Journal of Orange Technology (JOT)
Vol. 1, No. 2, April, 2025, pp. 91−102
E-ISSN: XXXX-XXXX | P-ISSN: XXXX-XXXX, DOI:10.34306

Blockchain Enabled Emotional Wellbeing Data Sharing Platform with Humanistic Ethical Governance Model

Irwan Sembiring[1], Qurotul Aini[2], Richard Andre Sunarjo[3], Dwi Julianingsih[4*],
Marta Rodriguez[5]
[1,2]Faculty of Information Technology, Satya Wacana Christian University, Indonesia
[3]Faculty of Business and Economics, Pelita Harapan University, Indonesia
[4]Faculty of Science and Technology, University of Raharja, Indonesia
[5]Eduaward Incorporation, United Kingdom
[1]irwan@uksw.edu, [2]aini@raharja.info, [3]richard.sunarjo@raharja.info, [4]dwi.julianingsih@raharja.info, [5]m.rodriguezz@eduaward.co.uk
***Corresponding Author**

Article Info

Article history:

Submission November 11, 2024
Revised December 11, 2024
Accepted March 30, 2025
Published April 14, 2025

Keywords:

Blockchain Technology
Emotional Wellbeing Data
Humanistic Ethical Governance
User Trust and Data Control
Data Sharing Intention

ABSTRACT

Emotional wellbeing data produced by digital mental health applications, wearable devices, and affective computing systems are highly sensitive and require robust mechanisms to ensure privacy, transparency, and ethical accountability. **This study develops** and evaluates a blockchain-enabled emotional wellbeing data sharing platform integrated with a humanistic ethical governance model using a quantitative research approach. **The research proposes** a decentralized architecture that leverages blockchain characteristics, including immutability, transparency, and secure consent management, while embedding humanistic ethical principles such as autonomy, fairness, and user-centered data control. A structured quantitative model is constructed to examine the relationships between blockchain features, ethical governance mechanisms, user trust, and intention to share emotional wellbeing data. Data were collected through a survey of domain experts and potential users and analyzed using statistical techniques to test the proposed hypotheses. **The results** demonstrate that blockchain transparency and ethical governance significantly influence user trust and perceived data control, which in turn positively affect data sharing intention. **The findings** confirm that combining blockchain technology with a humanistic ethical governance framework enhances trust, ethical compliance, and acceptance of emotional wellbeing data sharing platforms, contributing empirical evidence to the development of secure, ethical, and human-centered digital wellbeing infrastructures.

DOI: https://doi.org/10.34306/jot.v1i2.18

1. INTRODUCTION

The global rise in mental health challenges has become a critical concern in recent years, exacerbated by rapid digitalization, post-pandemic psychological stress, and increased social and economic uncertainty. In response, digital mental health technologies such as mobile wellbeing applications, wearable sensing devices, and affective computing systems have been increasingly adopted to monitor, assess, and support emotional wellbeing at scale [1]. These technologies generate vast amounts of emotional wellbeing data, including mood fluctuations, stress indicators, and behavioral patterns, which hold significant value for personalized care, early detection, and evidence-based mental health interventions. This development directly aligns with Sustainable Development Goal (SDGs) 3 on Good Health and Well-Being, which emphasizes the promotion of mental health and wellbeing across populations [2, 3].

Despite their potential benefits, the handling and sharing of emotional wellbeing data raise substantial ethical, technical, and governance-related challenges. Emotional data are deeply personal and psychologically sensitive, exposing individuals to risks such as privacy invasion, stigmatization, discrimination, and loss of autonomy if misused. Current data sharing practices in digital mental health ecosystems largely rely on centralized data storage and management models that are prone to security breaches, lack transparency in data governance, and often provide limited control to users over how their data are accessed, shared, or repurposed [4]. Such conditions undermine user trust and discourage voluntary data sharing, ultimately limiting the societal and scientific value of digital mental health innovations. These challenges highlight a critical gap between technological advancement and ethical responsibility, particularly in the pursuit of SDGs 16 on Peace, Justice, and Strong Institutions, which calls for accountable, transparent, and inclusive digital institutions [5, 6].

Blockchain technology has emerged as a promising solution to address these structural weaknesses by enabling decentralized, transparent, and tamper-resistant data management systems [7]. Through features such as immutability, distributed consensus, and traceable transactions, blockchain can strengthen data integrity, enhance transparency, and support verifiable consent mechanisms. In the context of emotional wellbeing data sharing, blockchain has the potential to shift control from centralized authorities toward data owners, thereby fostering accountability and trust [8]. This technological capability contributes to SDGs 9 on Industry, Innovation, and Infrastructure, which promotes resilient digital infrastructure and responsible technological innovation.

However, technological robustness alone is insufficient to resolve the ethical complexity surrounding emotional wellbeing data. Without a governance model grounded in humanistic ethical principles such as autonomy, dignity, fairness, and informed consent blockchain-based systems risk prioritizing technical efficiency over human values [9]. Ethical governance is essential to ensure that data sharing practices respect individual rights, promote equity, and prevent misuse, particularly when dealing with vulnerable populations. Integrating a humanistic ethical governance framework operationalizes ethical values into system rules, access control mechanisms, and decision-making structures, reinforcing SDGs 10 on Reduced Inequalities by safeguarding users from exploitative data practices [10, 11].

From a scientific standpoint, existing research on blockchain in healthcare and digital wellbeing predominantly adopts conceptual or technical perspectives, with limited empirical validation of user-centered outcomes. Few studies quantitatively examine how blockchain features combined with ethical governance mechanisms influence user trust, perceived data control, and intention to share emotional wellbeing data [12]. This lack of empirical evidence represents a significant research gap, especially given the growing demand for sustainable, ethical, and trustworthy digital health ecosystems. Addressing this gap supports SDGs 17 on Partnerships for the Goals, as effective and ethical data sharing is essential for collaboration between individuals, healthcare providers, researchers, and institutions [13].

Therefore, this study aims to develop and quantitatively evaluate a blockchain-enabled emotional wellbeing data sharing platform integrated with a humanistic ethical governance model by empirically examining the relationships between blockchain characteristics, ethical governance mechanisms, user trust, perceived data control, and data sharing intention [14]. The findings are expected to provide scientific evidence that ethical-by-design blockchain systems can enhance trust and participation in emotional wellbeing data sharing, thereby contributing to sustainable, human-centered, and ethically accountable digital wellbeing infrastructures aligned with the United Nations SDGs [15].

2. RESEARCH METHOD

This study adopts a systematic and structured methodological approach to empirically examine the factors influencing emotional wellbeing data sharing within a blockchain-enabled platform integrated with a humanistic ethical governance model. The research method outlines the overall procedures undertaken from the development of the conceptual model to the processes of data collection and statistical analysis [16]. It describes how relevant theories and prior empirical findings were synthesized to establish the constructs, dimensions, and measurement items used in the study. Furthermore, this section explains the selection of the study population, sampling strategy, data collection technique, and the analytical tools employed to validate both the measurement and structural components of the model [17]. By detailing these methodological steps, the research method provides a clear foundation for understanding how the quantitative assessment was conducted and how the relationships among blockchain characteristics, ethical governance, user trust, perceived data control, and data sharing intention were empirically evaluated [18].

2.1. Research Design and Approach

This study employs a quantitative research design using a theory-driven explanatory approach to empirically examine the factors influencing emotional wellbeing data sharing in a blockchain-based platform with a humanistic ethical governance model. The quantitative approach is selected to statistically validate the relationships between technological features, ethical governance mechanisms, user trust, perceived control, and intention to share emotional wellbeing data [19]. This design is appropriate for addressing the research gap identified in prior studies, which largely lack empirical evidence on user-centered outcomes in ethical blockchain-based digital wellbeing systems [20].

2.2. Literature Review and Theoretical Foundation

The research model is grounded in an integrated literature review spanning four domains including blockchain technology in healthcare and data governance, emotional wellbeing and digital mental health systems, ethical and humanistic governance frameworks, and trust-based behavioral intention models [21]. Prior studies highlight that blockchain features such as transparency, immutability, and decentralized consent management positively influence trust and perceived security in health data sharing environments. Meanwhile, ethical governance literature emphasizes autonomy, fairness, informed consent, and accountability as key determinants of ethical acceptance and sustained participation [22]. Behavioral theories such as trust-based intention models suggest that perceived control and trust play mediating roles between system characteristics and user intention. Drawing from these streams, this study integrates technological and ethical perspectives into a unified quantitative framework aligned with the SDGs, particularly SDGs 3, SDGs 9, SDGs 10, SDGs 16, and SDGs 17 [23].

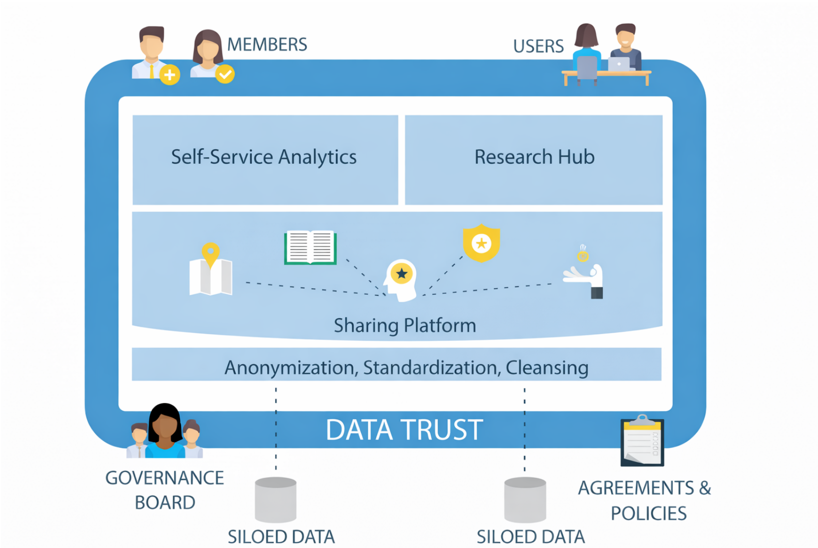

Figure 1. Blockchain Enabled Emotional Wellbeing Data Sharing Platform with Humanistic Ethical Governance Model

Figure 1 illustrates the proposed blockchain-enabled emotional wellbeing data sharing platform integrated with a humanistic ethical governance model. The framework shows how emotional wellbeing data from users and institutional members are processed through a secure sharing platform supported by blockchain-based data trust. At the application level, services such as self-service analytics and a research hub enable ethical data utilization for analysis and research purposes [24]. Prior to sharing, data undergo anonymization, standardization, and cleansing to ensure privacy protection and data quality. The underlying data trust layer represents the core governance mechanism, where blockchain technology enforces transparency, integrity, and traceability of data transactions, while governance boards, policies, and agreements regulate consent, access rights, and ethical oversight [25]. By integrating previously siloed data sources into a trusted and accountable ecosystem, the framework demonstrates how blockchain and humanistic ethical governance collectively enhance user trust, perceived data control, and willingness to participate in emotional wellbeing data sharing, in line with the research objectives and sustainable digital health principles [26].

2.3. Variables and Operational Definitions

The constructs and indicators used in this study are derived from validated instruments in prior literature and adapted to the specific context of emotional wellbeing data sharing. Each variable is operationalized to capture both technological and ethical dimensions within the proposed blockchain-enabled platform [27, 28]. The independent variables consist of Blockchain Characteristics measured through transparency, immutability, and traceability and Humanistic Ethical Governance, assessed through autonomy, fairness, accountability, and informed consent. These constructs reflect the system's ability to ensure secure, tamper-resistant data management while upholding user-centered ethical principles [29]. The mediating variables, User Trust and Perceived Data Control, represent users' confidence in the platform's reliability and their perceived autonomy over data access, ownership, and revocation. The dependent variable, Data Sharing Intention, captures users' willingness and continuity in sharing emotional wellbeing data within an ethically governed digital ecosystem. All indicators are measured using a five-point Likert scale to ensure consistency and suitability for quantitative structural equation modeling [30].

Table 1. Research Variables and Measurement Indicators

Variable	**Dimension**	**Example Indicators**
Blockchain Characteristics	Transparency, Immutability, Traceability	Data access visibility, tamper resistance
Humanistic Ethical Governance	Autonomy, Fairness, Accountability, Consent	User consent clarity, ethical data use
User Trust	Reliability, Integrity, Confidence	Trust in platform and institutions
Perceived Data Control	Access control, Ownership	Ability to manage and revoke data
Data Sharing Intention	Willingness, Continuity	Intent to share emotional wellbeing data

Table 1 presents the research variables and their operational definitions used in this study, outlining how each construct is conceptually defined and empirically measured. As shown in Table 1, the independent variables consist of Blockchain Characteristics and Humanistic Ethical Governance [31]. Blockchain characteristics are operationalized through the dimensions of transparency, immutability, and traceability, which reflect the system's ability to provide visible data access, prevent tampering, and ensure reliable transaction records. Humanistic ethical governance is measured through autonomy, fairness, accountability, and consent, emphasizing user-centered ethical principles such as clarity of consent and responsible data use [32]. The mediating variables include User Trust and Perceived Data Control, where user trust is captured by reliability, integrity, and confidence in both the platform and related institutions, while perceived data control reflects users' ability to manage data access, ownership, and revocation. The dependent variable, Data Sharing Intention, is assessed through willingness and continuity, representing users' intention to share emotional wellbeing data in a sustained manner [33, 34]. All measurement indicators are assessed using a five-point Likert scale ranging from strongly disagree to strongly agree, ensuring consistency and suitability for quantitative analysis using structural equation modeling.

2.4. Population, Sample, and Data Collection

The target population consists of individuals familiar with digital mental health technologies, including users of mental health applications, healthcare professionals, researchers, and IT practitioners. Data are collected using an online structured questionnaire distributed through purposive sampling. A minimum sample size of 150–200 respondents is targeted to ensure statistical robustness, particularly for structural equation modeling [35]. This sample size meets the recommended threshold for SEM-based quantitative analysis.

2.5. Data Analysis Technique

The collected data are analyzed using Structural Equation Modeling (SEM) with a variance-based approach such as PLS-SEM, which is suitable for exploratory and predictive research models with multiple latent constructs. The analysis follows two main stages including evaluation of the measurement model and evaluation of the structural model. Measurement model assessment includes construct reliability (Cronbach's alpha and composite reliability), convergent validity (average variance extracted), and discriminant validity [36]. The structural model evaluation examines path coefficients, coefficient of determination (R^2), effect sizes (f^2), and predictive relevance (Q^2).

The structural relationship can be expressed as:

$$\text{DSI} = \beta_1(\text{Trust}) + \beta_2(\text{Perceived Control}) + \varepsilon \quad (1)$$

Where DSI represents data sharing intention, β denotes the path coefficients, and ε represents the error term [37].

3. RESULTS AND DISCUSSION

This section presents the empirical findings derived from the analysis of the proposed blockchain-enabled emotional wellbeing data sharing model and discusses their theoretical and practical implications. The results are organized to first evaluate the quality of the measurement model, ensuring that all constructs demonstrate adequate reliability, validity, and discriminant properties before examining the structural relationships among variables. Following this, the structural model results are analyzed to determine the significance and strength of the hypothesized paths, providing insights into how blockchain characteristics and humanistic ethical governance influence user trust, perceived data control, and ultimately data sharing intention [38, 39]. The discussion integrates these empirical outcomes with existing literature, highlighting key contributions to the fields of digital wellbeing, ethical governance, and blockchain-based data management. By offering a comprehensive interpretation of the findings, this section establishes the relevance of the model and underscores the critical role of ethical and technological factors in shaping user behavior in sensitive emotional wellbeing data ecosystems [40].

3.1. Measurement Model Evaluation

The measurement model was evaluated to assess the reliability and validity of all latent constructs in the proposed framework, namely Blockchain Characteristics, Humanistic Ethical Governance, User Trust, Perceived Data Control, and Data Sharing Intention [41]. Reliability was examined using Composite Reliability (CR), while convergent validity was assessed based on indicator loadings and Average Variance Extracted (AVE).

Table 2. Measurement Model Evaluation

Construct	Indicator	Loading	CR	AVE
Blockchain Characteristics	BC1	0.820	0.910	0.620
	BC2	0.850		
	BC3	0.780		
Humanistic Ethical Governance	HEG1	0.830	0.920	0.640
	HEG2	0.870		
	HEG3	0.790		
User Trust	UT1	0.860	0.900	0.610
	UT2	0.840		
Perceived Data Control	PDC1	0.840	0.890	0.600
	PDC2	0.810		
Data Sharing Intention	DSI1	0.880	0.930	0.700
	DSI2	0.900		

Table 2 presents the results of the measurement model evaluation, confirming that all constructs in this study satisfy the recommended reliability and validity criteria in PLS-SEM analysis. For the Blockchain

Characteristics construct, measured through indicators BC1, BC2, and BC3, all factor loadings exceed the 0.700 threshold, supported by a CR value of 0.910 and an AVE of 0.620, indicating strong internal reliability and adequate convergent validity [42]. The Humanistic Ethical Governance construct, represented by HEG1, HEG2, and HEG3, also demonstrates high loadings (≥ 0.790, with a CR of 0.920 and an AVE of 0.640, confirming robust measurement quality. Similarly, the User Trust construct, measured by UT1 and UT2, shows strong loadings of 0.860 and 0.840, accompanied by a CR of 0.900 and an AVE of 0.610, fulfilling the required reliability standards. The Perceived Data Control construct, measured by PDC1 and PDC2, also achieves acceptable loadings (0.840 and 0.810), with CR reaching 0.890 and an AVE of 0.600, indicating sufficient reliability and convergent validity [43]. Lastly, the Data Sharing Intention construct, represented by DSI1 and DSI2, records the highest loadings (0.880 and 0.900), supported by a CR of 0.930 and an AVE of 0.700, making it the strongest construct in terms of measurement quality. Overall, all indicators exceed the recommended loading threshold of 0.700, CR values range from 0.890 to 0.930, and all AVE values surpass 0.500. These results confirm that the five constructs Blockchain Characteristics, Humanistic Ethical Governance, User Trust, Perceived Data Control, and Data Sharing Intention meet the criteria for indicator reliability, internal consistency, and convergent validity, indicating that the measurement model in this study is both valid and reliable [44, 45].

Table 3. Discriminant Validity (Fornell–Larcker Criterion)

Construct	BC	HEG	UT	PDC	DSI
Blockchain Characteristics (BC)	0.790				
Humanistic Ethical Governance (HEG)	0.530	0.800			
User Trust (UT)	0.560	0.620	0.780		
Perceived Data Control (PDC)	0.490	0.580	0.640	0.770	
Data Sharing Intention (DSI)	0.450	0.510	0.680	0.650	0.830

Table 3 presents the discriminant validity assessment based on the Fornell–Larcker criterion, which compares the square root of the AVE for each construct with its correlations with other constructs. As shown in Table 3, the diagonal values 0.790 for Blockchain Characteristics (BC), 0.800 for Humanistic Ethical Governance (HEG), 0.780 for User Trust (UT), 0.770 for Perceived Data Control (PDC), and 0.830 for Data Sharing Intention (DSI) are consistently higher than their respective inter-construct correlation values in the same rows and columns [44]. For example, the square root of the AVE for BC (0.790) exceeds its correlations with HEG (0.530), UT (0.560), PDC (0.490), and DSI (0.450). Similarly, HEG shows a diagonal value of 0.800, exceeding its correlations with BC (0.530), UT (0.620), PDC (0.580), and DSI (0.510). The same pattern is observed for UT, PDC, and DSI, where each diagonal value surpasses all corresponding off-diagonal correlations. This consistent pattern across all constructs confirms that each construct shares more variance with its own indicators than with other constructs. Therefore, Table 3 demonstrates that the measurement model satisfies the Fornell–Larcker criterion, providing strong evidence of satisfactory discriminant validity [45].

3.1.1. Structural Model Results

The structural model was evaluated to test the hypothesized relationships among constructs. Path coefficients, t-values, and p-values were obtained through a bootstrapping procedure, while multicollinearity, effect sizes, and predictive relevance were also examined to ensure the robustness of the structural relationships [46]. Prior to hypothesis testing, all Variance Inflation Factor (VIF) values were assessed and confirmed to be below the recommended threshold of 5, indicating the absence of serious multicollinearity issues among predictor variables. The bootstrapping procedure, using 5,000 resamples, generated stable estimates for all path coefficients, enabling rigorous statistical testing and providing strong support for the significance of the hypothesized relationships [47].

Furthermore, the model's predictive accuracy was evaluated using the coefficient of determination (R^2) for each endogenous construct, while predictive relevance (Q^2) was assessed through the blindfolding procedure. The results indicate that the model demonstrates satisfactory explanatory power as well as adequate predictive capability. Overall, the structural model results provide strong empirical support for the proposed theoretical framework, confirming that both blockchain-related technological characteristics and humanistic ethical governance play a significant role in shaping user trust and perceived data control, which in turn influence users' intention to share emotional wellbeing data [48].

Table 4. Structural Model and Hypothesis Testing Results

Hypothesis	**Path**	β	**t-value**	**p-value**	**Result**
H1	Blockchain Characteristics → User Trust	0.320	4.100	< 0.001	Supported
H2	Blockchain Characteristics → Perceived Data Control	0.280	3.650	< 0.01	Supported
H3	Humanistic Ethical Governance → User Trust	0.410	5.120	< 0.001	Supported
H4	Humanistic Ethical Governance → Perceived Data Control	0.360	4.770	< 0.001	Supported
H5	User Trust → Data Sharing Intention	0.390	5.440	< 0.001	Supported
H6	Perceived Data Control → Data Sharing Intention	0.310	4.020	< 0.001	Supported

Table 4 presents the results of the structural model assessment and hypothesis testing, showing the strength and significance of the relationships between the constructs. As displayed in Table 4, all six hypothesized paths are statistically significant and supported, with p-values below the recommended threshold of 0.05. Hypothesis H1 demonstrates that Blockchain Characteristics have a positive effect on User Trust ($\beta = 0.320$, $t = 4.100$, $p < 0.001$) [49]. Similarly, H2 shows that Blockchain Characteristics also significantly enhance Perceived Data Control ($\beta = 0.280$, $t = 3.650$, $p < 0.01$) [50]. Humanistic Ethical Governance exhibits strong positive influences on both User Trust (H3: $\beta = 0.410$, $t = 5.120$, $p < 0.001$) and Perceived Data Control (H4: $\beta = 0.360$, $t = 4.770$, $p < 0.001$), indicating its central role in shaping users' perceptions. Furthermore, User Trust is found to significantly increase Data Sharing Intention, as reflected in H5 ($\beta = 0.390$, $t = 5.440$, $p < 0.001$). Finally, H6 confirms that Perceived Data Control also contributes positively to Data Sharing Intention ($\beta = 0.310$, $t = 4.020$, $p < 0.001$) [51]. Overall, Table 4 confirms that all hypothesized relationships are supported, highlighting the importance of both blockchain-related characteristics and ethical governance in fostering trust, perceived control, and users' willingness to share data [52, 53].

Table 5. Coefficient of Determination R^2

Endogenous Construct	$\mathbf{R^2}$
User Trust	0.540
Perceived Data Control	0.480
Data Sharing Intention	0.620

Table 5 presents the coefficient of determination R^2 values for the endogenous constructs, demonstrating the predictive accuracy of the structural model. The results show that User Trust has an R^2 value of 0.540, indicating that Blockchain Characteristics and Humanistic Ethical Governance together explain 54% of its variance [54]. Perceived Data Control records an R^2 of 0.480, meaning that 48% of users' perceived control is accounted for by the same antecedent variables. Meanwhile, Data Sharing Intention shows the highest predictive power with an R^2 value of 0.620, suggesting that User Trust and Perceived Data Control jointly explain 62% of users' willingness to share data. Overall, Table 5 demonstrates that the model achieves moderate to substantial explanatory power across all endogenous constructs.

3.2. Discussion

The results provide empirical support for the proposed blockchain-enabled emotional wellbeing data sharing platform integrated with a humanistic ethical governance model. The significant influence of Blockchain Characteristics on User Trust and Perceived Data Control confirms that technological features such as transparency, immutability, and traceable consent mechanisms play a crucial role in reducing uncertainty and enhancing confidence in digital wellbeing systems [55, 56]. These characteristics strengthen users' perceptions of system reliability by ensuring that every access, modification, or transaction involving emotional wellbeing data is securely recorded and cannot be altered without detection. Importantly, the findings reveal that Humanistic Ethical Governance exerts a strong effect on both User Trust and Perceived Data Control, highlighting the importance of ethical principles such as autonomy, fairness, accountability, and informed consent in shaping users' attitudes and behavioral responses. This suggests that trust in emotional wellbeing data-sharing systems is not driven solely by technical security but also by users' perceptions of ethical integrity embedded in governance structures, which reinforces their sense of dignity and safety when interacting with the platform [57, 58].

The positive effects of User Trust and Perceived Data Control on Data Sharing Intention are consistent with trust-based behavioral intention models, which posit that individuals are more inclined to share sensitive information when they feel confident in the system and retain meaningful control over their data. When users perceive themselves as empowered, ethically respected, and fully aware of how their emotional wellbeing data will be stored, accessed, and utilized, their willingness to share increases substantially. This insight is particularly significant given the high psychological sensitivity and potential risks associated with emotional data, where breaches or misuse could lead to stigma, discrimination, or emotional harm. From a broader perspective, these findings contribute to the development of sustainable and ethically responsible digital wellbeing infrastructures by demonstrating that both technological advancements and ethical safeguards must coexist to foster user participation.

In this context, the integration of blockchain technology supports SDGs 9 (Industry, Innovation, and Infrastructure) by enabling resilient and transparent digital systems that enhance data integrity and operational accountability. At the same time, the humanistic ethical governance model promotes SDGs 10 (Reduced Inequalities) and SDGs 16 (Peace, Justice, and Strong Institutions) through inclusive and fairness-driven data governance mechanisms that ensure users' rights are protected. By encouraging ethical data sharing for mental health research and services, the platform also advances SDGs 3 (Good Health and Well-Being) and SDGs 17 (Partnerships for the Goals), supporting collaborative mental health initiatives grounded in trust, transparency, and ethical responsibility. Collectively, these findings underscore the necessity of integrating humanistic values within technologically advanced systems to build digital wellbeing ecosystems that are both secure and socially accountable.

4. MANAGERIAL IMPLICATIONS

The results of this study imply that managers and platform developers in digital mental health systems should prioritize blockchain features that directly enhance transparency and user trust. The significant effects of blockchain characteristics on trust and perceived data control indicate that technical design decisions such as immutable audit trails, traceable consent management, and transparent data access records play a crucial managerial role in reducing user uncertainty. Therefore, managerial investments should focus not only on security infrastructure but also on user-facing mechanisms that allow individuals to monitor and understand how their emotional wellbeing data are accessed and used.

In addition, the strong influence of humanistic ethical governance on both user trust and perceived data control highlights the necessity of embedding ethical principles into operational management. Managers and policymakers should institutionalize ethical governance through clear consent policies, accountability structures, fairness-based access rules, and independent ethical oversight. Treating ethics as an integral governance function rather than a compliance requirement enables organizations to operationalize autonomy, fairness, and informed consent in daily platform operations, thereby strengthening sustainable user engagement.

Finally, as user trust and perceived data control significantly drive data sharing intention, managerial strategies should emphasize user empowerment rather than coercive data collection approaches. By enabling users to easily grant, modify, or revoke data-sharing permissions, organizations can foster voluntary and long-term participation in emotional wellbeing data ecosystems. This managerial approach not only reduces reputational and regulatory risks but also supports sustainable digital health collaboration aligned with the Sustainable Development Goals, particularly SDGs 3, SDGs 9, and SDGs 16.

5. CONCLUSION

The rapid adoption of digital mental health technologies has increased the generation and use of emotional wellbeing data, raising critical challenges related to privacy, trust, and ethical governance. Existing data-sharing systems predominantly rely on centralized architectures that provide limited transparency and user control, conditions that often undermine trust and discourage voluntary participation in data sharing. Although blockchain technology has been proposed as a potential solution, prior research has largely emphasized its technical capabilities while giving limited empirical attention to ethical governance and user-centered outcomes. Addressing this gap, this study empirically examines the combined role of blockchain characteristics and humanistic ethical governance in shaping trust, perceived data control, and data sharing intention using a quantitative PLS-SEM approach.

The results demonstrate that blockchain characteristics such as transparency, immutability, and traceable consent management have significant positive effects on user trust and perceived data control. More importantly, the findings reveal that humanistic ethical governance exerts a strong influence on these user perceptions, indicating that ethical values embedded within governance structures are as essential as technological safeguards. These findings confirm that trust and perceived data control serve as key mechanisms through which ethical and technological factors influence users' willingness to share emotional wellbeing data. The primary novelty of this research lies in its integration of blockchain technology with a humanistic ethical governance model within a single empirical framework, translating ethical principles autonomy, fairness, accountability, and informed consent into measurable governance constructs and empirically validating their impact on user attitudes.

By doing so, the study extends trust-based behavioral intention theories to blockchain-enabled emotional wellbeing platforms and provides empirical evidence supporting ethical-by-design digital infrastructures. From both theoretical and practical perspectives, these findings contribute to the development of sustainable and trustworthy digital wellbeing ecosystems aligned with the United Nations Sustainable Development Goals, particularly SDGs 3, SDGs 9, SDGs 10, and SDGs 16. Despite its contributions, this study has limitations, including reliance on a cross-sectional quantitative design, which limits the ability to capture causal dynamics and behavioral changes over time. Future research may adopt longitudinal or experimental approaches, incorporate qualitative methods and cross-cultural comparisons, and examine technical performance, interoperability, and regulatory compliance in large-scale implementations to strengthen the practical applicability of ethically governed blockchain-based emotional wellbeing data-sharing platforms.

6. DECLARATIONS

6.1. About Authors

Irwan Sembiring (IS) https://orcid.org/0000-0002-6625-7533

Qurotul Aini (QA) https://orcid.org/0000-0002-7546-5721

Richard Andre Sunarjo (RA) https://orcid.org/0009-0007-7349-2375

Dwi Julianingsih (DJ) https://orcid.org/0000-0002-6257-4881

Marta Rodriguez (MR) https://orcid.org/0009-0000-1367-0511

6.2. Author Contributions

Conceptualization: RA; Methodology: QA; Software: MR; Validation: IS and DJ; Formal Analysis: QA and IS; Investigation: DJ; Resources: RA; Data Curation: MR; Writing Original Draft Preparation: DJ and IS; Writing Review and Editing: MR and QA; Visualization: RA; All authors, IS, QA, RA, DJ, and MR, have read and agreed to the published version of the manuscript.

6.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6.4. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

6.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

REFERENCES

[1] Z. Liu, Z. Yang, M. Liang, Y. Liu, M. Osmani, and P. Demian, "A conceptual framework for blockchain enhanced information modeling for healing and therapeutic design," *International Journal of Environmental Research and Public Health*, vol. 19, no. 13, p. 8218, 2022.

[2] G. Mustafa, W. Rafiq, N. Jhamat, Z. Arshad, and F. A. Rana, "Blockchain-based governance models in e-government: a comprehensive framework for legal, technical, ethical and security considerations," *International Journal of Law and Management*, vol. 67, no. 1, pp. 37–55, 2025.

[3] F. Hameed and K. Hameed, "A sustainable digital transformation in healthcare and well-being: An overview, integration, design and security challenges, blockchain technology, applications, and future research directions," 2023.

[4] H. E. Riwayati, H. A. Rachman, S. Pramesworo, N. Yustisia, H. Umar, and M. Siahaan, "Unveiling the dynamics of financial literacy and inclusion in women digital loan decision making," *Aptisi Transactions on Technopreneurship (ATT)*, vol. 7, no. 3, pp. 986–998, 2025.

[5] Y. Xi, "Blockchain decentralised ecosystems for the public health in china: emerging considerations for decentralised trust theory," Ph.D. dissertation, University of Birmingham, 2024.

[6] L. N. Jeenath and G. Tamilpavai, "Leveraging blockchain and iiot for sustainable workplace mental well-being: A clinical psychology approach," *Revista Argentina de Clínica Psicológica*, vol. 34, no. 1, pp. 1–10, 2025.

[7] H. Han, "The impact of artificial intelligence (ai) and blockchain adoption in corporate governance: ethical perspectives," Ph.D. dissertation, Brunel University London, 2022.

[8] J. Julyanthry, L. Suryati, Z. Mamadiyarov, M. Silalahi, L. Judijanto, M. D. Simanjuntak, and S. B. Baxtishodovich, "Impact of shopee promotions on spontaneous buying in pematangsiantar," *Aptisi Transactions on Technopreneurship (ATT)*, vol. 7, no. 3, pp. 1028–1040, 2025.

[9] P. Ruotsalainen and B. Blobel, "A system model and requirements for transformation to human-centric digital health," *Journal of medical Internet research*, vol. 27, p. e68661, 2025.

[10] R. de Filippis and A. Al Foysal, "Blockchain brains: Pioneering ai, ml, and dlt solutions for healthcare and psychology," *Open Access Library Journal*, vol. 11, no. 12, pp. 1–24, 2024.

[11] X. Wang, J. Huang, Q. Ni, Z. Wan, H. Xue, L. Stapleton, and F.-Y. Wang, "Society 5.0: Metaverse facilitated human-centric "5h" services across cyber-physical-social spaces," *IFAC-PapersOnLine*, vol. 58, no. 3, pp. 159–164, 2024.

[12] S. A. Sibagariang, N. Septiani, and A. Rodriguez, "Enhancing educational management through social media and e-commerce-driven branding," *International Journal of Cyber and IT Service Management (IJCITSM)*, vol. 5, no. 2, pp. 235–245, 2025.

[13] A. Saha, "Human-centred innovation in society 5.0," *Society 5.0: A Transformation towards Human-Centered Artificial Intelligence*, p. 143, 2025.

[14] D. Kovačević, "Smart contracts and transhumanism: Legal and ethical challenges of artificial intelligence in the society of the future," 2025.

[15] R. A. Zhanbayev, M. Irfan, A. V. Shutaleva, D. G. Maksimov, R. Abdykadyrkyzy, and Ş. Filiz, "Demoethical model of sustainable development of society: A roadmap towards digital transformation," *Sustainability*, vol. 15, no. 16, p. 12478, 2023.

[16] A. I. Zulkarnain, N. A. Achsani, M. Siregar, and I. S. Beik, "Enhancing accountability in hajj fund governance through regulatory impact analysis and value chain model," *International Journal of Cyber and IT Service Management (IJCITSM)*, vol. 5, no. 2, pp. 198–213, 2025.

[17] R. F. Ciriello, L. Mathiassen, M. Risius, M. Cheong, H. Scheepers, and E. Vaast, "Compassionate digital innovation: A pluralistic perspective and research agenda," *Information Systems Journal*, 2025.

[18] A. Nadarasa, "Social prescribing in the metaverse: a new frontier for primary care practice," *Global Health Journal*, vol. 8, no. 1, pp. 32–35, 2024.

[19] P. Oladokun, "Posthuman ethics in digital health: reimagining autonomy, consent, and responsibility in ai-augmented care," *Int J Eng Technol Res Manag*, 2025.

[20] F. Sutisna, N. Lutfiani, E. Anderson, D. Danang, and M. O. Syaidina, "E-commerce and digital marketing strategies: Their impact on startupreneur performance using pls-sem," *IAIC Transactions on Sustainable Digital Innovation (ITSDI)*, vol. 6, no. 2, pp. 215–223, 2025.

[21] Y. Lu, F. Liu, C. Zeng, and J. Zhang, "Ethical conflict and reconciliation of the emotional data flow in university teaching supported by multimodal affective computing," in *2025 International Conference on*

Artificial Intelligence and Digital Ethics (ICAIDE). IEEE, 2025, pp. 36–41.

[22] N. Bout, G. Moukhliss, H. Belhadaoui, N. Afifi, and M. Abik, "Integrating emotional ai, iot, and robotics for patient-centered healthcare: challenges and future directions," *Discover Internet of Things*, vol. 5, no. 1, p. 75, 2025.

[23] Y. E. Rachmad, "Bank emas: A stable and secure financial solution for the future," *United Nations Department of Global Communications*, 2025.

[24] H. D. Natalia and A. Aprillia, "Exploring the impact of e-wom on generation z purchase intention: The mediating role of brand image and perceived quality," *IAIC Transactions on Sustainable Digital Innovation (ITSDI)*, vol. 6, no. 2, pp. 164–176, 2025.

[25] L. Li, "Research on the architecture of intelligent teaching platform based on educational neuroscience and humanism perspective," in *International Conference on Computer Science and Educational Informatization*. Springer, 2023, pp. 142–154.

[26] C. M. Chang, G. T. Salinas, T. S. Gamero, S. Schroeder, M. A. Vélez Canchanya, and S. L. Mahnaz, "An infrastructure management humanistic approach for smart cities development, evolution, and sustainability," *Infrastructures*, vol. 8, no. 9, p. 127, 2023.

[27] S. Pratama and L. A. M. Nelloh, "Leveraging influencer marketing in higher education: Key roles, sectors, platforms, and influencer types for institutional branding," *Startupreneur Business Digital (SABDA Journal)*, vol. 4, no. 2, pp. 134–145, 2025.

[28] A. S. George, "Bridging the digital divide: Understanding the human impacts of digital transformation," *Partners Universal International Innovation Journal*, vol. 2, no. 3, pp. 1–34, 2024.

[29] Y. Lin, L. Cui, T. He, and X. Wu, "The coupling relationship between flexible governance and public emotion from the perspective of systems science and computational intelligence," *International Journal of High Speed Electronics and Systems*, p. 2540386, 2025.

[30] A. Simanjuntak, A. Sutarman, S. A. Anjani, and A. Nuche, "Integrating artificial intelligence in e-learning for organizational well-being through orange technology mapping," *IAIC Transactions on Sustainable Digital Innovation (ITSDI)*, vol. 7, no. 1, pp. 13–26, 2025.

[31] A. Abudaqa and I. Noburu, "Optimizing digipreneurship in the growth of the digital millennial creative economy ecosystem," *Startupreneur Business Digital (SABDA Journal)*, vol. 4, no. 1, pp. 24–34, 2025.

[32] A. M. Pasha, "The revolutionary impact of ai, machine learning, web3. 0, blockchain, metaverse and nfts on global society in the next decade," *American Journal of Computer Science and Technology*, 2025.

[33] A. Tabassum, E. Elmahjub, and J. Qadir, "Ethics and regulation in metaverse: Risks, current approaches, and way forward," *Understanding the Metaverse: Applications, Challenges, and the Future*, pp. 265–290, 2024.

[34] T. Pujiati, H. Setiyowati, B. Rawat, N. P. L. Santoso, and M. G. Ilham, "Exploring the role of artificial intelligence in enhancing environmental health: Utaut2 analysis," *Sundara Advanced Research on Artificial Intelligence*, vol. 1, no. 1, pp. 37–46, 2025.

[35] H. Wang, "Health informatics and digital health: Transforming healthcare through technology," *Journal of Integrated Health Innovation*, pp. 4–4, 2025.

[36] X. Li *et al.*, "Nurseverse: Nursing in the metaverse era," *Frontiers in Medicine*, vol. 12, p. 1577153, 2025.

[37] S. Vatankhah, V. Bamshad, H. E. Arici, and Y. Duan, "Ethical implementation of artificial intelligence in the service industries," *The Service Industries Journal*, vol. 44, no. 9-10, pp. 661–685, 2024.

[38] A. H. Aditiya, H. Hamdan, S. N. W. Putra, S. Visiana, and R. Thakkar, "Transforming education with genai: Case study on chatgpt, midjourney, and policy changes," *Sundara Advanced Research on Artificial Intelligence*, vol. 1, no. 1, pp. 20–27, 2025.

[39] A. B. Weyland, "International journal of cryptocurrency research," 2023.

[40] Z. Xianghan and L. Zhengwei, "Research on the impact of algorithmic management on employee work behavior in platform enterprises," *Journal of Economics and Management Sciences*, vol. 8, no. 2, pp. p99–p99, 2025.

[41] S. Kaddoura and F. Al Husseiny, "The rising trend of metaverse in education: Challenges, opportunities, and ethical considerations," *PeerJ Computer Science*, vol. 9, p. e1252, 2023.

[42] P. H. P. Tan, S. Wijaya, U. Rahardja, B. N. Henry, and A. Anjani, "Modeling the impact of digital literacy on ai based learning adoption through perceived usefulness and easeof use," *Sundara Advanced Research on Artificial Intelligence*, vol. 1, no. 2, pp. 56–64, 2025.

[43] H. Meissen, M. N. Gong, A.-K. I. Wong, J. J. Zimmerman, N. Nadkarni, S. L. Kane-Gil, J. Amador-

Castaneda, H. Bailey, S. M. Brown, A. D. DePriest *et al.*, "The future of critical care: optimizing technologies and a learning healthcare system to potentiate a more humanistic approach to critical care," *Critical Care Explorations*, vol. 4, no. 3, p. e0659, 2022.

[44] Y. Xiaowen, Z. Shenzhong, D. Jingjing, J. Hanzhen, and P. Huiling, "A study on the practical logic and promotion path of agile governance of distorted health information on the internet: A review," *Medicine*, vol. 104, no. 13, p. e41897, 2025.

[45] M. A. Syari, U. Rahardja, T. Wellem, H. D. Purnomo, and R. Buaton, "Iot enabled smart farming system for optimizing crop management using sensors and machine learning," in *2025 4th International Conference on Creative Communication and Innovative Technology (ICCIT)*. IEEE, 2025, pp. 1–7.

[46] G. S. Nale, "Integrating traditional indian medical knowledge systems with digital forensic and data management frameworks: A multidisciplinary approach to heritage preservation, healthcare innovation, and legal science," 2025.

[47] P. Magliocca, R. Canestrino, E. G. Carayannis, and A. R. Gagliardi, "Understanding human–technology interaction: evolving boundaries," *European Journal of Innovation Management*, 2024.

[48] D. Masliković and N. Vulikić, "Artificial intelligence in the service of cultural heritage: Enhancing protection and museum information systems," 2025.

[49] Y. E. Rachmad, "Danantara: The future of sovereign wealth management in indonesia," *The United Nations Global Compact*, 2024.

[50] P. Boopathy, N. Deepa, P. K. R. Maddikunta, N. Victor, T. R. Gadekallu, G. Yenduri, W. Wang, Q.-V. Pham, T. Huynh-The, and M. Liyanage, "The metaverse for industry 5.0 in nextg communications: Potential applications and future challenges," *IEEE Open Journal of the Computer Society*, 2024.

[51] Y. E. Rachmad, "The new era of hr management: Prioritizing competence over degrees," *United Nations Development Programme*, 2025.

[52] S. Quan, "Comprehensive social reform program-multi-dimensional governance for labor rights protection and cultural industries i. comprehensive program for protecting grassroots workers' rights and interests and preventing corporate violations," *Authorea Preprints*, 2025.

[53] Y. Xiao and Z. Zhang, "Analyzing the innovative thinking and optimization strategies of artificial intelligence development from the wisdom of thought in the tao te ching," in *Proceedings of the 2025 2nd International Conference on Computer and Multimedia Technology*, 2025, pp. 552–562.

[54] S. Li and X. Gu, "A risk framework for human-centered artificial intelligence in education," *Educational Technology & Society*, vol. 26, no. 1, pp. 187–202, 2023.

[55] Y. E. Rachmad, "The influencer effect: Exploring the impact of viral and gimmick marketing on behavior," *United Nations Economic and Social Council*, 2025.

[56] D. R. Chain, D. P. A. Abreu, and R. A. Iquiapaza, "Corporate governance in the metaverse: Perspectives on applicability and challenges from the standpoint of firm theory," *BBR. Brazilian Business Review*, vol. 22, p. e20231566, 2025.

[57] M. C. Tavares, G. Azevedo, and R. P. Marques, "The challenges and opportunities of era 5.0 for a more humanistic and sustainable society—a literature review," *Societies*, vol. 12, no. 6, p. 149, 2022.

[58] B. Jose, A. M. Verghis, S. M. Varghese, J. Cherian *et al.*, "From tools to co-learners: Entangled humanism and the co-evolution of intelligence in ai education introduction: Reframing intelligence in education," in *Frontiers in Education*, vol. 10. Frontiers, 2025, p. 1632990.