

THE ROLE OF ARTIFICIAL INTELLIGENCE IN DECISION- MAKING AND INNOVATION IN PRODUCT DEVELOPMENT: A SYSTEMATIC LITERATURE REVIEW

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Abstract: Artificial intelligence is changing how organizations develop products and make decisions. This literature review shows that AI is now a key driver for innovation and efficiency in product management. Companies use AI tools to improve every stage of the product lifecycle, from idea creation to final delivery and ongoing updates. AI helps managers analyze large sets of data, predict market trends, and speed up decision processes. Instead of replacing people, AI often supports human work by allowing teams to solve complex problems and test new ideas faster. However, successful AI adoption depends on quality data, organizational readiness, and clear strategies. Main challenges include technical questions, data trust, ethical issues, and staff training. Best practices highlight the importance of combining human expertise with AI tools, using agile methods, and developing transparent, responsible systems. Research gaps remain in understanding AI's long-term effects, especially in non-digital sectors and on employee motivation. This review provides a structured overview of trends, challenges, and future research directions for AI in product management and decision-making.

Keywords: Artificial intelligence, product management, decision-making, organizational transformation, digital transformation.

Review paper

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1. Introduction

Artificial intelligence (AI) is now a central force in product development and decision-making. It helps companies change their business models, speed up innovation, and make better decisions. With more available data and new algorithms, organizations use AI to improve every product's lifecycle step, from the first idea to design, launch, and further updates (Witkowski & Wodecki, 2024b). Many trends show AI does not replace people but makes their work easier, allowing teams to solve complex tasks faster and with more precision. AI supports innovation by collecting and analyzing data, suggesting improvements, or making prototypes, but humans still make the final decisions using their expertise and intuition (Johnson et al., 2022).

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Researchers focus a lot on the challenges of putting AI into real business. Main problems are getting and keeping good data, having enough technical knowledge, building trust, and making clear strategies. Success is measured by how AI affects innovation, efficiency, time-to-market, customer satisfaction, and business results (Witkowski & Wodecki, 2024b). Studies also show managers now need new skills and a flexible, cross-disciplinary approach, since they often mix intuition and data from AI to make decisions. It is also important to create knowledge models and training programs for using AI in every part of product management (Witkowski & Wodecki, 2024b).

This systematic literature review aims to give a clear overview of key theories and practical findings about using AI in product management and decision processes. It shows current trends, challenges, and success factors, and points out knowledge gaps that suggest new research areas. Questions include: How is AI used in product development and decision processes? What are the main challenges, benefits, and success factors? How are manager roles and required skills changing with digital transformation? What needs more research (Olsson & Bosch, 2024)?

AI is now key for making product management faster and more innovative. It can automate market analysis, suggest new features, predict product performance, and help teams organize work better (Olsson & Bosch, 2024; Parikh, 2023; Witkowski & Wodecki, 2024a). AI also brings up questions about trust in algorithmic recommendations and the right balance between automation and human input. Hybrid management models where AI and people work together are appearing more often in successful companies (Olsson & Bosch, 2024; Witkowski & Wodecki, 2024b).

The main goal of this paper is to map important knowledge, practical cases, and recommended actions for using AI in product innovation and decision-making, all based on current scientific articles and real-world evidence. This review uses the guidelines by Xiao and Watson (2019) to keep the process transparent and reliable for academic research.

Each chapter has a clearly defined role with the aim of providing the reader with a systematic and transparent overview of the most important aspects of AI's role in decision-making and innovation in product development. The first chapter, in addition to the theoretical basis and motivation for the research, sets out the research questions and the framework of the reviewed literature. The second chapter describes in detail the methodology of the systematic review, including criteria for the selection of papers, search strategies, as well as the flow of selection and quality assessment of sources.

The third chapter provides an analysis and synthesis of the most relevant results, clearly grouped by thematic units that reflect key areas: the application of AI in product development processes, implementation challenges and identified benefits. The fourth chapter is dedicated to the discussion, where the results are compared with previous researches and the theoretical and practical contributions, as well as identified gaps in the current literature, are apostrophized. In the conclusion of the paper, summarized answers to defined research questions are presented, the most important practical implications are highlighted and directions for further scientific research are suggested.

2. Research methodology

This paper uses a systematic literature review to analyze the role of artificial intelligence in product management and decision-making. The review was carried out using guidelines from Xiao and Watson (2019), which help ensure transparency, reliability, and scientific rigor.

Academic databases Web of Science (WoS), Scopus, and AIS eLibrary were selected for the literature search. The main search terms were “artificial intelligence” and “product

management.” The search focused on recent publications from 2019 to 2025, covering journal articles, conference papers, and book chapters. In total, 82 papers were first found in Scopus, 39 in WoS, and 24 in AIS eLibrary. After setting criteria for scientific quality, relevance, and article type, 65 Scopus papers, 23 WoS papers, and 22 AIS eLibrary papers were kept.

In the next step, title and abstract screening was done to select works that match the research goals. A total of 25 Scopus articles, 9 WoS articles, and 7 from AIS eLibrary were chosen for full-text analysis. Each paper’s quality and direct focus on AI in product management were checked, and after removing duplicates and non-relevant texts, 18 top-quality works were chosen as the main review corpus.

To ensure coverage and depth, backward and forward citation searches were also used. Backward search looked at references in selected papers and added important older works in the field. Forward search added new papers that cited the review’s core literature. This process added 9 more relevant articles and case studies.

A final total of 27 works were included and analyzed using a thematic and narrative approach. Results were grouped by main research themes: AI in product development, decision-making, practical challenges, benefits, and case studies. Every stage of analysis was documented to keep the process repeatable and transparent, as recommended by Xiao and Watson (2019).

3. Results

Artificial intelligence is now essential for product management and decision-making. Companies use AI to improve almost every part of product development: creating ideas, designing prototypes, running tests, and launching products. AI helps teams analyze big datasets, predict market needs, and automate routine tasks. The biggest advantage of AI is that it allows organizations to innovate faster and be more competitive. For example, in software, manufacturing, and logistics, AI enables better planning, flexibility, and real-time problem-solving. Modern approaches combine AI systems with human expertise, so both can work together to solve complex problems and make better decisions (Witkowski & Wodecki, 2024b; Johnson et al., 2022).

Main research shows that AI supports managers by giving clear insights, helping with quick and data-driven choices, and making organizations more adaptive. However, there are challenges such as quality of data, trust in AI recommendations, ethical questions, and need for strong employee training (Gupta et al., 2023; Khan et al., 2025). Success with AI depends on good data, agile workflows, skilled teams, and open cooperation between departments. The best results come from organizations that focus on both technical innovation and people, creating hybrid teams, using iterative methods, and keeping everyone trained.

Recent studies highlight new AI trends like generative models, digital twins for simulations, and predictive analytics. These technologies can personalize customer experiences and make product launches smoother. Still, there are limits to AI’s impact, especially in traditional industries or where data is incomplete. Responsible AI practices, transparency, and regular review of decisions are key to building trust and long-term success (Maurya et al., 2024; Witkowski & Wodecki, 2024a).

3.1. The role of AI in product development

AI is now a main driver of innovation in product development. Organizations use AI in every stage of a product’s lifecycle, starting from idea creation, design, testing, launch, and ongoing updates. AI makes it possible to analyze large amounts of market and user data very fast, which helps teams find new opportunities and design better products. Generative AI has a

strong impact on speeding up idea generation, supporting validation during design, and improving product features based on user feedback (Witkowski & Wodecki, 2024a; Gupta et al., 2023). Similarly, AI in digital marketing enables precise segmentation and personalization of offers, improving customer experience in the early stages of product development (Marić et al., 2024).

Instead of just automating routine tasks, AI tools and systems often work alongside human experts. Hybrid approaches mean AI collects and interprets data and gives suggestions, but final decisions and creative choices are still made by people combining intuition and data (Johnson et al., 2022). AI enables flexible processes and experimentation, such as simulating new features or virtual testing with digital twins, to predict product performance and market success (Roman et al., 2025). Multilayer Perceptron (MLP) network hyperparameter optimization improves product performance prediction accuracy, with MSE=0.012 in optimal configurations (Petkovski, 2025).

AI benefits go beyond just the design phase. In manufacturing and logistics, predictive analytics help with resource planning, cost reduction, and boosting sustainability through smarter supply chains (Khan et al., 2025). Platforms using AI support teamwork and sharing knowledge, helping multi-disciplinary teams be more innovative and efficient (Witkowski & Wodecki, 2024a).

For success, companies need high-quality data, digital skills, and open collaboration. AI systems also require careful oversight to ensure transparency and trust in their recommendations. As AI spreads across more sectors, responsible use, ongoing staff training, and agile management models become key for lasting innovation in product development (Maurya et al., 2024; Kanbach et al., 2024).

3.2. The role of AI in product development

AI is transforming how managers make decisions in product management. Companies use AI tools to analyze big data, find important trends, and predict market changes. This helps managers react quickly and lower the risks in business. AI lets teams study customer feedback, market signals, and performance results in real time so they can make better and faster decisions (Bervar & Bertoncel, 2025; Sharma & Gonaygunta, 2023). In Serbian companies, neural networks enable factor efficiency analysis, reducing risk in product decisions (Lukić et al., 2022).

The strongest outcomes happen when people work together with AI. Managers use both AI recommendations and their own professional experience when making important choices. This “human-in-the-loop” method keeps decision-making flexible and reliable, especially when the data has gaps or is unclear (Bervar & Bertoncel, 2025; Parikh, 2025).

Organizations still face some problems, such as making sure data is high quality and trustworthy, understanding ethical issues, and explaining AI logic to non-technical staff. It is also important to keep communication clear between technical experts and business teams. To solve these challenges, companies use regular staff training and have strict rules for checking AI advice before following it (Gupta et al., 2023; Khan et al., 2025).

Table 1 shows the main advantages, but also the key challenges that organizations face during the application of AI in the decision-making process. The presentation provides a quick insight into the balance between advantages and potential obstacles indicated by contemporary literature.

Table 1. Advantages and challenges of applying artificial intelligence in the decision-making process

Advantages of AI in decision-making	Challenges and Limitations of AI in Decision Making	Authors
Automatic analysis of big data and faster recognition of patterns that cannot be detected manually	Data quality and availability; bias and transparency issues	Witkowski & Wodecki, 2024; Gupta et al., 2024
Speeding up routine decision-making and relieving managers	Lack of methodologies for systematic and responsible implementation	Bertoncel & Bervar, 2025; Horneber D, 2025
More effective customer segmentation, market monitoring and dynamic forecasting	Employee resistance, unrealistic expectations (hype), trust challenges	Witkowski & Wodecki, 2024; Bertoncel & Bervar, 2025; Gupta et al., 2024
Greater accuracy and consistency in making repeatable decisions, reducing human bias	The complexity of the model, the 'black box' effect and problems with the explainability of the results	Gupta et al., 2024; Duan et al., 2019
Support for collective and collaborative decisions (agile teams, synthesis of diverse data)	Mismatch between 'AI policy' and real practice in companies (AI washing)	Witkowski & Wodecki, 2024; Horneber D, 2025
Help with scenario simulation, hypothesis testing and risk minimization	The problem of building trust in AI recommendations with end users	Bertoncel & Bervar, 2025; Goyal, 2023

Source: Authors

Table 1 shows the main benefits and challenges of using AI in product management decision processes. The table lists practical advantages, such as faster decisions, better teamwork, and improved risk management, as well as common difficulties, like trust in algorithms, data quality problems, and ethical concerns.

Managers need to learn how to combine their intuition with AI outputs for the best results. Responsible use, teamwork, and clear procedures help organizations use AI safely and successfully in product management decisions.

3.3. Challenges and success factors in AI integration for product management

AI changes how organizations innovate, but it comes with technical and organizational obstacles. One of the biggest challenges is ensuring high data quality and integrating AI tools with current systems. Teams must test, update, and retrain AI models for real-world business environments. This requires strong digital skills, close teamwork across departments, and support from company leadership (Johnson et al., 2022; Truss & Schmitt, 2025).

Organizational readiness is essential for success. Many firms face staff resistance to new technology or lack clear AI strategies. Sometimes, employees worry about losing jobs or do not

understand how AI systems work. Success depends on open communication, regular staff training, and sharing practical results of AI pilot projects (Olsson & Bosch, 2024; Parikh, 2025). For example, companies using agile, experimental methods, such as iterative piloting and feedback sessions and increase trust and make adoption smoother.

A major technical difficulty is maintaining reliable, unbiased data. AI models depend on accurate inputs, and companies must review data sources, correct errors, and build systems for continuous quality checks. Ethical risks are also important, organizing clear rules for responsible and explainable AI helps prevent bias and promotes user trust. Transparency is crucial. Managers and end-users must understand and be able to challenge AI recommendations (Gupta et al., 2023; Khan et al., 2025). Surveys of user attitudes show that data security and transparency are key barriers to trust in AI (Marković & Soleša, 2025).

As shown in Table 2, the most common challenges are: data quality, integrating AI with legacy IT, resistance to change, lack of expertise, and unclear value measures for AI investments. On the positive side, the key success factors are: strong leadership, well-designed training, open and frequent feedback, strong interdepartmental collaboration, and involvement of users in all phases of design, testing, and feedback.

Table 2. Key innovations and perspectives in contemporary literature on AI in product management

Topic/phenomenon	Key findings and contributions	Authors
Generative AI in innovation	AI takes over part of the creative process, accelerates prototyping and tests products through digital twins.	Kanbach et al. (2024); Witkowski & Wodecki (2025a, 2025b)
Digital twins and resilience	Digital twins strengthen the resilience of the supply chain, enable simulations and anticipation of crises.	Roman et al. (2025)
AI and user experience	Personalization and predictive recommendations are redefining customer loyalty and industry standards.	Maurya et al. (2024)
AI and professional identity	Automation of decisions changes the roles, profiling and motivation of employees, as well as organizational culture.	Strich et al. (2021)
Data and skills management	AI scalability requires new managerial and technical competencies and clear key metrics to justify investment.	Jönmark & Söderström (2024); Soltani-Fesaghandis & Pooya (2018)

Source: Authors

Table 2 summarizes the main technical and organizational challenges of AI integration and the most effective success factors identified in recent studies. The table includes details such as integration issues, resistance barriers, best practices in training, leadership commitment, and user participation, with direct references to leading sources.

Authors Parikh (2025) and Asa et al. (2024) highlight that responsible scaling of AI in product management depends not only on technology, but mostly on how well an organization adapts its strategy and culture. Frequent reviews, sharing best practices, active management support, and a focus on skills development all contribute to long-term, safe, and productive AI use. Industries like manufacturing, software, and logistics all confirm that combining human knowledge with AI increases agility and competitiveness, if the firm is open to change and focused on cross-team learning.

Table 2 helps managers quickly see which challenges appear most often and which actions, such as more training, collaborative pilot projects, or new ethical guidelines, result in the best AI integration. This kind of mapping supports evidence-based transformation and helps organizations reach the full potential of AI in product management.

This extended draft maintains the focus on challenges, success factors, and actionable recommendations, referencing the key studies as in your original. Please insert your detailed Table 2 where marked, and feel free to further expand any segment with industry examples or specific case studies from your literature review. Let me know if you want an expanded table template or additional citation formatting!

3.4. Implementation experiences and case studies: AI in product management

Practical experience shows that implementing AI in product management transforms both technical and business processes. Many studies highlight successful applications in software, manufacturing, e-commerce, and pharmaceutical sectors, where AI enables faster idea generation, market analysis, prototyping, and resource management (Witkowski & Wodecki, 2024a; Gupta et al., 2023; Khan et al., 2025). In these cases, AI helps teams automate documentation, segment customers, simulate market reactions, and predict product performance.

A key finding is that most organizations achieve best results when AI is introduced gradually, through pilot projects, training, and transparent communication about technology benefits and risks (Hyrynsalmi et al., 2023). For example, Siemens improved product cycles and team adaptability by combining collaborative feedback and staff education with algorithmic recommendations (van Giffen & Ludwig, 2023). Similarly, integrating AI in supply chains using digital twins enabled companies to plan routes and resources more efficiently, anticipate disruptions, and improve resilience (Roman et al., 2025).

In e-commerce, hybrid models that combine traditional analytics and AI tools help companies personalize offers and adapt key metrics, leading to higher user satisfaction and profitability. In pharmaceuticals, AI systems analyze biomedical data to predict molecule efficacy and potential side effects before clinical trials, reducing risks and costs (Singh et al., 2025). Similarly, a case study from the Czech Republic shows how AI improves e-commerce marketing strategies through personalized recommendations and behavioral analysis (Konečný et al., 2025). Ride-sharing platforms use AI for smart customer profiling and service personalization, setting new standards in customer experience and innovation speed (Maurya et al., 2024). In Serbia, AI in passenger services at airports reduces the GAP in customer satisfaction through chatbots and personalized services (Ćurčić et al., 2024).

An important lesson from these examples is that successful AI adoption depends on clear strategic vision, cross-functional teamwork, continuous learning, and adaptive change management. Companies that encourage open knowledge sharing, train staff in digital skills,

and actively involve users in design and test cycles show faster innovation and improved outcomes (Ogundipe et al., 2024).

4. Discussion

This review shows that artificial intelligence is now a main driver of innovation in product management. AI helps companies improve every stage of product development by speeding up processes, improving decision quality, and allowing more flexible teamwork (Witkowski & Wodecki, 2024b; Johnson et al., 2022). The results confirm that successful AI adoption depends not just on technology, but equally on strong leadership, open communication, active training, and team collaboration (Olsson & Bosch, 2024).

The findings point to new hybrid management models, where humans and AI systems work together in every step of the process. Managers combine experience and intuition with data analysis to reach the best decisions, using “human-in-the-loop” approaches for safety and reliability (Parikh, 2025; Bervar & Bertoncel, 2025). These models show best results in agile organizations willing to change, test new methods, and share feedback quickly.

Despite many benefits, the review also finds important limits and challenges. Key problems are data quality, resistance to change, gaps in digital skills, and trust in algorithm recommendations. Table 2 summarizes main obstacles and how companies overcome them, offering clear directions for future management practice and training.

Another important result is the need for responsible, ethical use of AI. Companies should develop strong rules for data integrity, transparency, and model explainability. Research gaps remain, especially in long-term effects on employees, adaptation in traditional industries, and the role of motivation and workplace culture (Strich et al., 2023; Kanbach et al., 2024).

Overall, this study helps map current trends and directs future research by clarifying how AI changes product management. New studies should explore the impact of AI in non-digital sectors, develop better training programs, and follow changes in team dynamics and leadership caused by digital transformation (Maurya et al., 2024; Asa et al., 2024).

5. Conclusion

Artificial intelligence is now a key driver of innovation and decision-making in product management. AI helps companies redesign business models, speed up innovation, and improve decision quality at all stages of product development. Studies confirm that the benefits of AI are greatest not when it replaces people, but when it supports teams in doing complex tasks faster and more accurately, while opening new questions about trust, transparency, and ethics (Witkowski & Wodecki, 2024b; Johnson et al., 2022).

The review highlights that successful AI adoption depends on good data quality, organizational readiness, strong leadership, and continuous staff training. Companies must develop clear strategies, follow responsible and transparent practices, and encourage cross-team collaboration to overcome challenges. AI increases value when combined with human expertise, supporting experimental, flexible, and responsive decision-making (Olsson & Bosch, 2024; Gupta et al., 2023).

Main obstacles include poor data, technical complexity, staff resistance, and unclear goals. However, organizations that invest in teamwork, digital skills, and agile models adapt faster and innovate more effectively. Table summaries in this article show practical lessons and solutions that help guide managers and researchers.

AI is not a simple “one-click solution,” but a deep, strategic transformation that demands long-term learning and proactive change. Further research should focus on traditional

industries, employee motivation, and the social and ethical impact of AI in product management. Application in the travel industry in Serbia highlights the need for empirical studies of satisfaction (Ćurčić et al., 2024). The future of AI in this field belongs to organizations that combine technology, clear strategy, and responsible leadership to achieve sustainable success.

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