SILESIAN UNIVERSITY OF TECHNOLOGY PUBLISHING HOUSE

SCIENTIFIC PAPERS OF SILESIAN UNIVERSITY OF TECHNOLOGY 2025
ORGANIZATION AND MANAGEMENT SERIES NO. 215

SUCCESS CRITERIA AND FACTORS OF AGILE-MANAGED IT PROJECTS

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Purpose: This study examines Agile practices as factors in the success of Agile-managed IT projects. These factors contribute to project success based on sector-specific success criteria. The result of the article is developed and validated through an empirical research model that connects Agile practices with these criteria.
Design/methodology/approach: A qualitative approach was used - in-depth interviews with Agile practitioners engaged in IT projects. Respondents assessed the relationships between Agile success factors (practices, tools, and artifacts) and the criteria that define project success. To ensure practical relevance, experts reviewed the model to verify its applicability and utility.
Findings: The study identified several Agile practices as significant contributors to IT project success, particularly in planning, product backlog management, and consistent software delivery. However, daily meetings were found to contribute only marginally to some success criteria. The model suggests that certain Agile practices may be less aligned with traditional success criteria, such as meeting budget and time constraints.
Research limitations/implications: The study's qualitative design may limit its generalizability, potentially missing variation in Agile practices across different types of projects. Future research could adopt, in addition, a quantitative approach, allowing for more specific insights across varied project types. Additionally, further study could focus on the role of success criteria in relation to overall project outcomes.
Practical implications: The findings offer guidance for managers to emphasize specific practices that improve resource planning and execution based on their team's success criteria. Agile teams can use the model to assess the value of their practices in meeting project goals, allowing for a more targeted approach to optimizing Agile processes.
Originality/value: This study presents an extensive model that links a wide range of Agile practices directly to project success criteria, providing a practical framework for Agile teams to evaluate and refine their work. The research is valuable for project managers, Agile teams, and organizations looking to enhance their Agile strategies for better project results.
Keywords: Agile success factors, IT project success criteria, IT project success.
Category of the paper: Research paper.

1. Introduction

Project management is a crucial aspect of modern, growing organizations, providing structured approaches to planning, implementing, and controlling activities aimed at achieving project success. Traditional project management methods follow a sequential process, beginning with the identification of requirements, followed by detailed planning, and continuous progress monitoring (Project Management Institute, 2008). While these methods are effective in stable environments, they struggle to address the challenges of today's rapidly changing business landscape, where customer needs and technological innovations evolve at unprecedented speeds.

To respond to these challenges, the Agile Manifesto was introduced at the beginning of the 21st century, forming the foundation for various Agile project management methodologies. Frameworks such as Scrum, Kanban, and Extreme Programming are grounded in Agile principles, emphasizing iterative and incremental approaches to project execution (Hohl et al., 2018). These methodologies aim to enhance project outcomes by fostering adaptability, increasing responsiveness to change, and improving alignment with customer and market needs. Practices derived from these approaches can be collectively referred to as "project success factors", as they are specific elements, conditions, and variables that, when effectively implemented, improve the likelihood of project success (Ika, 2009).

The challenge in the current business landscape lies in understanding project success from multiple perspectives and these diverse factors that influence it. In 2008, the last time there was extensive research on the relationship between Agile success factors and IT project success (Chow, Cao, 2008). In this work, the authors adopted the success factors that were important at that time, and the criteria were general statements based on the management triangle. Over the last 20 years, this importance of factors has changed, because the approach itself has been gradually adapting to market requirements. The same goes for the success criteria. Success is now multi-dimensional. Studies such as this done by Kerzner (Kerzner, 2017) emphasize that project success is defined across various perspectives, including budget, schedule, quality, and stakeholder satisfaction, many at the same time. The research initiated by Chow and Cao was continued. However, they did not evaluate the current state of the criteria or factors themselves but rather selected parts of them and tried to deepen them (Stankovic et al., 2018). However, there is no actual research in the available literature on the relationship between Agile success factors and the set of currently used success criteria. Specifically, there is no comprehensive model that maps a wide range of Agile practices to an extended set of project success criteria, divided into clear categories. This lack of a detailed framework limits the ability of managers to align practices with specific outcomes effectively.

This paper aims to address this gap by linking selected Agile success factors with project success criteria specific to the IT industry. The article seeks to bridge this gap through a structured, three-phase research process. The first phase involved an extensive literature review to identify key Agile practices and success criteria. This review resulted in a focus on 18 Agile success factors and 10 project success criteria - those most frequently mentioned in prior studies over the years. The term "Agile success factors" is used interchangeably with "Agile practices" throughout this work and includes practices, activities, and artifacts derived from Agile methodologies. By concentrating on widely recognized factors, the research ensures a balance between depth and breadth, avoiding the narrower focus of some previous studies that limit practical insights. The second of part of the research consisted of qualitative interviews with Agile practitioners, who evaluated the relationships between the identified success factors and criteria. These insights were synthesized into a detailed mapping that illustrates how Agile practices influence different success metrics (Fig. 1). Finally, the third phase involved validation through expert interviews. Experienced professionals assessed the proposed model, confirming its relevance to real-world project management and suggesting refinements to improve its practical applicability.

The findings reveal that Agile practices are more effective in supporting certain success criteria, such as team satisfaction and functional quality than others, like meeting budget and schedule compliance. This nuanced understanding addresses the identified research gap and provides a practical model for Agile teams and project managers. By offering a detailed framework that links Agile practices to specific project success criteria, this study contributes both to academic knowledge and to practical advancements in IT project management.

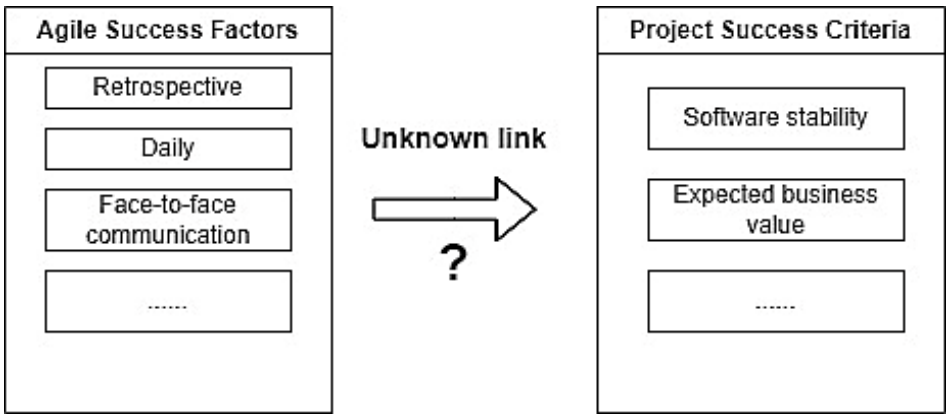

Figure 1. Model concept.

Source: Own elaboration.

2. Method

This paper's research was conducted in three stages. The first stage involved identifying Agile practices, and project success criteria by literature review. Then, part two, examines the links between these groups with Agile practitioners – resulting in creating a model. The third stage centered on an initial validation of the model by IT industry experts. This research structure and methodology were chosen to provide a well-rounded view of how Agile practices influence the success of IT projects (Fig. 2).

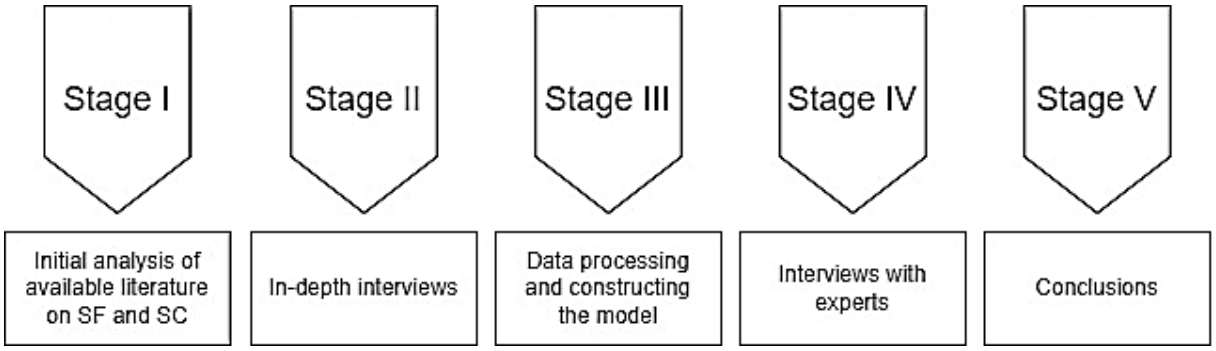

Figure 2. Research general plan.

Source: Own elaboration.

2.1. Systematic literature review – stage I

In this case, the literature review concentrates on providing a general overview of success factors within Agile work methodology and success criteria specific to Information Technology (IT) projects. The goal is to gather sources that discuss these two areas, critically evaluating their relevance to addressing the research question, which is formulated as follows: "How, do specific activities, artifacts, and practices from the Agile work methodology (success factors) impact IT projects' specific success criteria?"

The sources for this review were drawn from two major global databases, Web of Science and Scopus. The author organized the review in two rounds, each dedicated to one of these aspects. This approach resulted in two distinct literature pools - one for success factors and one for success criteria. To ensure a comprehensive literature review, the author applied an advanced search strategy, specifying multiple search criteria to accurately target relevant sources. Each search round and the associated search prompts are outlined below.

- **Agile success factors** => (((ALL=(agile)) AND ALL=(success factor*)) AND ALL=(IT) AND ALL=(project*))
- **IT project success criteria (Non-Agile)** => ((ALL=(success criteria*)) AND ALL=(project*) AND ALL=(IT))

The initial literature collection comprised nearly 400 items. At this stage, the author established inclusion and exclusion criteria to refine the set, focusing on items that directly relate to the research question. These criteria were categorized as "general" and "specific" to the two research areas. The author followed the PRISMA guidelines (Mazur et al., 2018) to ensure a structured approach, as illustrated in Fig. 3. Additionally, a "backward analysis" was conducted, which involved examining the bibliographies of accessible publications to identify foundational sources referenced by other authors (Jalali, Wohlin, 2012). This process led to the identification of four additional sources addressing success factors and success criteria in IT projects. The literature review resulted in tables summarizing the most commonly cited Agile team practices, along with the criteria frequently used to assess the projects' success they execute.

- **General criteria**

Admission criteria – all had to be met (failure to meet one eliminates from further analysis)

a) The research published after 2000 (the Agile methodology was initiated the year after).
b) The research published in English.
c) Fully available research (full text).
d) The research focused on IT projects or teams.

- **Criteria for each research topic**

Acceptance criteria – Agile success factors - meeting at least two qualifies for analysis

a) The research concerns success factors of IT projects or teams.
b) The research focuses on best practices of Agile teams in IT.
c) The research concerns Agile team performance.
d) The research concerns conditions in IT projects that affect teams operating in Agile.

- **Rejection criteria – Agile success factors –** meeting any of them eliminates from analysis
  a) The research does not concern the Agile work methodology in any way.
  b) The research focuses only on Agile trends.
  c) The research concerns the implementation or scaling of Agile in companies and teams.
  d) The research concerns Agile-hybrid methodologies.
- **Acceptance criteria – success criteria in IT projects**
  a) The research concerns the success criteria of IT projects.
- **Rejection criteria – success criteria in IT projects**
  a) The research concerns the impact of various company management methods and the functioning of stakeholders on the success criteria.
  b) The research focuses on Customer Success Managers.

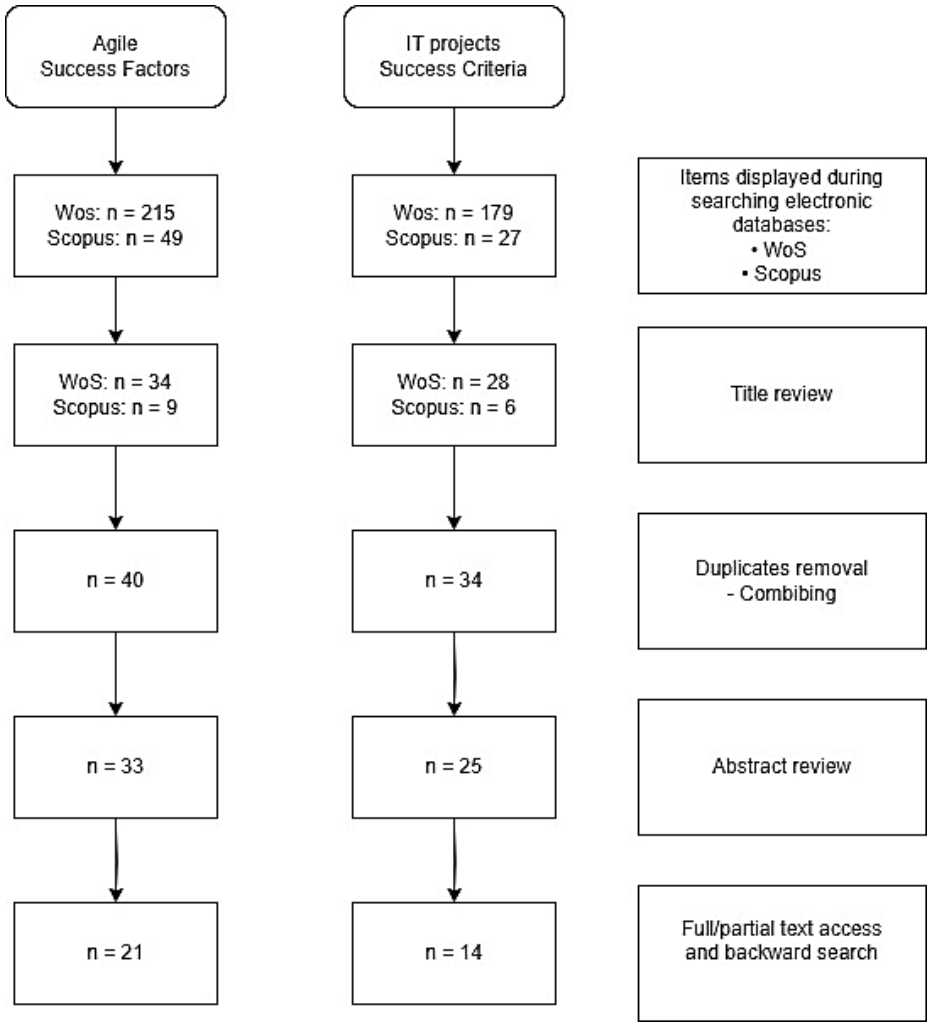

Figure 3. PRISMA standard used in literature review.

Source: Own elaboration.

The preparation process for both factors and criteria involved creating a frequency table (Table 3, Table 4 - Appendix) showing how often each Agile success factor and criterion was cited in the literature. To ensure relevance, the author implemented a multi-step selection process for Agile success factors and project success criteria:

1) **Literature Frequency**: Only factors referenced at least five times in the literature were included, as this frequency indicated their potential importance. Criteria with at least six mentions were selected.
2) **Agile-Specific Relevance**: Factors directly linked to Agile methodologies were prioritized over general business factors. For instance, while "high skills of the project team" is a widely recognized success factor, it is not exclusive to Agile. In contrast, "the team has all competencies to implement the project," which aligns with Scrum's concept of a multifunctional team, was deemed more Agile-specific.
3) **Reformulation for Precision**: Selected factors were refined to better reflect specific Agile practices or artifacts. Where appropriate, broader factors were broken down into more detailed components to facilitate a focused analysis of critical success factors in Agile IT projects. Criteria were refined similarly.

2.2. Empirical research – stage II

As outlined in section 2.1, the author's research focuses on the success of Agile projects. The initial phase of the empirical research aims to gather the data necessary to develop a model illustrating the relationships between success factors and criteria (Stage III). The primary objective of this empirical research can be stated as follows: "Investigating what impact the practices and tools used by Agile teams selected by the author have on the success criteria of the IT projects they implement. Do they help or hinder their fulfillment?"

Later it will be shown that 18 factors and 10 criteria were selected from the literature (Section 3.1), each to be rated by its degree of influence. The author proposed a scale ranging from -1 to 1, step 1/2. Value "-1" indicates that the success factor hinders meeting the success criterion (if the criterion is adopted for project evaluation), "0" signifies no impact or a balanced effect of positive and negative influences, and "1" reflects a clear positive impact, where the success factor supports meeting the criterion.

2.2.1. Methodology

Initially, quantitative approaches - particularly surveys - were considered for their efficiency and scalability in data collection (Babbie, 1990; Fowler, 2009). However, given the task of evaluating 180 (18 potential success factors and 10 success criteria) specific relationships between Agile success factors and criteria, there was a high risk of respondent fatigue. Such fatigue could lead to superficial responses or survey abandonment (Bryman, 2016), thereby compromising the reliability of the data - a risk that would undermine the objective of producing meaningful insights. In contrast, qualitative research offers a way to gather context-rich, nuanced insights directly from participants' experiences, aligning well with the objectives of this study. Agile project outcomes are often highly contextual, and shaped by factors such as team dynamics, organizational culture, and individual expertise. Qualitative methods are ideal for exploring these dimensions, as they allow participants to articulate how and why specific practices impact project success, beyond merely indicating agreement or frequency on predefined scales (Creswell, 2007; Marshall, 2006). Ultimately, qualitative interviews emerged as the optimal approach, enabling the collection of complex, context-specific insights necessary to understand Agile project success. This approach's flexibility, coupled with its capacity to capture in-depth participant experiences, makes it particularly suited to this study's goals.

The interview format was also carefully chosen. Semi-structured individual interviews were selected over group formats. Given that perceptions of practice impact can vary widely within Agile teams, group settings could lead to response conformity or dominant voices influencing the discussion, potentially skewing results (Butt et al., 2023). Semi-structured interviews, combining open-ended and focused questions, offer a balance of flexibility and consistency. This format allowed for an in-depth examination of specific factor-criteria relationships and captured individual perspectives, while also providing structure on critical areas, such as assigning weights to practices and exploring role-specific project contexts (Rubin, 2011).

2.2.2. Tools

The study was conducted from February to March 2024, with interviews held both in person and online. Microsoft Excel played a critical role during the interviews, particularly in managing the intensive weighting task. Excel's functionality, including drop-down lists for selecting weights, automated calculations, and real-time summaries, significantly accelerated the process. Additionally, any comments related to respondents' assigned weights were immediately recorded as in-document notes. Figure 4 shows a sample sheet from the study, illustrating the process: weights were selected from a list, and comments were added as annotations (indicated by purple markers in the cells).

To ensure that interviews were efficient, consistent, and substantive, a structured script was developed. The script was organized into three parts. The first part covered introductory questions on participants' current employment, Agile experience, and professional profiles. The second section, the focal point of the interview, addressed success factors and criteria, focusing on assigning weights to each factor in relation to the criteria. This section was designed to occupy over 90% of the interview duration.

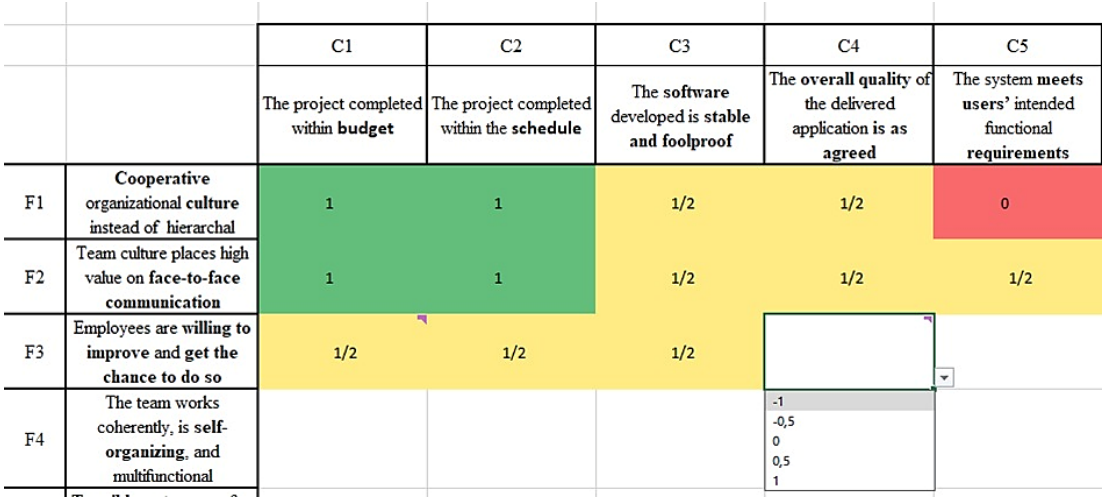

Figure 4. Assigning weights during the interview.

Source: Own elaboration.

2.3. Empirical research – stage IV

The first phase of the research focused on identifying connections between success criteria and success factors. In this chapter, the next research phase is described. This part was conducted to verify the alignment of these connections with the proposed model and to perform a preliminary validation of the findings.

2.3.1. Research aim and method

The model created with data from the first phase of empirical research was analyzed and evaluated by selected experts from the IT industry. This initial expert assessment provided a foundational verification for further model development and potential practical applications. The purpose of the expert validation was to examine how well the model's results aligned with

real-world business conditions. Three IT professionals with extensive Agile experience were chosen based on the following criteria:

1) **Professional Experience:** Each expert had a minimum of seven years in the IT industry, with at least five years specifically in Agile project work.
2) **Diversity of Roles:** Experts had experience across multiple roles, such as Developer, Scrum Master, Technical Leader, or similar.
3) **Reputation and Achievements:** Experts were recognized authorities in the field, with successful track records in implementing IT projects.

During individual meetings, the model and empirical findings were presented to the experts. Building on a prior review of research methods (Section 2.2.1), the author chose to conduct semi-structured interviews that combined open discussions with feedback on specific model elements. The discussions covered several key areas:

1) **Model Usability:** Experts assessed the technical structure, alignment of success factors with criteria, practical applications, and potential benefits of the model for Agile teams.
2) **Validity of Results:** Experts evaluated whether the model results reflected their experiences with Agile project teams and matched real-world development conditions.
3) **Improvement Suggestions:** Experts provided recommendations for refining the model to increase its practical utility and accuracy.

3. Results

The results of the conducted research are divided into 3 parts. The first part describes the results of the literature review, i.e. the list of success factors (Table 1) and success criteria (Table 2). The second part collects the results of empirical research with members of Agile teams, presented in the form of a table - called a model (Figure 5). The third and last part describes the results of interviews with experts on the proposed model (Section 3.3).

3.1. Literature review results – stage I

3.1.1. Success Factors

The final table of Agile success factors is provided below, representing the most impactful factors identified in the context of Agile methodologies and IT project success.

Table 1.
Final success factors table

ID	Success factors	
	Factor name	**The original name of the factor from the literature review – if it was changed**
F1	Cooperative organizational culture instead of hierarchal	-
F2	Team culture places high value on face-to-face communication.	-
F3	Employees are willing to improve and get the chance to do so.	-
F4	The team works coherently, is self-organizing, and multifunctional.	-
F5	Tangible outcomes after each iteration	-
F6	Culture of open feedback	-
F7	Usage of the "User Stories" tool	Following an Agile-oriented requirement management process
F8	Sprint plannings and creating sprints' backlogs	Following an Agile-oriented requirement management process
F9	Scrum master as a team facilitator	Following an Agile-oriented project management process, facilitated by Scrum Master
F10	Retrospectives	Following an Agile-oriented project management process, facilitated by Scrum Master
F11	Sprint Reviews and backlog refinements	Following an Agile-oriented project management process, facilitated by Scrum Master
F12	Strong communication focus with daily meetings	-
F13	Strong customer commitment and presence	-
F14	The right amount of documentation	-
F15	Regular delivery of software	-
F16	Delivering the most important features first	-
F17	Project nature being non-life-critical	-
F18	Small project team – up to 10 members	Projects with a small team

Data was gathered by author during literature review, the original table with the frequency of each factor can be found in the Appendix.

Source: Own elaboration.

3.1.2. Non-Agile, IT project success criteria

Table 2.
Final success criteria table

Item	Success criteria	
	Criterion name	**The original name of the criterion from the literature review – if it was changed**
C1	The project completed within budget	-
C2	The project completed within the schedule	-
C3	The software developed is stable and foolproof	The software developed is reliable
C4	The overall quality of the delivered application is as agreed	The overall quality of the delivered application is high (or, as agreed on)
C5	The system meets users' intended functional requirements	-
C6	Important initial requirements have been met	The project scope was met (gathered requirements)
C7	Product is profitable or brings the promised business value	Product brings benefits to the client (profitable) AND Project has added the promised business value

Cont. table 2.

C8	Users are satisfied with the system delivered	Users were satisfied with the system delivered (users' requirements)
C9	The project team is satisfied	-
C10	Customer is satisfied	Customer satisfaction

Data was gathered by author during literature review, the original table with frequency of each criterion can be found in Appendix.

Source: Own elaboration.

The criteria encompass four general areas of project success. The first three criteria cover the project management "iron triangle": time, budget, and scope/quality (Pollack et al., 2018). The fourth area addresses stakeholder satisfaction. Within this structure, budget and schedule are represented as single criteria. However, the scope/quality dimension is subdivided into multiple criteria (C3 to C7), reflecting Agile methodologies' emphasis on work scope and delivery, including quality, stability, and business value. The last three criteria relate to satisfaction - addressing team, client, and user feedback, with "satisfaction" focusing on both process feedback and the final project outcome.

3.1.3. Summary of literature review

The literature review shows that the author has thoroughly surveyed existing studies on success criteria and factors impacting Agile IT project success (as can be seen on the original list of all gathered factors and criteria in Appendix). This extensive review has provided a robust foundation, ensuring that the theoretical basis is solid for the subsequent research steps. The research question guiding this chapter was as follows: "How do specific activities, artifacts, and practices from the Agile work methodology (success factors) impact the final success of IT projects as defined by project success criteria?"

The literature review was divided into two segments to explore these elements. The first segment identified specific Agile activities, artifacts, and practices critical to IT project success, presented in Table 1. The second segment defined the general success criteria for IT projects, resulting in a set of criteria used to evaluate the impact of Agile practices on project success (see Table 2).

3.2. Empirical research results – stage II and III – creating the model

3.2.1. Model creation

Figure 5 presents a table linking success factors with success criteria. This table, developed from the literature, enabled participants to assign weights to the connections between factors and criteria, indicating whether a factor supports or hinders a particular criterion. Success factors are listed on the left side, while criteria are shown at the top. Each cell in the matrix holds a weight that represents the effect of a specific factor on one criterion. The "Rows' average" column on the right summarizes each factor's overall impact by averaging all the weights assigned across the criteria, while the "Columns' average" row at the bottom shows the average effectiveness of each criterion in the context of the model's practices. Although simplified, this method provides insight by assuming the use of either all practices or all criteria, offering general observations.

In presenting the results, the following terminology will be used: "weights" refer to individual numbers within each cell of the table, while "averages" denote the column and row averages described above. The color-coded scale in the table indicates the degree of support or hindrance each factor provides to each criterion:

- **Strong green**: The factor strongly supports the criterion.
- **Lighter green**: The factor supports the criterion to a moderate extent.
- **Yellow**: The factor does not support the criterion.
- **Orange**: The factor moderately interferes with the criterion.
- **Strong red**: The factor significantly interferes with the criterion.

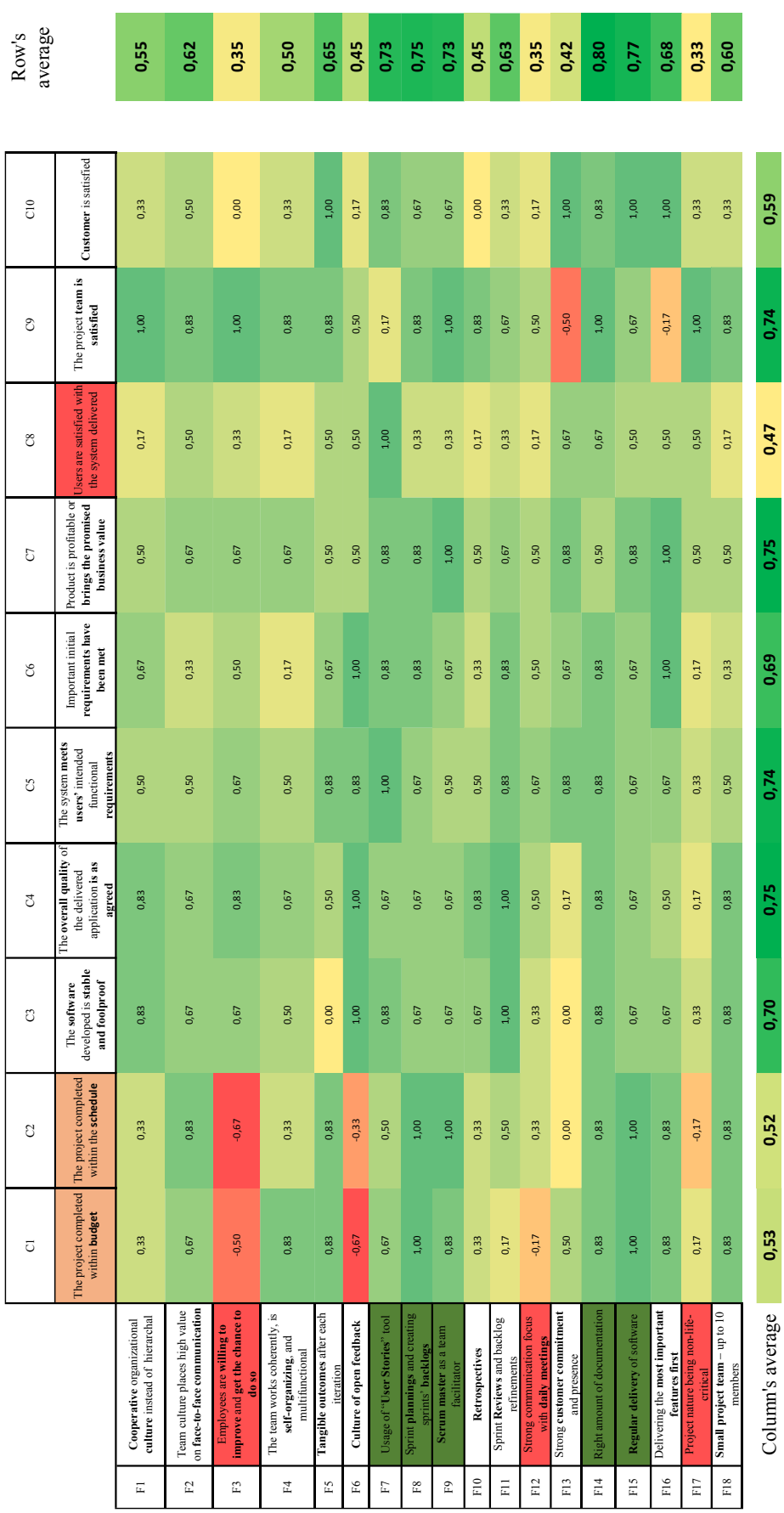

Figure 5. Connection between success factors and criteria.

Source: Own elaboration.

3.2.2. Description of interviewed people

A total of fifteen people took part in the model construction by selecting weights. The author tried to select respondents, so that their professional experience, knowledge of Agile management methodologies, and understanding of the IT industry were distributed as evenly as possible. Therefore, the respondents represent both large and small organizations, their knowledge of Agile comes from practice, and some acquired it from university studies. The paragraphs below present all information about the respondents that may be important from the point of view of determining the research context. They are as follows:

a) **Company size and operational scope** - The respondents both found their place in large companies with very extensive scope of activities and smaller ones. Bigger ones are divided into numerous branches, and are highly hierarchical. The others can be so-called "Local companies". This includes Polish companies (up to one hundred employees). This include software houses, companies developing after being established as startups, and providers of small IT services.
b) **IT area** - A significant group of the respondents (11) were people who are in IT departments/teams, but their company operates in a completely different industry. For example, one of the respondents works in the IT department serving Central Europe of a large consulting company.
c) **Orientation of activities** - The company's activities are focused primarily on the outside or inside of the organization. Internal activities are understood as the development of a new application to improve the functioning of the company (e.g. reserving seats at desks), working in the area of the Service Desk, or coordinating the internal work of teams in the company. In this case, 10 people were working in this area. Outside orientation mainly involves working with the client - providing services and products. These will include applications, but also the maintenance of servers and stakeholder websites – 5 people.
d) **Professional position** - Nine people are programmers - in a narrower or broader sense. The role of Project Manager also appears among the respondents. In the organizations where they work, the Agile approach is not the leading form of work. There is a clearly defined framework of the waterfall approach, large projects are carried out classically, and only at a very low level (team level) elements of agility are used. Therefore, it is not strange that the teams can include both a Manager and a Scrum Master.
e) **Experience working in Agile** - Due to the young age of the respondents (between 24 and 32), their work experience is also relatively short. Therefore, it was worth looking at the issue of experience in Agile methodologies. If someone worked in such a specific model for less than, for example, a year, there is a big chance that they would not have had the opportunity to get to know it so well in practice. Fortunately, there were no such people among the respondents. Three years of experience they have prevailed. In the author's opinion, this is sufficient to be able to reliably determine how success factors selected from agility may affect the implemented project.

f) **Experience with Agile before working** - An additional question in the context of experience was about knowledge of Agile before starting professional work in the current position. Almost half of the respondents said that at least one subject related to this type of management had appeared during their studies. The author finds it valuable, that even though most people studied technical fields, they had the opportunity to become familiar with this way of working, at least briefly. The respondents also said that in the company itself, there was little talk about why and what Agile work methodology looked like (even though they declare themselves as organizations that work in this way). Only a few respondents mentioned that the company provided them with short training exclusively in this area. Interestingly, there was no rule here regarding, for example, the organization's size and whether they provided training in this area. At this point, it seems quite random.

g) **Completed field of study -** Technical fields dominated among the respondents. Eight of them studied computer science directly. Five people graduated from a relatively new field of study in Poland - Systems Engineering. It is more focused on optimization and management than just programming. People with this degree are often called "requirements engineers". The author decided to consciously select such a large subset of people with such a professional profile because they form a bridge between IT practitioners and those dealing with management. They have a broader point of view on many project and organizational issues.

h) **Agile focused on product or helping team organization -** The last thing the respondents were asked about (apart from assigning weights to the success factors and success criteria connections) was their assessment of the orientation of the Agile practices used in their teams. The Agile work methodology was designed to deliver products first and foremost. All activities, artifacts, and practices that the team is to undertake are aimed at delivering it (3 respondents). Indirectly, they can influence the team to become more organized. However, this is not an aim itself - according to the definition (Srivastava, et al., 2017). Teams sometimes focus only on implementing Agile practices, without a clear product focus (12 respondents). They then simply focus on trying to organize the team and hope that it will help them deliver the product. However, practice shows that this is not the optimal path. (Dzierżek, 2021).

Summarizing the whole collected data about the respondents indicates two things. irstly, it is the diversity of the group. It is not the case that all people hold the same position. The size of the companies to which people belong also differs. Such diversity allows the author to claim that the research is cross-sectional. They indicate general trends in the beliefs and practical experience of people in the IT industry. On the other hand, there is the education and knowledge of people. Based on the length of experience in Agile work as well as education and knowledge of the methodology before starting the work, the author can have grounds to assess that the group of respondents understood the purpose of the study and that their conclusions

and interpretations can translate into real results and the models created can provide valuable recommendations for business.

3.3. Empirical research results – stage IV - experts' opinions

The expert interviews provided valuable feedback on the Agile project success model, offering insights into its practical usability, validity, potential improvements, and general applicability within IT project management. Here's a breakdown of each expert's profile and contributions.

Experts Profiles:

1. Project Management Specialist (PMO):
   - Experience: 15 years in IT project management, 7 in Agile monitoring and training.
   - Specialty: Agile team oversight, training, consultations.
2. Developer and Scrum Master:
   - Experience: 12 years in IT, extensive experience in Agile teams.
   - Role: Current leader of Scrum Masters.
3. IT Project Consultant, Agile Implementer for Small Organizations:
   - Experience: 9 years in consulting, and Agile project implementation across various organizations.
   - Specialty: Technical and managerial aspects of Agile.

1) Models' usability

Expert 1 found the model technically, and regarding the relationships between elements well-defined. They highlighted its practical applicability for project monitoring and planning, particularly in resource allocation and key area focus.

Expert 2 acknowledged the model's effectiveness in identifying areas for improvement and noted the difficulty in classifying practices as strictly used or unused. They emphasized the balance of allowing team members room for self-correction, as it could foster long-term improvement despite initial challenges.

Expert 3 also saw the model as technically well-constructed but questioned the validity of using generic weights for different teams/projects. The expert suggested that the model's real value lies in giving each team to prescribe exact measures.

2) Validity of results

Expert 1 affirmed the model's alignment with real-world Agile team dynamics, especially in dividing project scope into quality and stability aspects. They stressed the interdependence of factors, cautioning against isolating them; for example, communication might have an indirect but crucial impact on planning outcomes.

Expert 2 appreciated the extensive range of success factors, which they felt realistically captured the components of project success. However, they were surprised by the relatively low

weight assigned to customer satisfaction (C10), suggesting that this may undervalue the customer's role in Agile success.

Expert 3 noted a discrepancy between high ratings for scope-related criteria (e.g., stability) and the relatively low rating for user satisfaction (C7). They agreed with the model's results that consider budget and schedule flexibility, a reflection of Agile's inherent trade-offs.

3) Improvement suggestions

Expert 1 proposed expanding the model with detailed indicators for software quality, such as stability and reliability metrics. Additionally, they recommended integrating a risk assessment mechanism to better prepare teams for practice implementation.

Expert 2 suggested clarifying communication and collaboration factors to make them less ambiguous. They also emphasized incorporating factors for continuous integration and delivery to enhance the model's practical relevance.

Expert 3 recommended a risk assessment module for further practice suggestions and suggested a feedback mechanism for team assessments of Agile practices, allowing for periodic checks on team dynamics and performance.

4) Other comments

Expert 1 emphasized the need for the model to be flexible and updated regularly to stay relevant in a changing IT environment. They also proposed integrating the model into a larger system, incorporating communication tools and progress analysis.

Expert 2 suggested that the model should be adaptable to diverse IT project types. They proposed developing an application or reporting system that could use the model to recommend best practices for specific project criteria.

Expert 3 advocated for embedding the model within a broader analytical framework, cautioning that the results should guide rather than dictate decisions. They suggested piloting the model to refine its utility.

Overall, the experts agreed that the model is technically correct, with well-defined relationships between success factors and criteria, affirming its positive preliminary validation. They noted that it accurately reflects the dynamics of Agile project management, potentially serving as a valuable tool for project planning and monitoring. However, they recommended further refinement in areas like communication, continuous delivery, and software quality indicators. They also emphasized the importance of flexibility and regular updates to the model to maintain relevance. The experts saw the potential for the model to become part of a comprehensive support system for Agile teams. They suggested a dedicated application or reporting system that could extend its usability, supporting tailored project assessments and tracking Agile practices over time.

4. Discussion

4.1. General findings

This section explores research findings, as shown in Figure 5, through participant comments, focusing on the success criteria and selected success factors perspective.

Perspective from the criteria position – C1, C2

The study reveals that the first two criteria (C1 – budget, and C2 - schedule) have lower average ratings than subsequent criteria, with a notable difference of approximately 0.2 points. Additionally, these criteria exhibit more cells with negative weights, indicating that Agile practices may hinder rather than help meet them. A primary factor affecting these criteria is F3, the culture of improvement, which respondents found beneficial for learning from mistakes and developing autonomy. While this approach benefits long-term employee satisfaction and quality, it introduces short-term challenges: correcting mistakes incurs costs, time for error detection, and the engagement of senior staff. This factor could become a liability for projects with tighter deadlines (e.g., six months), although it is expected to yield benefits in longer-term projects.

Self-organization (F4) also impacts C1 and C2. While respondents acknowledge its positive effect on team satisfaction and budget management, the lack of a structured approach occasionally leads to chaotic task management, which may jeopardize project timelines. The feedback culture (F6) was another noteworthy factor; while feedback facilitates quality improvement, it may extend project costs and timelines. Respondents recognized that Agile feedback mechanisms enhance project quality but may compromise time and budget constraints. Similarly, daily meetings (F12) provide a limited positive impact on cost and schedule, as these meetings may devolve into unproductive status updates, driven by participants' need to report rather than engage in genuine problem-solving.

A final consideration related to C1 and C2 was the non-life-critical nature of projects (F17). This factor has a mixed effect, providing a relaxed environment conducive to quality work but potentially reducing productivity for employees who perform better under structured guidance (McGregor, 1960). Overall, respondents noted that Agile principles generally align with team satisfaction and quality but may fall short on cost and schedule criteria.

Perspective from the criteria position – C3-C7

The criteria from C3 to C7 align more closely with Agile methodologies, which focus on delivering functional outcomes. Five of the top six column averages from Figure 5 fall within this group, highlighting Agile's effectiveness in achieving operational stability, reliability, and functional delivery. For example, meeting functional requirements (C6) was rated slightly

lower, partly because of the dynamic nature of requirements under Agile. Respondents appreciated the flexibility to adapt requirements to the customer's evolving needs but noted that such changes require additional resources. Importantly, these criteria (C3–C7) are interrelated: a stable system minimizes risks, reduces unplanned outages, and enhances access to tools and data - ensuring both team efficiency and service continuity. Respondents emphasized that effective initial analysis of requirements (Davis, 1989) is essential to meet these goals, though challenging to achieve. Extensive analysis requires experience, making it resource-intensive.

Perspective from the criteria position – C8-C10

This segment covers team, customer, and end-user satisfaction (C8, C9, C10), with team satisfaction scoring the highest, followed by the customer and then end-user satisfaction. Agile practices focusing inward, such as the roles of the Scrum Master (F9), the non-critical atmosphere (F17), and self-organizing teams (F4, F18), notably contribute to team satisfaction.

For customer satisfaction, respondents perceived Agile's impact as moderate. The client's ability to follow progress (F13) contributes to a sense of control, but the extensive interaction required with the Agile process can strain customer satisfaction. Agile's impact on end-user satisfaction (C8) received surprisingly low ratings. Respondents attributed this to limited direct interaction with end-users, as Agile processes often assume the client represents the end-user's perspective. The client is often a business representative rather than an actual user, creating a gap between user needs and Agile team actions. Although Agile emphasizes end-user orientation, respondents suggested that the lack of direct-user communication limits Agile's impact on true end-user satisfaction.

Perspective from the position of the factors – F7-F9

Examining factors with the highest impact averages across criteria, three factors - F7 (user stories), F8 (sprint planning and backlog usage), and F9 (Scrum Master role) - stand out. User stories (F7) help Agile teams by organizing requirements and testing scenarios, simplifying quality assurance. However, implementing user stories effectively demands rigorous standardization. Sprint planning (F8) is another fundamental Agile practice that structures team efforts, though it alone does not ensure project success. The role of the Scrum Master (F9) emerged as crucial in bridging the team with the Product Owner, who connects the team with the client. This "double bridge" enhances communication, increasing project success likelihood and satisfaction for both the team and client.

Perspective from the position of the factors – F14, F15

Respondents underscored the impact of F14 (appropriate documentation) and F15 (continuous product delivery). Extensive documentation, though contractually required, often consumes time and resources that could be used for project tasks. Assigning documentation

tasks to less experienced team members also risks generating low-quality output. Respondents recommended focusing on essential documentation only, advocating for concise templates to streamline internal documentation. Continuous product delivery (F15), meanwhile, fosters a habit of regular development, aligning with Agile principles of iterative progress. However, respondents cautioned that continuous delivery without periodic reflection may compromise strategic direction.

Perspective from the position of the factor – F18

The team size factor (F18) influenced the efficacy of Agile practices in meeting criteria. Respondents suggested that increasing team size beyond a certain point (e.g., 15-20 members) could dilute Agile's impact, potentially excluding developers from vital sprint review meetings and leading to miscommunication. A smaller team, according to respondents, enables a direct connection between Agile practices and project success.

Perspective from the position of the factors – F7, F8, F11

Finally, respondents highlighted the time dedicated to Agile practices, particularly F7 (user stories), F8 (sprint planning), and F11 (test cases). These factors, requiring the Product Owner's involvement, were seen as essential for effective Agile implementation. Product Owners play a crucial role in translating client priorities into team tasks, underscoring their importance in Agile project success. The respondents recommended including the Product Owner's effectiveness as a future research success factor, emphasizing their role as a central link between the Agile team and the client.

4.2. Conclusions

The research findings offer a wide view of how Agile practices relate to project success criteria, showing both the advantages and challenges of using Agile methods in IT project management.

From the perspective of success criteria, Agile works well in areas like team satisfaction (C8) and delivering functional results (C3-C7). However, it is less effective at meeting strict budget (C1) and schedule (C2) goals. This happens because Agile focuses on flexibility and gradual progress, which improves quality and long-term outcomes but can lead to higher costs and longer timelines in the short term. Practices like self-organization (F4), space for making mistakes and changing them (F3), feedback culture (F6), and daily meetings (F12) reflect Agile's collaborative nature, but they sometimes lack the structure needed to help staying within budget and on schedule.

The study also highlights that Agile does not always fully address end-user satisfaction. While it emphasizes working closely with the customer, in some cases it is not working with a particular end-user. This can result in a gap between what users need and what teams deliver. Teams may benefit from more direct contact with end-users to improve outcomes.

Looking at success factors, certain practices like sprint planning (F8), user stories (F7), and the Scrum Master role (F9) play a key role in connecting team efforts to project success. These practices help teams organize their work, set priorities, and maintain good communication with the client. Respondents also suggested using simpler documentation processes and making time for reflection during continuous delivery to avoid losing focus on the main objectives.

Although Agile aims to orient teams toward product outcomes, this study found that Agile practices primarily foster internal collaboration. Agile practices are strong tools for building teamwork, flexibility, and quality, but they need to be adapted to fit different project goals, especially for managing costs, meeting deadlines, and ensuring end-user satisfaction. These results also highlight areas where Agile methods can be improved, such as better daily meetings or adjusting for larger teams.

5. Limitations and recommendations

This chapter identifies limitations in the research methodology and provides recommendations for enhancing the application of research findings and for future studies on Agile project success. These suggestions are intended to improve the study design, address identified barriers, and propose directions for future investigations.

5.1. Limitations

5.1.1. Extensive response analytics

The research model primarily used averages to calculate the impact of factors, a simplified measure that limits the insights derived. A more comprehensive analysis, using advanced techniques such as cluster analysis or regression analysis, could reveal patterns, trends, or deviations otherwise unseen. Such methods would allow for a deeper understanding of relationships between variables and enable the identification of nuanced insights, potentially offering more robust and actionable findings.

5.1.2. Complexity

While the model aims to reflect real-world Agile project dynamics by linking success factors directly to success criteria. This simplification overlooks the complexity of Agile project environments. The nonlinear and adaptive nature of Agile projects, with their dynamic requirements and dependencies, complicates the possibility of guaranteed outcomes from any

single practice. Attempting to model the intricacies of Agile project management in a linear way only partially captures the fluid nature of these projects, which require constant adjustment and are influenced by external, often unpredictable factors.

5.1.3. Answer declaration

Responses in the study are influenced by participants' theoretical or general knowledge of Agile practices, rather than specific, practical experiences. This can lead to a disconnection between declared practices and their actual application and effectiveness in projects. In Agile IT projects, for instance, development team members may implement practices without fully understanding how these align with broader success criteria (Forlicz, Rólczyński, 2016; Moyer , Syrett, 2019). It makes it challenging to assess the true impact of Agile methods on project outcomes, as responses may reflect assumptions rather than real practices.

5.2. Recommendations

5.2.1. Connection between Success Criteria and Project Success

Although the study links success factors and success criteria, it could benefit from incorporating an overarching project success metric. Building on principia, like Kerzner's approach (Kerzner, 2013), assigning weighted values to individual success criteria based on empirical data could yield a more nuanced understanding of project success. By leveraging data from managers with insights across various projects or portfolios, the model would better represent how individual practices contribute to a project's final success, providing practical and adaptable insights for Agile teams.

5.2.2. Defining project context

The research focuses on IT teams, yet this category includes a wide range of project types, from website development to real-time emotion detection models, each with distinct user types and success criteria. This broad scope may dilute the study's precision. A more context-specific approach - such as focusing on commercial IT projects in a single industry, like education - could yield more accurate, actionable results. To balance applicability with depth, future research might investigate a few closely related project types, offering insights that apply to similar projects without overgeneralizing findings.

5.2.3. Factors and criteria connections

The model's focus on linking success factors with success criteria overlooks dependencies among factors and criteria. For example, the implementation of a factor like sprint reviews (F11) relies on using a backlog (F8), creating a dependency that affects the model's applicability. A more advanced mapping approach could incorporate such interdependencies, enabling a more realistic application of the model. By allowing dependencies to be activated only when prerequisite practices are implemented, the model would more accurately reflect real-world project dynamics.

5.2.4. Research group, quantitative research

The research primarily used qualitative interviews, which offered detailed insights but limited the scope to a smaller sample size. To enable more generalizable conclusions, future studies should consider a quantitative approach, allowing for a larger and more statistically representative sample. Although more resource-intensive, quantitative methods could provide broader insights and a stronger foundation for making widely applicable recommendations.

5.2.5. Partial use of Agile practices

In the current model, Agile practices are assessed on a binary basis—either used ("1") or not used ("0"). This simplification fails to capture varying degrees of practice implementation, which could provide a more realistic picture. Using a scale from 0 to 1 to represent partial adoption of practices might offer more nuanced insights, although it presents challenges in determining non-linear relationships between partial use and project outcomes. Future research could explore these partial relationships by modeling them for selected success factors, enabling a more flexible and detailed analysis.

6. Summary

The primary objective of this paper is to investigate the impact of Agile practices on the success of IT projects, evaluated based on defined, industry-specific success criteria. The research-specific aim is to develop a model that delineates the connections between the Agile practices employed by project teams - viewed as success factors - and the success criteria used to evaluate project outcomes.

The first stage of this research involved an extensive literature review to establish a foundation for understanding Agile practices, artifacts, and tools that are potentially significant for IT project success. This review also identified key project success criteria from existing research, though they are not unique to Agile. Through this process, the author identified 18 Agile success factors (Tab. 1) and selected 10 general project success criteria (Tab. 2). The literature review concluded that the final model should outline the relationships between each Agile factor and each success criterion, providing insights into which factors hold the most significance for project teams and which success criteria are directly supported by specific Agile practices.

To develop this model, the author conducted qualitative research involving in-depth interviews with Agile practitioners currently working on projects managed with Agile methodologies. Participants in this study were asked to assign weights to the relationships between individual Agile factors and success criteria, indicating the relative importance of each factor-criterion connection. A total of 15 practitioners participated, and their responses formed the basis for constructing the final model (Section 3.2). During these interviews, key success

factors within Agile practices were highlighted, particularly practices like thorough planning, maintaining a product backlog, and delivering software incrementally. In contrast, certain practices, such as daily meetings, were rated as having a lower impact on project success criteria. The research also identified specific criteria that Agile practices in this study supported less effectively, such as meeting budget and timeline constraints and achieving high user satisfaction.

The model's initial validation involved follow-up interviews with three domain experts, who assessed the model's accuracy in depicting Agile's real-world application and evaluated its consistency with practical experience. The experts affirmed that the model accurately reflects the connections between Agile practices and project success criteria, as observed in professional settings.

The study's findings contribute to a deeper understanding of how Agile practices affect IT project success, offering a model that both Agile teams and project managers can use as a practical resource to inform resource planning and project implementation. This model illustrates how different Agile practices carry varying levels of impact on the overall success of IT projects, thus providing targeted insights for better project management and resource allocation.

Despite certain limitations, this research presents valuable findings that hold potential for both academic study and practical application in Agile IT project management. Taking into account the research steps described in the paper, it is fully replicable, and the results should differ when selecting respondents from a specific type of IT project or one professional profile (e.g. developers). Future research could delve deeper into individual Agile success factors and work on refining methods to assess their impact more accurately on project success, potentially enhancing the field's understanding of Agile's effectiveness in achieving project goals.

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Appendix

Table 3.
Success criteria frequency table

Project success criterion	References	Frequency
The iron triangle of management		
The project was completed within **budget**	(Ahimbisibwe, Cavana, Daellenbach, 2015), (Siddique, Hussein, 2016), (Wai, Yusof, Ismail, 2012), (Sheffield, Lemetayer, 2013), (Wateridge, 1998), (Iriarte, Bayona, 2020), (Wateridge, 1995), (Turner, Zolin, Remington, 2010), (Trisnawaty *et al.*, 2021), (Thomas, Fernández, 2008), (Lech, 2013), (Ozturan, Gursoy, Ceken, 2019b), (Phong, Quyen, 2017), (Khalilzadeh, Akbari, Foroughi, 2016b)	14
The project was completed within the **schedule**	(Ahimbisibwe, Cavana, Daellenbach, 2015), (Siddique, Hussein, 2016), (Wai, Yusof, Ismail, 2012), (Sheffield, Lemetayer, 2013), (Wateridge, 1998), (Iriarte, Bayona, 2020), (Wateridge, 1995), (Turner, Zolin, Remington, 2010), (Trisnawaty *et al.*, 2021), (Thomas, Fernández, 2008), (Lech, 2013), (Ozturan, Gursoy, Ceken, 2019b), (Phong, Quyen, 2017), (Khalilzadeh, Akbari, Foroughi, 2016b)	14
The project **scope** was met (gathered requirements)	(Ahimbisibwe, Cavana, Daellenbach, 2015), (Wai, Yusof, Ismail, 2012), (Wateridge, 1998), (Iriarte, Bayona, 2020), (Wateridge, 1995), (Turner, Zolin, Remington, 2010), (Trisnawaty *et al.*, 2021), (Lech, 2013), (Ozturan, Gursoy, Ceken, 2019b), (Khalilzadeh, Akbari, Foroughi, 2016b)	10
Other criteria		
The software developed is reliable	(Ahimbisibwe, Cavana, Daellenbach, 2015), (Wai, Yusof, Ismail, 2012), (Iriarte, Bayona, 2020), (Wateridge, 1995), (Thomas, Fernández, 2008), (Lech, 2013),	6
The developed product is easy to use	(Ahimbisibwe, Cavana, Daellenbach, 2015), (Sheffield, Lemetayer, 2013), (Thomas, Fernández, 2008)	3
Flexibility of the product/project is good	(Ahimbisibwe, Cavana, Daellenbach, 2015)	1
The product/project meets users' intended functional requirements	(Ahimbisibwe, Cavana, Daellenbach, 2015), (Siddique, Hussein, 2016), (Wai, Yusof, Ismail, 2012), (Sheffield, Lemetayer, 2013), (Wateridge, 1998), (Iriarte, Bayona, 2020), (Wateridge, 1995), (Khalilzadeh, Akbari, Foroughi, 2016b)	8
Users were satisfied with the delivered product/project (users' requirements)	(Ahimbisibwe, Cavana, Daellenbach, 2015), (Siddique, Hussein, 2016), (Wai, Yusof, Ismail, 2012), (Wateridge, 1998), (Iriarte, Bayona, 2020), (Wateridge, 1995), (Trisnawaty *et al.*, 2021), (Thomas, Fernández, 2008), (Lech, 2013), (Ozturan, Gursoy, Ceken, 2019b)	10
The project team is satisfied	(Ahimbisibwe, Cavana, Daellenbach, 2015), (Siddique, Hussein, 2016), (Sheffield, Lemetayer, 2013), (Wateridge, 1998), (Iriarte, Bayona, 2020), (Wateridge, 1995), (Trisnawaty *et al.*, 2021), (Thomas, Fernández, 2008), (Khalilzadeh, Akbari, Foroughi, 2016b)	9
Top level management of the client's organization is satisfied	(Ahimbisibwe, Cavana, Daellenbach, 2015), (Wai, Yusof, Ismail, 2012), (Thomas, Fernández, 2008)	3
The overall quality of the delivered application is high (or, as agreed on)	(Ahimbisibwe, Cavana, Daellenbach, 2015), (Sheffield, Lemetayer, 2013), (Wateridge, 1998), (Iriarte, Bayona, 2020), (Trisnawaty *et al.*, 2021), (Thomas, Fernández, 2008), (Phong, Quyen, 2017), (Khalilzadeh, Akbari, Foroughi, 2016b)	8
Product/project has added the promised business value	(Siddique, Hussein, 2016), (Wai, Yusof, Ismail, 2012), (Sheffield, Lemetayer, 2013), (Wateridge, 1998), (Iriarte, Bayona, 2020), (Wateridge, 1995), (Turner, Zolin, Remington, 2010), (Thomas,	11

	Fernández, 2008), (Lech, 2013), (Ozturan, Gursoy, Ceken, 2019b), (Khalilzadeh, Akbari, Foroughi, 2016b)	
Product/Project brings benefits to the client (is profitable for the customer)	(Wateridge, 1998), (Iriarte, Bayona, 2020), (Wateridge, 1995), (Turner, Zolin, Remington, 2010), (Thomas, Fernández, 2008), (Lech, 2013), (Khalilzadeh, Akbari, Foroughi, 2016b)	7
Metrics' benchmarks have been met	(Iriarte, Bayona, 2020)	1
Customer satisfaction	(Ahimbisibwe, Cavana, Daellenbach, 2015), (Siddique, Hussein, 2016), (Wai, Yusof, Ismail, 2012), (Sheffield, Lemetayer, 2013), (Wateridge, 1998), (Iriarte, Bayona, 2020), (Wateridge, 1995), (Turner, Zolin, Remington, 2010), (Trisnawaty *et al.*, 2021), (Thomas, Fernández, 2008), (Phong, Quyen, 2017), (Khalilzadeh, Akbari, Foroughi, 2016b)	12
Company (contractor) made money	(Siddique, Hussein, 2016), (Wai, Yusof, Ismail, 2012), (Iriarte, Bayona, 2020)	3
Experience or knowledge are gained from the project/product	(Wai, Yusof, Ismail, 2012), (Iriarte, Bayona, 2020), (Ozturan, Gursoy, Ceken, 2019b)	3
Personnel training	(Wai, Yusof, Ismail, 2012), (Iriarte, Bayona, 2020), (Ozturan, Gursoy, Ceken, 2019b)	3
All stakeholders satisfaction	(Turner, Zolin, Remington, 2010), (Trisnawaty *et al.*, 2021), (Thomas, Fernández, 2008), (Ozturan, Gursoy, Ceken, 2019b), (Phong, Quyen, 2017), (Khalilzadeh, Akbari, Foroughi, 2016b)	6

Source: Own elaboration.

Table 4.
Agile success factors frequency table

Project success factor	References	Frequency
ORGANIZATIONAL ASPECT		
Executive support is strong	(Chow, Cao, 2008), (Stankovic et al., 2013), (Sheffield, Lemetayer, 2013), (Qatan ani et al., 2021), (Zaleski, Michalski, 2021)	5
Cooperative organizational culture instead of hierarchal	(Chow, Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (Freire et al., 2018), (Tonelli et al., 2013), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013), (Zaleski and Michalski, 2021)	10
Team culture places high value on face-to-face communication	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (Alahyari et al., 2018), (Freire et al., 2018), (Tonelli et al., 2013), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013)	10
Agile methodology is universally accepted all over the company	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Shahane, Jamsandekar and Shahane, 2014), (Alahyari et al., 2018), (de Souza Bermejo et al., 2014)	6
The team is able to work in one place - stationary	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (Zaleski and Michalski, 2021)	6
Company facility with proper Agile-style work environment (boards, tables for standups, etc.)	(Chow and Cao, 2008), (Stankovic et al., 2013), (Zaleski and Michalski, 2021)	3
Reward/benefit system is appropriate for	(Chow and Cao, 2008), (Stankovic et al., 2013), (Ghayyur et al., 2018)	3

people working in an Agile		
Organization work is transparent to all teams	(Alahyari et al., 2018)	1
PEOPLE / TEAM		
Friendly and positive environment in the team	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Shahane, Jamsandekar and Shahane, 2014), (Alahyari et al., 2018), (Freire et al., 2018), (Ghayyur et al., 2018), (Goh, Pan and Zuo, 2013), (Misra, Kumar and Kumar, 2009)	9
Employees are willing to improve and get the chance to do so	(Sheffield and Lemetayer, 2013), (Alahyari et al., 2018), (Freire et al., 2018), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013), (Misra, Kumar and Kumar, 2009)	6
Team members have high competence and expertise	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (Alahyari et al., 2018), (Freire et al., 2018), (Ghayyur et al., 2018), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013), (Misra, Kumar and Kumar, 2009), (Zaleski and Michalski, 2021)	12
Team members have great motivation	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Qatanani, Al-Tawara and Qusef, 2021), (Alahyari et al., 2018), (Freire et al., 2018), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013), (Misra, Kumar and Kumar, 2009), (Zaleski and Michalski, 2021)	10
Managers have knowledge about the Agile process	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Zaleski and Michalski, 2021)	4
Managers have a light-touch or adaptive management style	(Chow and Cao, 2008), (Stankovic et al., 2013), (Zaleski and Michalski, 2021)	3
The team works coherently, is self-organizing, and multifunctional	(Chow and Cao, 2008), (Stankovic et al., 2013), (Shahane, Jamsandekar and Shahane, 2014), (Alahyari et al., 2018), (Qatanani, Al-Tawara and Qusef, 2021), (Freire et al., 2018), (Ghayyur et al., 2018), (Tonelli et al., 2013), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013), (Misra, Kumar and Kumar, 2009)	11
Good customers relationships	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Qatanani, Al-Tawara and Qusef, 2021), (Tonelli et al., 2013), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013), (Misra, Kumar and Kumar, 2009)	8
PROCESS		
Tangible outcomes after each iteration	(Srivastava et al., 2020), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (Alahyari et al., 2018), (Freire et al., 2018), (Ghayyur et al., 2018), (de Souza Bermejo et al., 2014), (Misra, Kumar and Kumar, 2009), (Zaleski and Michalski, 2021)	9
Culture of open feedback	(Chow and Cao, 2008), (Stankovic et al., 2013), (Srivastava et al., 2020), (Sheffield and Lemetayer, 2013), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (Alahyari et al., 2018), (Freire et al., 2018), (Ghayyur et al., 2018), (Tonelli et al., 2013), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013), (Misra, Kumar and Kumar, 2009)	13
Test and Lean approach – for instance using retrospectives	(Srivastava et al., 2020), (Qatanani, Al-Tawara and Qusef, 2021), (Alahyari et al., 2018), (Freire et al., 2018), (de Souza Bermejo et al., 2014), (Misra, Kumar and Kumar, 2009)	6
Following an Agile-oriented requirement management process	(Chow and Cao, 2008), (Stankovic et al., 2013), , (Qatanani, Al-Tawara and Qusef, 2021), (Alahyari et al., 2018), (Freire et al., 2018), (Ghayyur et al., 2018), (Tonelli et al., 2013), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013), (Misra, Kumar and Kumar, 2009)	10

Following an Agile-oriented project management process, facilitated by Scrum Master	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (Freire et al., 2018), (Ghayyur et al., 2018), (Tonelli et al., 2013), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013), (Misra, Kumar and Kumar, 2009)	11
Strong communication focus with daily meetings	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (Freire et al., 2018), (Ghayyur et al., 2018), (Tonelli et al., 2013), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013), (Misra, Kumar and Kumar, 2009)	11
Honoring regular working schedule – no overtime	(Chow and Cao, 2008), (Stankovic et al., 2013)	2
Strong customer commitment and presence	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (Tonelli et al., 2013), (de Souza Bermejo et al., 2014), (Misra, Kumar and Kumar, 2009)	8
Customer having full authority	(Chow and Cao, 2008), (Stankovic et al., 2013), (Qatanani, Al-Tawara and Qusef, 2021)	3
TECHNICAL		
Well-defined coding standards upfront	(Chow and Cao, 2008), (Stankovic et al., 2013), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (de Souza Bermejo et al., 2014), (Misra, Kumar and Kumar, 2009), (Zaleski and Michalski, 2021)	7
Pursuing simple design	(Chow and Cao, 2008), (Stankovic et al., 2013), (Ghayyur et al., 2018)	3
Rigorous refactoring activities	(Chow and Cao, 2008), (Stankovic et al., 2013), (Qatanani, Al-Tawara and Qusef, 2021)	3
Right amount of documentation	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Qatanani, Al-Tawara and Qusef, 2021), (Ghayyur et al., 2018), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013), (Zaleski and Michalski, 2021)	8
Regular delivery of software	(Chow and Cao, 2008), (Stankovic et al., 2013), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (Alahyari et al., 2018), (Freire et al., 2018), (Ghayyur et al., 2018), (de Souza Bermejo et al., 2014), (Zaleski and Michalski, 2021)	9
Delivering the most important features first	(Chow and Cao, 2008), (Stankovic et al., 2013), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (Alahyari et al., 2018), (Freire et al., 2018), (Ghayyur et al., 2018), (de Souza Bermejo et al., 2014), (Zaleski and Michalski, 2021)	9
Correct integration testing	(Chow and Cao, 2008), (Stankovic et al., 2013), (Shahane, Jamsandekar and Shahane, 2014), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013)	5
Appropriate technical training for the team	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (Ghayyur et al., 2018), (Tonelli et al., 2013), (de Souza Bermejo et al., 2014), (Goh, Pan and Zuo, 2013), (Misra, Kumar and Kumar, 2009), (Zaleski and Michalski, 2021)	11
PROJECT		
Change over plan approach	(Sheffield and Lemetayer, 2013), (Shahane, Jamsandekar and Shahane, 2014), (Freire et al., 2018), (Ghayyur et al., 2018)	4
Project nature being non-life-critical	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Qatanani, Al-Tawara and Qusef, 2021), (Ghayyur et al., 2018)	5

Project type being of variable scope with the emergent requirement	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Ghayyur et al., 2018)	4
Projects with a dynamic, accelerated schedule	(Chow and Cao, 2008), (Stankovic et al., 2013)	2
Projects with a small team	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Shahane, Jamsandekar and Shahane, 2014), (Qatanani, Al-Tawara and Qusef, 2021), (Freire et al., 2018), (Tonelli et al., 2013), (Misra, Kumar and Kumar, 2009)	8
Projects with no multiple independent teams	(Chow and Cao, 2008), (Stankovic et al., 2013), (Zaleski and Michalski, 2021)	3
Projects with up-front cost evaluation done	(Chow and Cao, 2008), (Stankovic et al., 2013)	2
Projects with up-front risk analysis done.	(Chow and Cao, 2008), (Stankovic et al., 2013), (Sheffield and Lemetayer, 2013), (Ghayyur et al., 2018), (Zaleski and Michalski, 2021)	5

Source: Own elaboration.