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AI-DRIVEN FILM PRODUCTION: A STUDY OF INNOVATION AND INDUSTRY TRANSFORMATION

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Abstract

Technological advancement has continually transformed the film industry, and artificial intelligence (AI) has become one of the major forces of innovation. AI technologies are actively being integrated into different stages of film production, shaping the creative process, efficiency of the operations, and decision-making. The purpose of this study is to explore the application of AI in the film production process, focusing on its awareness, usage, perceived influence, challenges, and prospects in the film production industry.

The research design was a quantitative study design with the use of a structured questionnaire that was given to 300 respondents consisting of film professionals, media experts, students, and researchers. The analysis of data was conducted through statistical methods like frequencies, percentages, mean, and standard deviation to evaluate responses.

The results indicate that the awareness and moderate use of AI technologies in film production are high. One of the most highlighted fields of the use of AI is technical, video editing, and visual effects, which greatly enhance productivity and change the way things are done. Although AI, too, is seen to decrease the expenses and improve creativity, it is still scarce in the creative fields of operation. Some of the major challenges have been identified as high implementation costs, ethical issues, and lack of expertise, and fears of job displacement. Regardless of these difficulties, participants were very optimistic about the future of AI by noting the significance of training and skill development. AI is transforming the film industry by improving efficiency and creating possibilities. Nonetheless, its successful implementation is also subject to overcoming financial, ethical, and technical issues. The key to sustainable transformation in the industry is the balanced approach that unites the abilities of AI with human creativity, as well as investing in training and policymaking.

Keywords: Artificial Intelligence, Film Production, Innovation, Visual Effects, Automation, Creative Industry, Digital Transformation

1. Introduction

It has been long established that the film industry is a very dynamic and innovation-driven industry, and it is one that keeps on changing as a result of technological change (Tsiavos & Kitsios, 2025). Since the adoption of silent movie into sound cinema and the subsequent substitution of analog with digital production, every technological advancement has transformed the creative and operational process of filmmaking (Anandraj & Aravind, 2023). Artificial intelligence (AI) has become a transformative force, in the recent years and has had a significant impact on the manner in which films are conceptualized, created, edited, and

distributed (Uddin et al., 2025; Afshar and Shah, 2025). The introduction of AI-based solutions into the film-making process is a paradigm shift, as it will allow moviemakers to be more efficient, creative, and make decisions based on data (Xu, 2025).

The use of AI technologies is becoming more common in many film production phases. During the pre-production phase, AI helps with scriptwriting, storyboarding, and predictive audience analysis, enabling creators to optimize the content according to the audience selection and market trends (Hilal, 2025). In the production process, AI-based tools support innovative cinematography, repetitive work automation, and resource distribution (Ullah et al., 2024). During post-production, AI has transformed editing, visual effects (VFX), and sound design through the major time and cost savings, and enhanced quality of output (Bian, 2025). These developments not only simplify the working process but also enlarge the range of creative opportunities that filmmakers have (Islam et al., 2026).

The industrial landscape is also changing with the increased application of AI in film production. Machine learning algorithms are gradually achieving greater acceptance in production companies as a way of predicting the success of a box office, establishing target audiences, and improving marketing campaigns (Nahid et al., 2025). Such a transition to data-driven filmmaking is facilitating the ability to make more informed decisions, decreasing financial risks, and increasing the overall success rate of film projects (Islam et al., 2025). Moreover, AI-based platforms are also assisting in the delivery of personalized content, thus increasing the audience engagement and satisfaction (Akter et al., 2025).

Although there are many benefits, the integration of AI into film production is not as easy as it may seem (Rahman et al., 2026). The issue of high cost of implementation, ethical issues, and the possibility of job loss have become a hot topic in the industry (Twaha, 2024). The fear of losing human creativity and job opportunities to AI is an acute phenomenon, especially among people working in the industry (Akib, 2024). Moreover, the issue of insufficient technical skills and education can serve as an obstacle to the use of AI technologies, particularly in developing countries (Dash et al., 2025).

Stakeholders involved in the production of films have been divided in terms of their views on the use of AI in film production, such as filmmakers, media professionals, and academic researchers (Shah et al., 2025). Although some agree that AI has been efficient and innovative, some are concern about the sustainability of the industry and creative autonomy (Badhan et al., 2023). These perceptions are essential to comprehend the actual effects of AI on the film industry and to determine areas where the policy and skill development should be conducted (Hasan et al., 2025).

The purpose of the study is to describe the way AI can revolutionize the film production process through the prism of its uses, opportunities, limitations, and strengths. The research will assume the quantitative research methodology in which perceptions of a sample population consisting of a variety of respondents will be collected in order to analyse the degree of AI adoption and its perceived industry implications. The results add to the overall outlook of the way AI-powered innovations transform the filmmaking of the future and give the stakeholders of the filmmaking industry, policymakers and researchers insights, which are helpful.

Problem Statement

The fast development of artificial intelligence has brought drastic transformation to the film production sector, and the use of it is not uniform and under-investigated. Although AI technologies may establish important changes to the filmmaking process and decrease its efficiency, cost-cutting, and production, empirical evidence concerning the empirical application of these technologies and their effects at the various production phases is lacking. The effectiveness of AI tools is still questionable in the majority of professionals within the industry, and the issues of expensive investments, ethics, and displacement are the challenges to the overall adoption. Moreover, the insufficiency of technical expertise and institutional training opportunities is also a secondary concern especially in the new markets. This disparity between technological possibilities and real applications demonstrates the necessity of a thorough study of the role of AI in film production. Thus, the paper will evaluate the awareness degree, usage, perceived advantages, and challenges of AI-driven film production to deliver information that can be used to make informed decisions and transform the industry sustainably.

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2. Literature Review

AI in Film Production Processes

Artificial intelligence has had an incredible impact on different phases of film production, both in pre-production and post-production. During the initial stages, AI applications were used to support the process of scriptwriting, content analysis and storytelling, allowing filmmakers to generate engaging narratives using data-driven insights (Twaha and Arfin, 2025). Content-generation machines and recommendation systems that rely on analysing successful film patterns are becoming more and more widespread through automated scriptwriting systems. In the production process, AI improves cinematography by using smart cameras, scene recognition, and real-time changes (Sultana et al., 2024). Even in post-production, AI-based editing applications, visual effects creation and sound recording programs have made complex operations more efficient and yield better results (Afshar and Shah, 2025).

Enhancement of Creativity and Efficiency

The effect that AI has on creativity is one of the most discussed topics in the field of filmmaking. Whereas certain researchers claim that AI will restrain human creativity by automating artistic activities, others emphasizes that it can improve creative expression (Nasir et al., 2026). AI allows filmmakers to experiment by creating new visual forms, creating realistic effects, and delving into novel narrative approaches (Tiwari, 2022). Additionally, AI makes work on editing and production processes shorter and enables creators to devote more attention to the artistic part of the filming business. Human creativity combined with machine intelligence is therefore considered a great force behind innovation in the movie industry.

Economic and Industrial Implications

The integration of AI technologies has important economic consequences to the film industry. AI helps to reduce costs and work towards greater profitability by automating labour-intensive operations and maximising the use of resources (Sookhom et al., 2023). The use of predictive analytics is increasingly prevalent among production companies to analyse market dynamics, anticipate the needs of the audience, and minimize financial risks (Rahman et al., 2026). It is a data-driven filmmaking paradigm that is transforming the traditional production framework and enables making smarter decisions (Kavitha, 2023). In addition, AI is influencing distribution and marketing behaviours involving personalized content recommendations and targeted advertising.

Challenges and Ethical Considerations

Despite these advantages, there are several issues with AI usage in filmmaking. It is also expensive to implement, and specific technical skills are required, which is not accessible to smaller manufacturers (Mengya et al., 2024). Intellectual property rights, authenticity, and other concerns related to the AI-generated content are also an issue of focus (Xue, 2024). The development of AI can be abused, and another example of it is the deepfake technology, which makes the media content less valid and reliable (Huang et al., 2023). Furthermore, the displacement of employees due to the introduction of automation is another reason that the representatives of the industry are also afraid of, which speaks of the need to take a balanced stance towards the integration of AI technologies (Xu, 2025).

Future Prospects of AI in Filmmaking

The future of AI in the movie industry appears to be bright, and further enhancement is underway and is likely to transform the industry further (Li and Yu, 2025). The process of making films is likely to be modified by new technologies such as generative AI, virtual production, and real-time rendering (Chen, 2025). Another opportunity is that AI can be used to make viewers more engaged by offering personal viewer experiences and interactive content (Prasad and Makesh, 2024). However, the successful adoption of AI will be premised on the design of appropriate policies, ethics, and training to ensure positive development and progress in the industry (Zhang et al., 2025).

Research Questions

1. What is the level of awareness of AI technologies in film production among respondents?
2. How is AI being utilized across different stages of film production?
3. What is the perceived impact of AI on efficiency, creativity, and cost reduction in filmmaking?
4. What challenges are associated with the adoption of AI in the film industry?

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5. What are the future expectations of AI-driven film production?

Research Objectives

1. To examine the level of awareness and familiarity with AI in film production.
2. To analyse the applications of AI in various stages of filmmaking.
3. To evaluate the impact of AI on efficiency, creativity, and industry transformation.
4. To identify key challenges and ethical concerns related to AI adoption.
5. To explore future trends and opportunities of AI in the film industry.

3. Methodology

Research Design

The study design employed in this study is a quantitative research design to establish the impact of artificial intelligence on film making. The survey process was structured in a manner, which allowed gathering measurable information on the awareness, utilization, effect, issues, and future of AI in the film industry.

Research Approach

The descriptive and analytical approach was employed to obtain the general image regarding the perceptions and experiences of the respondents. The study is interested with establishing patterns and relationships using statistical techniques.

Population of the Study

The target population involves the professionals of film industry, media professionals, students and academic researches who are directly or indirectly connected to the film production, and media studies.

Sample Size and Sampling Technique

A total of 300 respondents were selected to take part in the study. The convenience sampling method was used due to the ease of data collection and accessibility and the professional backgrounds were addressed.

Data Collection Instrument

Data were collected using a structured questionnaire with close-ended questions. The questionnaires were divided into sections, including demographic information, awareness of AI, AI application in the film industry, perceived impact, challenges, and future anticipations. A Likert scale (1-5) was used to measure the degree of agreement of the respondents.

Data Collection Procedure

The questionnaire was distributed through the media of communication and online platforms and the interviewees could easily participate. This was by the voluntary participation of the respondents and assurance of anonymity and confidentiality.

Data Analysis Techniques

The collected data were analysed using statistical methods.

- **Frequencies and percentages** were used to analyse demographic variables.
- **Mean and standard deviation** were calculated to evaluate responses related to AI awareness, usage, impact, challenges, and future trends.

Reliability and Validity

In order to reach reliability, the items in questionnaires were developed based on available literature and relevant constructs. Content validity was achieved through alignment of the questionnaire with the research questions and research objectives.

Ethical Considerations

Ethics were strongly observed. The purpose of the study was explained to the respondents and consent was signed before participation. All data were held in confidence and could be used only in academic purposes.

4. Results

Results are the structured reporting of findings of a research study received after analysis of data. They summarize the main results of the analysis of the collected data, which is often presented in tables, figures, and quantitative indicators frequencies, percentages, means, and standard deviations. The results section gives clear evidence that is not interpreted subjectively, leaving readers to have a clear understanding of what the data indicates before further discussion or analysis.

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Table 1
Demographic Information

Variable	Category	Frequency	Percentage
Gender	Male	180	60%
	Female	110	36.7%
	Prefer not to say	10	3.3%
Age Group	18–25	120	40%
	26–35	90	30%
	36–45	60	20%
	46 and above	30	10%
Education Level	Diploma	40	13.3%
	Bachelor's	130	43.3%
	Master's	90	30%
	PhD	25	8.3%
	Other	15	5%
Profession	Film Industry Professional	80	26.7%
	Media Professional	70	23.3%
	Student	90	30%
	Academic/Researcher	40	13.3%
	Other	20	6.7%
Experience	< 1 year	70	23.3%
	1–5 years	110	36.7%
	6–10 years	70	23.3%
	> 10 years	50	16.7%

The demographic aspect of the respondents (n = 300) shows that the sample is predominantly male with 60% being male with females making up 36.7% with a small percentage (3.3%) not wanting to disclose their gender. This reveals a medium gender imbalance, which can affect views used in the research.

Regarding the age distribution, most of the respondents are in the younger age groups and 40% of the respondents are between 18 and 25 and 30% lie between 26 and 35. The proportion of participants between the ages of 36 and 45 ranges to 20% whereas 10% are 46 years and older. This is indicative of a young and early-career workforce that may be more susceptible to new technology like AI.

In terms of educational qualification, the majority of the respondents have higher education degrees with 43.3% having a Bachelor degree and 30% having a Master degree. A reduced percentage has Diplomas (13.3%) and PhDs (8.3%) with 5 percent falling under other groups. This implies that it had a well-educated sample that would be able to give informed responses.

The most significant group is students (30%), then comes the film industry professionals (26.7%), and media professionals (23.3%). Academics/researchers constitute 13.3%, and 6.7% constitutes other professions. Such a wide range of representation complements the range of views, especially academic and industry viewpoints.

Experience wise, the data indicates an early to mid-career concentration with 36.7% of experience ranging between 1 and 5 years. The 23.3% represent those with less than 1 year and 6-10 years experience, and it is only 16.7% that have a greater experience than 10 years. This implies that the results are mostly biased by respondents who have moderate professional exposure.

The sample, in general, is described as young, well-educated, and moderately experienced with varied professional backgrounds that should be viewed as the relevant basis of the analysis of modern tendencies in the field.

Table 2

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Awareness of AI in Film Production

Item	Mean	SD
Awareness of AI technologies	3.95	0.88
Familiarity with AI tools	3.72	0.91
Use of AI tools	3.40	1.02

The findings show that the level of awareness about AI in film production among the respondents is moderate. The awareness of AI technologies mean score (M = 3.95, SD = 0.88) indicates that the majority of participants know the concept of AI technologies fairly well, and the responses are relatively consistent.

The familiarity with AI tools is also a positive tendency (M = 3.72, SD = 0.91), which means that not only do the respondents possess knowledge of AI in terms of the conceptual level, but they are also a bit familiar with practical applications of AI. The slightly large standard deviation demonstrates a moderate range of familiarity. But the practical application of AI tools is relatively smaller (M = 3.40, SD = 1.02), which indicates that there is a discrepancy between awareness and its application in practice. The greater standard deviation also points to the variety of experiences as some respondents actively use the AI tools, and some do not have any or have little use of it. Comprehensively, the results indicate that the level of awareness and knowledge of AI in film production is quite high, whereas the rate of its practical use is moderate, which reflects the possible obstacles in its application.

Table 3

Use of AI in Film Production

Statement	Mean	SD
AI in scriptwriting	3.68	0.95
AI in video editing	4.02	0.85
AI improves VFX	4.15	0.78
AI in casting	3.55	1.00
AI in audience analysis	3.90	0.89

The results show that there is a significant adoption of AI at different levels of film production, with different degrees of adoption and perceived efficiency.

The scores with the highest mean scores are AI use in video editing (M = 4.02, SD = 0.85) and its application in enhancing visual effects (VFX) (M = 4.15, SD = 0.78), which shows a strong agreement in the respondents. The standard deviations are relatively low, which implies that the perceptions are consistent, and the mentioned areas are the most established and accepted AI applications in film production.

Audience analysis through AI also has a positive trend (M = 3.90, SD = 0.89) and demonstrates the increasing role of AI in comprehending the preferences of the audience and the dynamics of the market. Likewise, AI in scriptwriting (M = 3.68, SD = 0.95) shows moderate acceptance, which implies the emergence, but not yet fully developed use. Conversely, the lowest mean (M = 3.55, SD = 1.00) and the highest variability are observed in the use of AI in casting decisions. This is indicative of ambivalent feelings of respondents, which could be because of issues relating to creativity, human judgment or ethics.

On balance, the findings indicate that AI can be best applied in a technical and data-driven side of creating films, whereas its use in creative and human-focused areas is relatively low and contentious.

Table 4

Impact of AI on Film Industry

Statement	Mean	SD
Improves efficiency	4.20	0.75
Reduces production costs	3.85	0.92
Enhances creativity	3.78	0.88
Transforms filmmaking	4.10	0.80

The findings show that AI has a strong positive influence on the film industry, especially in its

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efficiency of operations and production process transformation.

The middle value is the mean of efficiency (M = 4.20, SD = 0.75), which demonstrates a high consensus among the respondents, and the standard deviation among respondents is very low. This implies that AI has been well-known in terms of simplifying processes and speeding up production processes. On the same note, the remark that AI transforms filmmaking (M = 4.10, SD = 0.80) is associated with the high degree of agreement, highlighting that it alters the classical production processes.

The notion that AI decreases cost of production (M = 3.85, SD = 0.92) is also positive but with a bit higher variation implying that although many people respond with the effect of reduced cost, the experiences may not be uniform across the settings.

The contribution of AI to creativity (M = 3.78, SD = 0.88) is moderately agreeable, indicating that, although AI is playing a role in the creative processes, it is yet to be universally viewed as a powerful creative factor. Altogether, the results show that AI is greatly appreciated regarding efficiency and change, and its economic and creative benefits are accepted yet with relatively moderate levels of agreement.

Table 5

Challenges of AI in Film Production

Statement	Mean	SD
High investment required	4.05	0.83
Job displacement concerns	3.70	0.97
Ethical concerns	3.95	0.86
Lack of expertise	3.88	0.90

The findings highlight significant challenges associated with the adoption of AI in film production, with financial and ethical concerns being particularly prominent.

High investment required (M = 4.05, SD = 0.83) is registered as the highest mean score and shows a high level of agreement among respondents regarding the cost of implementing AI technologies as a significant hindrance. The standard deviation is relatively low, indicating consistency in perceptions in the sample.

Ethical issues (M = 3.95, SD = 0.86) are also of the highest priority, as the level of concern about the problem of data usage, authenticity, and ownership of the creation is immense. It means that the ethical implications are one of the critical aspects that still need to be considered when integrating AI.

The lack of expertise issue (M = 3.88, SD = 0.90) reveals that the respondents are aware that they have a skills gap that can potentially shape the successful adoption and use of AI tools in the industry.

Fourthly, the issues of job displacement (M = 3.70, SD = 0.97) represent the moderate agreement with a little more variation indicating a varied perception of how far the AI can take the place of human jobs.

In general, the findings indicate that despite the significant advantages of AI, its deployment is limited by financial and ethical considerations and skills, as well as the continuing concern with the workforce implication.

Table 6

Future of AI in Film Production

Statement	Mean	SD
AI will dominate production	4.00	0.84
AI will create jobs	3.75	0.89
AI training is essential	4.25	0.70
Enhances audience engagement	4.10	0.76

The results show the future of AI in film production is very optimistic, and respondents are aware of its increasing significance and potential in the long term. The strongest consensus and least variability are registered in AI training is essential (M = 4.25, SD = 0.70) where there is high consensus. This highlights the importance of skill development and capacity building as a critical measure of successfully incorporating AI

in the industry.

The agreement of the respondents that AI will increase the engagement of the audience (M = 4.10, SD = 0.76) and will take over the production processes (M = 4.00, SD = 0.84) is also high. The findings indicate that AI will probably have the transformative role in influencing the future practices in the film industry and enhancing the experiences of viewers. The view that AI will generate employment opportunities (M = 3.75, SD = 0.89) is moderately upbeat, but with a little more variance. This suggests that there is some degree of uncertainty among the respondents on the job creation versus displacement balance.

The findings represent the progressive opinion, highlighting the fact that training is needed and that AI has an increasing role in increasing the production and interactive with the audience, and the effects it has on the workforce are rather uncertain.

5. Discussion

The results of this research offer good empirical evidence of the increased role of artificial intelligence (AI) as a way of transforming film production, which is in line with the existing literature. The fact that the AI is an established tool in the industry, as the majority of the respondents are highly aware of the technology and familiar with AI technologies. Nevertheless, the gap between awareness and actual usage is observed, which is indicative of persistent implementation difficulties, this is also consistent with previous research pointing out the low degree of practical implementation based on technical and financial factors (Uddin et al., 2025; Dash et al., 2025).

The findings also suggest that AI is widely applied in technical fields like video editing and visual effects (VFX), where it proves to be efficient and reliable. This reinforces previous studies highlighting the power of AI in automating production processes which are complex and time-consuming (Afshar and Shah, 2025; Bian, 2025). By comparison, comparatively low uptake in such fields as casting and scriptwriting indicates that imaginative and human-focused elements of filmmaking continue to be heavily dependent on human intuition. The discovering agrees with the argument that AI does not completely eliminate human creativity, but only contributes to it (Nasir et al., 2026; Xu, 2025).

The expected value of AI in enhancing efficiency and changing the actual process of filmmaking is quite high, which confirms the idea that AI-based technologies facilitate the workflows and create the possibility of making decisions using the data (Tsiavos and Kitsios, 2025). Even though there are some positive responses regarding the decrease of costs and creative advancement, the relatively moderate level of scores signifies the diversity of experiences, which might be contingent on organizational resources and technological preparedness (Sookhom et al., 2023).

Regardless of these advantages, the paper outlines serious obstacles to the use of AI. The cost of high investment and the ethical issues are identified as the crucial challenges that follow the findings of the previous studies that indicate problems with affordability, data privacy, and intellectual property (Xue, 2024; Huang et al., 2023). Also, the shortage of professionalism highlights the necessity of formal education initiatives, especially in developing countries, which is highlighted in the literature (Mengya et al., 2024). The issue of job displacement also captures the ongoing discussions regarding the socio-economic impact of automation in creative sectors (Twaha, 2024).

In the future, the results show a promising future of AI in film production. The high focus on AI training and its expected supremacy in production processing justifies forecasts that AI will keep on transforming the industry (Li and Yu, 2025; Zhang et al., 2025). Nevertheless, the moderate consensus on job creation demonstrates that there is no certainty on workforce change and that balanced approaches to integration have to be implemented.

In conclusion, the study demonstrates that despite the enormous innovation and efficiency prospects of AI implementation, the technical challenge of the technology implementation will necessitate the resolution of the financial, ethical, and skills concerns, as a result of which the movie industry will become sustainable and inclusive.

6. Conclusion

The findings of the present research make it clear that artificial intelligence (AI) is continuing to transform the process of creating movies, influencing both technical aspects and strategic decision-making.

The results show a high level of awareness and familiarity with AI technologies among respondents, reflecting the growing recognition of AI as an essential tool in modern filmmaking. However, despite widespread awareness, there remains a gap between knowledge and actual usage, suggesting that full-scale implementation is still developing.

AI proves to be highly effective in technical fields such as video editing and visual effects, enhancing efficiency and changing industry practices. Nevertheless, its impact on creative processes like scriptwriting and casting is moderate, indicating that human creativity continues to play a vital role. This balance supports the notion that AI should complement rather than replace human expertise.

Despite these advantages, several barriers hinder successful AI integration in the film industry. High investment costs pose a significant challenge, especially for small-scale production units with limited resources. Ethical concerns; including data use, authenticity, and intellectual property, are also major obstacles. Additionally, a lack of technological skills and professional training impedes effective AI adoption. Job displacement remains a concern, and the long-term impact on employment is uncertain.

Looking ahead, AI is expected to further drive the evolution of film production. Respondents highlight the importance of training and skills development, underlining the need for the industry to equip professionals with the necessary expertise. AI is anticipated to enhance audience engagement and even dominate production processes in the future.

In summary, AI holds enormous potential for revolutionising film production, but its successful adoption relies on careful planning, investment in human resources, and thoughtful consideration of ethical and economic implications.

7. Recommendations

Based on these findings, several recommendations are offered. Firstly, industry stakeholders should invest in comprehensive training and development programmes to bridge the existing skills gap and support effective AI adoption. Secondly, policymakers and organisations must establish robust ethical guidelines and legislation to address concerns related to data privacy, intellectual property, and content authenticity. Thirdly, financial assistance schemes should be provided to make AI technologies more accessible, particularly for small-scale production studios. Furthermore, it is crucial to foster a harmonious coexistence between human creativity and machine intelligence, rather than positioning them as rivals. Finally, to sustain emerging trends, evaluate the long-term performance of AI, and promote sustainable development, ongoing research and collaboration with industry partners are essential.

Contribution of Authors

All the authors participated in the ideation, development, and final approval of the manuscript, making significant contributions to the work reported

Conflict of Interest Statement

The authors declare no conflicts of interest.

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Informed Consent

Informed consent was obtained from all individual participants included in the study.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Data Availability

The datasets generated during and analysed during the current study are available from the corresponding author on reasonable request.

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