SCIENTIFIC OASIS

Decision Making: Applications in Management and Engineering

Journal homepage: www.dmame-journal.org
ISSN: 2560-6018, eISSN: 2620-0104

The Influence of Neural Computing Engineering and AI on Social Media User Behavior and Decision Making

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ARTICLE INFO

Article history:
Received 5 April 2025
Received in revised form 19 May 2025 Accepted 7 June 2025
Available online 01 December 2025

Keywords:
Decision Making; social media; Perceived Algorithms Transparency; Decision Influence; Content Personalization

ABSTRACT

The objective of this study was to investigate the impact of received personalization of content, perceived algorithm transparency and perceived ethical concerns on user decision-making behaviour on social media (SM). For this purpose, quantitative data from the primary resources was collected and this study used RStudio for robust analysis. The population of this study was SM users from USA, Canada, United Kingdom, Brazil, India, Australia, Japan and Germany. A sample of 395 respondents was analysed, and the findings of this study highlight the impact of received personalization of content, perceived algorithm transparency and perceived ethical concerns on user decision-making behaviour on SM is positive and significant. The study has significant implications for the body of knowledge where the identified gaps were addressed. In addition, this study provides practical implications how the users can avoid the influence of SM to influence on their decision-making behaviour.

1. Introduction

In the modern time, social media (SM) has become an integral part of human life, and it has a significant influence on human behaviour [13]. With the advancement of technology and easy access to Internet, majority of the people who are educated are using SM platforms to share information and have digital presence. However, the availability of these people on SM platforms shapes their narrative based on the content they see on SM [2]. The content creators and propaganda people are highly activated on SM to share the information to shape the narrative. When the users are encountered with these kind of information, they are influenced by it sometimes without any intention [7]. However, check and balances on the SM is an important factor which can improve the digital presence of SM platform and activation of people in SM. It is necessary for SM users to develop significant positive attitude for the purpose of information sharing where the SM platforms can be appropriately used for shaping the human behavior [34]. On the other hand, if the users are easily influenced by the SM platforms, it reduces their creativity and leads to their interaction with the content that can influence them unintentionally [30].

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https://doi.org/10.31181/dmame8220251576

Meanwhile, the developers of SM platforms are also active in algorithm designing where they provide necessary information to the SM users based on their preferred content [10]. However, sometimes the information shared on the SM platforms is not aligned with them because of content and personalization of the SM users. In this way, a kind of attitude for SM users is developed where their personality is shaped by the artificial intelligence-based algorithm according to the design and engineering of it [19]. The privacy of SM users is also important, and the algorithm designers and the engineers of SM are required not to breach this privacy. It is an accessory where all information shared to the SM users should be protected and they can have access to better information [24]. At the same time, when the SM users are highly active to advance their strategies, the prompt engineers and AI based algorithm designers are recommended to not breach that information which can influence the decision-making of the users [25]. Similarly, there should not be any kind of third-party access to the user information on SM platforms, which can reduce the transparency in the shared information and influence the decision-making of users.

SM platforms have access to an enormous amount of personal data, and there are concerns about how this data is being stored, collected, and used. While SM ethical issues include privacy concerns, data misuse, misinformation, cyberbullying, addiction, and online harassment [31]. On the other hand, algorithms determine which content is shown to users and in what order, based on a variety of factors such as user engagement, relevance, and recency [33]. One of the major effects of SM algorithms on content distribution is the potential for bias and inequality. On the other hand, people use SM to share their experiences, reviews, information, advice, warnings, tips and any kind of issues that are interesting to their connection or friends [32]. While that information is a helpful source, which may influence consumer's decision-making. Similarly, consumers are more likely to buy when they get recommendations from a person they trust [18]. Accordingly, celebrities and popular people inspire their audience and influence their buying behavior.

In the previous studies, scholars significantly highlighted that SM platforms are influencing for decision-making in the sense of marketing [20]. Similarly, the previous studies also highlighted that SM platforms are the purpose of engagement bird the personalization of content shared on these platforms can be accessed by the third parties for the purpose of influence to buy product [16]. On the other hand, in the political scenario the SM platforms also have key role where the shared information on the platform is easily accessed to the people and their perceptions are changed. The decision-making process should not be influenced by any kind of third factor which is necessary for fair decision in the life of people [12]. Whereas the SM platforms are highly integrated with best engines of algorithm that customize the preference of people and bring the same information to them. Based on the previous studies, the SM algorithm has significant influence over the people and their decision-making. However, these studies paid little attention on the role of perceived personalization of content as effective to influence the human decision-making behaviour on SM [37]. Similarly, these studies have no evidence regarding the role of perceived algorithm personalization for influencing the decision-making of human based on SM. In addition, these studies have limited discussion regarding the rule of perceived ethics and the human decision-making on SM.

To address these gaps in the body of knowledge and literature, this study was conducted with the objective of investigating the impact of received personalization of content, perceived algorithm transparency and perceived ethical concerns on user decision-making behaviour on SM. For this purpose, quantitative data from the primary resources was collected and this study used RStudio for robust analysis. The findings of this study highlight the impact of received personalization of content, perceived algorithm transparency and perceived ethical concerns on user decision-making behaviour on SM is positive and significant. The study has significant implications for the body of knowledge where the identified gaps were addressed. In addition, this study provides practical implications for

how the users can avoid the influence of SM to influence their decision-making behaviour. The remaining part of this research it based on review of literature where the hypothesised relationships are discussed in the context of previous research. The next part is based on research methodology where the information related to data collection and data analysis is presented. Furthermore, the next part is based on the discussion of findings in the context of previous studies. Finally, this study provides the implications of this research and future directions in the last section.

2. Review of Literature

The personalization of content is important for SM user where they can modify the information and get the content of their choice [35]. With the help of modern algorithms, SM users can get best information at the time when it is required to them. Accordingly, the perception of SM users to the content is important as it can influence their decision to use the platform [36]. When SM users have appropriate knowledge about content personalization, they can modify the information to find the content related to their behaviour. It is important for the users to modify the content according to their choice because this kind of content influence their overall behavior on SM [17]. The perception of some users such as minor is also important to be designed according to the algorithm of SM where personal information can be delivered to them accordingly. Meanwhile, the focus on SM content advancement is necessary where users should get appropriate information required for their decision-making [6]. On behalf of SM, the management team should provide appropriate support and content personalization support to the public where the users can get their related information that can influence their decision-making behavior.

It is imperative for the SM management teams and algorithm designers to understand the privacy and context of their information design which can strongly influence the user decision-making [26]. In the modern time of marketing, the products are promoted on SM where related information is delivered to the users and their actions resulted in purchasing of the product. Therefore, this decision-making model should be improved and enhanced with the help of SM where all the related information should be fairly reported to the users [28]. It is the right of the users to have related authentic information on SM platforms, and at the same time their privacy should be protected. In the time of artificial intelligence algorithm, the content and information of the users should not be used to train the models [29]. The privacy of SM users should be protected where they have key role in making decisions according to their choice.

H1: *There is a relationship between perceived personalization of content and user decision-making behavior on social media.*

The algorithm of modern time is designed to run the SM platform and have interaction between the end users and the platform [5]. It isn't necessary for the companies to design these algorithms according to the user standard where all the related information is available to the users without any kind of privacy breach. The transparency in algorithm is also important where users have a good sense of mind religion to their information and available interaction with SM [14]. SM algorithms at the one hand provide information and related content to the users, and on the other hand get the user's behaviour and improve it for their working. It is necessary for the SM users to have appropriate information related to the algorithm working so they can control their behavior [9]. The fairness in business is also possible when the SM platforms are designed appropriately and their transparency in algorithm working is ensured for the user and protection [38]. It is a necessary factor where the related information should be delivered to the users, and their information should not be used to train artificial intelligence-based models.

The main purpose of SM algorithms is to have the heat map and get all the information where the users are visiting and what kind of product they are purchasing [21]. However, this advancement of

algorithms should not be used to influence the behavior of SM users where their decision-making should not be highly influenced from it. The algorithm designers are recommended to protect and provide privacy for the users information where all the sensitive data should not be used to influence their decisions in the future [22]. Similarly, SM users are recommended to improve their working behavior which can influence them for development of transparency where the major companies should protect the privacy of the users [11]. Accordingly, it is also important for the SM users do not share their sensitive information and not easily influenced by the algorithm based recommended content or information to make their decisions [1]. In this way, a gap of privacy and protection of data can be insured from the user end where the protected information can be used to improve the SM.

H2: *There is a relationship between perceived algorithmic transparency and user decision-making behavior on social media.*

The information of users on SM should be highly protected where all the related information should be modified for the purpose of delivering quality content to the users [38]. However, it is ethical responsibility of the SM users to provide related information for the purpose of advancement in management of SM and users content [21]. The bridge in any kind of ethical concern on the SM can lead the users to disasters where their sensitive information and data can be reached by the third party that can influence their decision making [3]. It is necessary for the SM users to keep an eye on their behavior without bypassing the sensitive information and algorithm design that can influence their behavior [39]. Accordingly, decision-making is important for SM users where all the sensitive information should be kept in privacy where algorithms should not give access to such kind of sensitive information to any kind of third party.

Ethically, it is responsibility of the SM platforms to protect the information of users which can be used for any kind of misadventure tool influenced their decision which is not necessary for them [27]. Even though, the SM related information has access to user behavior for content modification an advertisement or product on the SM platforms, but it should not be highly sensitive or influential to influence their decision making [29]. The platforms should be used appropriately to provide necessary information to the users, but their influential role should be limited. On the other hand, time to time awareness should be created for the SM users where they can achieve the information related to their behaviour that can interact with their standard of quality time spent on SM [5]. This kind of awareness is necessity where users can be influenced to not use SM platforms for the purpose of their decision-making bid, they should consider these platforms as a source of information sharing. It is necessary to protect the privacy of the users where the relative information on SM can influence their behaviour on the high end.

H3: *There is a relationship between perceived ethical concerns and user decision-making behavior on social media.*

3. Methodology

This study adopts a quantitative research design to investigate the influence of neural computing and artificial intelligence (AI) on SM users' decision-making behavior. While prior studies have largely employed secondary data or computational analysis, this research relies on primary data gathered through a structured questionnaire survey. A cross-sectional survey design was employed to capture responses at a single point in time. The quantitative approach was selected due to its suitability for hypothesis testing and for analyzing relationships among constructs using statistical models. The target population for this study comprises active SM users aged 18 years and above who engage regularly with algorithm-driven platforms such as TikTok, Instagram, YouTube, and Twitter/X. These platforms were chosen because of their reliance on neural computing models, including recommendation engines and content-filtering algorithms. Inclusion criteria required participants to

be weekly active users of at least one of the above platforms.

A purposive sampling strategy was combined with quota sampling to ensure representation across age cohorts and platform type. Data collection was facilitated through online distribution channels, including university networks, SM groups, and professional survey panels. Based on recommendations and robust analysis, a minimum of 300 responses was targeted. The survey instrument was designed using established measurement scales adapted from prior studies, with items tailored to the SM context.

Perceived personalization was assessed through items measuring the extent to which users felt content matched their interests. Secondly, perceived algorithmic transparency items focused on users' understanding and awareness of how AI systems recommend or filter content. Thirdly, perceived ethical concerns included items on privacy, manipulation, and autonomy. The dependent variable, user decision-making behavior, was measured through items reflecting the likelihood of engaging with, sharing, or being influenced by AI-curated content. The finalized questionnaire was distributed online through survey platforms. Participants provided informed consent before participation, and anonymity was assured. While screening questions ensured eligibility, and attention checks were embedded to enhance data quality. Finally, data collection lasted for four weeks to maximize participation across different user segments. This study used RStudio for robust analysis of data and findings [23].

4. Data Analysis and Findings

This research analyzed the data using RStudio where descriptive statistics were analyzed at first (see Table 1).

Table 1.
Descriptive Statistics

Statistic	PPC	PAT	PEC	UDMB
Valid	395	395	395	395
Missing	0	0	0	0
Skewness	0.008	0.017	-0.019	0.038
Std. Error of Skewness	0.123	0.123	0.123	0.123
Kurtosis	-0.979	-1.039	-1.164	-1.255
Std. Error of Kurtosis	0.245	0.245	0.245	0.245
Minimum	1	1	1	1
Maximum	5	5	5	5

PPC = Perceived Personalization of Content, PAT = Perceived Algorithmic Transparency, PEC = Perceived Ethical Concerns and UDMB = User Decision-Making Behavior

There were 395 valid responses with 0 missing values. Hence, the data was standardized, and no missing values were found. Secondly, the skewness (±2) and kurtosis (±7) values were achieved which confirmed the standardization of data. In accordance, the study tested minimum response was 1 and maximum response was 5 on five-point Likert scale instruments. The findings of descriptive statistics confirmed the reliability of data was achieved.

Secondly, the reliability statistics were tested where mean and standard deviation of the data was checked (see Table 2). Since this study used a five-point Likert scale, the mean value ±3 was found and accepted as normal [15]. Furthermore, the findings of standard deviation were also close to 1. Hence, the study significantly found that mean and standard deviation of the data was confirmed. The data was considered reliable for further analysis.

Table 2
Frequentist Reliability Statistics

Variable	Mean Estimate	Lower 95% CI	Upper 95% CI	SD Estimate	Lower 95% CI	Upper 95% CI
PPC	3.253	3.143	3.363	1.114	1.041	1.197
PAT	3.246	3.133	3.358	1.137	1.063	1.222
PEC	3.246	3.129	3.362	1.178	1.102	1.267
UDMB	3.299	3.185	3.412	1.152	1.077	1.238

PPC = Perceived Personalization of Content, PAT = Perceived Algorithmic Transparency, PEC = Perceived Ethical Concerns and UDMB = User Decision-Making Behavior

The demographics information of the respondents were analyzed and reported in Table 3. According to findings, there were 202 male and 193 female respondents. Furthermore, 124 respondents were between 18-24 years, 85 were between 25-34 years, 90 were between 35-44 years and 64 were between 45-54 years.

Table 3
Demographics

Variable	Level	Counts	Total	Proportion
Gender	Male	202	395	0.511
	Female	193	395	0.489
Age	18-24 years	124	395	0.314
	25-34 years	85	395	0.215
	35-44 years	90	395	0.228
	45-54 years	64	395	0.162
	55 years and Above	32	395	0.081
Education	High School or Below	40	395	0.101
	Diploma	60	395	0.152
	Bachelor Degree	136	395	0.344
	No formal education	159	395	0.403
Social Media Platform Most Used	TikTok	30	395	0.076
	Instagram	67	395	0.170
	Facebook	173	395	0.438
	Twitter/X	125	395	0.316
Daily Time Spent on Social Media	Less than 1 hour	59	395	0.149
	1-3 hours	215	395	0.544
	Above 4 hours	121	395	0.306

Note. Proportions tested against value: 0.5.

Accordingly, 32 respondents were 55 years and above. Regarding education, 40 respondents were high school or below, 60 were in diploma, 136 had bachelor's degree and 159 had no formal education. Accordingly, 30 respondents used TikTok, 67 used Instagram, 173 used Facebook while remaining 125 used twitter/X. Finally, 59 respondents used SM daily for less than 1 hour, 215 used between 1-3 hours and 121 used for above 4 hours.

Accordingly, the study analyzed the data to test correlations between the variables (see Table 4). This correlation analysis is used to investigate the relationship between variable and their direction. According to Benesty et al. [4], when p value is less than 0.05, a correlation between two variables is accepted as significant. Hence, the study found that all variables were significantly correlated with one. Furthermore, the direction of these correlated relationships was also positive.

Table 4
Pearson's Correlations

Variables	Pearson's *r*	p	Lower 95% CI	Upper 95% CI
PPC – PAT	0.586	< .001	0.518	0.647
PPC – PEC	0.587	< .001	0.518	0.648
PPC – UDMB	0.614	< .001	0.548	0.672
PAT – PEC	0.588	< .001	0.519	0.649
PAT – UDMB	0.597	< .001	0.53	0.657
PEC – UDMB	0.595	< .001	0.527	0.655

PPC = Perceived Personalization of Content, PAT = Perceived Algorithmic Transparency, PEC = Perceived Ethical Concerns and UDMB = User Decision-Making Behavior

Furthermore, the study investigated the summary of model with R, R2 and Adjusted R2. The findings of R above 0.4 are accepted and the model reflects significant correlation between two independent and dependent variables. Meanwhile, value of R2 was used to test the total variable in dependent variable explained by independent variables. In this way, the value of R2 above 0.5 is considered significant to predict the relationship [8]. Finally, there should be minimum difference between the value of R2 and Adjusted R2.

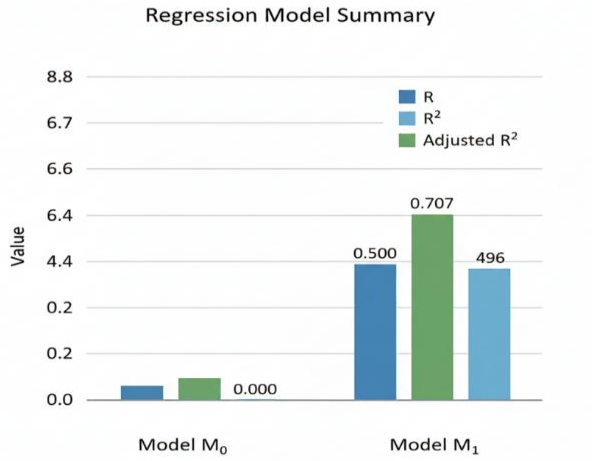

Fig.1: Model Summary

Hence, the findings of this study in Table 5 and Figure 1 confirmed that all thresholds were achieved and data confirmed significant predictive power of the model.

Table 5
Model Summary

Model	R	R^2	Adjusted R^2
M_0	0.000	0.000	0.000
M_1	0.707	0.500	0.496

Regarding hypothesis testing, this study performed regression analysis reported in Table 6 and Figure 2.

Table 6
Coefficients

Model	Predictor	Unstandardized	Standard Error	Standardized	t	p
M_0	Intercept	3.299	0.058		56.918	< .001
M_1	Intercept	0.575	0.144		3.996	< .001
	PPC	0.316	0.049	0.306	6.441	< .001
	PAT	0.269	0.048	0.265	5.584	< .001
	PEC	0.253	0.046	0.259	5.45	< .001

PPC = Perceived Personalization of Content, PAT = Perceived Algorithmic Transparency, PEC = Perceived Ethical Concerns and UDMB = User Decision-Making Behavior

The findings (t = 6.441 and p <.001) of H1 highlighted that there is a relationship between perceived personalization of content and user decision-making behavior on social media. Furthermore, H2 results (t = 5.584 and p <.001) reported that there is a relationship between perceived algorithmic transparency and user decision-making behavior on social media. Thirdly, the findings (t = 5.450 and p <.001) of H3 confirmed that there is a relationship between perceived ethical concerns and user decision-making behavior on social media.

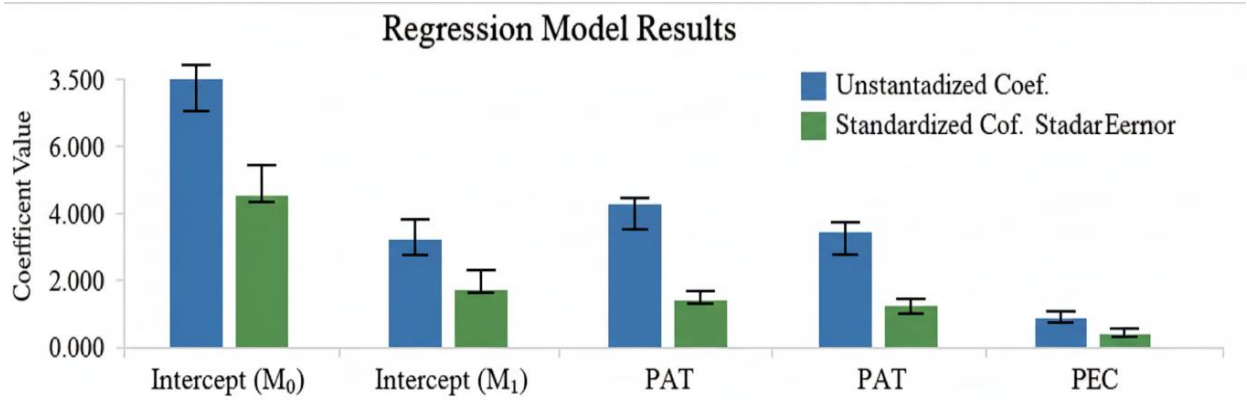

Fig.2: Coefficient Value

5. Discussion and Conclusion

This study achieved its objective by testing the hypotheses empirically. The findings of H1 highlighted that there is a relationship between perceived personalization of content and user decision-making behavior on SM. The findings of this research are compared to the existing studies. The findings of this research are aligned with Ozanne et al. [24] who reported that perceived personalization is an important factor For SM users. In the study it investigated that with the help of perceived personalization of content, the decision-making behaviour of SM users is influenced by SM. Furthermore, the findings of this research are aligned with Dogruel et al. [10] who highlighted when SM users have appropriate information related to the content, they are recommended to modify it according to their need. Meanwhile, Swart [31] also stated that when content personalization opportunity is available to the SM users, they should have protective attitude to keep that information and share it appropriately. On the other hand, Ebrahimi et al. [12] stated that when SM users find the related information according to the content modification, they should not be easily influenced to change their decision. Accordingly, Aysolmaz et al. [2] pointed out that SM users should not be easily influenced for their decision-making by the content shared on partial media platforms because the algorithm designs have significant influence on content personalization. Therefore, the finding of this relationship is supported by the previous studies where it was highlighted that perceived personalization of content and user decision-making behaviour on SM are correlated.

Furthermore, H2 results reported that there is a relationship between perceived algorithmic transparency and user decision-making behavior on SM. However, the results of this study are analyzed in the context of previous research. Lambillotte et al. [19] stated that perceived algorithm transparency is important factor for SM users to influence their decision. According to this study, when algorithms are designed with fairness and transparency, it has little damage on the content personalization and decision-making of the users. On the other hand, when the content personalization is not available to the users, they have very limited information regarding the transparency of algorithm [7]. Therefore, the decisions of SM users are highly influenced with the transparency of algorithms. According to Perez Vallejos et al. [25], the SM users should have the related information according to the working of algorithm, where they can help to modify the related information. It would be beneficial for the SM users to customize and personalize information

according to their standard [34]. The study Starke et al. [30] highlighted that when there are no transparency and fairness in algorithm, the user decision-making on the SM platforms is influenced without their knowledge. Meanwhile, Yu and Li [37] and Voorveld et al. [33] stated that algorithm transparency is very important for user decision-making behavior because based on the algorithm content the information shared to them is different and that can influence their decision making. To sum up, the findings of this relationship are also supported by previous studies where it was highlighted that perceived algorithm transparency and user decision-making behavior on SM are correlated.

Thirdly, the findings of H3 confirmed that there is a relationship between perceived ethical concerns and user decision-making behavior on SM. Meanwhile, the findings of this relationship are interpreted in the context of existing research. Accordingly, Liao and Sundar [20] stated that perceived ethical concerns are important in someone life were user decision-making behavior in important on SM. Ethical issues are normal on the SM platform where users interact with algorithms and other users. However, Hermann [16] highlighted that the modern algorithm should be designed with fairness where the ethical concern should not be eliminated from the perspective of algorithm design and it should be user friendly. In this way, the perceived ethical concerns would be helpful for the user decision-making behaviour on SM and make it a platform for sharing information. Accordingly, Kushwaha et al. [18] also highlighted that the decision-making of user based on the influence of SM can be good or not in their favour, therefore the working on algorithm should be designed appropriately where the user personal information should not be used to influence them for decision making. Moreover, Taylor and Choi [32] pointed out that when users influenced for their decision-making behaviour by the SM, it reduces their ethical understanding about the algorithm and SM using [13]. Therefore, a significant kind of mechanism should be developed where users should have control over some specific information management on SM where they should not be easily influenced by decision-making. Following that, it is found that the findings of this relationship are also supported by previous studies.

6. Implications

The findings of this study have significant implications for both theory and practice. From a theoretical perspective, this research contributes to the growing literature on the intersection of artificial intelligence, SM algorithms, and user behavior. While prior studies have often emphasized the marketing or political aspects of SM, they have paid less attention to the psychological and ethical dimensions of algorithm-driven personalization. By empirically validating the influence of perceived personalization of content, perceived algorithmic transparency, and perceived ethical concerns on user decision-making behavior, this study addresses key gaps in literature. It expands theoretical understanding by integrating cognitive, behavioral, and ethical considerations into decision-making models, offering a multidimensional approach for future research on digital behavior.

From a practical standpoint, the findings highlight important lessons for SM companies and platform designers. When users perceive algorithms as transparent, fair, and understandable, they are more likely to trust the platform and make informed decisions. This underscores the need for explainable AI mechanisms, clear algorithmic disclosures, and user-friendly personalization features that empower individuals rather than manipulate them. For marketers and content creators, the study emphasizes the double-edged nature of personalization. While tailored advertising can enhance engagement and influence purchasing decisions, excessive or intrusive personalization risks undermining user trust. Developing ethical and transparent content strategies can therefore foster long-term credibility and stronger consumer relationships.

For policymakers, the results underscore the importance of strengthening data protection

regulations and algorithmic transparency policies. Clear guidelines are needed to ensure that SM platforms prioritize user privacy and accountability in their AI-driven systems. Such regulatory measures can mitigate risks of undue influence in areas as diverse as consumer spending, political opinion formation, and social attitudes. At the user level, the implications are equally important. This study reminds individuals that their online experiences are continuously shaped by personalization and algorithmic design. Users are encouraged to cultivate digital literacy skills, question the sources of information they encounter, and remain mindful of the ethical implications of sharing personal data online. By becoming more critical and aware, users can better navigate the influence of AI-driven platforms on their decisions and behaviors.

7. Future Directions

This study analyzed the data and investigated how algorithms of SM and other factors influence the decision-making process of users. However, there are some recommendations for further studies in this area. This study used primary data while previous studies majorly used secondary data for this purpose. Therefore, the studies in future should conduct interviews to investigate how SM is critical to influence the decision of the users. Accordingly, this study recommends that interviews would be helpful for the thematic analysis of the data where a better insight would be contributed to literature. Similarly, the study recommended that future studies should be conducted in a cross-cultural context where the findings should provide another perspective of information sharing and user decision making with the help of SM. Working on these directions will improve the body of knowledge.

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