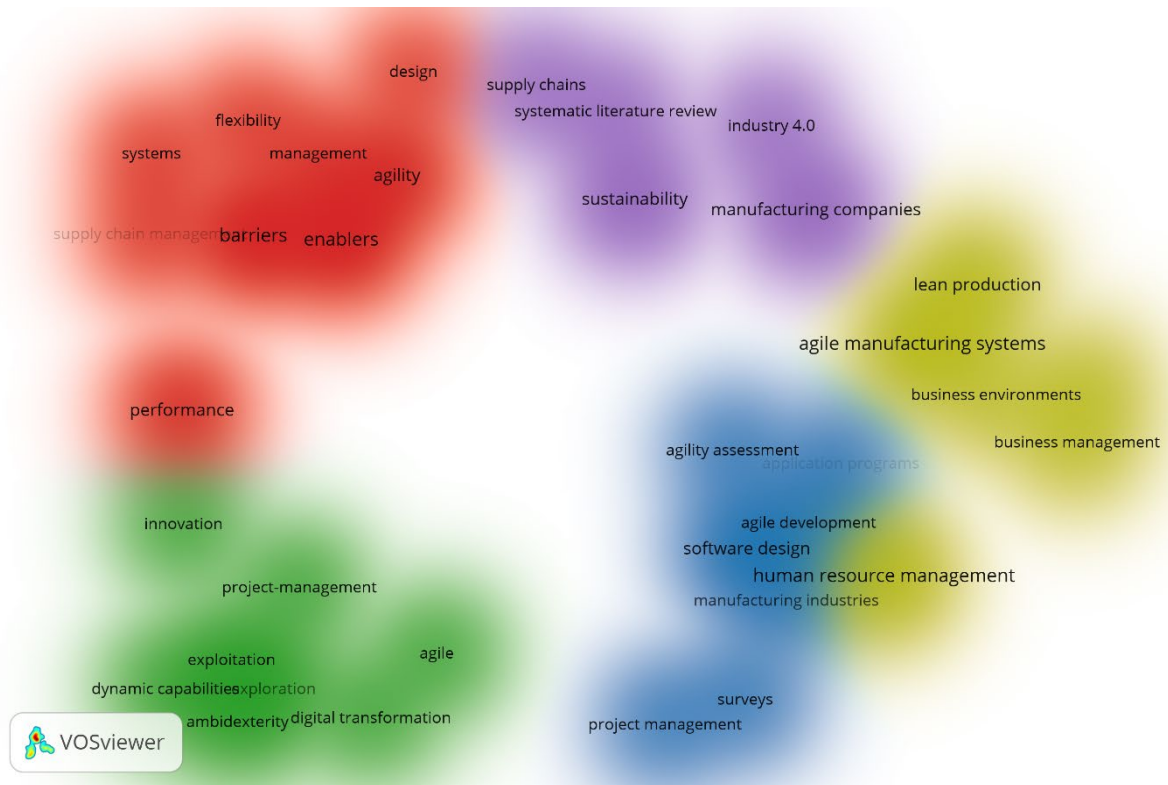


Figure 2: Density of keywords

The Figure 3 shows the relationship between the keywords, and the minimum co-occurrence established was two within the sample of articles analyzed. The keywords agile manufacturing systems, barriers, enablers, performance, human resource management stood out in terms of occurrence. The keyword “systematic literature review” has lower occurrences than the others mentioned before which evidences the need of investigation on this gap of literature correlating the “barriers” and “agile” through a systematic literature review.

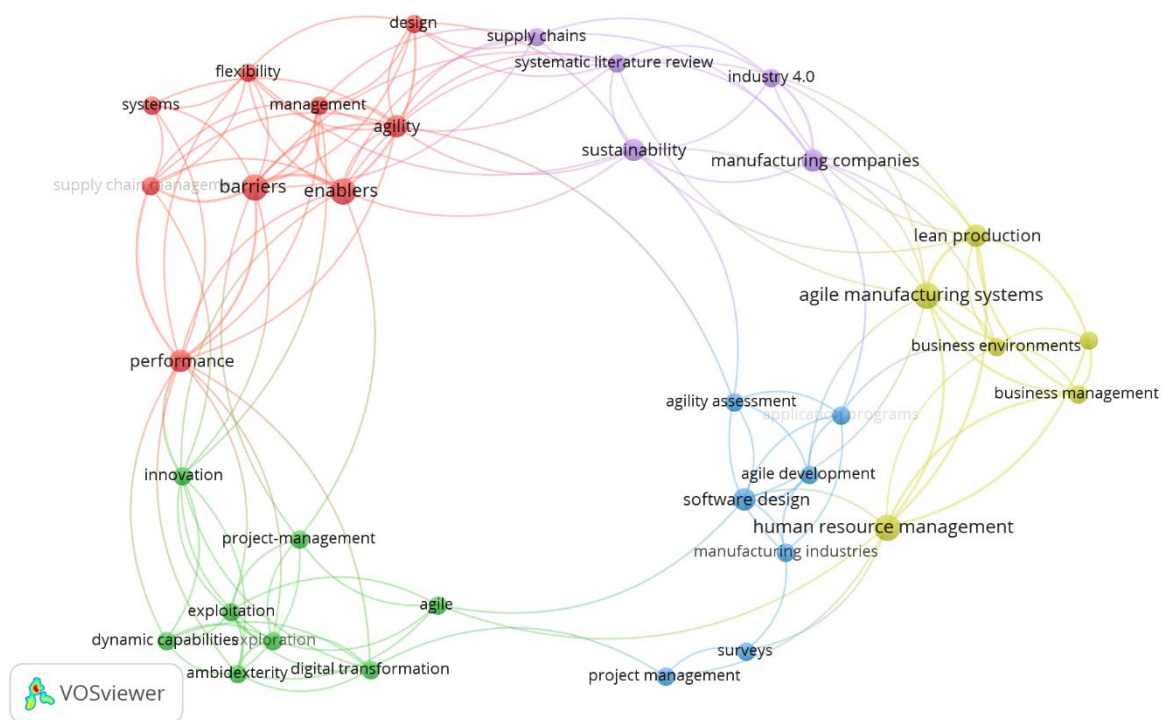


Figure 3: Keywords

Another factor analyzed was the occurrence of the 35 keywords present in the sample of articles analyzed. Being that the keywords agile manufacturing systems, barriers, enablers, human resource management and the keyword barrier is the one that has the highest number of connections with other keywords (Figure 4).

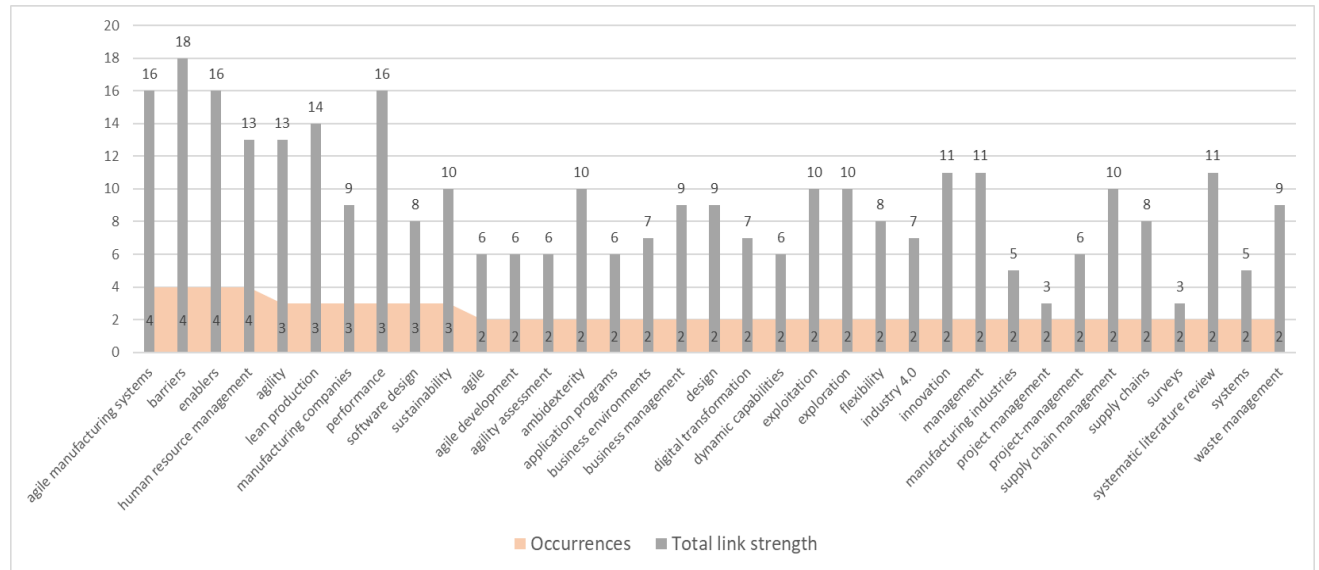


Figure 4: Occurrences and total link strength

Table 1 shows the list of articles selected for the literature review in a total of 26 articles.

Table 1: List of articles selected for literature review.

n°	Authors	Article Title	Database	Source
1	Soares et al. (2022)	Identifying Barriers in the Implementation of Agile Methodologies in Automotive Industry	Web of Science	Sustainability
2	Ozorhon et al. (2022)	Investigating the Agile Hybrid Approach in Construction	Scopus	Journal of Management in Engineering
3	Zakrzewska et al. (2022)	Enterprise agility – its meaning, managerial expectations and barriers to implementation – a survey of three countries	Scopus	Journal of Organizational Change Management
4	Reischl et al. (2022)	Contextual Ambidexterity: Tackling the Exploitation and Exploration Dilemma of Innovation Management in SMEs	Scopus	International Journal of Innovation and Technology Management
5	Ng et al. (2023)	AgiBuild: A Proposed Framework for Agile Building Adaptation Project Management Based on Literature Review	Scopus	International Conference on Construction in the 21st Century
6	Reich and Peppard (2022)	Realizing Value from Digital Transformation: Benefits Management Re-imagined	Scopus	2022 Portland International Conference on Management of Engineering and Technology (PICMET)
7	Palsodkar et al. (2022)	Recent trends in agile new product development: a systematic review and agenda for future research	Scopus	Benchmarking: An International Journal

8	Sambinelli and Borges (2022)	What Software Agile Teams Do To Create Customer Value: A Mixed-Methods Analysis In Brazil	Scopus	International Journal of Computer Information Systems and Industrial Management Applications, 14, pp. 68–91
9	Srinivas et al. (2022)	Sustainable implementation drivers and barriers of lean-agile manufacturing in original equipment manufacturers: a literature review study	Scopus	International Journal of Business Excellence
10	Erhun et al. (2021)	Sustainable Triple-A Supply Chains	Scopus	Production and Operations Management, 30(3), pp. 644–655
11	Kumar et al. (2020)	An empirical investigation and prioritization of barriers toward implementation of agile manufacturing in the manufacturing industry	Scopus	TQM Journal, 33(1), pp. 183–203
12	Bueechl et al. (2021)	Potentials and Barriers of Agility in Small and Medium Sized Enterprises: Insights From Qualitative Research in Germany	Scopus	Business Information Systems
13	Trolle et al. (2021)	Exploring Barriers for Software Development in Agile and Integrated Development of Production Systems	Scopus	2021 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)
14	Durbin and Niederman (2021)	Bringing templates to life: overcoming obstacles to the organizational implementation of Agile methods	Scopus	International Journal of Information Systems and Project Management
15	Shashi et al. (2020)	Agile supply chain management: where did it come from and where will it go in the era of digital transformation?	Scopus	Industrial Marketing Management
16	Rane et al. (2019)	Developing strategies to improve agility in the project procurement management (PPM) process: Perspective of business intelligence (BI)	Scopus	Business Process Management Journal, 26(1), pp. 257–286
17	Holbeche (2019)	Shifts in Organizational Culture When Implementing Agility	Scopus	Journal of Creating Value, 5(2), pp. 124–138
18	Zhukov et al. (2019)	Agile Supply Chain Management in Multinational Corporations: Opportunities and Barriers	Scopus	International Journal of Supply Chain Management, 8(3), pp. 416–425
19	Becerril et al. (2018)	Assessing the Agility of Teams within Mechatronic Product Development	Scopus	IEEE International Conference on Industrial Engineering and Engineering Management, 2019-December, pp. 952–956, 8607700
20	Moe et al. (2019)	Trends and Updated Research Agenda for Autonomous Agile Teams: A Summary of the Second International Workshop at XP2019	Scopus	Lecture Notes in Business Information Processing, 364, pp. 13–19
21	Tiwari and Tiwari (2019)	Measuring agility of indian automotive small & medium sized enterprises (SMEs)	Scopus	Management and Production Engineering Review, 10(1), pp. 58–67

22	Schuh et al. (2018)	Methodology for Determining Agile Product Scopes in Development Projects	Scopus	PICMET 2018 - Portland International Conference on Management of Engineering and Technology: Managing Technological Entrepreneurship: The Engine for Economic Growth, Proceedings, 8481926
23	Narkhede et al. (2020)	Implementation barriers to lean-agile manufacturing systems for original equipment manufacturers: an integrated decision-making approach	Web of Science	The International Journal of Advanced Manufacturing Technology
24	Al-Zabidi et al. (2021)	An Approach to Assess Sustainable Supply Chain Agility for a Manufacturing Organization	Web of Science	Sustainability
25	Agrawal et al. (2019)	Analysis of barriers in implementation of digital transformation of supply chain using interpretive structural modelling approach	Web of Science	Journal of Modelling in Management
26	Sharma et al. (2022)	Investigation of critical barriers for achieving agility in the manufacturing systems – AHP	Web of Science	Materials Today: Proceedings

2.3 Reporting and dissemination

After finishing the analysis of the content analysis of the articles listed in Table 1, the main barriers related to the application of agile project management methods were extracted. And based on the concept author matrix (Watson and Webster, 2020), the Table 2 was made, and it presents the main findings extracted from the literature review.

Table 2: List of Articles and Main findings

n°	Authors	Article Title	Main findings												
			1	2	3	4	5	6	7	8	9	10			
1	Soares et al. (2022)	Identifying Barriers in the Implementation of Agile Methodologies in Automotive Industry		x		x									x
2	Ozorhon et al. (2022)	Investigating the Agile Hybrid Approach in Construction	x										x		
3	Zakrzewska et al. (2022)	Enterprise agility – its meaning, managerial expectations and barriers to implementation – a survey of three countries			x										x
4	Reischl et al. (2022)	Contextual Ambidexterity: Tackling the Exploitation and Exploration Dilemma of Innovation Management in SMEs				x									
5	Ng et al. (2023)	AgiBuild: A Proposed Framework for Agile Building Adaptation Project Management Based on Literature Review		x											x
6	Reich and Peppard (2022)	Realizing Value from Digital Transformation: Benefits Management Re-imagined		x											
7	Palsodkar et al. (2022)	Recent trends in agile new product development: a systematic review and agenda for future research	x	x											x

3. Methods

The method adopted to seek and answer the research question “*What are the main barriers for Agile Project Management*” was a systematic literature review and a framework was also built and followed to help performing this research (Figure 5). It helps us to understand step by step what has been done to get into final result listing the main barriers from Agile Project Management.

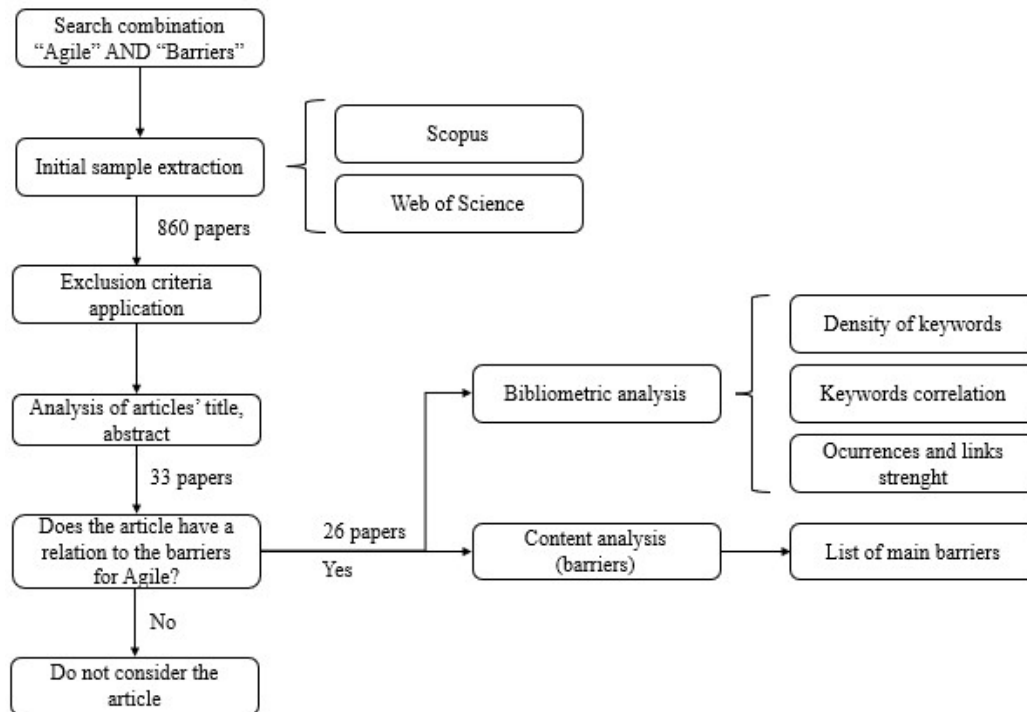


Figure 5: Method for research.

4. Results and Discussion

After the analysis of the articles in Table 2, the following barriers were found in the implementation of agile methods: lack of involvement of senior management; lack of alignment of objectives and overview; perception of the value of the traditional method; lack of time, budget and skills; lack of communication of benefits; lack of resources; waste in the system and in time; difficulty in finding value for the customer; poor information flow. The complete list of main findings can be found into Table 3.

Table 3: Main findings

1 - Lack of top management support and commitment
2 - Lack of alignment and general view
3 - Awareness of value of traditional way of working
4 - Lack of time, budget and competencies
5 - Lack of understanding the benefits
6 - Lack of ressources
7 - Waste in the system and in time
8 - Difficulty to find the value for client
9 - Information flow insuficient
10 - Resistance to change and cultural aspects

Table 3 indicates the main barriers to implementation of Agile Project Management and here it is briefly described each one of them.

Lack of top management support and commitment causes a tough barrier to implement Agile because the employees will naturally resist either without seeing openness from top management. Besides that, this is the top one most often found barrier to the Agile because it requests radical changes in policy, organizational culture and

processes (Ozorhon et al. 2022) (Palsodkar et al. 2022) (Srinivas et al. 2022) (Agrawal et al. 2019). The openness of top management for new ideas coming from employees and being a friend guide to their team members help agility to be implemented (Kumar et al. 2020) (Rane et al. 2019).

Lack of alignment and general view comes from the fact that deliverables that are undefined in the formal process do not get neither attention from top management nor proper resources and then to show the benefits for stakeholders and an overall vision become a hard mission (Trolle et al. 2021) (Becerril et al. 2018) (Reich and Peppard 2022).

Awareness of value of traditional way of working is a barrier related to the resistance to change and a culture which prefers a traditional management philosophy (Zakrzewska et al. 2022). And the adoption of very known tools like PDCA (plan-do-check-act) is still valuable to deal with daily problems (Shashi et al. 2020). It has also been noticed that a hybrid state mixing Agile and Traditional ways can coexist for a while like a customization of Agile (Durbin and Niederman 2021).

Lack of time, budget and competencies. Without having support from top managers is also a consequence to do not have budget either, including for improving competencies. And the daily run to get the things done lead the teams to sensation of lack of time to do anything else particularly, different ways of management (Reischl et al. 2022).

Lack of understanding the benefits becomes a barrier due the difficulty to measure the result after their Agile implementation and show the benefits for stakeholders (Becerril et al. 2018).

Lack of resources. Autonomy is a key requirement for an autonomous team (present into Agile) and when employees are part-time involved it becomes a barrier to that (Moe et al. 2019).

Waste in the system and in time. Whenever decision making processes are not that fast it clashes with Agility and the ability to identify and reduce waste in the system is also requested to have the Agile properly implemented (Tiwari and Tiwari 2019) (Al-Zabidi et al. 2021).

Difficulty to find the value for client. Discovering what is value for the customer it is observed that the customer is not always willing to “collaborate” even it is counterproductive so, to create agility companies must broaden their viewpoint about “what is value for the client” getting more diverse stakeholders’ opinion like activists, regulators, and employees (Sambinelli and Borges 2022) (Erhun et al. 2021).

Information flow insufficient. Agile and information flow are closely connected but sometimes the fear of losing confidential information poses an obstacle to Agile (Agrawal et al. 2019). It does add to it the shortage of information on concerned markets that may happen as well (Sharma et al. 2022).

Resistance to change and cultural aspects. The resistance to change is inherent in human beings sometimes caused by the fear whether of getting out their comfort zone or losing their jobs. Additionally, the *status quo* present into several companies often create a barrier to be overcome by new ways of management. Cultural aspects have been built over the years by older employees established as “the only good way” to get the jobs done so it also becomes a barrier.

The Figure 6 shows how often each barrier for Agile implementation occurred according to the systematic literature review made in the 26 articles. The top one is the lack of alignment and general view because without having a whole view about how good or bad project are going, Project Managers have difficult to stand for whether their ideas or methods of management. Companies are usually driven by their foreseen results and profits, having almost nothing view for future it becomes tough mission to keep stakeholders’ commitment. The resistance to change and cultural aspects takes the second place with 17% of occurrences knowing human beings are sometimes afraid to changes, thinking they are just not able to deal with the new methods correctly or just keeping themselves into the comfort zone is safer than trying new things. Cultural aspects show how cling to safety the old employees or even new employees are to the old way of management, this causes difficulties implementing Agile specially because of old ways have been followed over the course of often many years. It can curious the fact that lack of resources takes just the last place on the other hand it can also be connected to the one of the values of Agile that is “individuals and interactions over processes and tools”. It can ultimately lead us to conclude that if people are in, things tend to happen even tough the availability of resources is not that high.

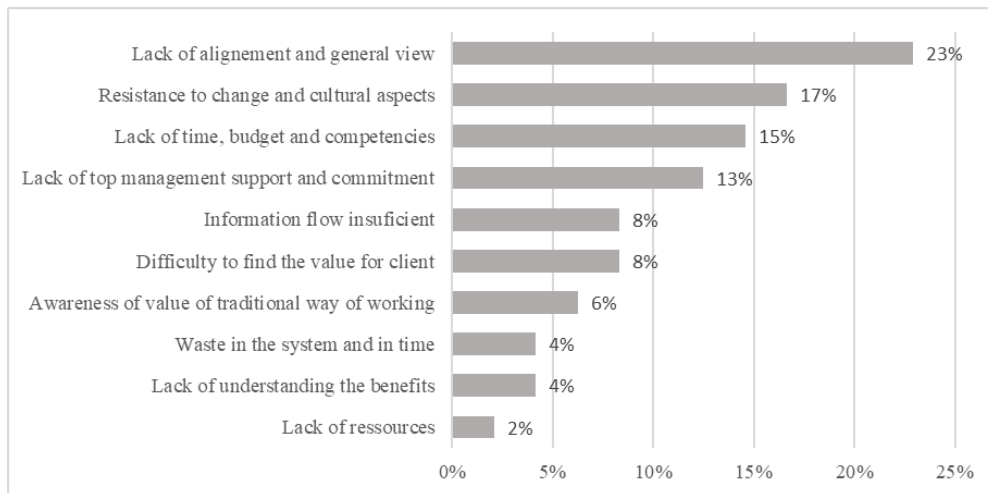


Figure 6: Occurrences of barriers

Looking more closely at the four more often barriers found, those that sum up result to 67% of total, the Figure 7 shows which authors mentioned those barriers.

Authors	23%	17%	15%	13%
(Agrawal et al. 2019)	x		x	x
(Soares et al. 2022)	x	x	x	
(Palsodkar et al. 2022)	x	x		x
(Srinivas et al. 2022)	x	x		x
(Rane et al. 2019)			x	x
(Narkhede et al. 2020)		x		
(Ozorhon et al. 2022)				x
(Zakrzewska et al. 2022)		x		
(Ng et al. 2023)	x	x		
(Sambinelli and Borges 2022)	x			
(Erhun et al. 2021)	x			
(Kumar et al. 2020)		x		x
(Becerril et al. 2018)	x			
(Tiwari and Tiwari 2019)		x		
(Sharma et al. 2022)			x	
(Reischl et al. 2022)			x	
(Reich and Peppard 2022)	x			
(Bueechl et al. 2021)			x	
(Trolle et al. 2021)	x			
(Zhukov et al. 2019)	x			
(Schuh et al. 2018)			x	

Figure 7: Authors for the four main barriers

5. Conclusion

The systematic literature review returned 26 articles selected for further analysis and these ones exposed the barriers to adequate implementation of agile methods. Although Agile Project Management has been increasingly adopted to get better results for the companies it often faces barriers to its implementation and development particularly for people who do not know exactly how it works. The lack of top management support and commitment is one of the top barriers that Agile implementation faces sometimes because the Top management are stuck in the old ways of management. Having no support from highly hierarchical levels of the company it becomes even tough to get the investments on competencies to use and perform Agile properly. Finally, it is important to investigate ways to overcome those main barriers cited in this article, which in turn it is a suggestion for future research into the field.

5.1 Practical implications

The practical implications are that the main barriers exposed in this article can help other researchers have a compilation view about “what are the main barriers to Agile Project Management”. Additionally, Agile Teams can serve themselves of this study preventing them about which barriers they will face during the Agile implementation.

5.2 Theoretical implications

The implications to the theoretical aspect are important knowing no systematic literature review has been found through the research done into the databases selected. Besides that, regarding the theoretical implications, this article brings a novel contribution, showing the main barriers to Agile Project Management implementation for Management area.

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Biographies

Edson Oliveira Martins is a Mechanical Engineer at Federal Technological University of Paraná (UTFPR), and he has performed an MBA – Project Management at Federal University of Paraná (UFPR). He works currently at a multinational OEM from Automotive sector at his hometown Curitiba, there he is in charge of management Power Train projects, it includes Engines and Gearboxes locally produced and also overseas as well. His past function at the same company was Project Management for Engines where he helped the company got disruptive results in terms of Quality, Cost reduction and Punctuality of the projects. At that time, he studied internally how Agile works and applied into the Company with almost no investment and fortunately the results arrived, and it helps to the Company look at the Agile differently and applies onto others sectors too. He is a master's degree student at UFPR studying the contribution of Lean Office over Project Management.

Guilherme Francisco Frederico is a Professor of Operations, Supply Chain and Project Management at Federal University of Paraná – UFPR – School of Management, Curitiba, Brazil. He works by teaching and leading researches in the graduate programs (PhD and MSc in Information Management and Master in Business Administration) and undergraduate programs (Business Management) at UFPR. Also, Prof. Frederico has been working in collaboration with the Centre for Supply Chain Improvement at University of Derby – UK as a Visiting

Professor and affiliated Researcher. His research interests and expertise on Supply Chain Management field are related to Maturity and Performance Measurement, Project Management, Knowledge Management, Strategic Sourcing and Impacts from Industry 4.0 and Industry 5.0. He has published his research outcomes in international journals such as Supply Chain Management an International Journal, Journal of Cleaner Production, Business Process Management Journal, International Journal of Productivity and Performance Management, Operations Management Research Journal, Benchmarking an International Journal, International Journal of Logistics Management and Knowledge and Process Management Journal. Prof. Frederico is an Area Editor of Operations Management Research - OMR – Springer Journal and member of the Editorial Board of the Computers & Industrial Engineering Journal – Elsevier, Sustainable Manufacturing and Service Economics – Elsevier and International Journal of Industrial Engineering and Operations Management - Emerald. He has also been leading some special issues on reputed and highly ranked journals as managing guest editor as well as serving as an expert reviewer. Prof. Frederico has also been contributed to some reputable supply chain magazines (e.g., Supply Chain Management Review, Logistics Management, Celerity Logistics, Performance Magazine) publishing articles with relevant practical insights. Also, he has been invited as international guest speaker in universities of different countries such as UK, Sweden, India and UAE. Previously the academic career he worked in strategic positions for more than 10 years on SCM field in Global and Large Companies (e.g., Bunge, Deere & Company) involving different segments of Industry including manufacturing and logistics services operations.