

Agile and Scrum as Adaptive Frameworks for Managing Complexity in Innovation and Entrepreneurship

Virgen, M. (2026). Agile and Scrum as Adaptive Frameworks for Managing Complexity in Innovation and Entrepreneurship. Available at, [Doctors In Business Journal](#).

2026-01-31

ORCID: <https://orcid.org/0009-0006-6170-5532>

The Agile and Scrum framework represents a fundamental shift in how organizations conceive, plan, and execute complex work. Emerging initially within software development, Agile challenged traditional, plan-driven project management approaches that assumed stable requirements and predictable outcomes. Software Development based on Scrum Agile in a distributed development environment plays a pivotal role in the software industry by facilitating software development across geographic boundaries. However, in the past different frameworks utilized to address the challenges like communication and collaboration in scrum agile distributed software development (SADSD) were notably inadequate in transparency, security, traceability, geographically dispersed location work agreements, geographically dispersed teamwork effectiveness, and trust Qureshi, et al., 2024). These deficiencies resulted in delays in software development and deployment, customer dissatisfaction, canceled agreements, project failures, and disputes over payments between customers and development teams Qureshi, et al., 2024). Scrum, as one of the most widely adopted Agile frameworks, operationalized these principles into a structured yet flexible method for organizing work in environments characterized by uncertainty, interdependence, and rapid change.

Scrum is an Agile framework that enables people, teams, and organizations to create value via adaptive solutions for complex work problems. The Scrum framework can be explained via three broad categories: roles, events, and artifacts. The roles are particular to the Scrum team, which involves team members (developers), a product owner, and a Scrum master (Lawong, et al., 2025). This paper provides an explanation of the Agile and Scrum framework, situating it within broader theoretical discussions in management, entrepreneurship, and organizational studies. It argues that Agile and Scrum should be understood not merely as project management techniques, but as adaptive organizational frameworks that enable learning, coordination, and value creation under conditions of complexity.



Intellectual Origins and Theoretical Foundations of Agile and Scrum

The intellectual foundations of Agile and Scrum draw from diverse traditions, including systems theory, organizational learning, and complexity science. Early critiques of waterfall-style development models highlighted the limitations of linear planning in environments where customer needs and technological possibilities evolve continuously. These critiques resonated with broader organizational theories that questioned the effectiveness of hierarchical control in dynamic contexts.

Scrum's conceptual roots can also be traced to empirical studies of high-performing teams, particularly research that emphasized cross-functional collaboration, self-organization, and iterative progress. From a theoretical standpoint, Agile aligns closely with the notion of organizations as complex adaptive systems, where outcomes emerge from interactions rather than from centralized design. This perspective challenges mechanistic views of management and supports more decentralized, learning-oriented forms of coordination.

Core Philosophy and Logic of the Agile Framework

The core philosophy of Agile centers on adaptability, customer value, and continuous improvement. Rather than attempting to fully specify requirements upfront, Agile assumes that understanding evolves through action and feedback. This assumption reflects a constructivist epistemology, where knowledge is generated through engagement with real-world conditions rather than abstract prediction.

Scrum operationalizes this philosophy by structuring work into short, time-bound cycles that facilitate frequent inspection and adaptation. These cycles create regular

opportunities for teams to reassess priorities, incorporate feedback, and adjust their approach. In doing so, Scrum balances flexibility with discipline, providing enough structure to coordinate work while preserving the capacity to respond to change.

Scrum as a Socio-Technical Framework

From an organizational perspective, Scrum functions as a socio-technical framework that integrates human interaction with process design. It emphasizes clear roles, shared goals, and transparency, fostering a collective sense of ownership and accountability. Teams are encouraged to self-organize around tasks, leveraging diverse skills and perspectives to solve problems collaboratively.

This emphasis on self-organization aligns with theories of intrinsic motivation and empowerment, which suggest that autonomy and mastery enhance performance in knowledge-intensive work. By reducing reliance on top-down control, Scrum enables faster decision-making and greater responsiveness. At the same time, the framework's emphasis on regular reflection supports organizational learning and continuous improvement.

Agile and Scrum in Innovation and Entrepreneurship

Students may struggle to apply Scrum in real world projects due to a gap between theoretical instruction and practical application. Therefore, it is essential to combine disciplinary didactics with professional didactics, as framed by activity theory, in order to enhance the ability to effectively implement Scrum in real world projects (Gannar, et al., 2025). Agile and Scrum have become central frameworks in entrepreneurship and innovation, particularly in digital and technology-driven ventures. Startups operate under extreme uncertainty, where both the problem and the solution are often unclear. Agile provides a structured way to navigate this uncertainty by enabling rapid experimentation and iterative development.

In entrepreneurial contexts, Scrum complements frameworks such as the Lean Startup and the Minimum Viable Product by providing a disciplined execution model for experimentation. While lean approaches focus on learning and validation, Scrum addresses the practical challenge of coordinating work within small, resource-constrained teams. This integration has reshaped how ventures develop products, engage customers, and scale operations.

Strategic Implications of Agile and Scrum

Scrum is an Agile framework that enables people, teams, and organizations to create value via adaptive solutions for complex work problems. The Scrum framework can be explained via three broad categories: roles, events, and artifacts. The roles are particular to the Scrum team, which involves team members (developers), a product owner, and a Scrum master (Lawong, et al., 2025). Beyond project execution, Agile and Scrum have significant strategic implications. Traditional strategy models often rely on long-term planning and stable competitive assumptions. In contrast, Agile

supports a strategy-as-learning perspective, where strategic direction emerges through ongoing experimentation and feedback.

Organizations that embed Agile principles at the strategic level can enhance their dynamic capabilities, particularly their ability to sense changes in the environment and respond effectively. Scrum's emphasis on transparency and prioritization also facilitates alignment between strategic intent and operational execution. This alignment is critical in complex organizations where miscommunication and inertia can undermine strategic initiatives.

Methodological Applications in Research and Education

With the increasing adoption of agile methodologies in distributed software development teams, there is a need to adapt these practices for large-scale environments. However, the lack of specific guidance can make this process difficult. With the growing popularity of agile methodologies, there is an increasing need to adapt them to suit the specific needs of distributed teams operating in large-scale contexts (Camara, et al.,2024). In academic research, Agile and Scrum are frequently examined through qualitative methodologies such as case studies, ethnography, and action research. These approaches are well-suited to capturing the iterative, social, and emergent nature of Agile practices. Scholars have used Scrum as a lens to study team dynamics, knowledge sharing, and organizational change.

Agile has also influenced pedagogy in business and engineering education. Experiential learning models grounded in Scrum encourage students to engage with real problems, collaborate in teams, and reflect on their learning processes. From a research standpoint, these educational settings provide valuable opportunities to study how Agile frameworks shape cognition, behavior, and performance.

Critiques and Limitations of the Agile and Scrum Framework

Despite its widespread adoption, the Agile and Scrum framework has attracted substantial critique. One concern is that organizations often adopt Agile superficially, focusing on rituals and terminology while retaining hierarchical control structures. Such implementations risk undermining the core principles of self-organization and adaptability.

Another limitation involves scalability and contextual fit. While Scrum works well for small, cross-functional teams, its effectiveness in large, highly regulated, or safety-critical environments remains contested. Additionally, the emphasis on short-term iteration may conflict with long-term architectural planning and strategic coherence. These critiques highlight the importance of adapting Agile principles to organizational context rather than applying them rigidly.

Agile and Scrum in Contemporary Organizational Theory

In contemporary organizational theory, Agile and Scrum reflect a broader movement toward flexible, networked, and learning-oriented forms of organizing. They challenge traditional command-and-control models by emphasizing trust, transparency, and collaboration. As such, they align with emerging research on agile organizations, ambidexterity, and continuous transformation.

For scholars, Agile provides a rich empirical setting for exploring how organizations manage complexity and uncertainty. For practitioners, Scrum offers a pragmatic framework for translating abstract principles of agility into daily practice.

Conclusion: Agile and Scrum as Frameworks for Adaptive Organizing

This paper has argued that Agile and Scrum should be understood as adaptive frameworks for managing complexity in innovation and entrepreneurship. Rooted in interdisciplinary theory and refined through practice, they enable organizations to learn, coordinate, and create value in uncertain environments. While Agile and Scrum are not universal solutions and must be applied thoughtfully, their core contribution lies in reframing management as an ongoing process of learning and adaptation. In an era of rapid change and increasing complexity, this reframing represents a profound and enduring shift in how organizations approach work, strategy, and innovation.

Keywords:

Agile Scrum framework explained academic, Agile methodology in entrepreneurship and innovation research, Scrum framework organizational agility scholarly review, Agile project management theory and practice, Agile Scrum for complex adaptive systems

References:

Camara, R., Marinho, M., (2024). Agile tailoring in distributed large-scale environments using agile frameworks: A Systematic Literature Review. CLEI. DOI: <https://doi.org/10.19153/cleiej.27.1.8>

Gannar, S., & Chiraz, B. K. (2025). Difficulties revealed in the teaching-learning process of scrum. *Social Sciences & Humanities Open*, 11, 101357. <https://doi.org/10.1016/j.ssaho.2025.101357>

Lawong, D. A., Akanfe, O., & Lawong, D. A. (2025). Overcoming team challenges in project management: The scrum framework. *Organizational Dynamics*., 54(1). <https://doi.org/10.1016/j.orgdyn.2024.101073>

Qureshi JN, Farooq MS (2024) ChainAgile: A framework for the improvement of Scrum Agile distributed software development based on blockchain. PLoS ONE 19(3): e0299324. <https://doi.org/10.1371/journal.pone.0299324>

ORCID: <https://orcid.org/0009-0006-6170-5532>

Virgen, M. (2026). Agile and Scrum as Adaptive Frameworks for Managing Complexity in Innovation and Entrepreneurship. Available at, [Doctors In Business Journal](#).