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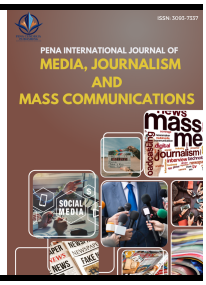
Pena International Journal of Media, Journalism and Mass Communication

Journal homepage:
https://penacendekia.com.my/index.php/pijmjmc/index
ISSN: 3093-7337



Embracing AI: Maximising the Benefits of AI Technology in the Malaysian Filmmaking Industry

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ARTICLE INFO

Article history:
Received 4 September 2025
Received in revised form 13 September 2025
Accepted 30 September 2025
Available online 9 October 2025

Keywords:
Artificial Intelligence; filmmaking industry; Malaysian filmmakers; benefits of AI

ABSTRACT

Artificial Intelligence (AI) 's historical use in the film industry highlights its function in streamlining procedures and increasing creative components. Moreover, AI enhances pre-production, production, post-production, film marketing, and even predictions by using data to comprehend audience interests and preferences, assist with budgeting, offer comments on screenplays, and visualise special effects concepts. Technological innovation, characterised by the replication of human intelligence in machines in order to simulate human cognition and behaviour, is also represented by AI. There is a lack of understanding among stakeholders. This has led to several discussions and case studies that need to be addressed. This study aims to examine AI's benefits in maximising them in the filmmaking industry among professional filmmakers in Malaysia. On the other hand, this study employed purposive sampling, selecting 15 informants who met specific criteria for one-on-one interviews from different states in Malaysia. Semi-structured interviews, guided by eight predetermined questions, were conducted, and the data were analysed using thematic analysis. Additionally, the study was framed within the context of Technological Determinism Theory that found four main themes: i) Accountability & Transparency, ii) Data Security & Privacy, iii) Reduce Bias & iv) Diversity, and Redefine Job Roles. The integration of AI into various filmmaking processes has been recognised as a means to enhance both productivity and creativity, a view shared by the filmmakers interviewed. This study's findings are consistent with the notion that AI can automate scene analysis, recommendation engines, and scriptwriting processes. In addition, the study offers valuable insights for professional filmmakers by identifying the specific benefits of AI technology in enhancing creativity, production efficiency, and storytelling innovation. By examining ways to maximise these benefits, the research provides actionable guidance for industry practitioners to leverage AI without compromising artistic integrity.

1. Introduction

Artificial Intelligence (AI) is affecting every aspect of people's lives by helping to find information and the advancement of technologies [1]. AI has also become increasingly prevalent across various

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https://doi.org/10.37934/pijmjmc.3.1.2638

industries, including the film industry. Its integration into filmmaking has facilitated the automation of tasks, reduced production costs, and enhanced the efficiency and quality of film production [2]. AI applications span the entire filmmaking process, from pre-production to post-production, as well as film marketing and audience engagement. Some important uses include analysing audience preferences, assisting with budgeting, providing feedback on screenplays, and visualizing special effects concepts [3]. By using these data-driven insights, AI aids filmmakers in tailoring content according to audience interests as well as improving the overall production workflow.

Additionally, technological innovation characterized by the replication of human intelligence in machines to simulate human cognition and behaviour is also represented by AI [4,5]. This concept includes machines capable of executing tasks that are traditionally associated with human thought processes, including learning and problem-solving [4]. It was also noted by Datta *et al*., [4] that the application has greatly influenced the media and entertainment industry, with a focus on its transformative potential.

An essential part is where AI has shown significant potential in visual effects (VFX). Tools like Adobe Sensei and Nvidia GauGAN ensure the creation of realistic landscapes and environments that would otherwise require substantial time and financial resources [6]. Visual effects (VFX) and animation advancement are significantly shown in AI as it leverages techniques that include procedural generation and AI-driven motion capture. These two further improve both production efficiency and creative possibilities. A study by Izani *et al*., [7] concluded that the integration of deep learning in animation facilitates the development of detailed character movements and interactions, which contribute to a more enriching and engaging storytelling experience. Furthermore, AI-driven algorithms like neural networks help to enhance precision and detail in tasks like colour grading and compositing [8,9].

AI technologies have also influenced scriptwriting, as novel approaches for idea generation, dialogue creation, and character development are introduced. According to [10] advanced language models trained on large-scale textual datasets can produce realistic dialogue that aligns with character traits and storylines. However, ensuring the authenticity and creative coherence of AI-generated outputs remains a critical challenge.

Furthermore, AI is utilized to analyse audience behaviour, enabling data-driven decision-making in content creation as well as marketing strategies [11]. For example, by analysing social media data and search trends, filmmakers can get insights into audience preferences and emerging trends [12]. Clearly, these insights assist in aligning content with audience demands and enhancing engagement.

Regardless of these advancements, there is still a lack of comprehensive understanding among stakeholders and professional filmmakers regarding the potential benefits and implications of AI in filmmaking [8]. This gap has led to concerns including ethical considerations, creative authenticity, job displacement and legal implications [13]. The research discussed how AI also raises apprehensions about its impact on the labour market and traditional creative processes, despite it being able to foster innovation and introduce efficiencies [14].

Current research highlights the dual impact of AL in which it may displace certain roles while simultaneously creating new opportunities and enhancing creative possibilities. This includes AI applications in editing, special effects, and distribution, which have brought transformative changes to the filmmaking landscape [9]. To address these challenges, it is essential to explore ways to maximize AI's benefits while mitigating its potential drawbacks.

Additionally, the integration of AI into the filmmaking process offers a few advantages, like the generation of special effects, image analysis capabilities and the development of script concepts. Nonetheless, AI application in the film industry raises concerns regarding its potential impact on originality [5,9].

1.1 Purpose of the Study

To study the perceived benefits of AI technology in the filmmaking industry and identify ways to maximise these benefits among professional filmmakers in Malaysia.

1.2 Research Background

For manuscript publication, despite being a relatively new innovation, AI has profoundly influenced the filmmaking industry, particularly in production and distribution processes. According to Prasad *et al*., [15], its impact became apparent in the 2000s as studios increasingly integrated AI into tasks such as screenplay analysis, post-production editing and visual effects. Not only did this evolution smoothen workflows, but AI also introduced filmmakers to a various range of innovative and unconventional creative possibilities. Furthermore, AI has revolutionized the techniques in filmmaking, most especially in cinematography, editing, visual effects and post-production. At present, this research looks at the applications of AI in these areas, emphasizing how AI-powered tools enhance efficiency, build creativity and upgrade the visual aesthetics of contemporary cinema [16].

By 2010s, AI further extended its role within the industry, contributing to script analysis, character development and audience profiling. Its application expanded to production tasks like shot composition, camera placement and lighting with AI-powered cameras and drones that enable filmmakers to capture complex cinematic shots easily [10]. A significant example of AI's transformative role in filmmaking is its application in the production of *The Irishman (2019)* directed by Martin Scorsese. AI technologies were contributory in the film's post-production, particularly in de-aging central actors, Robert De Niro & Al Pacino. Furthermore, advanced video encoding algorithms analysed each shot, compressing video data while maintaining image quality and minimizing data usage [15].

Recently, AI has been used across a wide spectrum of filmmaking activities, including content creation, distribution and marketing. AI algorithms can now generate complete film scripts, create visual actors and build original film scores. For example, OpenAI's DALL-E has the potential to revolutionize visual creation by allowing filmmakers to generate imagery from textual descriptions, therefore reducing production costs and timelines [5,8]. Likewise, AI-based Chabot's like ChatGPT have been used in marketing campaigns like The Lion King to enlist audiences through personalized interactions, amplifying the film's visibility on social media and improving user experience [10].

The assimilation of AI into filmmaking challenges traditional notions of creativity and authorship as AI systems can independently generate content, duplicate artistic styles and construct narratives. This raises critical questions on originality, authorship and the uniqueness of AI-generated works [3]. Besides, AI's potential to address bias in storytelling is exemplified by IBM's 'AI Fairness 360' toolkit, which allows producers to detect and check for biases in AI models, fostering more inclusive narratives [17]. AI's role in scriptwriting has also seen significant advancements. For example, Script Book AI uses machine learning to analyse scripts, anticipate commercial viability and provide insights into audience preferences. By evaluating story elements, themes and dialogues, Script Book AI proposes data-driven forecasts about a script's market potential, influencing creative decisions within the filmmaking process [6].

Not only that, Disney's efforts to leverage AI for character development underscore its commitment to inclusive storytelling. AI algorithms are able to prompt adjustments to ensure precise representation and cultural sensitivity by analysing character designs for embedded stereotypes. This has allowed creators to resonate with various audiences [3].

Regardless of these advancements, the implementation of AI raises concerns on job displacement and the potential loss of human creativity. The Writers Guild of America (WGA) event in 2023 drew special attention on fears that AI could replace human writers by generating scripts independently or partially. The fears were aggravated by instances like Marvel Studios' use of AI in the end credits of Secret Invasion, which faced industry criticism [2].

However, rather than focusing on the concerns about job displacement, filmmakers have the chance to collaborate with AI technologies to maximize their advantages. This includes advocating for legal frameworks to address ownership rights of AI-generated content and implementing transparent data practices. Initiatives like Google's 'AutoML' contribute to the democratization of AI, enabling independent filmmakers to form custom AI models for tasks such as scene recognition [18]. Correspondingly, AI-powered editing platforms like Magisto provide smaller production companies with tools to produce high-quality content without large-scale technical expertise [15]. It is also important to note that the ongoing integration of AI into creative processes continues to open new avenues for innovation within the filmmaking industry.

Research found that the study explores the future potential of AI in the context of prominent technologies like virtual reality (VR) and 360° video, calling attention to their ability to expand storytelling possibilities for both short and long-term content production [4]. It is expected that technological advancements can make VR and augmented reality (AR) more attainable, facilitating the creation of specialized content across diverse platforms. Additionally, the film industry is transforming an IT-centric and technologically sophisticated domain. Core filmmaking processes, including video editing, animation and visual effects (VFX) are progressively transitioning to cloud-based systems. This shift to cloud technology addresses challenges related to data density in film production, offering real-time access and collaborative functionality from any global location [4].

1.3 Theory of Technological Determinism

Theory of Technological Determinism postulates that technology serves as the main catalyst for societal development, shaping human behaviour and culture through its autonomous logic and innate capabilities. This point of view upholds that technology operates as an independent force, often influencing societal structures and practices that are beyond human control or intent [19].

In the context of AI in filmmaking, these theories propose that the integration of AI technologies deeply impacts the production, distribution and consumption of films. Advanced AI tools, including machine learning algorithms, natural language processing, and computer vision, have the potential to ease filmmaking processes, reduce operational costs, and enhance efficiency through automation [3].

Additionally, through the lens of Technological Determinism's key dimensions' processes, people, structure and organizational culture, the adoption of AI technologies could modify audience engagement with cinematic content. For example, AI-generated narratives may introduce innovative storytelling approaches, captivating viewers with unique and personalized experiences. Similarly, AI-driven film distribution systems can enhance accessibility, enabling audiences to discover and access content tailored to their preferences with greater convenience.

2. Methodology

A qualitative research design was adopted to achieve the objective of this research. Interviews were utilized as the primary method of data collection. This approach is widely known for its effectiveness in getting a detailed understanding of complex social phenomena. Specifically, this

study investigates the perceived benefits of AI in the filmmaking industry and strategies in order to optimize its potential.

An in-depth interview method is utilized to receive feedback among filmmakers in Malaysia. As cited in Ruslin *et al*., [20], interviews are mainly used to explore the life stories of individuals or groups as they represent a form of structured or semi-structured conversation between two or more parties (the interviewer(s) and the interviewee(s)), to which questions are posed to obtain information from the participating interviewee(s).

Semi-structured interviews were also employed as the data collection method in this study. This format not only provides flexibility, but it also allows researchers to guide the conversation using a predetermined set of topics and questions while also exploring emerging themes. Semi-structured interviews are widely used in social science research as these interviews are capable of eliciting interviewees' perspectives in a more open and flexible setting as compared to standardised conversations, such as those used in questionnaires [20,21].

This study used five questions as a guideline for semi-structured questions, and two additional questions were found during the interview. The online interview session was held according to the informant's time via the Google Meet application, and the session was recorded via video and audio. This interview session was approximately 45 minutes to one hour and 30 minutes. This interview initially started with a briefing session including the research title, research objectives, goals of the study, and a brief of terms and conditions before, during, and after the interview session. After the briefing, if the informants do not agree or withdraw from this study, the researcher will end the session. On the other hand, those who agree to the terms and conditions and are willing to participate in an interview, are required to fill out the consent form and digitally sign the form then return the consent form via email or what's apps. This includes permission to record video and audio during the interview session. After the informant agrees, the researcher will begin the interview by asking the questions that have been prepared and several additional questions until the interview is complete. All data obtained are intended for this study in the form of conferences presentations and publications.

This study employed a purposive sampling to identify and get participants who met the predefined inclusion criteria. Given the study's aims and objectives, the rationale for employing a purposive sampling stem from the assumption of how certain individuals may have different and significant perspectives on the issues under investigation and therefore should be included in the sample. Purposive sampling focuses on ensuring that specific cases that are deemed relevant to the research objectives are intentionally selected for inclusion in the final sample [22]. A total of 15 informants were selected from across Malaysia, representing diverse states, including *Perak, Perlis, Kedah, Pulau Pinang, Pahang, Kelantan, Terengganu, Selangor, Melaka, Negeri Sembilan, Johor, Sabah, Sarawak, Wilayah Persekutuan (WP) Kuala Lumpur, and WP Labuan*. Among the criteria required as informants for this study are: i) Informants must have knowledge or experience in the filmmaking industry for at least three years and above, and ii) Informants must be 25 years old or older.

The sampling approach assured the selection of informants with relevant expertise and experience, ensuring a smooth process of the generation of rich and meaningful data [22]. Thematic analysis as suggested by Braun *et al*., [23] was used to analyse the collected data, a qualitative method that allow researchers to identify and interpret recurring patterns and themes. Thematic analysis is also used to identify, analyse and report patterns within a dataset. It gives and organised and accurate description of the data collected while often extends beyond this to understand various aspects of the research topic [24]. Before the thematic process was done, the researcher transcribed the data and the coding process was determining before the thematic process (find the main

themes). The process of thematic analysis is engaging as it reveals themes and concepts enclosed in a data. Nonetheless, describing themes as 'emerging' or being 'discovered' shows a passive view of the analytical process. This point of view overlooks the active role of the researcher in identifying patterns, determining their relevance as well as presenting them to the audience [23-25]. The analysis of this research was guided by the theoretical framework Technological Determinism, which gives a lens for examining the interaction between technology and its impact on filmmaking processes, stakeholders and organizational structures.

3. Results

The results from the one-on-one semi-structured interviews revealed four primary themes: i) Accountability and Transparency, ii) Data Security and Privacy, iii) Reduce Bias and Diversity, and iv) the Redefinition of Job Roles (refer figure 1).

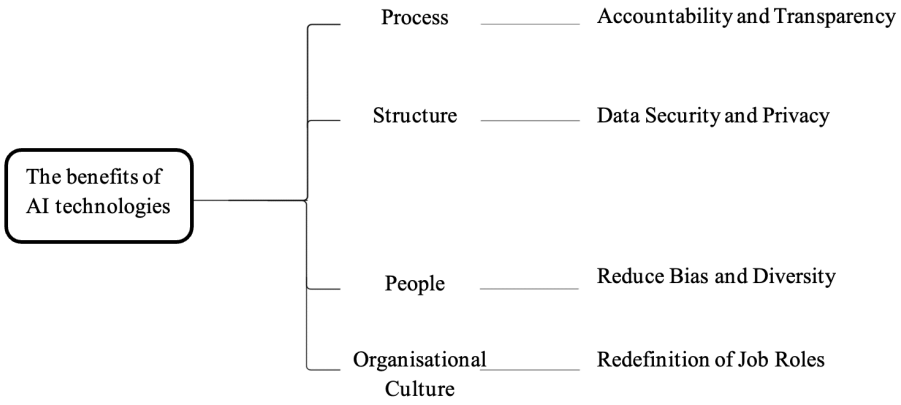

Fig. 1. The themes of benefits of AI technologies

3.1 Accountability and Transparency

The interviewees' responses emphasize AI's profound influence on the filmmaking process. In response to the question, "In optimizing the filmmaking process during your most recent experience or through an industry example, which specific tasks or stages of production do you believe AI enhances, and what were the outcomes?", participants identified several critical areas.

First, AI's capability to identify scenes requiring special effects was highlighted as a key factor in reducing post-production timelines. Additionally, its application in generating ideas and dialogue has streamlined the screenplay writing process, enabling faster and more efficient content creation. By automating labour-intensive tasks, AI facilitates the production of highly realistic scenes with minimal manual intervention, ultimately enhancing the overall quality of films. In addition, AI can analyse character arcs, pacing, and dialogue, offering insights that traditionally required the expertise of a team of experienced writers. By providing data-driven recommendations, AI supports scriptwriters in refining their narratives and enhancing collaboration with other writers.

Moreover, participants noted that AI's ability to quickly select the optimal shots significantly reduces time and resource consumption during editing. For example, film editors can utilize AI to assist in the production of film trailers. AI systems are capable of identifying and extracting action-packed or emotionally charged scenes from movies, providing valuable suggestions to editors in

creating engaging and compelling trailers. These insights, shared by multiple informants, collectively underscore the transformative role of AI in modern filmmaking.

> *"For me, AI-generated scripts have increased the writing process's effectiveness," (I1, 30 yo, Perak).*
> *"I think, AI-driven visual effects have been a game-changer," (I3, 40 yo, Kedah).*
> *"The software like Adobe Firefly Beta helps speed up my editing process, especially with documentaries," (I4, 38 yo, Johor).*
> *"In my opinion, AI facilitates the creation of more realistic scenes with reduced manual effort, thereby improving the overall quality of films," (I12, 28 yo, Selangor).*

In response to the second question, "How do you think the integration of AI has influenced the way filmmakers and studios handle legal and copyright issues and engage with content creators in the filmmaking industry?", the interviewees offered diverse perspectives.

While some raised concerns about the challenges posed by evolving regulatory frameworks, such as the impending European AI Act, most participants acknowledged AI's potential to enhance transparency in the creative process. They emphasized how AI-driven tools can generate unique insights and ideas that might not otherwise surface. Additionally, the role of AI-powered Chabot's was highlighted for their effectiveness in boosting audience engagement by delivering prompt responses and personalized recommendations. Similar views were echoed by other informants, underscoring the multifaceted impact of AI on legal, creative, and audience interaction aspects of filmmaking.

> *"From the cases I've been dealing with these few months, AI has helped streamline tasks like scene analysis and recommendation engines for marketing," (I11, 42 yo, Sabah).*
> *"My thoughts, AI Chabot's for audience engagement has been a hit. They (Chabot's) are really helpful make work easy," (I6, 35 yo, Melaka).*
> *"I think AI in film distribution has made it easier for viewers to find films tailored to their preferences." (I8, 48 yo, Pahang).*
> *"AI promotes transparency in the creative process by providing unique insights and ideas," (I15, 25 yo, WP Labuan).*

3.2 Data Security and Privacy

The interviewees provided several insightful responses, particularly regarding privacy and data security concerns. The first question in this theme, "When working with AI in filmmaking, do you think sensitive data, especially audience data, can remain secure and private?" prompted more than half of the interviewees to emphasize the need to balance the potential benefits of data collection with the imperative to respect privacy rights and regulations. For instance, while AI can analyse facial expressions and body language without identifying specific individuals, interviewees stressed the importance of responsible data usage. A shared point among most participants was the recognition of the need for accountability in conjunction with the transformational potential of AI in content creation.

The second question, "Do you think AI-driven marketing or audience interaction strategies significantly impact a film's success?" led the majority of interviewees to highlight the importance of safeguarding personal data when using AI for audience profiling, in line with transparency standards.

They proposed solutions such as encryption and anonymization techniques to protect private information while still benefiting from AI-driven insights. The interviewees collectively emphasized that privacy protection and compliance with data protection regulations should take precedence in AI-driven marketing strategies. Similar views were expressed by other informants, reinforcing these concerns.

> *"Data security is a concern, and advances in AI have led to the development of algorithms designed to prevent breaches and unauthorized access, which complicates the achievement of comprehensive security," (I2, 41 yo, Perlis).*
> *"It's challenging to guarantee complete data security which AI systems that handle this content are susceptible to data privacy," (I7, 36 yo, Pulau Pinang).*
> *"My opinion, AI-driven marketing can be effective because it has the potential to collect vast amounts of data," (I9, 32 yo, Kelantan).*
> *"I think, tools like Amazon Recognition can provide insights without disclosing private information," (I10, 27 yo, Terengganu).*

3.3 Reduce Bias and Diversity

The interviewees' responses reveal a widespread recognition within the film industry of AI's potential to reduce bias and promote diversity in storytelling. When asked, "How do you think AI-generated content has influenced storytelling and creativity, perhaps by recounting an example where AI played a key role in filmmaking?" the interviewees agreed on the ethical and authenticity concerns associated with AI-generated content. However, despite these concerns, they acknowledged AI as a valuable tool for combating bias and noted its transformative impact on creativity, particularly in visual elements. Some concerns have been raised regarding the potential limitations of AI-generated content, particularly its perceived lack of creativity and emotional depth compared to content produced by human artists. AI was seen as having the potential to foster more inclusive storytelling by addressing these challenges. Some interviewees even cited examples of how AI-generated plot twists have driven innovation. Machine learning algorithms can analyse extensive datasets, such as film scripts, to generate unique content. This capability significantly accelerates the scriptwriting process, reducing time and resource expenditure for filmmakers. Additionally, other interviewees emphasised AI's role as a catalyst for industry development. Similar opinions were shared by other informants.

> *"By helping to develop backstories for minor characters in a complicated narrative, AI could create creativity in storytelling," (I5, 44 yo, Negeri Sembilan).*
> *"I think, the human touch needs to be addressed, AI can still be helpful in avoid perpetuating harmful narratives in the story, so AI will reduce the bias," (I13, 43 yo, Sarawak)*
> *"My opinion is AI can be a tool for change. It helps by scanning scripts for bias and recommending more diverse character arcs. It's a step in the right direction," (I14, 31 yo, WP KL)*
> *"I have some thought that AI has the potential to foster more inclusive storytelling by drawing attention to these challenges," (I7, 36 yo, Pulau Pinang).*

3.4 Redefine Job Roles

Building on this theme, most interviewees expressed the belief that AI will significantly reshape employment roles in the filmmaking industry, particularly through human-AI collaboration. In response to the first question, "How do you see AI reshaping job roles within the filmmaking industry, and what opportunities might it create for collaboration between humans and AI?" interviewees highlighted how AI is transforming job responsibilities, fostering collaboration, and increasing the efficiency of marketing teams. In addition, AI can automate repetitive and routine tasks, enabling humans to dedicate their time to more complex and strategic activities that contribute to business objectives as well as personal and professional growth. Furthermore, filmmaker play a crucial role in training and fine-tuning AI by providing feedback and addressing errors, which improves the accuracy and performance of AI systems while facilitating their adaptation and evolution over time.

Further insights were shared in response to the second question, "Can you share a personal experience or industry example where AI has enhanced the efficiency and creativity of specific job roles in filmmaking without replacing them entirely?" Interviewees widely acknowledged AI's role in improving the efficiency of sound editing and production teams. They also recognized AI's contribution to the costume department, particularly in enhancing the creativity of set designers, thus illustrating the evolving nature of employment roles within the industry. In addition, AI holds significant potential to streamline the pre-production process by assisting in tasks such as scheduling, identifying locations that align with the storyline, and supporting other preparatory activities. By automating the creation of shooting schedules based on actor availability, AI can save time and enhance overall efficiency. In addition, AI is revolutionising location scouting by streamlining workflows and providing advanced decision making tools. A notable innovation is the utilization of AI-powered databases, which efficiently identify potential locations based on keywords, visual aesthetics, and specific scene requirements.

> *"AI is reshaping job roles by automating routine tasks. This allows us filmmakers to focus on the more creative aspects of filmmaking. It's a partnership that enhances efficiency," (I3, 40 yo, Kedah).*
> *"I see this evolution as a collaborative one because AI is changing job roles by taking out repetitive jobs," (I8, 48 yo, Pahang).*
> *"Yes, there are concerns, but we should learn how to use the tool instead, and I think our industry will catch up just like coding and computer science," (I14, 31 yo, WP KL).*
> *"It can illustrate a better picture to casting and wardrobe departments," (I1, 30 yo, Perak).*

In summary, the data highlights the extensive impact of AI on the filmmaking industry, encompassing process optimization and the critical importance of data security and privacy. Filmmakers recognize the potential of AI to enhance transparency and efficiency while remaining vigilant in securing sensitive data in compliance with regulatory standards. The findings underscore the awareness among filmmakers of AI's capacity to transform job roles, address biases, and foster inclusivity and diversity within the industry.

3.5 Discussion

The findings of this study are consistent with previous research on the benefits of AI in the filmmaking industry. The assimilation of AI into various aspects of filmmaking has been recognized

as a way of enhancing both productivity and creativity, reflecting the views expressed by the filmmakers interviewed.

Looking at the process of optimization, AI's role in streamlining tasks is in line with wider industry trends. Past studies suggest that AI can lighten monotonous and time-consuming tasks in filmmaking, with capabilities such as scene analysis, recommendation engines, and scriptwriting automation supporting these findings [26]. Furthermore, research that examines AI-driven tools for post-production tasks strengthens AI's impact on improving visual effects, image analysis, and script concept development. However, past studies highlight issues regarding the potential erosion of originality within the film industry because of AI's application [5]. However, the concerns raised by interviewees regarding data security and privacy are in line with ongoing ethical and legal debates surrounding AI in the entertainment industry, particularly in relation to AI-driven audience profiling and marketing [6]. Moreover, maintaining audience trust requires filmmakers and streaming platforms to prioritize user privacy through compliance with strong data protection regulations [27].

The emphasis on the responsible use of AI by interviewees aligns with broader ethical considerations identified in the literature, especially regarding AI's potential to infringe on privacy rights [28]. Interviewees also highlighted opportunities for human-AI collaboration and shifts in employment roles, which reflect ongoing industry trends. Pradeep *et al*., [16] mentioned that the adoption of AI technologies in the film industry is likely to lead to a reorganization of job categories and the emergence of new roles focused on managing and collaborating with AI systems. This change may create a demand for AI specialists to develop and maintain these systems, data scientists to analyse and interpret the huge amounts of data generated by AI, and experts to address the ethical considerations associated with AI use in filmmaking. For instance, AI's impact on sound editing and costume departments, echo broader discussions about AI's role in amplifying human capabilities in creative fields [30]. The expectation that AI will become an essential tool for filmmakers reflects the evolving relationship between AI and creative professionals, as stated in AI literature [29].

The results of the interviews are persistent with previous studies, exemplifying the multifaceted applications of AI in filmmaking, including process optimization, concerns about data security and privacy and the transformation of job roles through human-AI collaboration. According to [8] AI-driven cinema may lead to the restructuring of job roles, potentially causing both job displacement and compelling changes to current roles.

Furthermore, the current study offers valuable insights into organizational culture, people and processes within the context of AI's influence on the filmmaking industry, as is presented by the Theory of Technological Determinism [38]. This is in line that suggest that AI-driven cinema may employ algorithms to duplicate artistic styles, narrative techniques or cultural elements from an array of traditions [16]. Furthermore, it is important to ensure that AI's role in appropriating cultural elements is performed with respect, understanding and recognition of their cultural significance and context. Not only that, AI significantly amplifies visual storytelling in filmmaking by enabling advanced computer-generated imagery (CGI), automating script, character development and increasing audience engagement [31]. It is also important to note that the assimilation of AI has introduced ethical concerns including algorithmic bias, job displacement and data privacy issues. These challenges stress the need to balance out technological innovation with the preservation of human artistic contributions [27].

This study has also highlighted that AI has expedited various stages of film production including scene analysis, scriptwriting, visual effects and editing. These findings underpin the principles of Technological Determinism which posit that technological advancements navigate changes in processes and workflows [19]. The concerns raised by interviewees regarding structural adaptions further enhance this theory, emphasizing how new technologies can interrupt established systems

and norms [32,33]. As suggested in response to ever-evolving regulations, filmmakers are now obliged to adapt to new structures that prioritize data protection and privacy, exemplifying how technology can change the foundational elements of an industry [8,34].

Finally, our data analysis also suggests that there is a potential that AI may reduce human biases as well as promote diversity in storytelling. AI-generated content can encourage creativity and introduce new perspectives, thus altering traditional narrative approaches. This indicates how technology can impact attitudes and behaviours within an industry as AI is increasingly recognized as an essential technology in the film industry with the potential to enhance performance and effectiveness across various production processes [9,35]. Moreover, the Theory of Technological Determinism claims that technology can reform organizational culture by making changes in roles and responsibilities [36]. The prominent human-AI collaboration marks a change in the industry's organizational culture, where such collaboration amplifies both productivity and creativity [3,37].

3.5 Recommendation

Firstly, keeping up with the rapid advancements in AI applications for filmmaking posed a significant challenge, which may have constrained the breadth and depth of the literature review. To better address the evolving AI landscape, future research should consider incorporating real-time or recurring updates. Additionally, leveraging industry connections and networks could help overcome the difficulty of identifying experienced filmmakers with direct exposure to AI technologies.

Secondly, the limited number of interviews conducted posed a challenge as this was mainly due to the difficulty in searching for seasoned filmmakers who have experience in implementing AI in their films. As AI adoption in filmmaking is still in its early stages, not all industry professionals have first-hand experience with these technologies, which restricted the scope of the insights gathered. To strengthen future research, longitudinal studies method can be looked into, or collaboration with industry organizations can be explored, in line with AI that is becoming more integrated into the field.

Thirdly, the integration of AI into filmmaking has sparked debates and concerns over its influence on creative control. While some people express their concerns of how AI might overshadow human creativity all while limiting artistic expression, others view it as a collaborative tool that enhances the creative process. Striking a balance between human intuition and AI capabilities is significant to maintain artistic integrity. Therefore, this study recommends that future researchers look into the disadvantages and limitation of AI within the Malaysian film industry.

4. Conclusions

Data collected from interviewees' personal and industry experiences were intricately analysed and validated, providing strong evidence to support the study's findings. Both technical and societal implications were considered, and recommendations were suggested for future research as well as the development of effective solutions to address the key factors which were identified. This study employed the Theory of Technological Determinism, emphasising four essential factors: Process, Structure, People, and Organizational Culture, which were primary to the research topic.

All in all, this study offers an in-depth exploration of AI's potential benefits in the filmmaking industry, addressing ethical considerations and its impact on employment opportunities. The study contributes to a better understanding of AI's role in the industry and provides recommendations for its responsible and ethical usage, with considerations of concerns of various stakeholders. As the industry faces unknown challenges, the collaboration between AI and filmmakers is integral in

striking a balance that preserves both the artistic integrity and legal framework of the sector, with AI now enhancing rather than replacing human creativity.

Acknowledgement
This research was not funded by any specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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