ISSN: P-2455-0515
E- 2394-8450

Educreator Research Journal

OPEN ACCESS

Volume–XIII, Special Issues–I(b) Jan – Feb 2026

Original Research Article

IMPACT OF AI-BASED DECISION SUPPORT SYSTEMS ON MANAGERIAL EFFECTIVENESS IN PROJECT MANAGEMENT

** Mr. Varadvinayak Aute & **Mr. Vaibhav Karande*

** & **Entrepreneurial Development Students, B.K. Birla College, (Empowered Autonomous Status), Kalyan.*

Abstract:

Artificial Intelligence is rapidly transforming contemporary Project Management practices by enabling advanced Decision Support Systems that enhance data-driven managerial processes. This study examines the impact of AI-Based Decision Support Systems on Managerial Effectiveness in project environments, with particular attention to planning, risk forecasting, and Resource Allocation. Drawing on survey-based empirical evidence, the research evaluates how Predictive Analytics and intelligent automation influence decision accuracy, speed, and consistency. The findings indicate that AI-enabled Decision Support Systems significantly improve managerial insight by processing large-scale project data and generating actionable recommendations. However, the study also identifies practical limitations, including overreliance risks and the continuing need for Human-AI collaboration in complex project contexts. Overall, the research demonstrates that Artificial Intelligence functions most effectively as a strategic decision-support partner rather than a managerial replacement, offering practical implications for organizations seeking to strengthen Project Management performance through data-driven innovation and evidence-based managerial practices across dynamic and technology-intensive project environments worldwide today. These managerial insights provide a structured foundation for future empirical investigations and guide practitioners in responsibly integrating AI-driven tools into everyday managerial workflows without undermining professional expertise or contextual decision-making quality within modern project-based organizations operating under conditions of uncertainty and competitive pressure globally today and beyond.

Keywords: *Decision Support Systems, Predictive analytics, Intelligent automation, Risk forecasting, Resource allocation, Human–AI collaboration, Project performance, Managerial insights, Managerial workflows.*

Introduction:

Project management today operates in an environment marked by tight deadlines, resource constraints, and rising uncertainty. Under these conditions, the effectiveness of managerial decision-making plays a decisive role in determining project success or failure. Traditional approaches, which rely heavily on manual analysis and managerial intuition, are increasingly challenged by the volume and complexity of project data. As projects become more data-intensive, managers require tools that can process information quickly and provide reliable analytical support.

Advancements in Artificial Intelligence have led to the emergence of AI-based Decision Support Systems capable of analysing complex datasets, identifying patterns, and generating predictive insights. Organizations across industries are adopting these systems to improve planning accuracy, strengthen risk assessment, and

ISSN: P-2455-0515
E- 2394-8450

Educreator Research Journal

OPEN ACCESS

Volume–XIII, Special Issues–I(b) Jan – Feb 2026

Original Research Article

enhance resource allocation decisions. Despite growing adoption, there remains limited empirical evidence regarding how these tools actually influence managerial effectiveness in real project environments.

Importantly, project outcomes still depend significantly on human judgment, experience, and contextual understanding. This raises a critical question about whether AI serves as a replacement for managerial decision-making or as a complementary support mechanism. The present study addresses this gap by examining how AI-enabled decision support systems affect managerial effectiveness, with particular attention to planning quality, risk management, and resource deployment in contemporary project settings.

Review of Literature:

- **Mohsen Soori — *AI-based Decision Support Systems in Industry 4.0: A Review* (2024).**
  Soori(2024) examines the expanding role of AI-based Decision Support Systems within Industry 4.0 ecosystems, emphasizing their ability to integrate Internet of Things (IoT) data, cloud computing infrastructure, and real-time sensor analytics to enhance operational intelligence. The study explains that machine learning–driven predictive analytics significantly improves predictive maintenance, quality monitoring, and production planning efficiency. By enabling intelligent automation and continuous data visibility, AI-powered DSS strengthen organizational responsiveness in data-rich environments. However, the discussion remains largely operations-centric and gives limited attention to managerial cognition and decision behaviour. While the research convincingly establishes the technological strength of AI-enabled systems, it leaves an important gap regarding how such intelligent platforms influence managerial effectiveness in dynamic project management contexts.
- **Jose Ignacio Santos et al. — *Explainable Machine Learning for Project Management (Monte Carlo + ML)* (2023).**
  Santos et al.(2023) propose an advanced explainable machine learning framework integrated with Monte Carlo simulation to improve project forecasting under conditions of uncertainty and risk volatility. A key contribution of the study is the incorporation of SHAP-based explainability, which enhances transparency and interpretability of AI-generated insights for project managers. The authors argue that explainable AI strengthens managerial trust and supports more data-driven replanning decisions within complex project networks. The model demonstrates strong analytical sophistication and aligns with the growing emphasis on responsible AI and transparent predictive analytics. However, the research remains predominantly technical in orientation and does not empirically evaluate how managers behaviourally respond to or depend on these intelligent decision-support outputs in real-world project environments.
- **Yogesh Dwivedi et al - *AI Adoption in Managerial Decision-Making (ScienceDirect, 2022).***
  Dwivedi et al. (2022) explore artificial intelligence adoption in managerial decision-making contexts, highlighting the interplay between technological capability, organizational readiness, and user trust. The study emphasizes that even highly advanced AI-driven decision systems deliver limited value if managers lack confidence in algorithmic recommendations or if organizational culture resists intelligent automation. The authors caution against excessive technological hype and stress the importance of human oversight,

ISSN: P-2455-0515
E- 2394-8450

Educreator Research Journal

OPEN ACCESS

Volume–XIII, Special Issues–I(b) Jan – Feb 2026

Original Research Article

ethical governance, and responsible AI deployment. Their analysis provides important strategic insight into adoption barriers and behavioural dynamics. However, the discussion remains broad and cross-sectoral, offering limited project-specific empirical evidence. This indicates a clear need for focused research examining how AI-based Decision Support Systems directly influence managerial effectiveness within structured project management environments.

Objectives of the Study:

1. Identify key AI tools used in project management.
2. Examine how AI supports managerial decisions in planning and scheduling.
3. Analyse the impact of AI on risk assessment and resource allocation decisions.
4. Assess managerial perceptions of AI-driven decision support systems.

Research Methodology:

This study adopts a quantitative and descriptive research design to examine the impact of AI-based Decision Support Systems on managerial effectiveness in project management. Primary data were collected through a structured questionnaire administered via Google Forms to capture the perceptions and experiences of professionals using AI-enabled tools in project environments.

1. **Targeted Audience**

   The targeted audience for the study comprised project managers, team leaders, and Students involved in project management activities who have exposure to or experience with AI-based decision support tools. This ensured that the responses were relevant, informed, and grounded in practical project environments.

2. **Sampling Technique**

   The study employed a non-probability convenience sampling technique. Respondents were selected based on their accessibility and willingness to participate, allowing efficient data collection within the available time and resource constraints.

   - The study used a **non-probability convenience sampling technique**, selecting respondents who were readily accessible and willing to participate.
   - This approach was chosen due to **time and resource constraints** and the exploratory nature of examining AI-based decision support usage among project professionals.
   - While the method enabled **quick and practical data collection**, it may limit the **generalizability** of the findings because of potential sampling bias.

3. **Sample Size**

   For the purpose of analysis, the study considered a sample size of **126 respondents**, which was deemed adequate for conducting descriptive statistical analysis and identifying trends related to AI adoption and managerial effectiveness.

ISSN: P-2455-0515
E- 2394-8450

Educreator Research Journal

OPEN ACCESS

Volume–XIII, Special Issues–I(b)

Jan – Feb 2026

Original Research Article

Significance of the Study:

This study is significant because it shifts the discussion of artificial intelligence in project management from purely technological capability to measurable managerial impact. While existing literature frequently highlights the computational strengths of AI systems, fewer studies examine how these tools influence real decision-making behaviour in project environments. By focusing on planning accuracy, risk handling, and resource allocation, the research provides grounded insight into where AI-based Decision Support Systems deliver practical managerial value.

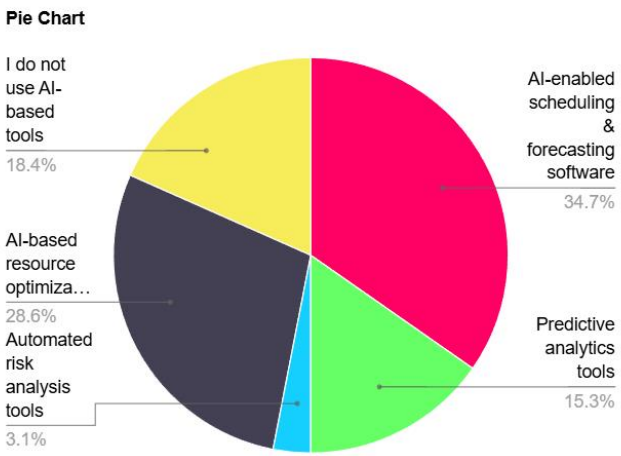
From an organizational perspective, the findings help decision-makers evaluate whether investments in AI-enabled tools are translating into meaningful improvements in managerial effectiveness. The study also contributes to academic understanding of human–AI collaboration by emphasizing that technological sophistication alone does not guarantee better decisions without appropriate human oversight. For practitioners, the results highlight both the performance benefits and the operational cautions associated with AI adoption. Additionally, the research offers a useful empirical reference point for UG-level investigation in a rapidly evolving domain. Overall, the study supports a more balanced and evidence-based approach to integrating AI-driven decision support within modern project management practices.

Analysis and Data Interpretation:

The Questionnaire we used is given below

https://forms.gle/WdkHPYr6Wy5ST3sf9

- **Type of AI-based Tools used in Projects:**



ISSN: P-2455-0515
E- 2394-8450

Educreator Research Journal

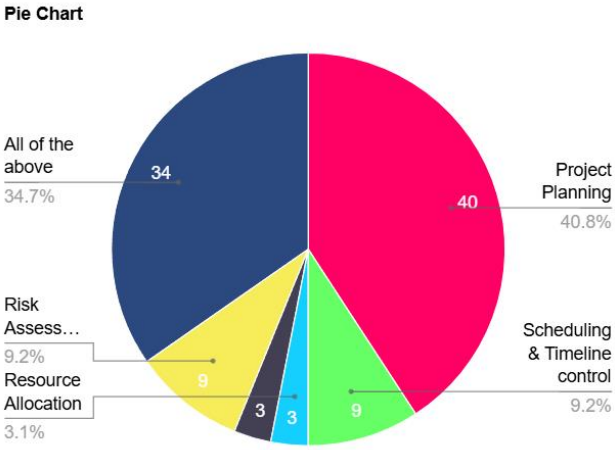
OPEN ACCESS

Volume–XIII, Special Issues–I(b)

Jan – Feb 2026

Original Research Article

- **Which functions do you use AI-based DSS:**



- **List of AI-based Project Management Software's or Tools used most frequently:**

AI-Based Decision Support Systems Used by Respondents

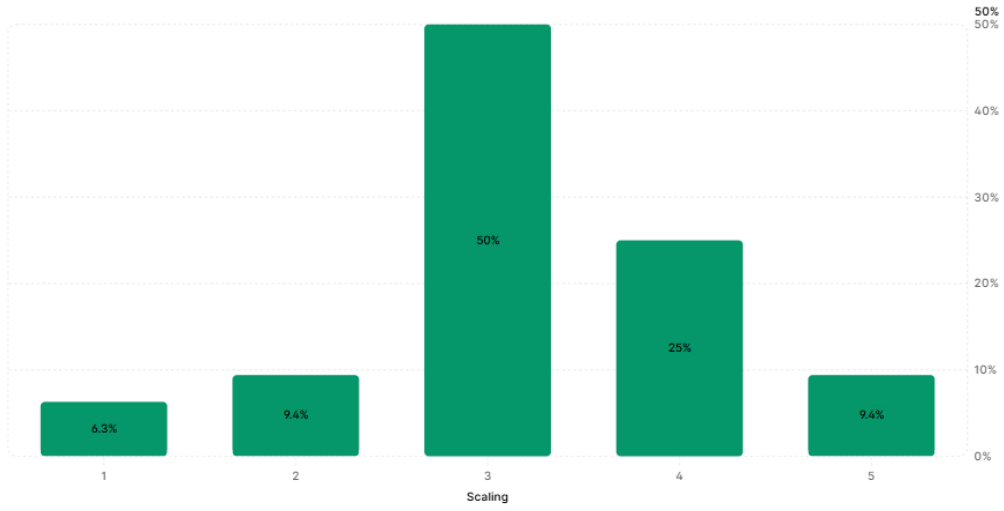
Most Used Tool

☆ **ChatGPT AI - 35.25%**

Other Tools Reported

Asana AI | Monday AI | Google Gemini | Claude AI | ClickUp AI | Hive AI Microsoft Copilot | Power BI | Trello AI | Wrike AI | Notion AI | Jira

- **What extend does AI support Decision Making in Project Management:**



ISSN: P-2455-0515
E- 2394-8450

Educreator Research Journal

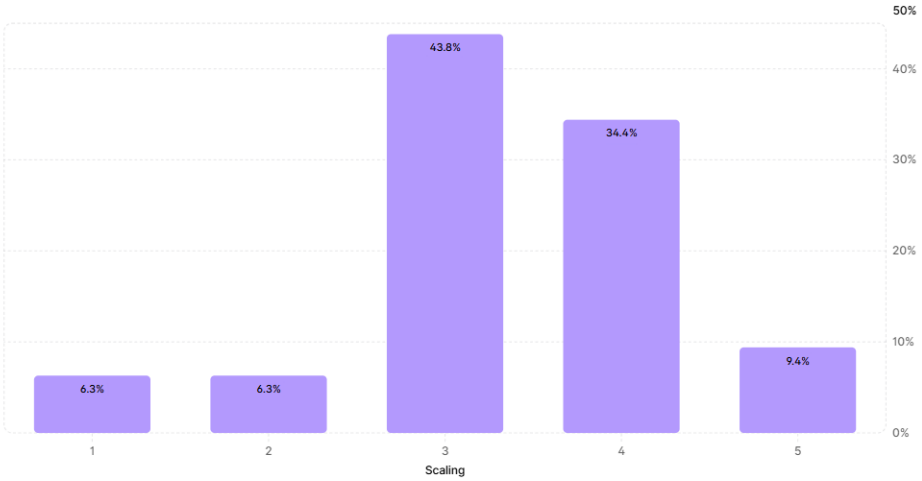
OPEN ACCESS

Volume–XIII, Special Issues–I(b)

Jan – Feb 2026

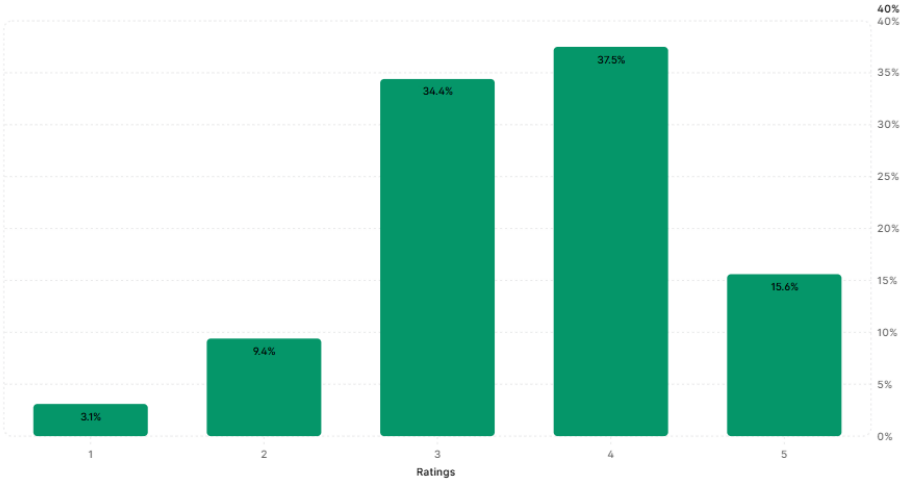
Original Research Article

- **Effectiveness of AI-based tools in improving scheduling accuracy:**

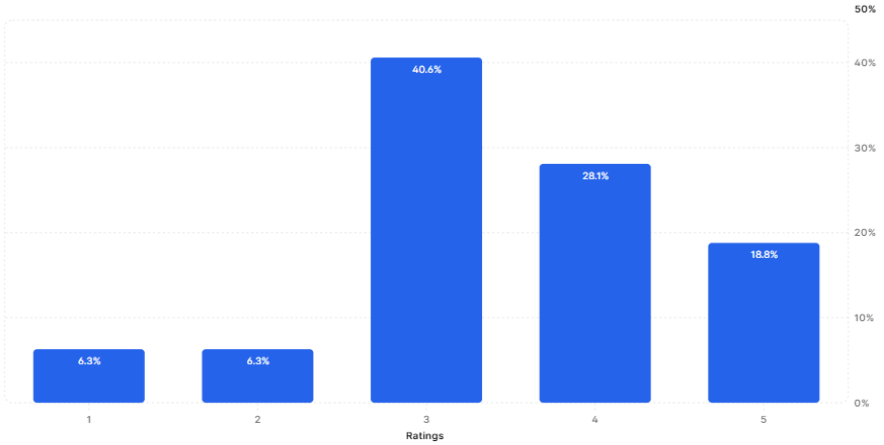


- **Rating of AI-based DSS on the following managerial decisions:**

1. **Risk Identification:** Average Rating = 3.5



1. **Risk Mitigation Planning:** Average Rating = 3.4



ISSN: P-2455-0515
E- 2394-8450

Educreator Research Journal

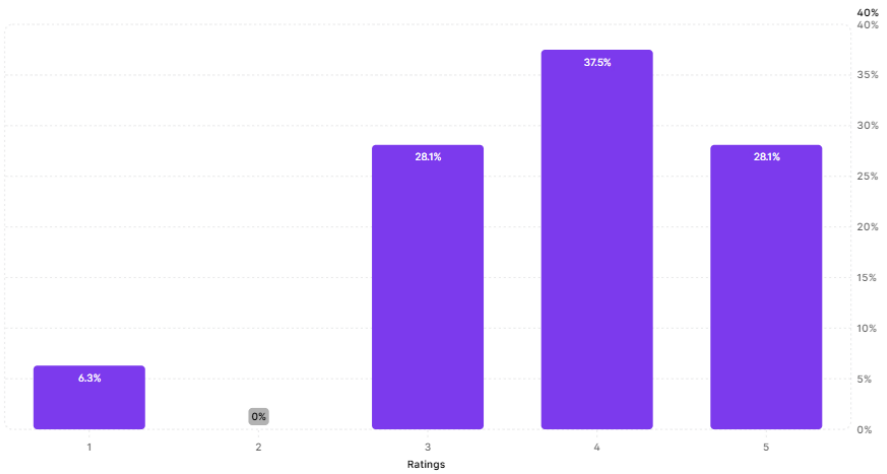
OPEN ACCESS

Volume–XIII, Special Issues–I(b)

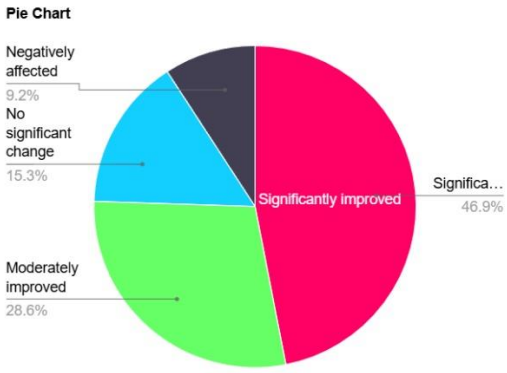
Jan – Feb 2026

Original Research Article

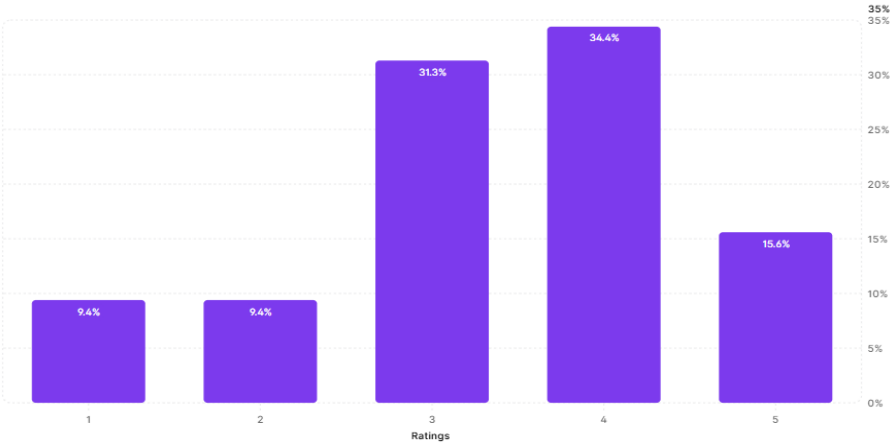
2. **Resource Allocation Efficiency:** Average Rating = 3.8



- **Compared to traditional methods, how has AI influenced your ability to manage project risks:**



- **"As a project manager, I trust AI-generated insights when making critical project decisions."**



ISSN: P-2455-0515
E- 2394-8450

Educreator Research Journal

OPEN ACCESS

Volume–XIII, Special Issues–I(b) Jan – Feb 2026

Original Research Article

- **From your experience, how has the use of AI-based decision support systems affected your overall managerial effectiveness in project management:**

➢ This question evaluates how the use of AI-based Decision Support Systems affects the overall managerial effectiveness of project managers in project environments.

Summary of Respondents:

i. Majority reported **improved managerial effectiveness** after using AI-based DSS.
ii. Respondents observed **reduced errors and faster decision-making**.
iii. Many highlighted **better data analysis and project monitoring** capabilities.
iv. AI tools were viewed as helpful in **planning and control functions.**
v. Overall perception indicates a **moderately strong positive impact.**

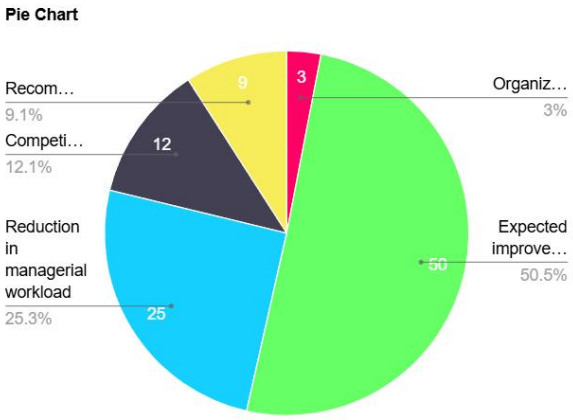
- **What limitations or challenges do you face as a project manager when using AI-based decision support systems in real project environments:**

➢ This question aims to identify the key challenges and practical limitations faced by project managers while using AI-based Decision Support Systems in real project settings.

Summary of Respondents:

i. The most common issue reported was **dependence on data quality.**
ii. Respondents noted AI's **limited understanding of human and contextual factors.**
iii. Some participants mentioned **accuracy and reliability concerns**.
iv. Technical issues such **as internet dependency and system constraints** were observed.
v. Overall, respondents emphasized the continued need for **human oversight.**

- **Which factor most influenced your decision to adopt AI-based tools in project management:**



ISSN: P-2455-0515
E- 2394-8450

Educreator Research Journal

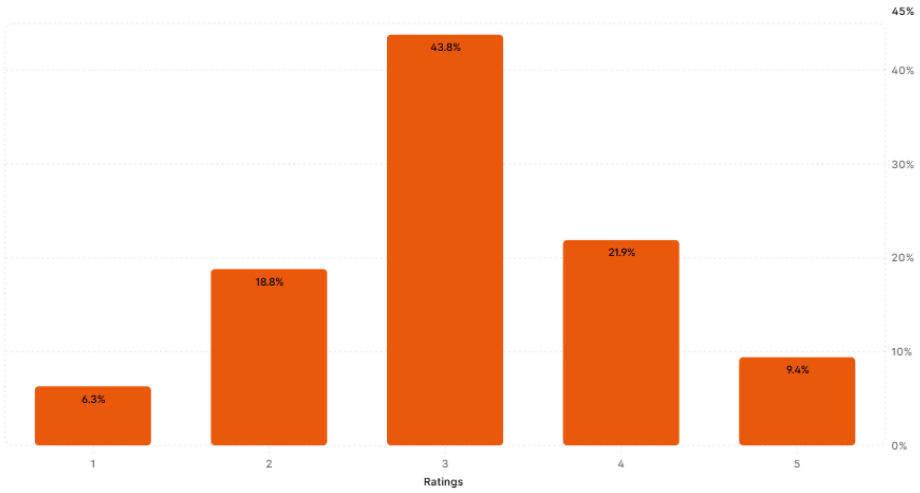
OPEN ACCESS

Volume–XIII, Special Issues–I(b)

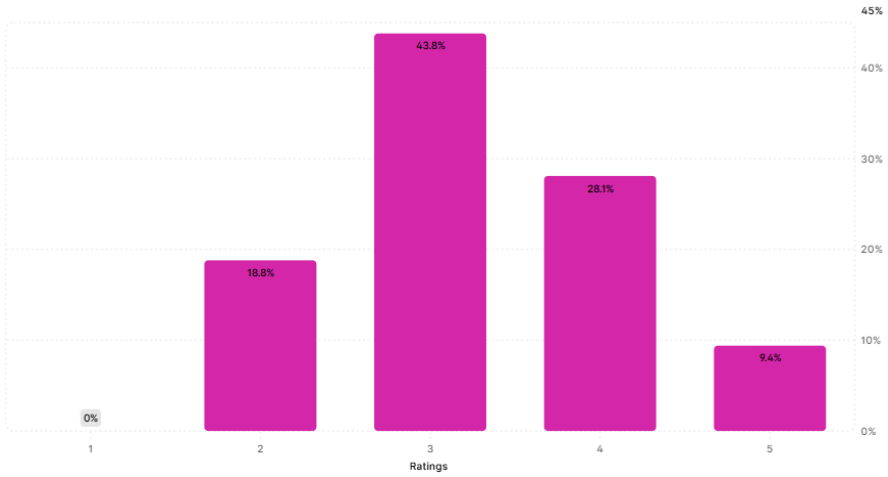
Jan – Feb 2026

Original Research Article

- **To what extent has the use of AI-based decision support systems reduced uncertainty in planning and scheduling decisions you make as a project manager:**



- **"AI-based decision support systems help me allocate project resources more objectively and effectively under risk and uncertainty."**



- **As a project manager, what is your overall perception of AI-based decision support systems in enhancing your managerial effectiveness:**

➢ This question examines the overall perception of project managers regarding the role of AI-based Decision Support Systems in enhancing managerial effectiveness.

Summary of Respondents:

i. Most respondents described AI-DSS as **helpful and productivity-enhancing**.
ii. Many stressed that **AI performance depends heavily on data quality**.
iii. Several expressed **cautious trust rather than complete reliance**.
iv. AI is widely viewed as a **supportive decision-making aid**.
v. The overall sentiment is **positive but carefully optimistic.**

ISSN: P-2455-0515
E- 2394-8450

Educreator Research Journal

OPEN ACCESS

Volume–XIII, Special Issues–I(b) Jan – Feb 2026

Original Research Article

Limitations of the Study: Despite providing useful insights, the study is subject to several limitations that should be acknowledged when interpreting the results. First, the research relies on self-reported perceptions collected through a structured questionnaire, which may introduce response bias and subjective interpretation. Second, the use of a non-probability convenience sampling technique and a relatively modest sample size restricts the ability to generalize the findings across all project management contexts and industries.

Third, the study evaluates perceived managerial effectiveness rather than objective project performance indicators such as cost variance or schedule adherence. As a result, the findings primarily reflect managerial sentiment rather than verified performance outcomes. Additionally, respondents reported using different types and maturity levels of AI tools, which may have created variability in experiences and assessments. The cross-sectional nature of the research further limits the ability to observe long-term effects of AI adoption on managerial decision-making. Finally, time and resource constraints typical of undergraduate research limited the depth of industry coverage. Future research using larger samples, longitudinal designs, and objective performance metrics would provide more comprehensive and generalizable evidence.

For Future Research:

1. **Longitudinal Impact of AI on Managerial Effectiveness:**
   Future researchers should examine the long-term effects of AI-based Decision Support Systems on managerial effectiveness using longitudinal research designs. Your study is cross-sectional, which means it captures a snapshot, not evolution. Researchers can track projects over time to assess whether sustained AI usage improves decision consistency, learning curves, and project success rates or whether performance gains plateau or decline due to overreliance on automated insights.
2. **Comparative Analysis Across Industries**
   Further studies should conduct sector-wise comparisons, particularly between industries such as construction, IT, healthcare, and manufacturing. The impact of AI tools is unlikely to be uniform because project complexity, data maturity, and technological readiness vary widely. Comparative research can identify industry-specific effectiveness patterns and adoption barriers, which your broader approach cannot fully isolate.
3. **Integration of Objective Performance Metrics**
   Future research should incorporate objective project performance indicators such as cost variance, schedule variance, productivity indices, and defect rates. Your study relies on managerial perceptions, which are useful but imperfect. Hard performance data would strengthen causal claims about whether AI-based Decision Support Systems genuinely improve project outcomes rather than merely improving managerial confidence.
4. **Human–AI Trust and Decision Dependency Dynamics**
   Researchers should explore behavioural dimensions such as managerial trust in AI recommendations, resistance to algorithmic advice, and risks of overdependence on automated decision support. Understanding when managers appropriately override AI versus blindly follow it is critical for designing responsible and effective AI-enabled project environments.

ISSN: P-2455-0515
E- 2394-8450

Educreator Research Journal

OPEN ACCESS

Volume–XIII, Special Issues–I(b) Jan – Feb 2026

Original Research Article

Conclusion:

The integration of AI-based Decision Support Systems is steadily reshaping the informational landscape of project management. The findings of this study indicate that AI-enabled tools contribute positively to managerial effectiveness, particularly by improving analytical speed, enhancing decision consistency, and supporting more structured resource allocation. Respondents generally perceive AI systems as valuable aids in planning and monitoring functions, although the degree of impact varies depending on data quality and contextual complexity.

At the same time, the results clearly demonstrate that AI does not eliminate the need for human judgment. Managers continue to play a critical role in interpreting outputs, handling ambiguous situations, and making context-sensitive decisions that automated systems cannot fully capture. The most effective project environments appear to be those where AI functions as an intelligent support layer within a human-in-the-loop framework.

Overall, the study reinforces the view that the future of project management will be defined by strategic human–AI collaboration rather than technological substitution. Organizations that adopt AI with realistic expectations, strong data governance, and appropriate managerial oversight are more likely to achieve sustained improvements in project decision quality and operational responsiveness.

References:

1. *Mohsen Soori — AI-based Decision Support Systems in Industry 4.0: A Review (2024).*
2. *https://www.sciencedirect.com/science/article/pii/S2949948824000374*
3. *Jose Ignacio Santos et al. — Explainable Machine Learning for Project Management (Monte Carlo + ML) (2023). https://www.sciencedirect.com/science/article/pii/S0360835223002851*
4. *Rajesh Paul, Rahman, Md. Nuruzzaman — AI-Enabled Decision Support Systems for Smarter Infrastructure Project Management in Public Works (Review of Applied Science and Technology, 2024).*
5. *https://www.researchgate.net/publication/393655215*
6. *Sofia Gomes Abreu Bento — Artificial Intelligence in Project Management: a brief (Master's thesis, ISCTE, 2022).*
7. *https://www.sciencedirect.com/science/article/pii/S2444569X25001179*
8. *Laurie Hughes — Impact of artificial intelligence on project management (ScienceDirect, 2025).*
9. *https://repositorio.iscte-iul.pt/bitstream/10071/28390/1/Master_sofia_abreu_bento.pdf*
10. *Yogesh Dwivedi et al - AI Adoption in Managerial Decision-Making (ScienceDirect, 2022). https://www.sciencedirect.com/science/article/pii/S0268401222000767*

Cite This Article: **Mr. Aute V. & Mr. Karande V. (2026).** *Impact of AI-Based Decision Support Systems on Managerial Effectiveness in Project Management*. **In Educreator Research Journal: Vol. XIII (Issue I),** pp. 155–165. **Doi: https://doi.org/10.5281/zenodo.20205185**