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Measuring the Humanistic Impact of Digital Technologies on Happiness A Cross-Cultural Analysis

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ABSTRACT

The rapid advancement of digital technologies has transformed social interaction, daily activities, and individual well-being across societies. While prior studies emphasize economic and technological outcomes, limited attention has been given to the humanistic impact of digital technologies on happiness across cultural contexts. **This study aims** to measure the humanistic impact of digital technologies on happiness through a cross-cultural analysis. **A quantitative** research design was employed using survey data collected from multiple countries representing diverse cultural, social, and economic backgrounds. Digital technologies were conceptualized as a multidimensional construct encompassing digital access, usage intensity, digital inclusion, and human-centered digital engagement, while happiness was measured using subjective well-being indicators. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS, including measurement model evaluation, structural model assessment, and multi-group analysis to examine cross-cultural differences. **The findings** demonstrate that digital technologies have a positive effect on happiness when they support humanistic values such as social connectedness, autonomy, and inclusivity. However, the strength of these relationships varies across cultural groups, indicating the moderating role of cultural norms.**This study contributes** to the literature by integrating a humanistic perspective into digital well-being research and offers globally applicable implications for policymakers and technology designers.

1. INTRODUCTION

The widespread adoption of digital technologies has emerged as a central driver of global transformation in the modern era. Innovations such as digital platforms, artificial intelligence, mobile technologies, and data-centric systems increasingly influence how individuals interact, learn, work, and engage in social life [1]. These developments closely align with the United Nations Sustainable Development Goals (SDGs), particularly SDGs 9 (Industry, Innovation, and Infrastructure), which emphasizes the role of technological advancement in fostering inclusive and sustainable growth. However, beyond infrastructure and economic ex-

pansion, the deeper question concerns whether digital transformation genuinely enhances human well-being and happiness [2, 3]. As societies become progressively digitized, evaluating the qualitative human outcomes of technological progress becomes as important as measuring its economic efficiency.

Happiness, commonly conceptualized as subjective well-being, constitutes a central component of SDGs 3 (Good Health and Well-Being), which recognizes mental and emotional health as essential dimensions of sustainable development. While technological innovation and economic growth are often assumed to improve quality of life, empirical findings suggest that their relationship with happiness is neither linear nor universal [4]. Digital technologies can promote well-being by facilitating social connectivity, expanding access to education and healthcare, and enabling flexible forms of work and self-expression. At the same time, they may contribute to digital fatigue, algorithmic bias, misinformation exposure, privacy concerns, and widening digital divides [5]. These dual effects indicate that technological diffusion alone does not guarantee positive psychological outcomes; rather, the human-centered design, governance, and accessibility of digital systems determine whether they function as sources of empowerment or stress [6, 7].

A humanistic perspective therefore becomes critical in assessing the broader societal implications of digital technologies. Humanistic impact refers to the extent to which digital systems promote dignity, autonomy, inclusivity, fairness, and meaningful participation in social and economic life [6]. This orientation resonates strongly with SDGs 10 (Reduced Inequalities), which calls for equitable access to opportunities, and SDGs 16 (Peace, Justice, and Strong Institutions), which emphasizes trust, transparency, and accountable governance including within digital ecosystems. Despite these normative commitments, much existing research continues to evaluate technological success primarily through productivity gains, adoption rates, or financial performance metrics [8]. Such approaches risk overlooking how digital environments shape emotional well-being, social cohesion, and perceptions of fairness. Consequently, there is a pressing need to operationalize and empirically measure the humanistic dimensions of digital transformation [9].

Moreover, the impact of digital technologies on happiness is deeply embedded in cultural contexts. Cultural norms influence how individuals perceive autonomy, social connection, authority, and collective responsibility within digital spaces [10]. Societies characterized by collectivist orientations may derive well-being from digitally mediated community engagement, whereas more individualistic cultures may prioritize personal achievement and self-expression in online environments. Variations in institutional trust, digital literacy, and social safety nets further shape how digital tools are adopted and experienced [11–13]. Yet, prior empirical investigations have frequently been confined to single-country samples, limiting the generalizability of findings and constraining cross-cultural understanding. This methodological limitation hinders the development of culturally responsive digital strategies aligned with SDGs 4 (Quality Education) and SDGs 9, particularly in increasingly interconnected global contexts.

In response to these gaps, this study develops a cross-cultural analytical framework to measure the humanistic impact of digital technologies on happiness. By employing PLS-SEM, the research captures the multidimensional constructs of digital humanistic impact such as inclusivity, autonomy support, social connectedness, and perceived fairness and examines their direct and indirect relationships with subjective well-being [14]. The cross-cultural design enables systematic comparison across cultural groups, providing insights into contextual variations in digital well-being outcomes. The findings are expected to advance theoretical integration between sustainability, humanistic technology design, and happiness research, while offering practical guidance for policymakers, educators, and technology developers seeking to promote SDGs aligned digital ecosystems that prioritize not only innovation and growth, but also equitable and enduring human flourishing [15, 16].

2. RESEARCH METHOD

This section outlines the methodological procedures employed to examine the humanistic impact of digital technologies on happiness within a cross-cultural framework. The research method was systematically designed to ensure conceptual clarity, measurement validity, and analytical rigor. It describes the overall research strategy, data collection procedures, sampling techniques, measurement development, and statistical analysis approach [17]. By integrating established quantitative methods with a structural modeling framework, this study seeks to provide robust empirical evidence regarding the relationships among digital technology utilization, humanistic values, and subjective well-being. The methodological structure ensures that the proposed conceptual model can be tested comprehensively while allowing for cross-cultural comparison and predictive

evaluation.

2.1. Research Design

This study employs a quantitative research design to investigate the humanistic impact of digital technologies on happiness across different cultural contexts. A cross-sectional survey approach was adopted to capture respondents' perceptions at a single point in time, which is appropriate for examining structural relationships among latent variables in social and behavioral research. The quantitative approach enables objective measurement of abstract constructs such as digital technologies, humanistic impact, and happiness, and allows hypothesis testing using statistical modeling. Consistent with the study objectives and prior digital well-being research, PLS-SEM was applied using SmartPLS [18]. PLS-SEM is suitable for this research because it accommodates complex models with mediating and moderating relationships, does not require strict normality assumptions, and is effective for cross-cultural comparative analysis. Furthermore, PLS-SEM emphasizes prediction-oriented analysis, aligning with the study's goal of explaining happiness outcomes derived from digital technologies [19, 20].

2.2. Literature Review and Conceptual Framework

Existing literature on digital technologies and well-being suggests that digital adoption can enhance happiness through increased social connectivity, information accessibility, and personal autonomy [21, 22]. Digital platforms facilitate communication, reduce geographical barriers, and provide new opportunities for learning and participation. However, contrasting evidence highlights potential negative outcomes, including digital fatigue, privacy concerns, techno-stress, and social isolation. These divergent findings indicate that the effects of digital technologies on happiness are complex and context-dependent [23].

To address this complexity, this study adopts a humanistic perspective, which emphasizes human dignity, inclusivity, autonomy, and meaningful participation as essential dimensions of technological development. This perspective aligns closely with the United Nations SDGs, particularly SDGs 3 (Good Health and Well-Being), SDGs 9 (Industry, Innovation, and Infrastructure), SDGs 10 (Reduced Inequalities), and SDGs 16 (Peace, Justice, and Strong Institutions). Within this framework, digital technologies are viewed not merely as technical tools, but as socio-technical systems that shape human experiences and well-being [24]. Drawing from this literature, the study conceptualizes humanistic impact as a key explanatory mechanism through which digital technologies influence happiness. Additionally, recognizing cultural diversity, cultural context is proposed as a moderating factor that shapes how individuals perceive and experience digital technologies and happiness [25].

2.3. Research Framework and Hypotheses

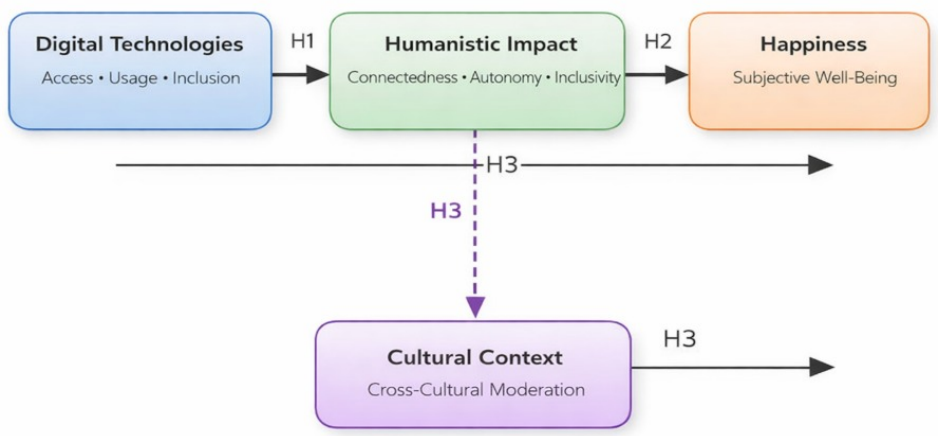

Figure 1. Proposed Research Framework and Hypotheses

Figure 1 presents the conceptual research model illustrating the relationships among digital technologies, humanistic impact, and happiness within a cross-cultural framework. In this model, digital technologies are positioned as an exogenous construct reflecting individuals' access to, intensity of use, and inclusion in digital systems, highlighting the role of technological innovation in shaping everyday life in line with SDGs 9

(Industry, Innovation, and Infrastructure) [26, 27]. Humanistic impact functions as a mediating construct that captures the extent to which digital technologies enhance social connectedness, individual autonomy, and inclusivity, indicating that the influence of technology on happiness is not merely technical but operates through human-centered mechanisms that support dignity and meaningful participation, consistent with SDGs 3 (Good Health and Well-Being) and SDGs 10 (Reduced Inequalities). Happiness is modeled as the main endogenous construct representing subjective well-being, including life satisfaction and positive affect, while a direct path from digital technologies to happiness acknowledges potential immediate effects of technology use on well-being [28]. Furthermore, cultural context is incorporated as a moderating variable, emphasizing that cultural values, social norms, and institutional environments shape how digital technologies and their humanistic impacts translate into happiness across societies, thereby aligning the model with SDGs 16 (Peace, Justice, and Strong Institutions) [29, 30].

2.4. Variables and Measurement

All constructs were measured using multi-item reflective indicators adapted from established literature and adjusted to fit the digital and cross-cultural context of this study. The adaptation process ensured conceptual equivalence while maintaining the theoretical integrity of the original scales [31]. Each construct was operationalized as a latent variable represented by several observable indicators to capture its multidimensional characteristics accurately. Responses were captured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), which is commonly applied in cross-cultural survey research due to its clarity, reliability, and suitability for measuring attitudes and perceptions [32]. The use of a standardized Likert scale facilitates comparability across cultural groups and supports robust statistical analysis within the PLS-SEM framework. Higher scores indicate stronger agreement with the statements reflecting digital technology engagement, humanistic impact, happiness, and cultural alignment.

This measurement approach enables a systematic assessment of the relationships among constructs while ensuring consistency, reliability, and cross-cultural applicability of the collected data [33].

Table 1. Construct Operationalization

Construct	Dimensions	Sample Indicators
Digital Technologies (DT)	Digital access, usage intensity, digital inclusion	Access to digital services, frequency of digital use
Humanistic Impact (HI)	Social connectedness, autonomy, inclusivity	Digital tools enhance meaningful interaction
Happiness (HP)	Life satisfaction, positive affect	Satisfaction with life and digital experiences
Cultural Context (CC)	Cultural orientation, social norms	Technology aligns with cultural values

Table 1 presents the operationalization of the key constructs used in this study, detailing how each latent variable is defined, dimensionally structured, and empirically measured [34]. DT are operationalized through dimensions of digital access, usage intensity, and digital inclusion, reflecting individuals ability to access and actively engage with digital services. HI is measured using dimensions of social connectedness, autonomy, and inclusivity, capturing the extent to which digital technologies support meaningful interaction and human-centered values [35]. HP is operationalized through life satisfaction and positive affect, representing subjective well-being in both general life and digital experiences. Finally, CC is defined by cultural orientation and social norms, emphasizing the alignment between technology use and prevailing cultural values. Together [36], these constructs and indicators provide a comprehensive measurement framework suitable for PLS-SEM analysis, ensuring that the multidimensional and cross-cultural nature of the relationships examined in this research is adequately captured.

2.5. Data Collection and Sampling

Data were collected through an online questionnaire distributed across multiple countries to ensure cross-cultural diversity. The online survey method was chosen due to its efficiency, scalability, and suitability for international data collection involving digitally active respondents. The target population consisted of individuals who regularly use digital technologies for communication, work, learning, or social interaction. A

purposive sampling technique was employed to ensure that respondents possessed sufficient experience with digital technologies, enabling them to meaningfully assess their humanistic and well-being impacts [37, 38]. Inclusion criteria required respondents to have regular access to digital devices and internet-based platforms.

The minimum sample size was determined using the 10-times rule in PLS-SEM, which states that the sample size should be at least ten times the maximum number of structural paths pointing to a latent construct in the model. This rule ensures adequate statistical power for estimating path coefficients and assessing model reliability and validity [39].

Table 2. Sampling Criteria

Criterion	Description
Age	Minimum 18 years
Digital experience	Regular use of digital technologies
Geographical scope	Multiple countries
Participation	Voluntary and anonymous

Table 2 outlines the sampling criteria used in this study to ensure that respondents are appropriate and capable of providing reliable data for the cross-cultural analysis [40]. Participants were required to be at least 18 years old to ensure legal and cognitive eligibility to provide informed consent. The criterion of digital experience ensures that respondents regularly use digital technologies, enabling them to meaningfully evaluate digital access, usage intensity, and humanistic impacts. The geographical scope includes multiple countries to capture cultural diversity and support cross-cultural comparison, which is essential for examining moderating effects of cultural context. Finally, participation was voluntary and anonymous, ensuring ethical compliance, reducing response bias, and encouraging honest responses [41, 42].

After establishing clear sampling criteria, the study proceeds to describe how data were systematically collected from eligible respondents. To enhance methodological transparency and provide a comprehensive overview of the research process, the data collection and sampling steps are illustrated visually in Figure 2.

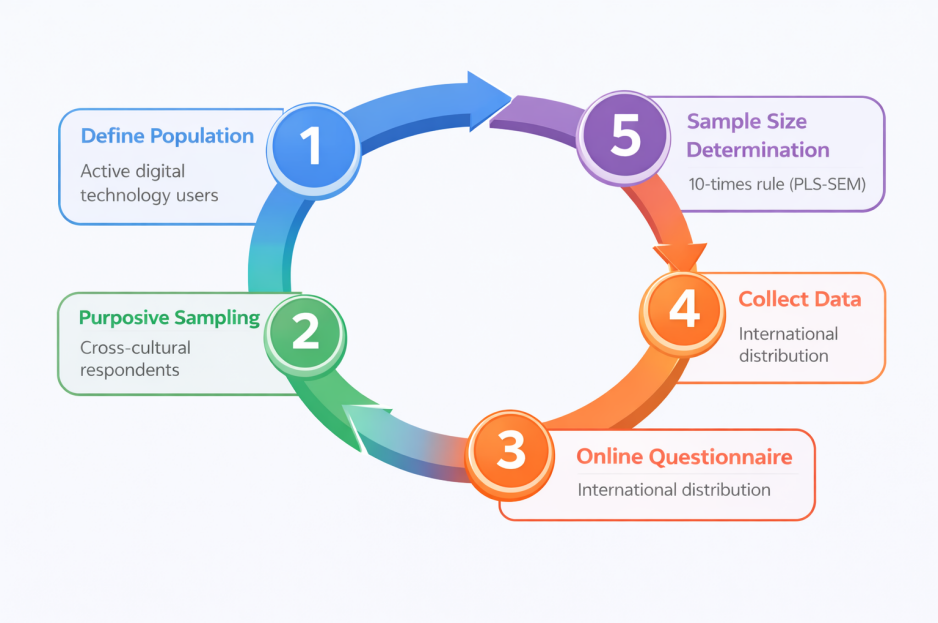

Figure 2. Data Collection and Sampling Procedure

Figure 2 presents a comprehensive and structured overview of the methodological steps undertaken in the study, illustrating a systematic flow from population identification to data collection. The process begins with defining the target population, which consists of active digital technology users, thereby establishing clear

inclusion criteria and ensuring that the study focuses on individuals who are directly relevant to the research objectives. Following this, the study employs purposive sampling, a non-probability sampling technique in which respondents are deliberately selected based on predefined characteristics. In this case, cross-cultural respondents are included to enhance the diversity and generalizability of the findings across different cultural contexts. The figure further indicates that sample size determination is guided by the 10-times rule within the PLS-SEM framework. According to this rule, the minimum sample size should be at least ten times the maximum number of structural paths directed at a particular construct or the largest number of indicators used to measure a construct in the model, thereby ensuring adequate statistical power and model stability. Finally, data are collected through an online questionnaire that is distributed internationally, enabling broad geographic reach, efficient data gathering, and accessibility for respondents from different regions. Overall, Figure 2 highlights a logically sequenced and interconnected research procedure that integrates clear population definition, targeted respondent selection, methodologically justified sample size determination, and systematic international online data collection to support robust empirical analysis.

2.6. Data Analysis Technique (PLS-SEM)

This study employed PLS-SEM using SmartPLS, as the method is appropriate for predictive analysis, complex structural models, and cross-cultural comparisons. The analysis was conducted in two main stages: evaluation of the measurement model and assessment of the structural model.

The measurement model was examined by assessing indicator reliability (outer loadings ≥ 0.70), internal consistency reliability using Cronbach's Alpha and Composite Reliability (≥ 0.70), and convergent validity through the Average Variance Extracted (AVE ≥ 0.50), calculated as:

$$AVE = \frac{\sum_{i=1}^{n} \lambda_i^2}{n} \tag{1}$$

Where λ_i represents the standardized factor loadings and n denotes the number of indicators. Discriminant validity was evaluated using the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio.

The structural model was assessed by examining path coefficients and their statistical significance using bootstrapping with 5,000 subsamples. The coefficient of determination was computed as:

$$R^2 = 1 - \frac{SS_{res}}{SS_{tot}} \tag{2}$$

Additionally, effect size (f^2) and predictive relevance (Q^2) were evaluated to determine the model's explanatory and predictive power. Cross-cultural differences were analyzed using PLS Multi-Group Analysis (PLS-MGA) after establishing measurement invariance through the MICOM procedure.

3. RESULTS AND DISCUSSION

This section presents the results of the empirical analysis and discusses the findings in relation to the proposed research model. The analysis was conducted using PLS-SEM to examine the relationships among Digital Technologies, Humanistic Impact, Cultural Context, and Happiness. The evaluation follows a two-step approach, beginning with the assessment of the measurement model to ensure the reliability and validity of the constructs, followed by the structural model evaluation to test the proposed hypotheses.

3.1. Measurement Model Results

The measurement model was evaluated to assess the reliability and validity of the constructs prior to testing the structural relationships. Table 3 presents the results of the measurement model assessment. All constructs demonstrate strong internal consistency reliability, as indicated by Cronbach's Alpha values ranging from 0.829 to 0.873, exceeding the recommended threshold of 0.70. Composite Reliability values also surpass the minimum requirement, ranging from 0.881 to 0.914, confirming the stability and consistency of the measurement scales.

Convergent validity is established for all constructs, as the AVE values exceed the recommended minimum threshold of 0.50. The AVE values range from 0.604 to 0.682, indicating that each construct explains more than half of the variance of its indicators. Among the constructs, Humanistic Impact exhibits the highest AVE value, suggesting that its indicators strongly capture the human-centered dimensions of digital technology

use. Overall, these results confirm that the measurement model satisfies the reliability and convergent validity criteria required for PLS-SEM analysis and is suitable for subsequent structural model evaluation.

Table 3. Measurement Model Assessment

Construct	**Cronbach's Alpha**	**Composite Reliability**	**AVE**
Digital Technologies (DT)	0.842	0.889	0.618
Humanistic Impact (HI)	0.873	0.914	0.682
Happiness (HP)	0.861	0.905	0.656
Cultural Context (CC)	0.829	0.881	0.604

As shown in Table 3, all constructs demonstrate satisfactory levels of reliability and validity. Cronbach's Alpha values range from 0.829 to 0.873, exceeding the recommended threshold of 0.70, which indicates strong internal consistency among the indicators measuring each construct. Similarly, Composite Reliability values range from 0.881 to 0.914, further confirming the stability and reliability of the measurement scales. In terms of convergent validity, the AVE values range from 0.604 to 0.682, all above the minimum criterion of 0.50, indicating that each construct explains more than half of the variance of its indicators. Among the constructs, HI shows the highest AVE value (0.682), suggesting that its indicators most strongly represent the underlying latent variable. Overall, the results presented in Table 3 confirm that the measurement model satisfies the required reliability and convergent validity criteria, supporting its suitability for subsequent structural model analysis.

3.2. Structural Model Results

After confirming the adequacy of the measurement model, the structural model was evaluated using a bootstrapping procedure with 5,000 subsamples. The results indicate that digital technologies have a significant positive effect on humanistic impact, supporting H1. This finding suggests that increased access to and engagement with digital technologies enhance social connectedness, individual autonomy, and inclusivity. Humanistic impact also exhibits a significant positive effect on happiness, supporting H2, demonstrating that happiness is strengthened when digital technologies are experienced in ways that align with human-centered values. Furthermore, digital technologies show a direct positive effect on happiness, supporting H3, although this effect is weaker compared to the indirect effect through humanistic impact. Mediation analysis confirms that humanistic impact partially mediates the relationship between digital technologies and happiness, thereby supporting H4. This result highlights that digital technologies contribute to happiness not merely through usage intensity, but through their capacity to foster meaningful and inclusive human experiences. The coefficient of determination (R^2) indicates moderate explanatory power for both humanistic impact and happiness, suggesting that the proposed model effectively explains variance in subjective well-being.

3.3. Cross-Cultural Analysis Results

To examine cross-cultural differences, PLS-MGA was conducted after establishing measurement invariance using the MICOM procedure. The results reveal statistically significant differences in several structural relationships across cultural groups, supporting H5. Specifically, the effect of humanistic impact on happiness is stronger in collectivist-oriented cultures, where social connectedness and inclusivity play a central role in well-being. In contrast, in more individualistic cultures, the direct effect of digital technologies on happiness is relatively stronger, reflecting a greater emphasis on autonomy and efficiency in technology use.

3.4. Discussion

The findings of this study provide robust empirical evidence that digital technologies positively influence happiness when their utilization is grounded in humanistic principles such as social connectedness, autonomy support, and inclusivity. The results demonstrate that digital tools do not inherently generate well-being; rather, their contribution to happiness depends on the extent to which they facilitate meaningful interpersonal interaction, empower users to exercise choice and control, and ensure equitable participation across diverse groups. The significant mediating role of humanistic impact confirms that technological advancement alone is insufficient to enhance subjective well-being unless it is intentionally designed to support positive human experiences. This finding advances the digital well-being literature by empirically validating a human-centered

explanatory pathway, highlighting that the quality of digital engagement rather than mere access or frequency of use serves as a critical determinant of happiness outcomes.

From a sustainability perspective, the results align closely with the United Nations SDGs. The positive association between digital technologies and humanistic impact reinforces the objectives of SDGs 9 (Industry, Innovation, and Infrastructure), particularly in promoting innovation that fosters inclusive and socially beneficial outcomes. Simultaneously, the strong relationship between humanistic impact and happiness substantiates the relevance of SDGs 3 (Good Health and Well-Being), emphasizing that psychological and emotional dimensions must be integrated into digital development agendas. Furthermore, the moderating role of cultural context underscores the importance of SDGs 10 (Reduced Inequalities) and SDGs 16 (Peace, Justice, and Strong Institutions), as culturally sensitive digital ecosystems can strengthen trust, reduce disparities in digital access, and encourage equitable participation. These findings collectively suggest that sustainable digital transformation requires more than technological expansion including it demands ethical governance, inclusive design, and context-aware implementation.

Overall, this study contributes to the expanding body of research on digital well-being by systematically integrating humanistic and cross-cultural perspectives into a unified analytical framework. By demonstrating that humanistic impact functions as a central mechanism linking digital technologies to happiness, the research offers both theoretical and practical implications. Theoretically, it bridges sustainability discourse with subjective well-being research, enriching our understanding of how digital environments shape psychological outcomes across societies. Practically, the findings provide actionable insights for policymakers, educators, and technology developers seeking to promote sustainable, happiness-oriented digital transformation. Designing digital systems that prioritize dignity, inclusiveness, and meaningful engagement can serve as a strategic pathway toward achieving long-term societal well-being in increasingly digitized global contexts.

4. MANAGERIAL IMPLICATIONS

The findings of this study underscore the strategic imperative for managers and technology developers to systematically embed human-centered design principles into the lifecycle of digital innovation. Rather than privileging operational efficiency, technical sophistication, or functional optimization as primary success indicators, organizations should reconceptualize digital technologies as socio-technical systems that actively shape users' psychological, social, and emotional experiences. In this regard, digital products and platforms must be intentionally engineered to cultivate social connectedness, reinforce user autonomy, and promote structural inclusivity. Managers are therefore encouraged to institutionalize design features that facilitate meaningful interaction, strengthen user agency, and ensure equitable accessibility across diverse demographic and sociocultural groups. These humanistic dimensions function not merely as complementary attributes, but as foundational mechanisms through which digital technology utilization translates into enhanced subjective well-being and sustained happiness outcomes.

From an organizational and strategic management perspective, digital transformation initiatives should be recalibrated to align with well-being–oriented performance architectures. This entails expanding traditional key performance indicators (KPIs) to incorporate multidimensional user well-being metrics within technology assessment and governance frameworks. Organizations should implement systematic monitoring mechanisms to evaluate digital fatigue, cognitive overload, and longitudinal user satisfaction, while simultaneously reinforcing ethical standards related to privacy protection, algorithmic transparency, and responsible data stewardship. By embedding humanistic impact considerations into digital governance structures, innovation roadmaps, and risk management protocols, decision-makers can ensure that technological advancement is not merely productivity-enhancing but also conducive to sustainable employee engagement, customer trust, and long-term organizational legitimacy.

Furthermore, the cross-cultural evidence generated by this study highlights the necessity of culturally adaptive and context-sensitive digital strategies. Managers operating within globalized, transnational, or culturally heterogeneous environments must recognize that perceptions, interpretations, and emotional responses to digital technologies are deeply shaped by cultural values, social norms, and collective behavioral patterns. Consequently, standardized technological solutions may generate uneven well-being outcomes across different cultural contexts. To address this complexity, organizations should adopt flexible interface architectures, localized content ecosystems, and culturally responsive engagement strategies that resonate with diverse user expectations. Such adaptive approaches not only maximize the positive humanistic impact of digital tech-

nologies but also advance inclusive digital development agendas, thereby contributing to broader sustainability objectives related to social equity, well-being enhancement, and the reduction of structural inequalities.

5. CONCLUSION

This study addresses a significant gap in the digital well-being literature by moving beyond purely technical and economic evaluations of digital technologies to examine their humanistic impact on happiness within a cross-cultural context. While prior research has largely emphasized direct relationships between technology usage and subjective well-being often within single-country settings this study advances a more integrative perspective by positioning humanistic impact as a central explanatory mechanism. The findings confirm that digital technologies do not automatically enhance happiness; rather, their contribution depends on the extent to which they foster meaningful human experiences. In particular, the results demonstrate that digital technologies positively influence happiness when they strengthen social connectedness, support individual autonomy, and promote inclusivity across diverse user groups. By incorporating cultural context as a moderating factor, the study further reveals that the pathways linking technology, humanistic impact, and happiness are not universal, but culturally contingent and socially embedded.

The primary theoretical contribution of this research lies in the integration of a humanistic framework with cross-cultural analysis using PLS-SEM, offering a multidimensional conceptualization of humanistic impact. By operationalizing humanistic impact through interconnected dimensions social connectedness, autonomy, and inclusivity this study provides empirical evidence that human-centered design principles are essential in translating digital innovation into enhanced subjective well-being. The moderating role of cultural context enriches the model by demonstrating that cultural norms, values, and social structures shape how individuals interpret and experience digital technologies. Practically, these findings underscore the importance for policymakers, platform designers, and technology developers to prioritize inclusive and culturally sensitive design strategies that align technological advancement with broader human development and sustainability goals.

Despite its contributions, this study acknowledges several limitations that open avenues for future research. The cross-sectional design restricts causal inference and does not capture the dynamic evolution of digital behaviors and well-being over time; therefore, longitudinal or experimental designs are recommended to strengthen causal claims. Future research may also integrate objective digital usage data, such as platform analytics or behavioral logs, to complement self-reported measures and reduce potential bias. Additionally, expanding the model to include contextual variables such as institutional trust, digital literacy, regulatory environments, or emerging technologies (e.g., AI-driven platforms) would provide a more nuanced understanding of digital well-being ecosystems. Broader sampling across underrepresented regions and socio-economic groups would further enhance generalizability and support the development of globally relevant, human-centered digital policies.

6. DECLARATIONS

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6.2. Author Contributions

Conceptualization: LP; Methodology: NR; Software: NP; Validation: MR and MM; Formal Analysis: NR and NP; Investigation: LP; Resources: MM; Data Curation: LP; Writing Original Draft Preparation: NP and MR; Writing Review and Editing: NR and MM; Visualization: LP; All authors, NP, MM, LP, MR, and NR, 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.

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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.

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