

Why Trust Matters More Than Utility: Physicians' Acceptance of Algorithmic Management in AI-Driven Pharmaceutical Communication

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Abstract. *Today's society is witnessing an accelerated expansion of artificial intelligence systems and algorithmic management systems in customer relationship management across most areas of life, transforming the way companies communicate with professionals, this transition being fully underway also in the pharmaceutical and healthcare domain. First of all, AI-supported digital communication in the pharmaceutical and medical field promises efficiency, personalization, and scalability, however it has been observed that the acceptance of an algorithmically mediated communication model remains a topic on which healthcare professionals have uneven approaches. Based on an extended Technology Acceptance Model, this study investigates the role of trust in algorithms as a central mechanism in shaping physicians' behavioral intention to use AI-based pharmaceutical communication systems.*

Data were collected through a questionnaire from physicians in several European countries and analyzed using Partial Least Squares Structural Equation Modeling, and thus, our model examines the effects of perceived usefulness and perceived ease of use on behavioral intention, treating trust in algorithms both as a direct predictor and as a mediating variable. The study results show that perceived usefulness does not directly influence behavioral intention, its effect being fully mediated by trust in algorithms, but instead, perceived ease of use has both direct and indirect effects, highlighting its dual role in adoption and in trust formation, thus our study offers relevant managerial implications, suggesting that digital strategies in the pharmaceutical industry should be centered on transparency, ethical design, and usability in order to support sustainable engagement of healthcare professionals.

Keywords: algorithmic management in healthcare; trust in algorithms; Technology Acceptance Model (TAM); pharmaceutical communication; physicians' behavioral intention.

Introduction

The increasingly broad integration of artificial intelligence (AI) in the field of healthcare extends beyond clinical decision support systems to areas such as pharmaceutical communication and digital relationship management (Liebenspacher & Siegfried, 2022). In this context, we observe that pharmaceutical companies increasingly use AI-based customer relationship management (CRM) platforms to personalize interactions with healthcare professionals (HCPs), to prioritize informational flows, and to coordinate communication strategies on a large scale.

These systems can be described in terms of algorithmic management, defined as the use of artificial intelligence and algorithmic techniques to structure, monitor and optimize professional processes by automating managerial functions traditionally performed by human managers (Bisaschi et al., 2025). In pharmaceutical communication, AI does not replace medical judgment, but mediates how information reaches medical doctors, filters relevant content, and shapes the

dynamics of professional relationships. Thus, algorithmic systems indirectly influence the information environment in which clinical decisions are formed.

The main contribution of this study consists in the reconceptualization of trust in algorithms not as a simple antecedent of technological adoption, but as a mediating mechanism that explains how perceptions of the system are transformed into behavioral intention. Although the literature regarding AI acceptance in healthcare has increased considerably (Lambert et al., 2023; Shevtsova et al., 2024), most studies treat trust either as a direct predictor or as a result of adoption. The modeling of trust as a central explanatory link within a structural model remains insufficiently explored, especially in contexts of algorithmic management and regulated professional communication.

The Technology Acceptance Model (TAM) traditionally explains technology adoption across perceived usefulness (PU) and perceived ease of use (PEOU) (Davis, 1989). Subsequent extensions have confirmed the robustness of the model in various organizational contexts (Venkatesh & Davis, 2000; Venkatesh & Bala, 2008). However, AI-based systems differ from conventional technologies because they operate autonomously, rely on opaque data processing processes, and restructure the professional informational environment (Shin, 2021). In such contexts, trust becomes the critical element that can mediate the relationship between perceptions of usefulness and ease of use and the intention to adopt.

The focus on Central and Southeast Europe is relevant in this study. In particular, the countries of Southeast Europe are facing more significant challenges in terms of the digitisation of health systems and the level of preparedness for the adoption of artificial intelligence (Radeva et al., 2026). These difficulties are often linked to economic constraints and lower investment in health information technology infrastructure (Ploegmakers et al., 2022). Such structural conditions can influence how doctors evaluate and adopt artificial intelligence-based systems, making trust a particularly important factor in this context. In addition, the literature on AI-based pharmaceutical communication in this regional context is limited and direct access to respondents in the area has allowed the collection of current and relevant data.

Although recent studies analyze physicians' acceptance of AI-based clinical tools (Dingel et al., 2024; Rosenbäck et al., 2024), few studies examine algorithmic management systems used in pharmaceutical promotional communication. This gap is important in a strictly regulated professional environment with high responsibilities, where transparency, accountability and confidence in the correctness of algorithms directly influence the decision to use these systems.

This study aims to offer a context-sensitive examination of algorithmic acceptance in pharmaceutical communication, addressing the following research questions:

RQ1: How do perceived usefulness and perceived ease of use influence physicians' trust in algorithmic systems used in pharmaceutical communication?

RQ2: To what extent does trust in algorithms affect physicians' behavioral intention to engage with AI-based pharmaceutical communication platforms?

RQ3: Does trust in algorithms mediate the relationships between perceived usefulness, perceived ease of use, and behavioral intention?

RQ4: How does algorithmic trust reshape traditional technology acceptance mechanisms in regulated, high-stakes professional environments?

By answering these questions, we aim to contribute to the literature by refining TAM for algorithmic management contexts, advancing trust-in-AI theory, and providing grounded insights into physicians' resistance and acceptance of AI-based pharmaceutical communication.

Literature review

The adoption of artificial intelligence (AI) and digital systems in the field of healthcare, as well as in pharmaceutical communication, represents a subject of major interest both for academic research and for organizational practice. The review of the literature shows that the acceptance of these systems is not determined solely by their technical performance, but also by ethical, organizational, and psychological factors such as perceived usefulness, perceived ease of use and trust in technology (Lambert et al., 2023).

In this context, the Technology Acceptance Model (TAM) provides a well-established theoretical framework for analyzing the factors that influence the intention to use information technologies. Within TAM, perceived usefulness (PU) refers to the extent to which a system is considered capable of improving professional performance, and perceived ease of use (PEOU) reflects the degree to which interaction with the system is perceived as effortless (Davis, 1989). These two concepts are traditionally considered direct determinants of behavioral intent. Later extensions of the model, TAM2 and TAM3, confirmed the solidity of this framework and its applicability in complex organizational contexts (Venkatesh & Davis, 2000; Venkatesh & Bala, 2008).

However, recent research shows that in the case of artificial intelligence-based technologies, especially in the health field, trust in algorithms is essential for these systems to be accepted and used. (Shevtsova et al., 2024). The fact that many algorithmic systems are not easy to understand, that there may be risks related to errors, lack of accountability or ethical issues, and that they may influence clinical decisions makes it necessary to clearly include trust in models explaining the adoption of the technology (Shin, 2021). Consequently, the conceptual model proposed in this research extends TAM by including the construct Trust in Algorithms (TA), in order to capture more accurately the psychological mechanisms that underlie physicians' intention to use digital systems and AI-supported solutions in pharmaceutical communication.

Hypotheses development

H1: Perceived usefulness (PU) → Behavioral intention (BI)

The perceived usefulness describes the extent to which a system is considered capable of improving efficiency and productivity in professional work. (Davis, 1989). When users perceive that a technology supports their tasks and enhance the quality of their outcome, the likelihood of adoption increases. Empirical evidence from digital health and AI applications confirms that utility is a constant predictor of intent to use (Venkatesh & Davis, 2000; Dingel et al., 2024). Therefore, in the context of AI-supported pharmaceutical communication, we assume that: H1: Perceived usefulness positively influences behavioral intention.

H2: Perceived ease of use (PEOU) → Behavioral intention (BI)

The perceived ease of use means how simple and easy a system is to use (Davis, 1989). In complex professional environments, such as medical, if the technology is understandable and integrates well into daily work, doctors are more likely to want to use it. Studies on artificial intelligence in medicine show that if a system is difficult to use, it can be rejected, even if it is considered useful (Lambert et al., 2023). Thus: H2: The perceived ease of use positively influences the behavioral intention.

H3: Perceived usefulness (PU) → Trust in algorithms (TA)

Beyond its direct effect on the intention, the perceived usefulness can function as a signal of the competence and reliability of the system. When algorithmic systems provide relevant and

valuable results, users can interpret these performances as evidence of consistency and credibility, thus contributing to the formation of trust (Shevtsova et al., 2024). AI acceptance studies indicate a positive association between perceived benefit and level of confidence in algorithmic systems (Shin, 2021). Consequently: H3: Perceived usefulness positively influences trust in the algorithms.

H4: Perceived ease of use (PEOU) → Trust in algorithms (TA)

Ease of use can, realistically, play an important role in the formation of trust, because it reduces technology anxiety and increases perceived control, two conditions that, in practice, make interaction with algorithmic systems feel “safer” and more predictable for the user. In particular, intuitive systems, well integrated into the workflow, are often perceived as more transparent and less risky (Lambert et al., 2023), and thus the AI literature shows that improving the user experience and the understanding of how the system works can significantly influence the clinician’s level of trust (Rosenbäck et al., 2024). Consequently, within our research, it is reasonable to assume that PEOU positively influences TA.

H5: Trust in algorithms (TA) → Behavioral intention (BI)

In areas of high responsibility such as health, trust is becoming a central factor in technology adoption. Even systems perceived as useful and user-friendly can be rejected if there are doubts about the accuracy, impartiality or ethical correctness of the algorithms. Empirical research confirms that trust in artificial intelligence-based systems is associated with intention to use and recommend them (Dingel et al., 2024; Kauttonen et al., 2025). Thus: H5: Trust in algorithms positively influences behavioral intention.

H6a: PEOU → TA → BI (mediation)

Based on the literature, we consider it plausible that the effect of perceived ease of use on behavioral intention is not only direct, but can also be explained partially through trust (Chen et al., 2025). More concretely, an easy-to-use system reduces uncertainty and increases the feeling of control, and this can facilitate the development of trust; in turn, trust becomes a psychological impulse that supports the intention to use. Recent research describes trust as an intermediary mechanism between system characteristics and intentional behavior, in AI contexts (Rosenbäck et al., 2024). Consequently, in this study, we formulate the hypothesis that TA mediates the relationship between PEOU and BI.

H6b: PU → TA → BI (mediation)

When physicians perceive digital systems as useful and relevant to their practice, this positive evaluation can contribute to building trust, which then is reflected in the intention to use and recommend. The literature on AI acceptance supports the role of trust as a mechanism that transforms perceived value into intentional behavior, (Kauttonen et al., 2025; Shevtsova et al., 2024), therefore, in this study, we assume that TA mediates the relationship between PU and BI.

Based on the theoretical insights discussed above, Figure 1 presents the conceptual model used to test the proposed relationships

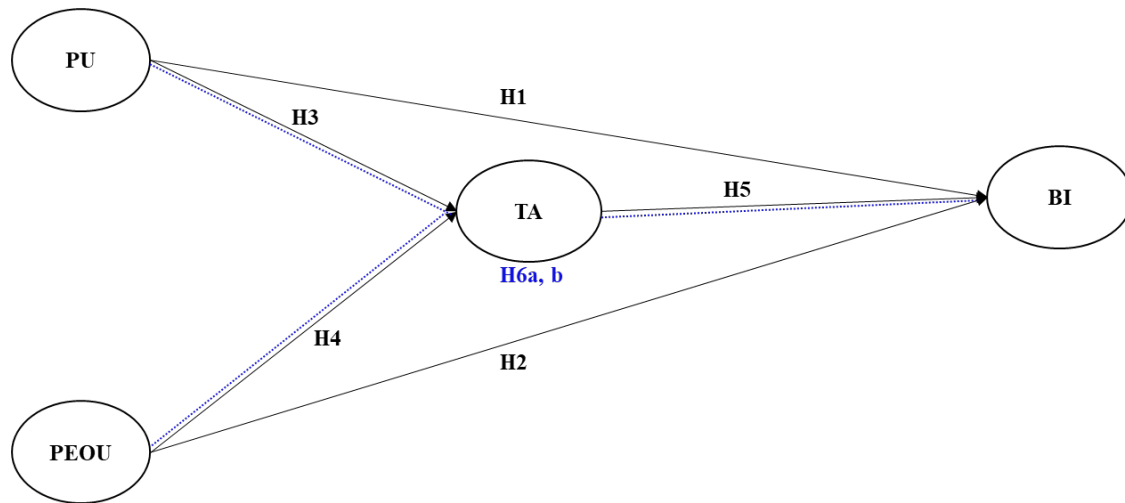


Figure 1. Research Framework

Bold lines are hypotheses. Blue dotted lines denote mediated role (H6a, b).

Source: Authors' own research.

Methodology

Measurements

The data used in this study were collected through a self-administered online questionnaire, distributed in the period 30 October 2025 – 27 January 2026, among healthcare professionals active in clinical practice.

The measurement instrument captured Perceived Usefulness, Perceived Ease of Use, Trust in Algorithms, and Behavioral Intention, all items being adapted from Kamal et al. (2020) and Dhagarra et al. (2020). Perceived usefulness assessed performance benefits (for example, that digital systems save time and provide clinically relevant content), perceived ease of use captured interaction simplicity (for example, the ease of interacting with digital platforms and the low effort required to use the tools), while trust in algorithms reflected confidence in reliability (for example, trust in professional medical information). Behavioral intention measured respondents' willingness to continue using such systems in professional practice.

Participation in this study was voluntary and anonymous, and all items were measured using a Likert-type scale, from strong disagreement to strong agreement. Data analysis was conducted on 101 valid questionnaires, using Partial Least Squares Structural Equation Modeling (PLS-SEM), with SmartPLS version 4.1 (Ringle et al., 2024).

Respondent profile

In Table 1 we summarized the demographic and professional profile of the respondents (N = 101), with most participants being aged between 41–50 years (41.6%), followed by 31–40 years (28.7%), recording a relatively balanced gender distribution (53.5% men, 46.5% women). The sample is one with high experience, as 77.2% report more than 11 years of professional experience, with respondents coming from countries of the Central–South-Eastern European area, such as Romania (37.6%) and Bulgaria (30.7%), followed by Hungary (15.8%) and Greece (12.9%). In terms of clinical specialization, most professionals are oncologists (57.4%), followed by urologists (16.8%) and professionals in general oncology (13.9%), while other specialties (for example, pathology, gastroenterology, radiation oncology) are less represented.

Table 1. Profile respondents

Characteristics	N (101)	100 (%)	Characteristics	N (101)	100 (%)
Age group			Gender		
Under 30 years	10	9.9	Male	54	53.5
31–40 years	29	28.7	Female	47	46.5
41–50 years	42	41.6	Country of practice		
51–60 years	12	11.9	Romania	38	37.6
Over 60 years	8	7.9	Bulgaria	31	30.7
Years of professional experience			Hungary	16	15.8
Under 5 years	5	5	Greece	13	12.9
5–10 years	18	17.8	Netherlands	2	2
11–20 years	42	41.6	Spain	1	1
Over 20 years	36	35.6			
Clinical specialty					
Oncologist	58	57.4	Gastroenterologist	2	2
Oncology (general)	14	13.9	Radiation oncologist	2	2
Urologist	17	16.8	Hematologist	1	1
Pathologist	5	5	Radiotherapist	1	1

Source: Authors' own research.

Results and discussions

Measurement model

The measurement model specifies the relationships between the latent constructs and their observed indicators and has the role of evaluating the quality and robustness of the measurement instrument. The assessment of the measurement model started with the analysis of construct reliability, using composite reliability as the main criterion, and according to established methodological guidelines, composite reliability values of at least 0.60 indicate an acceptable level of internal consistency (Ringle et al., 2018). The results show that all latent constructs included in the model exceed this threshold, thus confirming adequate reliability (see Table 2).

Subsequently, convergent validity was examined through the Average Variance Extracted (AVE), and an AVE value of 0.50 or higher indicates that a construct explains at least 50% of the variance of its associated indicators (Ringle et al., 2018). The findings reveal that the AVE values for all constructs exceed the recommended threshold, providing strong evidence of convergent validity within the measurement model (Table 2).

Table 2. Factor loadings, reliability, and validity (n=101)

Variables / Items	FL	α	CR	AVE
Perceived Ease of Use		0.944	0.959	0.855
PEOU1	0.910			
PEOU2	0.941			
PEOU3	0.942			
PEOU4	0.906			
Perceived Usefulness		0.762	0.863	0.677

Variables / Items	FL	α	CR	AVE
PU1	0.801			
PU2	0.876			
PU3	0.789			
Trust in Algorithms		0.831	0.888	0.665
TA1	0.810			
TA2	0.776			
TA3	0.816			
TA4	0.858			
Behavioral Intention		0.898	0.929	0.767
BI1	0.910			
BI2	0.925			
BI3	0.776			
BI4	0.883			

Note. FL = Factor Loadings; α = Cronbach's Alpha; CR = Composite Reliability; AVE = Average Variance Extracted.

Source: Authors' own research based on calculations from SmartPLS.

Discriminant validity was assessed using the Heterotrait–Monotrait (HTMT) ratio, which is widely regarded as a rigorous and reliable criterion for evaluating construct distinctiveness. Following the conservative threshold proposed by Henseler et al. (2015), discriminant validity is established when HTMT values are below or equal to 0.900. In the present study, all HTMT ratios fall below the recommended threshold, indicating that the constructs are empirically and conceptually distinct from one another (see Table 3).

Table 3. Discriminant validity using HTMT

	BI	PEOU	PU	TA
BI				
PEOU	0.826			
PU	0.619	0.753		
TA	0.796	0.867	0.797	

Note. BI = Behavioral Intention; PEOU = Perceived Ease of Use; PU = Perceived Usefulness; TA = Trust in Algorithm;

Source: Authors' own research based on calculations from SmartPLS.

Structural Model

The structural model illustrates the relationships (paths) among the constructs included in the proposed research framework and demonstrates satisfactory explanatory power, specifically, our model explains 61.4% of the variance in behavioral intention ($R^2 = 0.614$) and 62.6% of the variance in trust in algorithms ($R^2 = 0.626$), thus indicating, according to the guideline proposed by Chin (1998), a moderate to high level of predictive accuracy for both endogenous constructs.

The PLS-SEM results indicated to us that perceived usefulness (PU) does not have a significant effect on behavioral intention (BI) ($\beta = -0.013$, $t = 0.135$, $p = 0.893$), and therefore, H1 is rejected, suggesting that perceived usefulness does not directly influence behavioral intention in the analyzed context.

Hypothesis H2 examined the effect of perceived ease of use (PEOU) on behavioral intention, and the results reveal a positive and statistically significant relationship ($\beta = 0.568$, $t = 5.459$, $p < 0.001$), indicating that perceived ease of use plays a critical role in shaping users' behavioral intention, thus, H2 is accepted.

Regarding the relationship between perceived usefulness and trust in algorithms, our findings demonstrate a positive and significant effect ($\beta = 0.248$, $t = 3.620$, $p < 0.001$), a result that supports H3. This result indicate that higher levels of perceived usefulness contribute to greater trust in algorithmic systems.

At the same time, perceived ease of use exerts a strong and positive influence on trust in algorithms ($\beta = 0.608$, $t = 9.586$, $p < 0.001$), thus H4 is accepted, highlighting perceived ease of use as a key antecedent of trust in algorithms.

The last hypothesis assessed the effect of trust in algorithms on behavioral intention, the result indicating a positive and statistically significant relationship ($\beta = 0.267$, $t = 2.310$, $p = 0.021$), and thus, demonstrating that higher levels of trust in algorithms lead to a stronger behavioral intention to use the technology. Therefore, H5 is accepted (see Table 5).

Table 5. Hypotheses testing

	β	STDEV	t-value	p-value	Result
H1: Perceived Usefulness $\rightarrow$ Behavioral Intention	-0.013	0.095	0.135	0.893	Not confirmed
H2: Perceived Ease of Use $\rightarrow$ Behavioral Intention	0.568	0.104	5.459	0.000	Confirmed
H3: Perceived Usefulness $\rightarrow$ Trust in Algorithms	0.248	0.068	3.620	0.000	Confirmed
H4: Perceived Ease of Use $\rightarrow$ Trust in Algorithms	0.608	0.063	9.586	0.000	Confirmed
H5: Trust in Algorithms $\rightarrow$ Behavioral Intention	0.267	0.116	2.310	0.021	Confirmed

Note. β = Beta Coefficient (Path Coefficient), STDEV = Standard Deviation, t = T -statistics, p = Probability* value;

*Relationships are significant at P -value < 0.05 .

Source: Authors' own research based on calculations from SmartPLS.

Mediation analysis

Hypothesis H6a examined whether Trust in Algorithms (TA) mediates the relationship between Perceived Usefulness (PU) and Behavioral Intention (BI), and the results obtained indicate to us that the total effect of PU on BI is positive, but statistically non-significant ($\beta = 0.053$, $t = 0.608$). However, after introducing the mediator into the model, the direct effect of PU on BI remains non-significant ($\beta = -0.013$, $t = 0.135$), while the indirect effect through TA is positive and statistically significant ($\beta = 0.066$, $t = 1.996$, $p < 0.05$), and with these findings, our study provides evidence of full mediation and demonstrates that the influence of perceived usefulness on behavioral intention is transmitted exclusively through trust in algorithms. Therefore, H6a is accepted.

Hypothesis H6b evaluated the mediating role of Trust in Algorithms in the relationship between Perceived Ease of Use (PEOU) and Behavioral Intention, and our study results show that the total effect of PEOU on BI is positive and statistically significant ($\beta = 0.731$, $t = 11.474$). After the mediator is included, the direct effect remains positive and significant ($\beta = 0.568$, $t = 5.459$), while the indirect effect through TA is also statistically significant ($\beta = 0.163$, $t = 2.138$, $p = 0.033$), these results indicating partial mediation, demonstrating that perceived ease of use influences

behavioral intention both directly and indirectly, through trust in algorithms. Consequently, H6b is accepted (see Table 6).

Table 6. Mediation analysis

H	Total Effects		Direct Effects		Mediating Effect	Indirect Effects			Results
	β	t	β	t		β	t	p	
PU→BI	0.053	0.608	-0.013	0.135	H6a: PU→TA→BI	0.066	1.996	0.046	Confirmed
PEOU→BI	0.731	11.474	0.568	5.459	H6b: PEOU→TA→BI	0.163	2.138	0.033	Confirmed

Note. H = Hypothesis, β = Beta Coefficient, t = t – statistics, p = Probability* value; *Relationships are significant at P-value < 0.05.

Source: Authors' own research based on calculations from SmartPLS.

Conclusion

Theoretical implications

This study shows that in the context of algorithmic management in AI-based pharmaceutical communication, the classic mechanisms of the Technology Acceptance Model (TAM) work differently from the original formulation.

In the TAM model, ease of use is the first factor that influence intention to adopt, as it reduces the effort required for the use of technology (Davis, 1989). Studies show that usage problems can prevent adoption even when the system is perceived as useful (Lambert et al., 2023). Our results show that ease of use has a dual role, in fact it directly influences the intention to use and at the same time contributes to the formation of trust. Thus, intuitive and well-integrated systems not only facilitate the use, but also strengthen the trust in technology (Rosenback et al., 2024).

The insignificant direct effect of the perceived usefulness on the intention to use is an important theoretical contribution to the literature. According to the TAM model, utility is the strongest predictor of intention (Davis, 1989; Venkatesh & Davis, 2000), and this relationship has been confirmed in recent research in health and artificial intelligence (Dingel et al., 2024). However, our results show that, in the case of algorithmic management systems in pharmaceutical communication, the utility is not sufficient to generate the intention to use. In regulated and ethically sensitive environments, the mere perception that a system is useful does not guarantee adoption. Thus, the study shows that the role of utility is different in this context and depends on other factors.

Instead, the effect of perceived utility on intention is fully conveyed through reliance on algorithms, which indicates a total mediation effect. This result clearly shows that utility itself is not sufficient to generate intent to use. Physicians can recognize the benefits of a system, but these evaluations become relevant only when the system is considered trustworthy. In this respect, trust functions as an essential mechanism that transforms perceptions of utility into intention to use, which is also supported by recent research on the adoption of AI (Shevtsova et al., 2024; Kauttonen et al., 2025). In terms of ease of use, the results point to partial mediation, in the sense that it influences the intention both directly and indirectly through trust. Thus, an easy-to-use system reduces uncertainty and increases the sense of control, which can strengthen confidence in technology (Lambert et al., 2023; Rosenback et al., 2024).

The study shifts attention from clinical AI applications to algorithmic management systems in pharmaceutical communication, where AI functions as a managerial intermediary and influences

how information is delivered and perceived. By using PLS-SEM on data collected from several countries, the results show that the acceptance of these systems is not only driven by utility, but is essentially dependent on trust, thus contributing to the refinement of the TAM model in the current context of AI.

Managerial implications, limitations, and future research directions

The results of this study offer clear and applicable implications for pharmaceutical companies that implement AI-based CRM systems and algorithmic management in communication with physicians, therefore, optimizing content relevance or efficiency is not sufficient if physicians do not trust the mechanisms through which messages are generated, personalized, and delivered. In this sense, trust becomes a central managerial lever, in the sense that firms should prioritize transparency, ethical design, and medical validation of the systems, as well as explicit communication about data usage, personalization logic, and content governance, in order to reduce skepticism.

Our study also revealed that perceived ease of use has a dual role, influencing intention both directly and indirectly through trust, which suggests that intuitive interfaces, low cognitive effort, and smooth integration into workflows are essential not only for usability, but also for trust formation. Overall, algorithmic systems should be viewed as a trust-centered relational infrastructure, not only as an efficiency-oriented technology, and we consider that performance evaluation should also include measures of trust and relationship quality.

However, the study has limitations that open future research directions. First, it is based on self-reported and cross-sectional data, which limits causal inferences. Other limitation of the study is the relatively small sample size ($N = 101$). Although the PLS-SEM method is appropriate for the analysis of structural models in the case of smaller samples, the limited number of respondents may influence the stability of the estimations and the degree of generalization of the results. Future research should test the model on larger samples in order to strengthen the robustness of the conclusions. Also, future research could use longitudinal designs or experiments to analyze how trust in algorithms and behavioral intention evolve over time.

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