

Soft Skills in Agile Culture: An Analysis of Literature, Job Vacancies, and Survey Evidence on the Product Owner in the Information Systems Industry

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Abstract. Research Context: Career development in computing requires competencies that prepare professionals for dynamic industry environments. Among these, soft skills are essential for team performance and project success in agile contexts. **Scientific and/or Practical Problem:** Despite their relevance, there is limited integrated evidence combining literature, industry demands, and professional practice regarding soft skills in agile Information Systems development. **Proposed Solution and/or Analysis:** This study adopts a multi-stage research design integrating a systematic literature review, industry analysis, and an ongoing survey with practitioners. **Related IS Theory:** The study is grounded in Socio-Technical Theory, emphasizing the interdependence between social and technical dimensions in Information Systems. **Research Method:** A 25-year review analyzing 97 studies identified 33 soft skills across 14 development roles. In addition, 202 job vacancies were examined, and a survey with Product Owners is currently being conducted. **Summary of Results:** Communication, teamwork, leadership, and adaptability emerge as recurrent competencies, with preliminary evidence of alignment between literature and industry demands. **Contributions and Impact to IS area:** By triangulating literature, industry data, and practitioner perspectives, this research advances the socio-technical understanding of agile IS development and informs professional training and curriculum design.

1. Introduction

The development of Information Systems (IS) is widely recognized as a sociotechnical and human-centered endeavor [Mnkandla and Dwolatzky 2004, Lenberg et al. 2015, Teixeira et al. 2016, Miranda et al. 2021]. In this context, human factors directly influence quality, productivity, and innovation in software development [Matturro et al. 2015, Souza et al. 2024, Faquin et al. 2016]. Evidence suggests that aligning specific skills to project roles contributes to improved outcomes, particularly in agile environments that emphasize adaptability and collaboration [John et al. 2005, Ahmed et al. 2012, Faquin et al. 2016, Diniz et al. 2025]. Agile methodologies prioritize flexibility, rapid delivery, and responsiveness to change, emerging as alternatives to rigid plan-driven models [Al-Saqqa et al. 2020, Abrahamsson et al. 2002]. Frameworks such as Scrum, Kanban, XP, and SAFe require a balanced integration of technical and behavioral

competencies [Al-Saqqa et al. 2020]. Scrum reinforces communication during ceremonies [Hidayati et al. 2020], Kanban emphasizes organization and time management [Sampaio et al. 2021, Choque-Soto and Sosa-Jauregui 2024], XP values teamwork through practices such as pair programming [Sampaio et al. 2021], and SAFe highlights communication in large-scale coordination [Poláková et al. 2023]. These approaches reflect adaptive and human-oriented practices aimed at generating value in IT contexts [Lima et al. 2025], reinforcing the relevance of soft skills in agile IS development.

In this context, this study investigates **what are the main soft skills identified in agile Information Systems development and how they are reflected in both the scientific literature and professional practice**. To address this objective, a multi-stage research design was adopted. First, a 25-year Systematic Literature Review (SLR) was conducted, analyzing 97 studies and identifying 33 distinct soft skills, as well as associated roles, seniority levels, and agile methodologies. Second, a documentary analysis of job vacancies was performed to examine how soft skills are demanded in the industry. Finally, a survey with Product Owners is currently being applied to investigate professionals' perceptions regarding the relevance of these competencies in practice.

Aligning with the Grand Research Challenges in Information Systems in Brazil 2016–2026 (I GrandSI-BR) [Boscarioli et al. 2017], bridging technical and social competencies remains a central challenge [Cafezeiro et al. 2017]. By integrating evidence from literature, industry demands, and practitioners' perspectives, this research seeks to strengthen the sociotechnical understanding of agile IS development and contribute to a more comprehensive view of professional competencies in the field.

2. Background

The Product Owner (PO) is recognized as a key role in agile development, acting as a bridge between *stakeholders*, teams, and customers. Prior studies emphasize the PO's responsibility in maximizing value, prioritizing demands, and ensuring alignment across parties [Kantola et al. 2022, Kadenic et al. 2023, Magnussen et al. 2024]. Core activities include backlog management, defining product vision and objectives, approving deliverables, communicating with *stakeholders*, planning releases, and coordinating teams [Ghiba 2022, Spiegler et al. 2021, Mariño et al. 2025]. However, the role is influenced by individual, organizational, and team maturity factors, making it multifaceted and context-dependent [Remta et al. 2020].

The literature also highlights challenges such as role overload, ambiguity of responsibilities, lack of clarity regarding required competencies, and difficulties in decision-making [Grass et al. 2020, Hassani-Alaoui et al. 2020, Kantola et al. 2022]. Technical domain knowledge may facilitate communication and informed decisions depending on the adopted agile methodology [Cornide-Reyes et al. 2021], while shared prioritization approaches have been suggested to mitigate overload [Gren and Ralph 2022]. Regarding soft skills, competencies such as Communication, Strategic Vision, Leadership, Adaptability, and Emotional Intelligence are considered essential for effective PO performance [Alsaman and Chyad 2025, Kadenic et al. 2023]. Nevertheless, few studies examine how these competencies manifest in the PO's daily activities.

3. Research Design

This research adopts a mixed and sequential approach, structured into complementary stages, aiming to integrate evidence from scientific literature, industry demands, and professional practice. The methodological design enables triangulation across multiple data sources, strengthening the validity of the findings and providing a more comprehensive understanding of the Product Owner role from a socio-technical perspective.

3.1. Systematic Literature Review (SLR)

The Systematic Literature Review (SLR) was conducted to identify and map the main soft skills discussed in the scientific literature within agile software development contexts. The study followed established protocols in Software Engineering and covered a 25-year period (2000 to May 2025), spanning from the consolidation of the Agile Manifesto to the current landscape. Six major Computer Science databases were consulted, using a search string structured according to the PICOC strategy. Initially, 2,083 studies were retrieved. After duplicate removal, title and abstract screening, and full-text reading, 97 primary studies were selected for final analysis. Through data extraction and consolidation, 33 distinct soft skills were identified, associated with 14 professional roles in agile teams. The most recurrent competencies include Communication, Teamwork, Leadership, and Adaptability, reinforcing the centrality of human factors in agile environments. The analysis also enabled the identification of emerging and stable competencies over time, as well as the predominance of methodologies such as Scrum in the analyzed studies. The findings of the SLR provided the theoretical foundation for the subsequent stages of the research, enabling comparisons between scientific evidence, industry demands, and professional practice.

3.2. Analysis of Industry Job Vacancies

To investigate how the Brazilian industry demands Product Owner (PO) competencies, an analysis of job vacancies published on LinkedIn, Gupy, and Glassdoor between July and October 2025 was conducted. Initially, 975 opportunities were collected, resulting in 202 valid vacancies after applying exclusion criteria. The vacancies were analyzed in terms of seniority, work format, sector, certifications, education, agile methodologies, responsibilities, and soft skills. Most vacancies do not explicitly specify seniority, although Mid-level and Senior positions are more frequent among those that do. Nevertheless, seniority showed a clear association with both required activities and interpersonal skills. Among the soft skills, Communication, Analytical Thinking, Teamwork, Leadership, and Negotiation stand out. Many of these competencies appear implicitly, requiring interpretative analysis. The findings reveal both convergences and discrepancies between the literature and the demands of the Brazilian industry.

3.3. Survey Application, Data Collection, and Analysis

Following the job vacancy analysis stage, a survey application phase was conducted to identify the skills, responsibilities, and specific characteristics associated with the Product Owner (PO) role in professional practice. This stage represents the practitioners' perspective within the triangulation strategy adopted in this research. The instrument was developed based on findings from the SLR and the job vacancy analysis, aiming to address gaps identified in the previous stages. The questionnaire was validated by two

experienced product professionals to ensure clarity, coherence, and contextual adequacy. Subsequently, a pilot test was conducted with two additional Product Owners, enabling refinements in wording, structure, and estimated response time. The survey is currently being applied nationwide, targeting Brazilian professionals working as Product Owners across different sectors and seniority levels. The data collection aims to capture a diverse sample to identify patterns related to exercised soft skills, performed responsibilities, and contextual organizational characteristics. The collected data will be analyzed using both quantitative and qualitative approaches, including frequency analysis, cross-tabulation of variables (such as seniority, sector, and adopted methodologies), and interpretative analysis of open-ended responses, allowing a deeper understanding of the practical performance of the PO role in Brazil.

3.4. Comparative Analysis between SLR, Job Vacancies, and Survey

The comparative analysis represents a future phase of this research and aims to integrate findings from three sources of evidence: (i) the Systematic Literature Review (SLR), (ii) the job vacancy analysis, and (iii) the practitioner survey. This triangulation seeks to identify convergences, divergences, and gaps between what the scientific literature describes, what the industry formally demands, and what professionals report performing in practice. For instance, while the SLR maps the most recurrent soft skills over a 25-year period, it does not detail aspects such as seniority distribution or specific characteristics of the Brazilian context. Similarly, job vacancies may emphasize formal competencies that do not fully reflect everyday professional activities. The comparative analysis will help clarify inconsistencies, complement evidence, and address questions not fully explored by each individual method. Therefore, this phase aims to provide a more integrated and realistic understanding of the Product Owner role, articulating theoretical, industry, and practical dimensions within the socio-technical perspective adopted in this study.

4. Emerging Results

Preliminary findings from the first two stages of this research reveal important patterns regarding the role of soft skills in agile contexts and, more specifically, in the Product Owner (PO) profile. The SLR, covering 25 years of publications (2000–2025), identified 97 primary studies and 33 distinct soft skills associated with agile development environments. Communication, Teamwork, Leadership, Adaptability, and Problem Solving emerge as the most recurrent competencies, suggesting the existence of a consolidated core of interpersonal skills required in agile teams. In particular, Communication stands out with 87 occurrences (89.6%) in the SLR. The analysis also indicates a distinction between stable competencies (e.g., Teamwork and Leadership) and emerging ones (e.g., Adaptability and Knowledge Management), reflecting evolving industry demands. However, despite mapping multiple professional roles, the literature still provides limited role-specific analysis, particularly regarding the Product Owner. Complementing the literature perspective, the analysis of 202 job vacancies for Product Owner positions in the Brazilian industry reinforces the centrality of soft skills. Communication, Analytical Skills, Teamwork, Leadership, and Negotiation are the most frequently demanded competencies. Communication appears in 109 job postings (54.0%), while Analytical Thinking, although less prominent in the literature with only 6 mentions (6.2%) in the SLR, is mentioned in 60 postings (29.7%), indicating a stronger emphasis in industry demands. Notably, no new soft skills

were identified beyond those already discussed in the literature, indicating alignment between academic discourse and industry expectations. At the same time, 40.1% of the vacancies do not clearly specify seniority levels, suggesting structural ambiguity in how organizations define the scope and maturity expectations of the PO role. Together, these preliminary results highlight both convergence and gaps: while there is agreement on a core set of soft skills, uncertainties remain regarding role boundaries, seniority differentiation, and contextual specificities. These aspects will be further explored through the ongoing survey with Brazilian Product Owners, enabling a comparative and triangulated analysis across literature, industry, and professional practice.

5. Expected Contributions

This study aims to contribute both theoretically and empirically to the fields of Information Systems and Software Engineering, particularly regarding human aspects in agile contexts. From a theoretical perspective, the research seeks to deepen the understanding of soft skills specifically associated with the Product Owner role, moving beyond generic approaches that analyze agile teams in aggregate. By integrating evidence from scientific literature, industry data, and professional practice, the study aims to advance the consolidation of a more precise and contextualized socio-technical profile of this role. Empirically, the study provides an overview of the Brazilian industry, highlighting how organizations describe, structure, and demand competencies for the Product Owner position. The comparative analysis across literature, job vacancies, and practitioners' perceptions is expected to reveal convergences, gaps, and potential misalignments between formal expectations and actual professional practice. Finally, the findings are expected to support educators, managers, and professionals in defining curricula, training strategies, and recruitment criteria that are better aligned with contemporary agile development demands.

6. Conclusion

This research design addresses the need to better understand the soft skills associated with the Product Owner role within agile Information Systems development. Although prior studies recognize the importance of interpersonal competencies in agile teams, there remains a lack of integrated evidence that combines literature findings, industry demands, and practitioners' perspectives in a structured and comparative manner. To address this gap, this study proposes a mixed and sequential research strategy based on triangulation across three complementary sources: a 25-year systematic literature review, an empirical analysis of job vacancies in the Brazilian industry, and an ongoing nationwide survey with Product Owners. Preliminary findings indicate convergence around a core set of soft skills, while also revealing ambiguities regarding seniority definitions and role boundaries in professional practice. By integrating theoretical, industry, and practitioner perspectives, this research aims to provide a more comprehensive socio-technical understanding of the Product Owner role and to support future studies, curriculum development, and organizational practices aligned with contemporary agile environments.

Acknowledgments

The authors acknowledge the use of OpenAI's GPT-4 language model to assist with grammatical review and translation of the manuscript. Responsibility for the intellectual content remains solely with the authors.

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