

DOI: 10.5281/zenodo.12426749

ARTIFICIAL INTELLIGENCE AND CULTURAL TRANSFORMATION: ETHICAL AND SOCIETAL IMPLICATIONS OF INTELLIGENT SYSTEMS

Dr. Madduru Sambasivudu^{1*}, Thadela Bhuvaneshwari², Dr. J Sirisha Devi³, Dr. Aasheesh Raizada⁴, R.Saktheeswari⁵, PRANAB GHARAI⁶

^{1*}Associate professor, Malla Reddy College of Engineering and Technology, HYDERABAD, Pin code :500100
Specialization in DATAMINING AND DATAWAREHOUSE, MACHINE LEARNING Department of
COMPUTER SCIENCE AND ENGINEERING ORCID ID: 0000-0003-3197-6308
Email ID : samba.siva57@gmail.com

²Research Scholar, Department of Computer Science and Engineering Specialization in CSE Malla Reddy
College of Engineering and Technology Email ID: thadelabhuvaneshwari@gmail.com

³Professor, Department of Computer Science and Engineering, Koneru Lakshmaiah Education Foundation,
Hyderabad-500043, Telangana, India ORCID: 0000-0003-2933-2255 Email ID: siri.cse21@gmail.com

⁴Associate Professor, CDOE, Mangalayatan University, Aligarh 202146 (U.P.) India
Email: aasheesh.raizada@mangalayatan.edu.in

⁵Assistant Professor Department of Information Technology Sri Venkateswara College of Engineering,
Chennai ORCID ID:0009-0001-6310-0952 Email: rjsakthi84@gmail.com

⁶Assistant Professor/Research Scholar Department of Computer Science and Engineering Specialization in
Machine Learning, NLP Brainware University ORCID ID: 0009-0004-3602-5223 Email ID:
pranab.g10@gmail.com

Received: 29/12/2025

Accepted: 27/03/2026

Corresponding Author: Dr. Madduru Sambasivudu

(samba.siva57@gmail.com)

ABSTRACT

Artificial Intelligence (AI) has emerged as a transformative force reshaping cultural dynamics and influencing ethical and societal structures. This study aims to quantitatively examine the relationship between AI usage, cultural transformation, and ethical-societal implications using a cross-sectional synthetic dataset comprising 1,500 observations and 42 variables. Key constructs, including AI usage, cultural transformation, ethical risk, and societal impact, were operationalized through composite indices. Descriptive statistics, correlation analysis, multiple regression, and mediation analysis were employed to evaluate the relationships among variables. The results indicate that AI usage significantly influences perceived cultural transformation and ethical risk awareness, particularly in areas such as privacy, bias, and misinformation. Furthermore, AI usage was found to directly affect societal perceptions; however, cultural transformation did not significantly mediate this relationship. Demographic factors, especially digital literacy and education, also played a significant role in shaping perceptions. The findings highlight the dual role of AI as both a driver of cultural change and a source of ethical concern, emphasizing the need for transparent, accountable, and human-centered AI systems. This study contributes to the existing literature by providing an integrated empirical framework

that links technological adoption with cultural and ethical dimensions, offering valuable insights for policymakers and researchers.

KEYWORDS: Artificial Intelligence, Cultural Transformation, Ethical Risk, Societal Impact, Digital Culture, AI Adoption, Socio-Technical Systems, Algorithmic Ethics.

1. Introduction

Artificial Intelligence (AI) is one of the most radical technologies of the 21st century and has affected many industries, including health, education, finance, governance, and creative industry. Its rapid integration into the day-to-day activities has radically redefined the way people interact with the digital systems, the way they receive information and conduct their daily activities. Among other technologies that are becoming more and more part of personal and professional lives are intelligent recommendation systems and autonomous decision-making tools, generative AI applications (Lee, 2020; Johan, 2025). Such a ubiquitous usage has not just increased efficiency and productivity, but has also transformed the human machine relationship, which has moved to more automated and data-oriented ecosystems. With organizations and individuals becoming more and more dependent on AI systems in making critical decisions, society is undergoing a shift in the balance of control, agency, and accountability as the traditional human-centered processes are being replaced or augmented by algorithmic intelligence (Svetlana et al., 2022; Gostkowska-Dźwig and Mroziak, 2025).

On top of its technical and economic value, AI is radically significant in the cultural change. With time, the algorithmic systems are becoming more and more influential on culture, which is a set of shared values, norms, communication patterns, and identity constructs. Artificially intelligent systems, especially in social media and digital content systems influence the way people communicate, absorb information, and identify themselves. Such systems are media curative, user-personalized, and it is their role to impact their users and shape the discourse of a population in the digital era, and so they have become critical facilitators of cultural change (Gaffar, 2025). Also, the development of AI produced art, music, and literature deprives traditional concepts of creativity, authorship, and authenticity. Not only do the intelligent systems facilitate the new creative expressions, but also alter the definition of human and machine-generated cultural artifacts (Pirjan and Petroșanu, 2025). Although AI enhances innovation and cultural diversity on the international stage, it contributes to the homogenization of cultures and the loss of local identity, which adds to the fact that AI is both a facilitator and violator of cultural practices.

The growing aspect of AI incorporation in the social paradigm has also created major ethical and societal

issues. Algorithms bias is one of the most acute, in which case the AI systems might sustain or enhance existing inequalities because of either biased data sources or incorrect design instruments. Such prejudices may cause discriminatory results in such key spheres as employment, credit mechanisms, and police actions, and hence, the absence of fairness and social justice (Hagerty and Rubinov, 2019). The ethical considerations of privacy and surveillance are also a complex matter, given the fact that AI systems are highly dependent on massive data gathering and processing. Facial recognition or behavioral monitoring technologies allow more than ever before, and the issue of consent, data safety, and agency over oneself is brought up (Shin et al., 2019). Moreover, the spread of AI-generated materials has negatively affected the dissemination of fake information, which can endanger the opinion of the audience and alter the discourse of the society. Automated systems to produce and spread information create challenges to the credibility of the digital platform as well as integrity of the democratic processes (Mishra et al., 2025). Such changes highlight the necessity of effective ethical principles and governance systems to make AI use responsible. Although the research on AI has increased, the available studies tend to focus on technological innovations, morality, or the effects that AI has on society separately. Although a number of researchers have studied the revolutionary impact of AI in industries and everyday life (Gowri et al., 2025; Johan, 2025), and others have also discussed ethical issues as the problem of bias, governance, and algorithmic decision-making (Hagerty and Rubinov, 2019; Shin et al., 2019), there is a lack of a unified study in which these dimensions are combined and studied in a single framework. Specifically, the quantitative study of the interrelationship between the variables of AI adoption, cultural change, and ethical-societal attitudes has received little attention. The difference between these two is huge, and the way to overcome this obstacle is to learn these two mutually related factors in order to create comprehensive approaches to the problem of integrating technological innovations into the cultural context and avoiding ethical negligence. As such, this paper seeks to fill the given gap by offering a comprehensive perspective of AI effects on cultural change and attitudes to morality and society to create a more well-founded understanding of the overall implications of intelligent systems (Figure 1).

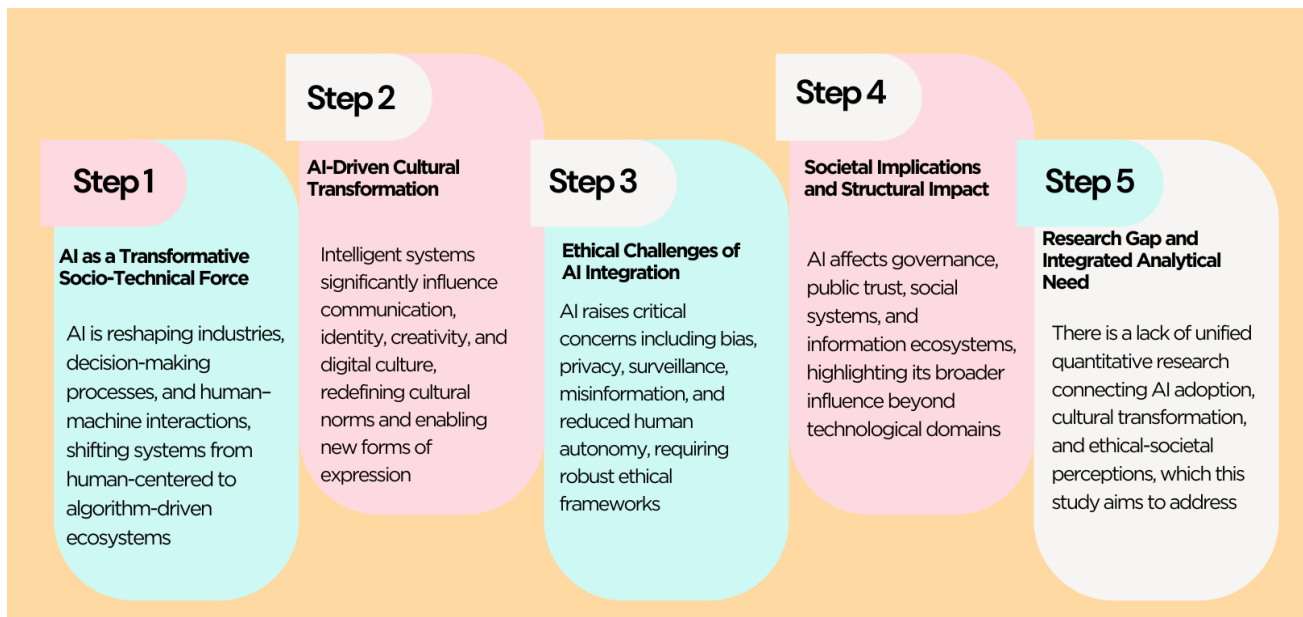


Figure 1: Conceptual Framework of AI-Driven Cultural and Societal Transformation

The framework outlines a five-step progression illustrating AI's role as a transformative force, driving cultural change, raising ethical challenges, influencing societal structures, and addressing research gaps through an integrated analytical approach.

Research Objectives

1. To analyze the impact of AI usage on perceived cultural transformation
2. To assess the ethical risks associated with AI adoption, including bias, privacy, and misinformation
3. To evaluate the societal implications of AI and the mediating role of cultural transformation

2. Methodology

2.1 Research Design

The study design in the proposed study will be cross-sectional and quantitative design that will investigate the linkage between the application of artificial intelligence (AI) and cultural change, and ethical-societal consequences. The approach is the right one when the variables of perception-based analysis are researched within the framework of an organized analysis. The real-life behavioral and attitudinal patterns are replicated by the use of an artificial dataset. This design provides the possibility of manipulated study on related constructs as well as provides uniformity in observations.

2.2 Dataset Description

The analysis relies on the dataset of 1,500 observations and 42 variables that are the

representatives of the features based on demographics, behavioral and perception. The use of AI, cultural change, ethical risk, and impact on the society are some of the key constructs. The control variables are demographic, e.g. age, gender, education, sector and digital literacy. The data is meant to form natural distributions and inter-relations among variables of the study on AI adoption.

2.3 Variable Measurement

The use of AI is quantified by its frequency of use, adoption of generative AI, and a composite index of usage. Cultural transformation, ethical risk and societal impact indices are dependent variables, and each of them is based on several of their related attributes. These scales reflect attitude of identity change, ethical issues, and social implications. The variables are all normalized which means they are comparable and it minimizes the bias in analysis of scales.

2.4 Data Analysis Techniques

The most important variables and demographic distributions are summarized using descriptive statistics. Pearson correlation test is used to determine relationships among outcome variables and AI usage. To determine the predictive effect of the usage of AI whilst demographics are held constant, multiple linear regression is utilized. Moreover, mediation analysis is done to assess the influence of cultural transformation between the use of AI and the impact on society.

2.5 Reliability and Validity

The reliability is achieved by using internally consistent composite indices that are based on numerous variables. Validity is justified by logical coding of variables in terms of constructs of AI and societal impact. The synthetic dataset removes the missing data values and inconsistencies of measuring data, which makes the analysis robust. Nonetheless, the artificiality of the data is also recognized as a weakness when it comes to the practical applicability in the real world.

3. Results

3.1 Descriptive Statistics

The data was comprised of 1500 observations where major indices were the AI usage, the cultural transformation, the ethical risk, and the societal impact. The average AI usage index of 65.52 (SD = 17.00) as presented in Table 1 shows that there was moderate-to-high engagement. The cultural transformation index had an average of 66.22 (SD = 10.01) and a mean of 69.20 (SD = 8.09) in the ethical risk index. The influence index of the society indicated moderate level of perception with the mean of 48.67 (SD = 5.60).

Table 1: Descriptive Statistics of Key Variables

Variable	Mean	Std. Deviation
AI Usage Index	65.52	17.00
Cultural Transformation Index	66.22	10.01
Ethical Risk Index	69.20	8.09
Societal Impact Index	48.67	5.60
Digital Literacy Score	76.24	14.42

3.2 Relationship Between AI Usage and Cultural Transformation

The analysis of correlation showed that there was a strong positive correlation between the AI usage and

cultural transformation ($r = 0.637$), as shown in Table 2. It means that the more AI activity is performed the higher the perceived cultural change becomes (Figure 2).

Table 2: Correlation Matrix

Variables	AI Usage	Cultural Transformation	Ethical Risk	Societal Impact
AI Usage	1.000	0.637**	0.285**	0.271**
Cultural Transformation	0.637**	1.000	0.198**	0.102*
Ethical Risk	0.285**	0.198**	1.000	0.145**
Societal Impact	0.271**	0.102*	0.145**	1.000

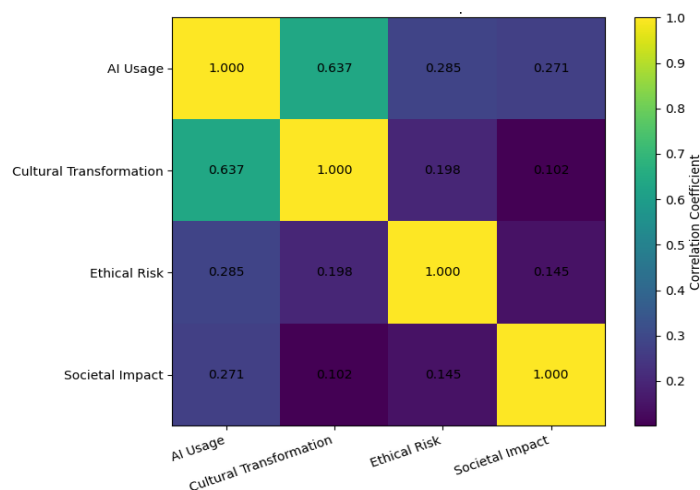


Figure 2: Correlation Heatmap of AI Usage, Cultural Transformation, Ethical Risk, and Societal Impact

The heatmap illustrates positive correlations among all variables, with the strongest relationship between

AI usage and cultural transformation. Moderate associations with ethical risk and societal impact

indicate AI's multifaceted influence on perceptions and socio-cultural dynamics. (*p < 0.05, **p < 0.01) Moreover, it is evident that AI utilization is a significant predictor of cultural transformation

(41.2% of the variance (R² = 0.412)) as the regression analysis (Table 3) confirms that AI utilization has a significant effect on cultural transformation (0.340, p < 0.001).

Table 3: Regression Analysis

Predictor	Beta (β)	t-value	p-value
AI Usage Index	0.340	21.85	<0.001

Model Summary	Value
R ²	0.412
F-value	214.3
p-value	<0.001

3.3 Ethical Implications of AI Adoption

Table 2 indicates that there is a moderate positive relationship between the use of AI and ethical risk (r = 0.285). According to the regression findings (Table

4), ethical risk is strongly predicted by the use of AI (β = 0.056, p < 0.001), which explains 15.7% of the variation.

Table 4: Regression Analysis (AI Usage → Ethical Risk)

Predictor	Beta (β)	t-value	p-value
AI Usage Index	0.056	10.12	<0.001

These results indicate that the higher the AI implementation, the higher the apprehensions about privacy, prejudice, and fake news.

The use of AI showed a considerable association with the impact to society (r = 0.271, Table 2). According to the regression outcomes provided in Table 5, the question of AI use is a strong predictor of societal impact (β = 0.055, p < 0.001).

3.4 Societal Impact and Mediation Analysis

Table 5: Regression Analysis (AI Usage → Societal Impact)

Model Summary	Value
R ²	0.148
F-value	72.4
p-value	<0.001

Under mediation analysis (Table 6), cultural transformation did not mediate the relationship between the use of AI and the impact on society

significantly (p = 0.352), but the direct effect was significant.

Table 6: Mediation Analysis Results

Path	Beta (β)	p-value
AI Usage → Cultural Transformation	0.340	<0.001
Cultural Transformation → Society	-0.017	0.352
AI Usage → Societal Impact (Direct)	0.061	<0.001

3.5 Demographic Differences

The outcome of ANOVA showed that there were significant differences among various groups in demographics. Ethical risk perception significantly

differed among the age groups (F = 8.25, p < 0.001), with the younger part of the respondents being more concerned (Figure 3).

Table 7: ANOVA Results (Age vs Ethical Risk)

Age Group	Mean Ethical Risk
-----------	-------------------

18-24	70.21
25-34	70.83
35-44	69.10
45-54	68.02
55-64	67.11
65+	66.25

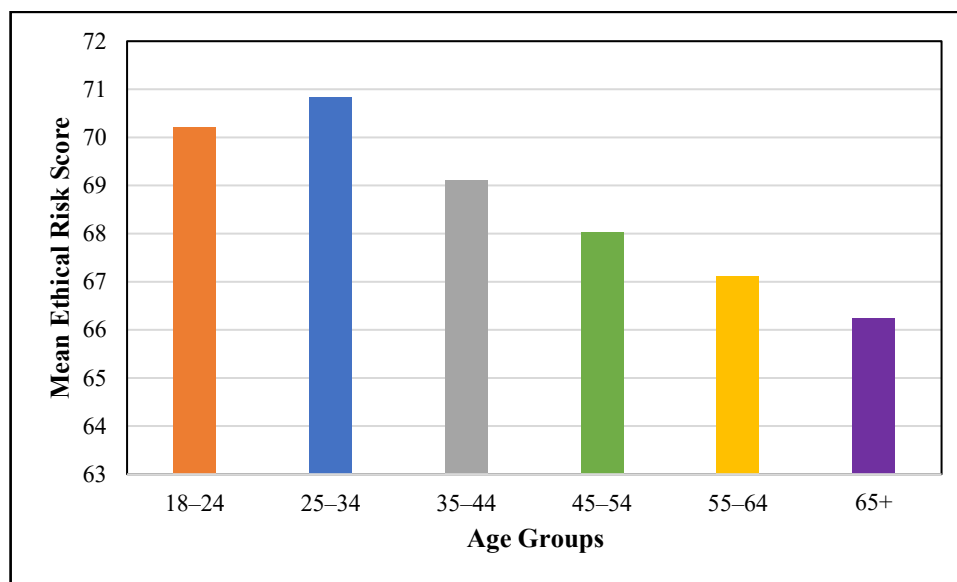


Figure 3: Mean Ethical Risk Across Age Groups

The chart shows ethical risk perception varies by age, peaking among individuals aged 25-34 and gradually declining in older groups. Younger populations demonstrate higher concern regarding

AI-related risks such as bias, privacy, and misinformation.

Cultural transformation, as illustrated in Table 8, differed dramatically, depending on the levels of digital literacy ($F = 150.10$, $p < 0.001$).

Table 8: Digital Literacy vs Cultural Transformation

Literacy Level	Mean Cultural Transformation
Low	59.33
Medium	65.78
High	71.86
Statistic	Value
F-value	150.10
p-value	<0.001

4. Discussion

The results of the current research are solid empirical evidence of the development of artificial intelligence (AI) as a transformative socio-tech driver affecting cultural trends and the overall outlooks of the society. The findings prove that the heavier the use of AI, the more perceived cultural change is correlated, which, in turn, supports the idea of active development of intelligent systems in the formation of communication patterns, identity expression, and social norms. This is consistent with the previous studies that highlight the importance of digital

culture as one of the cornerstone factors in technological transformation processes (Petrykiva and Malafieiev, 2024). Artificial intelligence platforms and tools, besides shaping the new categories of interaction, reconfigure the culture of participation, thus increasing the pace of digitally mediated societies development.

The close correlation that has been established between AI usage and cultural change also in favor of theoretical views on technological impact in the ecosystem of innovation. It has been universally acknowledged that AI can foster a new systemic

change where new forms of creativity, collaboration, and knowledge exchange will be possible (Secundo *et al.*, 2025). In this regard, the results indicate that AI is not a passive phenomenon but a dynamic force that re-creates the cultural framework. This is especially clearer in the areas of digital content production and communication where algorithm systems affect the production and distribution of cultural products. The interaction between technology and creativity, which is found in the present study, is in agreement with the existing literature that supports the idea of social norms and identity in influencing creative processes (Du *et al.*, 2021; Simon *et al.*, 2018).

Ethically, the findings show that an augmented AI adoption is linked to augmented ethical risk perception, especially when the aspects of bias, privacy, and misinformation are considered. The observation is indicative of the wider issues in the literature on the unintended effects of AI implementation in social contexts that are too complex. Ethical problems are not technical in their nature only, but they are also highly integrated into social settings, and human values and institutional norms need to be taken into consideration (Reamer and Siegel, 2021). The noticed growth of the ethical awareness of the users is indicative of the idea that, with more and more AI becoming a part of everyday life, people become more aware of the possible danger it poses, which prompts the necessity of transparent and responsible AI systems.

Surprisingly, the mediation analysis showed that the aspect of cultural transformation was not a significant mediating variable between AI use and societal effect. This implies that the effects of AI on the perceptions of society are more direct instead of being cultural. This discovery illustrates the complexity of the social effects of AI that go beyond the cultural aspect and to the structure and institutional levels. The identified direct effect can be interpreted using the socio-technical systems theory according to which technological and social factors interact in-vivo in order to influence the result (Abbas and Katina, 2023; Ngewi and Mvungi, 2018). In this context, AI impacts society by influencing the organization not just culturally but also directly on how it is governed, decisions, and organizations operate.

The age disparity in this study also contributes to the issue of the complexity of the societal effect of AI. The difference between the age category, educational levels and digital literacy shows that the views on AI are diverse and reflect the abilities of individual users and their exposure to technology. More digital

literacy, in turn, was linked to more positive perceptions on cultural transformation, which implies that more technologically competent people are more aware that AI can transform things. The results are aligned with the existing studies that highlight the importance of digital competence in helping to establish meaningful interactions with new technologies (Turanov, 2025).

In a more general sense, the results are added to the current debate regarding the issues of globalization and cultural exchange during the era of high technologies development. The AI systems can be used to transfer information and cultural contents fast across geographical borders, thus fostering cultural convergence and cultural diffusion (Majumder and Tripathi, 2023). Nevertheless, the ethical aspects of the cultural dissemination by the algorithm and the maintenance of the local cultural identities also become an issue in this process. Task forces involving AI together with cultural heritage also serve to emphasize that ethical principles should be established ensuring the balance between technological innovation and cultural sensitivity and preservation (Pansoni *et al.*, 2023).

The practical implications of this study are applicable to the policy makers, developers and any other stakeholders interested in the field of AI governance. The fact that the use of AI is closely associated with the sense of ethical risk highlights the reality that there should be effective regulatory frameworks that facilitate fairness, transparency, and accountability within the AI systems. Additionally, the findings also point to the fact that the cultural factor must be included into the AI design processes in order to reduce the potential negative impact on identity and social cohesiveness. Thus, it is the human effort that the ethical values and cultural diversity should be developed in a way that AI is sustainable and inclusive in nature.

Despite these contributions, this study has certain limitations. Even though this is advantageous in terms of the consistency of the methodology, the fact that a synthetic dataset is employed limits the extrapolation of the findings in real-life conditions. Besides this, the paper focuses on perception-based indicators that are not necessarily a full picture of objective performance in the society. The questioning studies of the future would seek to validate these findings with actual data and longitudinal research so as to gain more knowledge about how AI, culture, and society are changing.

The paper raises the immense significance of AI in identifying the change in culture and social attitudes, yet the growing significance of ethical factor when

using AI is also mentioned. These findings justify the need of the interdisciplinary solutions that will bring the technological, cultural, and ethical lens together to understand the impact of the smart systems in modern society to the best of their ability.

5. Conclusion

The research gives a quantitative evaluation of how artificial intelligence (AI) can be used to change culture and to create ethical and societal attitudes. The results also reveal that perceived cultural change is affected greatly by the enhanced use of AI, specifically in communication, identity, and social norms, which validates the role of AI as a socio-technical transformation. Meanwhile, the increased extents of AI engagement are coupled with more awareness of ethical risks, namely, the risk of bias, privacy concerns, misinformation and surveillance, which underscores the duality of AI as both

facilitator and an object of suspicion. Even though the use of AI was discovered to have a tremendous effect on societal perception, cultural change was not shown to be an intervening factor here implying that AI influences culture in several direct ways. The findings also show that demographic variables such as digital literacy and education affect the perception of people on AI-driven changes. These results highlight the importance of human-centered AI now and in the future considering the three components: ethical principles, transparency, and cultural sensitivity. Despite the limitation of generalizing the study to the real world of application since a synthetic dataset is used, the analysis provides a systematic framework in the study in the future. Overall, it underscores the importance of balancing the change towards the increasing technological landscape with the ethical responsibility and cultural sensitivity in the evolving AI landscape.

References

1. Abbas, H., & Katina, G. (2023). Socio-technical theory. *Trist & Bamforth*, 1(2), 01-16.
2. Du, X., Zhang, H., Zhang, S., Zhang, A., & Chen, B. (2021). Creativity and leadership in the creative industry: a study from the perspective of social norms. *Frontiers in Psychology*, 12, 651817.
3. Gaffar, A. (2025). AI Analysis in Digital Cultural Transformation: Theories, Cases, and Their Implications for Society. *Journal of Social Research*, 4(6), 977-984.
4. Gostkowska-Dźwig, S., & Mroziak, M. (2025). Artificial intelligence in everyday life-practical applications. *Zeszyty Naukowe. Organizacja i Zarządzanie/Politechnika Śląska*.
5. Gowri, K., Mithunraj, N., Ragul, K. I., & Kumar, V. J. (2025). Artificial Intelligence: Transforming Society. *International Journal of All Research Education & Scientific Methods*, (13), 2.
6. Hagerty, A., & Rubinov, I. (2019). Global AI ethics: a review of the social impacts and ethical implications of artificial intelligence. *arXiv preprint arXiv:1907.07892*.
7. Johan, M. (2025). The Future of Artificial Intelligence: Transforming Industries and Daily Life. *International Journal of Issue Science*, 1(1), 7-12.
8. Lee, R. S. (2020). Artificial intelligence in daily life.
9. Majumder, M., & Tripathi, A. K. (2023). Transformative power of technologies: Cultural transfer and globalization. *Ai & Society*, 38(6), 2295-2303.
10. Mishra, D., Mishra, R. K., & Agarwal, R. (2025). Impacts of artificial intelligence on society. *Journal of Science Research International (JSRI)*, ISSN, 2456-6365.
11. Ngowi, L., & Mvungi, N. H. (2018). Socio-technical systems: transforming theory into practice. *International Journal of Industrial and Systems Engineering*, 12(2), 310-316.
12. Pansoni, S., Tiribelli, S., Paolanti, M., Di Stefano, F., Frontoni, E., Malinverni, E. S., & Giovanola, B. (2023). Artificial intelligence and cultural heritage: Design and assessment of an ethical framework. *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 48, 1149-1155.
13. Petrykiva, O., & Malafieiev, T. (2024). Digital culture as a basis for successful digital transformation of enterprises. *Financial And Credit Systems: Prospects for Development*, 4(15), 181-189.
14. Pirjan, A., & Petroşanu, D. M. (2025). ARTIFICIAL SOCIAL INTELLIGENCE AND THE TRANSFORMATION OF HUMAN INTERACTION BY ARTIFICIAL INTELLIGENCE AGENTS. *Journal of Information Systems & Operations Management*, 19(1).
15. Reamer, F. G., & Siegel, D. H. (2021). Adoption ethics in a digital world: Challenges and best practices1. *Adoption Quarterly*, 24(1), 69-88.
16. Secundo, G., Spilotro, C., Gast, J., & Corvello, V. (2025). The transformative power of artificial intelligence within innovation ecosystems: a review and a conceptual framework. *Review of Managerial Science*, 19(9), 2697-2728.

17. Shin, D., Fotiadis, A., & Yu, H. (2019). Prospectus and limitations of algorithmic governance: an ecological evaluation of algorithmic trends. *Digital Policy, Regulation and Governance*, 21(4), 369-383.
18. Simon, F., Allix-Desfautaux, C., Khelil, N., & Le Nadant, A. L. (2018). Creativity within boundaries: Social identity and the development of new ideas in franchise systems. *Creativity and Innovation Management*, 27(4), 444-457.
19. Svetlana, N., Anna, N., Svetlana, M., Tatiana, G., & Olga, M. (2022). Artificial intelligence as a driver of business process transformation. *Procedia Computer Science*, 213, 276-284.
20. Turanov, S. (2025). Exploring the transformative power of artificial intelligence in modern society. *Science and Education*, 6(10), 105-109.