

Agile project management application and business performance in e-commerce industry

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ISSN: 2243-7770

Online ISSN: 2243-7789

OPEN ACCESS

Received: 17 June 2026

Available Online: 31 August 2026

Revised: 22 August 2026

DOI: 10.5861/ijrsm.2026.26108

Accepted: 29 August 2026

Abstract

E-commerce project management is challenging since the development of e-commerce systems is extremely rapid. These environments offer little predictability or stability. This presents project managers with a variety of competing demands. Companies need to develop systems within a variable and rapidly changing environment. This study examines agile project management (APM) in the context of China's e-commerce industry. It evaluates APM and analyzes how this methodology impacts the timeliness and quality of product delivery, and the overall efficiency of the product development process, and evaluates businesses in terms of revenue growth, the ability to respond to changing customer needs, and their overall innovation. The study examines the existing literature to determine if there is a significant relationship between APM and business performance. Based on the findings from the research, a plan to enhance business performance via agile methods was developed. The research used a quantitative descriptive research design with a structured questionnaire to collect data from e-commerce firms in China. The tool included the three aspects of agile project management and the three aspects of business performance and used a four-point Likert scale. The internal consistency of all six dimensions was acceptable. Ranging from 0.701 to 0.798, Cronbach's alpha was used. To measure the effectiveness of agile project management and the level of business performance, the weighted mean and ranking methods were used. Since the results of the Shapiro-Wilk test indicated that the data were not normally distributed, Spearman's rho was used to evaluate the relationships among the study variables. SPSS version 28 was used for the statistical analysis. Results indicate that across all included studies, agile project management, in general, scored a 3.50. Project management contributed to the rating with Product Development Efficiency scoring a 3.53, Product Quality scoring a 3.51 and Product Delivery scoring a 3.46. Business performance scored a 3.50. Market Responsiveness and Innovation performance scored a 3.51 with the remaining scores a 3.49 (Revenue Growth). Despite positive ratings, the correlation analysis showed no statistically meaningful

relationships between the dimensions of agile project management and business performance. This most likely means it is equally as challenging for organizations to develop business performance when employing agile practices. Some recommendations include focusing on product delivery with product quality and development with revenue growth, market responsiveness and innovation expectation. This specifically looks at the areas of product delivery and product quality, development with revenue growth, market responsiveness and innovation performance in e-commerce.

Keywords: agile project management, business performance, e-commerce, product development efficiency

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1. Introduction

After the popularization of mobile Internet and the rapid development of the e-commerce industry, software development projects have entered a new era, characterized by variability, uncertainty, complexity, and ambiguity. Therefore, software development projects face shorter online timelines, more user needs, and higher experience requirements. For e-commerce R&D teams, it is necessary to leave room for trial and error, take small steps, and continuously iterate software development projects.

In the dynamic and unpredictable landscape of market and demand fluctuations, managing software development projects requires methodologies that are both adaptable and efficient. Agile project management has emerged as a crucial approach in this context, enabling teams to deliver value rapidly and respond flexibly to changes. This flexibility is vital in enhancing strategic fault tolerance, reducing resource waste, and ultimately improving business performance. Agile methods, such as Scrum and Kanban, emphasize iterative development, continuous feedback, and adaptive planning, which are essential in environments characterized by uncertainty and rapid change (Schwaber & Sutherland, 2017). These methodologies allow organizations to pivot quickly in response to market demands, thereby maintaining a competitive edge. E-commerce, as a critical channel in modern business, has become deeply intertwined with corporate performance. It has transformed how businesses operate by expanding market reach, enhancing transaction efficiency, and enabling precision marketing through sophisticated data analysis (Laudon & Traver, 2020). Companies that effectively leverage e-commerce platforms can quickly respond to shifting market demands and optimize supply chain management, leading to significant improvements in performance and profitability. The integration of agile methodologies within e-commerce strategies further amplifies these benefits, allowing businesses to not only keep pace with market changes but to also capitalize on them through enhanced flexibility and responsiveness (Serrador & Pinto, 2015). This synergy between agile project management and e-commerce practices underscores the importance of adopting adaptive frameworks in the pursuit of sustained business growth.

The target respondents for this study were employees of e-commerce companies across China. As one of the largest and most dynamic e-commerce markets in the world, the Chinese e-commerce industry is a key area to examine the impact of agile project management on business performance. These respondents are involved in all aspects of e-commerce operations and face the challenges of rapidly changing market demands and consumer expectations. In this context, the importance of agile project management is obvious. Chinese e-commerce companies operate in a highly competitive environment, and the ability to quickly deliver value and adapt to changes in consumer behavior is critical. However, many of these companies struggle with strategic error tolerance, resource optimization, and maintaining high levels of performance under uncertainty. By studying their experiences, this study aims to determine how agile methods can address these issues, thereby improving their overall business performance and enabling them to thrive in a fast-paced market.

Despite the widespread adoption of agile project management in various industries, research gaps remain in understanding its specific impact on business performance, particularly in the rapidly evolving e-commerce sector in China. Existing studies often focus on the technical aspects of agile methodologies but overlook how these practices translate into tangible business outcomes, such as revenue growth and market responsiveness. This study addresses these gaps by exploring how agile project management can enhance strategic flexibility and reduce resource waste in Chinese e-commerce companies. The rationale for this research stems from the need to provide practical insights that can help these companies navigate the complexities of a highly competitive market. Personally, this study is important to me as it bridges my interest in innovative management practices with the practical challenges faced by businesses in a fast-paced digital economy. My goal is to contribute to the body of

knowledge by offering actionable strategies that can be implemented to achieve sustained business success.

Objectives of the study - This study aims to assess agile project management application to business performance in E- Commerce industry in China. Specifically, it seeks to determine the effectiveness of agile project management in terms of product delivery, product quality, and product development efficiency; assess the company's business performance in terms of revenue growth, market responsiveness, and innovation performance; very high, high, moderate, low; test the significant relationship between agile project management application and business performance; and propose a plan of action to improve the application of agile project management to enhance business performance.

2. Methods

Research Design - The basic research idea is: first, through a large amount of literature analysis, the theoretical basis and conceptual representation of agile methods and traditional project management are established; the different characteristics and advantages and disadvantages of traditional business models and e-commerce models in business performance. Then, through questionnaire surveys, relevant existing problems are discovered, and feedback is provided based on comparative data; then, qualitative analysis methods are used to analyze the advantages of agile project management and business performance in e-commerce based on actual conditions. And empirical analysis and summary are conducted.

Participants of the Study - E-commerce enterprises and the innovative businesses involved have certain uncertainties. Businesses need to develop rapidly. When the right growth point is not found, they need to keep trying and respond to various changes. This greatly increases the uncertainty of market competition and user needs. Therefore, in terms of project management, it is necessary to help e-commerce enterprises develop and respond quickly in order to seize a place in the fierce market competition. For the improvement of business performance, the development and application of e-commerce should also be considered. How to do our best to develop the e-commerce market, e-commerce marketing, shorten the supply chain, and maximize business performance as much as possible. This study mainly conducts a questionnaire survey on the agile development projects and business performance of e-commerce enterprises to find out the existing problems.

Instruments - In order to achieve the above research objectives, a detailed questionnaire was designed, which is divided into two main parts. Utilization of Agile Project Management: Covering three aspects: product delivery, product quality and product development efficiency. Respondents scored each question according to the actual situation (4 = strongly agree / highly effective, 3 = agree / moderately effective, 2 = disagree / effective, 1 = strongly disagree / ineffective) (Mishra, Mishra, & Ostrovska, 2016). Company's business performance: Evaluate the company's performance in revenue growth, market responsiveness and innovation performance, also scored on a 4-point scale (4 = strongly agree / excellent performance, 3 = agree / moderate performance, 2 = disagree / average performance, 1 = strongly disagree / poor performance). The data gathering instrument was approved by the university's ethics review committee and has undergone a reliability test. Table 1 shows the reliability results.

Table 1
Reliability Test

Indicators	No. of Items	Cronbach Alpha	Remarks
Product delivery	5	0.737	Acceptable
Product quality	5	0.707	Acceptable
Product development efficiency	5	0.798	Acceptable
Revenue growth	5	0.716	Acceptable
Market responsiveness	5	0.701	Acceptable
Innovation performance	5	0.713	Acceptable

George and Mallery (2003) provide the following rules of thumb: “_ > .9 – Excellent, _ > .8 – Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor, and _ < .5 – Unacceptable”

Procedure - Conduct a questionnaire survey on the quality standards of the company's current project management and business performance. Find the existing problems and analyze the questionnaire results. The

purpose is to find the existing problems and provide corresponding solutions. (Xiuying, Ma, 2021) Based on the problems analyzed, make judgments, use external forces to propose the reasons that may cause problems during project implementation, and summarize them to get the root causes. How to analyze data and summarize experience for Agile project management in terms of product delivery, product quality, and product development efficiency; assess the company's business performance in terms of revenue growth, market responsiveness, and innovation performance; test the significant relationship between agile project management application and business performance; and propose a plan of action to improve the application of agile project management to enhance business performance.

Ethical Considerations - Prior to the actual conduct of the survey, all respondents were informed of the purpose and intent of the study. Furthermore, they are assured that the information obtained will be kept strictly confidential and will be used only for academic research purposes or to solve relevant problems. It will not be leaked to the outside world. And provide relevant confidentiality agreements.

Data Analysis - Weighted mean and rank were used to determine the effectiveness of Agile project management in terms of product delivery, product quality, and product development efficiency; assess the company's business performance in terms of revenue growth, market responsiveness, and innovation performance. The result of Shapiro-Wilk Test showed that p-values of all variables were less than 0.05 which means that the data set was not normally distributed. Therefore, Spearman rho was used as part of the non-parametric tests to determine the significant relationship. All analyses were performed using SPSS version 28.

3. Results and discussion

Table 2

Summary Table on Effectiveness of Agile Project Management

Key Areas	Composite Mean	VI	Rank
Product Delivery	3.46	Effective	3
Product Quality	3.51	Highly Effective	2
Product Development Efficiency	3.53	Highly Effective	1
Grand Composite Mean	3.50	Highly Effective	

Legend: 3.50-4.00=Highly Effective; 2.50-3.49=Effective; 1.50-2.49=Moderately Effective; 1.00-1.49=Not Effective

Table 2 presents summary on Effectiveness of Agile Project Management. The composite mean of 3.50 reveals its highly effectiveness. The highest-ranked key area is "Product Development Efficiency," with a Weighted Mean (WM) of 3.53 and a verbal interpretation of "Highly Effective." This ranking suggests that Agile Project Management has been particularly successful in improving product development efficiency within the organization. The high effectiveness rating is likely due to Agile's emphasis on iterative development, continuous feedback, and focus on delivering value quickly. Agile practices such as Scrum and Kanban encourage teams to break down projects into manageable increments, which allows for more efficient use of resources and time. By reducing the likelihood of rework and ensuring that development efforts are consistently aligned with user needs, Agile methodologies help streamline the development process, making it more responsive and adaptive to change. The "Highly Effective" rating indicates that these practices have significantly enhanced the efficiency of product development, leading to faster delivery of high-quality products. Supporting this analysis, a study by Dingsøyr, Nerur, Balijepally, and Moe (2012) found that Agile methodologies contribute significantly to improving development efficiency by facilitating better planning, reducing waste, and ensuring that development activities are more closely aligned with customer needs. Additionally, research by VersionOne (2019) in their annual State of Agile Report consistently highlights that improved project visibility and productivity are among the top benefits reported by organizations adopting Agile, further confirming the effectiveness of Agile practices in enhancing development efficiency.

The lowest-ranked key area is "Product Delivery," with a WM of 3.46 and a verbal interpretation of "Effective." Despite being ranked lowest, the "Effective" rating indicates that Agile Project Management has still positively impacted product delivery, although not as strongly as in other areas. This slightly lower ranking may suggest that

while Agile practices have improved the frequency and consistency of product deliveries, challenges remain in fully optimizing the delivery process. These challenges could include coordination across teams, managing dependencies, and ensuring that all aspects of the delivery process are as streamlined as the development process. Additionally, the complexity of integrating Agile practices into existing delivery frameworks might slow down the realization of full benefits in this area.

This interpretation aligns with findings by Serrador and Pinto (2015), who noted that while Agile methodologies can significantly enhance certain aspects of project delivery, the overall impact on delivery timelines can be variable depending on how well Agile practices are integrated and supported within the organization. Similarly, Cohn (2010) pointed out that achieving the full benefits of Agile in product delivery often requires overcoming substantial organizational and cultural barriers, which can explain why improvements in this area might be less pronounced than in development efficiency.

Table 3

Summary Table on Company's Business Performance

Key Result Areas	Composite Mean	VI	Rank
Revenue Growth	3.49	Performing	3
Market Responsiveness	3.51	Highly Performing	1.5
Innovation Performance	3.51	Highly Performing	1.5
Grand Composite Mean	3.50	Highly Performing	
Legend: 3.50-4.00=Highly Performing; 2.50-3.49=Performing; 1.50-2.49=Moderately Performing; 1.00-1.49=Not Performing			

Table 3 presents summary on Company's Business Performance. The composite mean of 3.50 reveals its high performance. The highest-ranked areas are "Market Responsiveness" and "Innovation Performance," both with a Weighted Mean (WM) of 3.51 and a verbal interpretation of "Highly Performing." The equal ranking of Market Responsiveness and Innovation Performance indicates that these two areas are perceived as the most significant contributors to the company's overall business success. "Market Responsiveness" likely received a high ranking because of the company's ability to effectively adapt to market demands, gather customer feedback, and respond with relevant products and services. In today's fast-paced market, companies that can quickly react to changes in customer preferences and market trends are better positioned to maintain competitive advantage and ensure sustained growth. Similarly, "Innovation Performance" is critical, as continuous innovation is essential for maintaining relevance in the market, meeting evolving customer needs, and staying ahead of competitors. The high rating in this area suggests that the company has been successful in implementing innovation strategies that drive business performance. Supporting this analysis, a study by Teece, Pisano, and Shuen (1997) emphasizes the importance of dynamic capabilities, such as market responsiveness, in helping companies adapt to changing environments and achieve sustained competitive advantage. Additionally, Schilling (2017) highlights the crucial role of innovation in business performance, arguing that companies that invest in innovation are more likely to experience long-term success due to their ability to meet new customer needs and differentiate themselves from competitors.

The lowest-ranked area is "Revenue Growth," with a WM of 3.49 and a verbal interpretation of "Performing." Although "Revenue Growth" is still rated as "Performing," its lower ranking relative to the other areas suggests that there may be challenges in translating the company's market responsiveness and innovation efforts directly into significant revenue increases. This could indicate that while the company is doing well in adapting to market changes and innovating, these efforts have not yet fully translated into substantial financial returns. Factors such as market saturation, pricing strategies, or the time lag between innovation and revenue realization could contribute to this lower rating. The "Performing" rating indicates that while the company is growing, there may be opportunities to further optimize its revenue generation strategies. This interpretation aligns with findings by Porter (1996), who argued that while innovation and market responsiveness are critical, companies must also have strong revenue models and strategies to effectively monetize their efforts. Additionally, a study by Christensen (1997) on the innovator's dilemma suggests that even when companies are highly innovative, they can struggle to achieve immediate revenue growth due to the disruptive nature of new technologies or business models, which may take

time to be fully embraced by the market.

Table 4

Relationship Between Agile Project Management Application and Business Performance

Variables	rho	p-value	Interpretation
Product Delivery			
Revenue Growth	-0.031	0.662	Not Significant
Market Responsiveness	0.013	0.855	Not Significant
Innovation Performance	0.019	0.791	Not Significant
Product Quality			
Revenue Growth	0.021	0.769	Not Significant
Market Responsiveness	-0.043	0.544	Not Significant
Innovation Performance	-0.042	0.551	Not Significant
Product Development Efficiency			
Revenue Growth	0.012	0.864	Not Significant
Market Responsiveness	0.037	0.603	Not Significant
Innovation Performance	-0.013	0.851	Not Significant

Significant at p-value < 0.01

The highest correlation, though still “Not Significant,” is between “Product Development Efficiency” and “Market Responsiveness” with a rho value of 0.037 and a p-value of 0.603. This result suggests a slight positive relationship between product development efficiency and market responsiveness, implying that as product development becomes more efficient, the company might respond slightly better to market demands. However, the relationship is not statistically significant, indicating that the improvement in development efficiency may not directly translate into enhanced market responsiveness. This could be due to various factors such as market conditions, customer expectations, or the complexity of translating development speed into market-ready products. This finding aligns with research by Schilling (2017), which suggests that while efficient development processes are crucial, they must be coupled with strong market alignment to effectively enhance responsiveness. Similarly, Tidd and Bessant (2013) emphasize that innovation alone isn’t enough; it must be properly managed and aligned with market needs to impact performance significantly.

The lowest correlation is between “Product Delivery” and “Revenue Growth” with a rho value of -0.031 and a p-value of 0.662, indicating a slight negative but insignificant relationship. This suggests that improvements in product delivery do not necessarily lead to revenue growth. The negative correlation, though not significant, may imply that other factors, such as market conditions or product-market fit, play a more critical role in driving revenue than merely improving delivery efficiency. This interpretation is supported by Cooper (2019), who argues that while delivery efficiency is essential, revenue growth often depends more on product innovation and market positioning. Additionally, Christensen (1997) highlights that disruptive innovations, rather than incremental improvements in delivery, often lead to substantial revenue growth.

Table 5

Proposed Plan of Action to Enhance Business Performance through Agile Project Management

Key Result Areas	Strategy/ Activities	Objectives	Expected Outcome	Person/ Work Units Involved
Application of Agile Project Management in Product Delivery	Adoption of agile project management methodologies such as Scrum to improve the product delivery process.	Improve product delivery timelines, reduce delays, and ensure that products meet customer expectations more effectively.	Faster product delivery cycles, reduced issues related to delivery delays and resource insufficiency, improved customer satisfaction.	Project management teams, IT R&D departments.
Application of Agile Project Management in Product Quality	Implement continuous code review, regular unit and integration testing, frequent user feedback, and iterative improvements.	Enhance product quality by identifying and resolving defects early in the development process.	Higher quality products with fewer defects, better user experience, improved reliability and performance of products.	Quality assurance teams, development teams, product management teams.

Application of Agile Project Management in Product Development Efficiency	<i>Streamline communication between marketing and R&D departments, reduce redundant communication, and focus on value delivery.</i>	<i>Increase efficiency in the product development process, reduce R&D rework and cycle time, improve overall productivity.</i>	Enhanced collaboration, more efficient meetings, clearer documentation, reduced development time, improved efficiency in delivering product features.	Marketing teams, R&D teams, product management teams.
Company's Business Performance in terms of Revenue Growth	<i>Invest in new product and service development, improve internal operational efficiencies, and optimize processes.</i>	<i>Drive revenue growth by meeting customer needs promptly, and by improving product and service offerings.</i>	Positive impact on revenue growth, enhanced capability to meet customer demands, and improved operational efficiency leading to better financial performance.	Executive management, finance department, product development teams.
Company's Business Performance in terms of Market Responsiveness	<i>Collect and respond to market feedback effectively, improve communication of needs between the company and customers.</i>	<i>Increase the company's responsiveness to market changes, improve customer satisfaction.</i>	Positive market feedback, improved ability to meet customer needs, enhanced market competitiveness.	Marketing teams, customer service departments, product development teams.
Company's Business Performance in terms of Innovation Performance	<i>Continuous innovation in products and services, efficient implementation of innovation projects.</i>	<i>Enhance the company's innovation capabilities, speed up the market introduction of innovative solutions.</i>	Improved innovation performance, increased market shares due to innovative products, efficient execution of innovation projects.	R&D departments, innovation teams, executive management.

4. Conclusion and recommendations

Based on the findings of the study, the following conclusions were drawn: Agile project management is highly effective as applied to product delivery, product quality, and product development efficiency. The business is highly performing as assessed in terms of revenue growth, market responsiveness, and innovation performance. There is no significant relationship between agile project management applications and business performance. A plan of action to improve the application of agile project management to enhance business performance was proposed. The following were recommended based on the result: Analyze the actual situation of different companies, provide different agile project management methods. Professional training and use of professional agile project management tools and technologies. Invest in the development of new products and services. This will help capture new market opportunity and drive revenue growth. Respond to market changes as soon as possible. Use agile project management to speed up the development of innovative products. E-Commerce companies may review and validate the proposed action plan to apply agile project management to enhance business performance. Future research could explore the long-term impact of agile practices on innovation, compare agile with traditional methods in e-commerce, and examine technology's role in agile project management.

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