

The Influence of Digital Artificial Intelligence Technology on Quality of Life with a Global Perspective



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Author Notification
10 October 2023
Final Revised
20 October 2023
Published
23 October 2023

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Kosasi, S., Lukita, C., Chakim, M. H. R., Faturahman, A., & Kusumawardhani, D. A. R. (2023). The Influence of Digital Artificial Intelligence Technology on Quality of Life with a Global Perspective. Aptisi Transactions on Technopreneurship (ATT), 5(3), 24–34.

DOI: <https://doi.org/10.34306/att.v5i3.354>

Abstract

The rapid development of digital technology and artificial intelligence (AI) has brought significant changes in many areas of life, including business, healthcare, education, and entertainment. The great potential of AI technologies to provide positive benefits to society is balanced with concerns about their negative impact on quality of life. This study aims to explore the influence of digital AI technology on the overall quality of life around the world, focusing on the Performance Expectancy, Effort Expectancy, and Use Behavior aspects of digital AI technology. This research method utilizes the UTAUT (Unified Theory of Acceptance and Use of Technology) approach and collects data quantitatively through a questionnaire covering 3 variables related to digital AI technology and its influence on quality of life. Data analysis was conducted using PLS-SEM (Partial Least Squares - Structural Equation Modeling) to identify important aspects related to the advantages and disadvantages of AI technology. The results from the 70 respondents indicated that digital AI technologies have the potential to improve quality of life by meeting performance expectations and providing ease of use, and a balanced approach is needed in the development and implementation of AI technologies to maximize their positive impact while minimizing their negative impact.

Keywords: Quality of Life, Technology AI Digital, Performance Expectancy, UTAUT, PLS-SEM

1. Introduction

The rapid development of digital, artificial intelligence (AI) technology has brought significant changes in various aspects of human life, including business, health, education, and entertainment [1]. AI technology is used to process and analyze data quickly and



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efficiently, providing information that can be used to make better and faster decisions. According to [2]. In recent years, digital AI technology has developed rapidly and has enormous potential to improve the quality of human life. However, along with technological development, concerns about its negative impact on quality of life exist. Moreover, AI technology's rapid and limitless growth can have unexpected and undesirable effects on society. There are concerns that AI technology may lead to mass unemployment, threaten data privacy and security, and increase social and economic disparities. Therefore, this study aims to investigate the influence of digital AI technologies on the overall quality of life worldwide [3].

This research will discuss the good and bad impacts of digital AI technology on various aspects of life, such as education, health, business, and work [4]. In addition, this research will also discuss the factors that influence the use of digital AI technology on quality of life, such as Performance Expectancy, Effort Expectancy, and Usage Behavior [5]. By collecting quantitative data through online questionnaires, this research will increase the understanding of how digital AI technologies affect people's quality of life globally. The results of this research can help policy makers and practitioners to recommend policies and ethical guidelines and develop and implement digital AI technologies in a more balanced way by maximizing the benefits and minimizing the negative impacts. Through this research, wiser decisions can be made by using digital AI technology to improve the quality of human life in a sustainable manner. AI technology enables computers and machines to learn and adapt to data, make decisions, and complete complex tasks without human intervention. With its ability to collect, analyze, and use data effectively, AI technology can help improve efficiency, productivity, and innovation in various industries.

AI technology has become widespread and significantly impacts daily life ranging from the impact of wearable technology on personal life to the effect of legacy systems on national productivity. Although AI technology impacts every element of human life, there is conflicting data regarding its contribution to improving the quality of life. Nonetheless, AI technology still has a significant impact on people's lives. Research [6] [7] has tried to identify some factors that influence the quality of life, but further research is needed to understand the relationship between AI technology and QoL fully.

Research [8] reveals that better digital AI technologies provide many potential benefits. These include decreased social isolation, greater utilization, active usability in an increasingly computerized healthcare system, and social impact. Digital AI technologies, according to [9], can improve the sustainability of government services for older people. According to [10] and [11], industrialized countries have more advanced digital technologies than developing countries, primarily due to their established digital infrastructure and higher levels of digital literacy. Despite these significant advantages of digital AI, it remains to be seen how these advancements will affect people's quality of life. The results of [12] showed that digital technology can predict people's quality of life in Australia. Future research should fill the gap left by their study's inability to generalize to worldwide settings. The authors also suggest more research to measure digital AI technologies. Therefore, the following are the hypotheses.

H1. Digital AI technology improves the quality of life.

Digital AI technology has enormous potential to improve living standards and increase productivity in various industries [13]. Previous research confirms that digital AI technologies have great potential to increase productivity in various industries, along with their ability to fulfill user demands and solve problems effectively [14]. Higher expectations of the efforts made on digital AI technologies can drive the adoption and use of these technologies to improve productivity and efficiency [15]. Therefore, AI technology development and implementation efforts should consider how to ensure that digital AI systems are easy to use and do not require excessive effort from users. This is hypothesized.

H2. Effort Expectations result in benefits to Technology AI Digital.

Based on previous research, performance expectations in digital AI technologies have been identified as crucial, especially in the context of the system's ability to automate processes and analyze complex data more quickly and accurately [16]. The research also noted that digital AI technologies have significant potential to improve people's quality of life through increased operational effectiveness, improved quality of work, and better public services, as well as providing higher customer satisfaction [17]. At present, it appears that users' expectations about the performance of such technologies markedly influence the extent to which these technologies are adopted. Users with high expectations tend to be more motivated to utilize these technologies, which in turn can increase the effectiveness in their implementation. However, it should be recognized that too high expectations of digital AI technologies also have the potential to have a negative impact [18]. Users who have too high expectations tend to feel dissatisfied when the technology does not meet their expectations. Therefore, to meet realistic performance expectations, organizations must ensure that users have an appropriate understanding of the capabilities of digital AI technologies. In addition, adequate training and support need to be provided by organizations to ensure that users can effectively adopt and utilize digital AI technologies [19]. The hypothesis in this context becomes a key factor in understanding the adoption and utilization of digital AI technologies.

H3: People's performance expectations can be improved by digital AI technology.

The advent of digital AI technology has brought about significant transformations in various industries, with user behavior being a pivotal domain affected by these changes. User behavior, which delineates how individuals interact with technology, has garnered increasing importance within the realm of digital AI technology. Several studies, such as those by [20], [21] have substantiated that user experience and the level of confidence in utilizing digital AI technologies have a positive impact on user behavior. Furthermore, investigations into the psychological and social dimensions reveal that these factors substantially influence the way people engage with digital AI technologies, as indicated by [22]. Consequently, user behavior is not only shaped by the perceived advantages and disadvantages of using digital AI technologies but also by the social milieu in which the technology is employed. These findings underscore the necessity of crafting intuitive and user-friendly technologies while emphasizing the significance of considering psychological and social aspects when promoting the increased utilization of digital AI technologies, thus reinforcing hypothesis four.

H4. Use Behavior is positively influenced by digital AI technology.

User behavior in the use of digital AI technology has a significant impact on users' quality of life. A study [23] has revealed that user behavior plays an important role in influencing the quality of life of individuals. In addition to the influence of user behavior, technology quality also plays a very important role in this regard. This research emphasizes the importance of considering the level of technology quality when trying to improve users' quality of life. Therefore, in an effort to maximize the benefits of digital AI technology for quality of life improvement globally, it is crucial to consider the variables that influence user behavior. As revealed in a study published in the Journal of Business Research [24], factors such as user happiness, simplicity of technology use, and technology effectiveness have a significant impact on user behavior and their quality of life. Therefore, it can be concluded that technology quality, user behavior, and quality of life are interrelated in the context of using digital AI technologies, and this reinforces the urgency of research into the influence of digital AI technologies on quality of life globally.

H5. Whether Use Behavior Has a Positive Effect on Quality of Life.

2. Research Method

2.1 Data sources, variables, and constructs

The research technique used in this study consists of two parts, namely the data collection stage and the data analysis stage. An online questionnaire survey was used in this study to collect data from 70 respondents who had adequate knowledge and expertise in digital artificial intelligence technology. The questionnaire was used to assess the five factors under study, including Performance Expectations, Effort Expectations, Digital AI Technology, Usage Behavior, and Quality of Life. To make the data gathered relevant and useful, qualified respondents were specifically sought.

Data analysis was done using the UTAUT (Unified Theory of Acceptance and Use of Technology) paradigm. This model facilitates the relationship between the variables investigated in the research, such as performance expectations, effort expectations, digital artificial intelligence technology, usage behavior, quality of life, and the acceptance and use of this technology.

Additionally, the Partial Least Squares Structural Equation Modeling (PLS-SEM) research technique was used to examine how digital AI technology might affect people's quality of life. Researchers can determine the impact of digital AI technology on respondents' quality of life by using the potent statistical tool known as PLS-SEM to examine the association between variables in a structural model.

Researchers analyzed and evaluated the data using SmartPLS version 4 software. To verify indicator reliability, internal consistency reliability, convergent validity, and discriminant validity, the measurement model was first evaluated [25]. This is done to make that the variables measured by the questionnaire are accurate and in line with the goals of the study.

After that, the model fit and path coefficients were assessed, and the structural model analysis was used to test the hypotheses. The researcher was able to determine the amount to which digital artificial intelligence technology improves the respondents' quality of life by examining the structural model, which allowed her to examine the causal link between the variables.

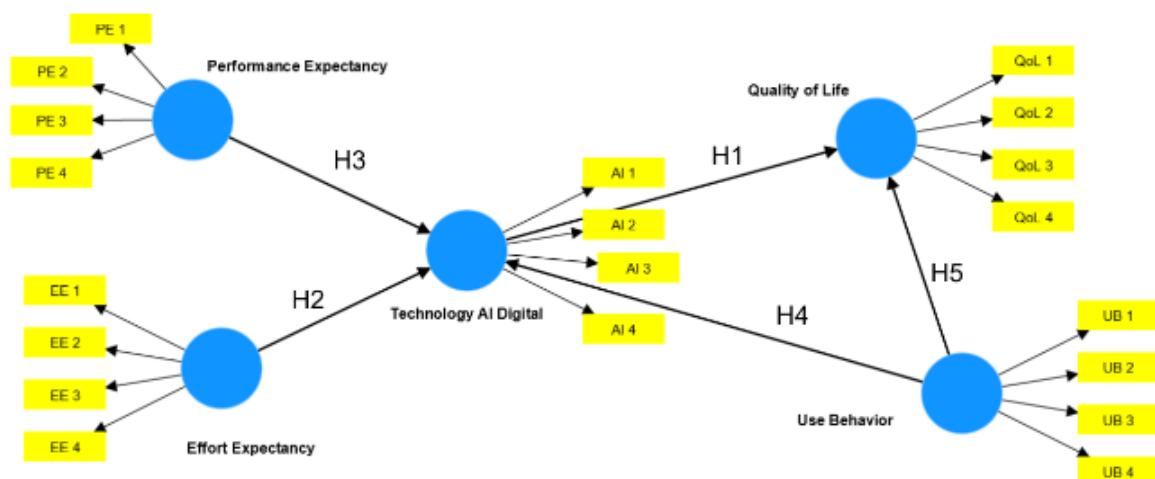


Figure 1. Framework Model

Figure 1 shows the aspects that influence the Influence of Digital Artificial Intelligence Technology on Quality of Life from a Global Perspective. There are 3 (three) variable indicators to analyze the factors that influence Digital Artificial Intelligence Technology and determine how much influence these factors have on Quality of Life from a Global Perspective. Performance Expectancy (PE) describes the extent to which users

believe that Digital Artificial Intelligence Technology helps them in influencing their quality of life [26], Effort Expectancy (EE) describes the extent to which users find Artificial Intelligence Technology easy to use, Usage Behavior (UB) refers to the extent to which users use Artificial Intelligence Technology.

3. Findings

The 70 participants from the questionnaire consisted of various genders and were aged between 15 to 45 years old. The survey was conducted by people who are professionals in the field of AI to gain insight into diverse perspectives and experiences in different age and gender categories. The comprehensive group of 70 participants, as outlined in Table 1, met the established questionnaire criteria, so their responses could be used and are an integral part of this investigation.

Table 1. Survey respondent profile

Variable	Description	Frequency	Percentage %
Gender	Female	40	56%
	Male	30	42%
Age	15-30	29	41%
	30-45	24	34%
	>45	17	25%

3.1 Results of SmartPLS

The SmartPLS statistical analysis method was used to measure outer loading, which describes the extent to which the variables involved in the use of digital artificial intelligence technology affect the quality of life. Outer loading is one of the important aspects in SmartPLS analysis, which serves to measure the level of influence and validity of the indicators used in the research model on the construct being measured. Thus, this outer loading can be interpreted as an indication of how well the indicators represent more abstract constructs. The outer loading value scale ranges from 0 to 1, and the closer the value is to 1, the stronger the indicator's contribution in representing the measured construct. This indicates that the indicators can be considered a valid representation of the constructs being studied, as seen in Figure 2.

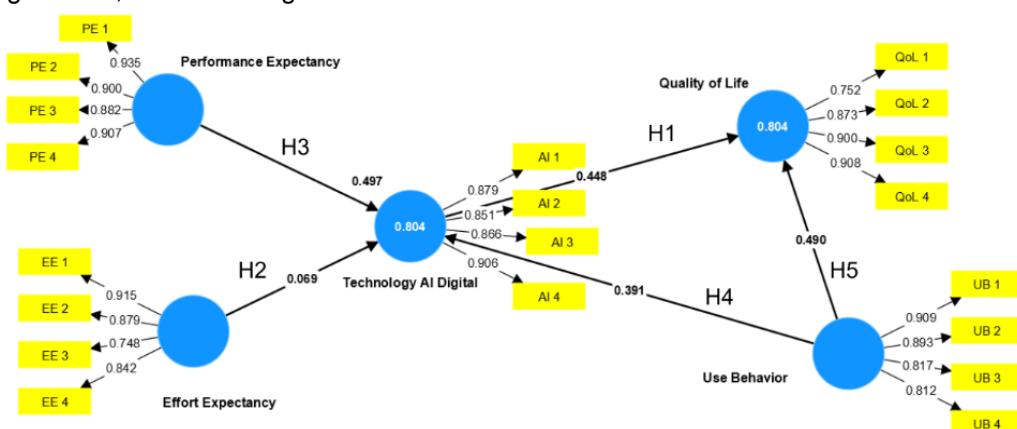


Figure 2. SmartPLS Outer Loading

The evaluation results of the reflective measurement model, including Cronbach's alpha, Composite reliability (ρ_a), and (ρ_c), are shown in Table 2. Composite reliability of 0.708, which is the minimum value required for Composite reliability evaluation [27], indicates that the items in this model measure the construct adequately.

Table 2. Composite Reliability Evaluation

	Cronbach's alpha	Composite Reliability (ρ_c)	Composite Reliability (ρ_a)
Performance Expectancy	0.927	0.948	0.930
Effort Expectancy	0.868	0.911	0.886
Technology AI Digital	0.899	0.929	0.900
Use Behavior	0.880	0.918	0.885
Quality of Life	0.881	0.919	0.889

Internal consistency reliability was assessed using the composite reliability (CR) value. [28] It is recommended to use a CR value of at least 0.70 to guarantee internal consistency and dependability. The CR values in Table 3 indicate that internal consistency dependability has been achieved. Convergent validity was evaluated using Average Variance Extracted (AVE). Convergent validity requires an AVE value of at least 0.40. According to Table 3, each AVE value is more than 0.60.

Table 3. Composite Reliability Evaluation

Composite Reliability	Average variance extracted (AVE)
Performance Expectancy	0.821
Effort Expectancy	0.719
Technology AI Digital	0.767
Use Behavior	0.738
Quality of Life	0.740

As shown in Figure 3, the bootstrapping method is used as one of the powerful statistical techniques to test the significance of the relationship between the use of digital artificial intelligence technology and quality of life. Bootstrapping is a resampling method that allows researchers to obtain the sampling distribution of the estimated parameters in the PLS-SEM model. Through the bootstrapping procedure, the results of this analysis provide a higher level of confidence in the relationships found in the model. Thus, researchers can conclude how the use of digital artificial intelligence technology has a significant influence on the quality of life globally.

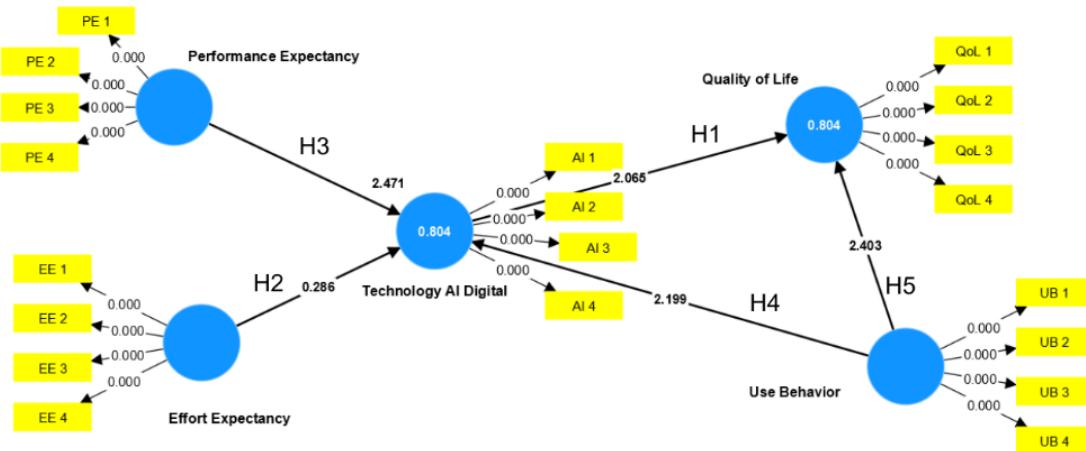


Figure 3. Bootstrapping Results

Discriminant validity is evaluated. The values for cross-loading are shown in Table 4. Table 4 shows that the item loadings are greater for the assigned construct than the other constructs, thus indicating discriminant validity [29]. Another criterion used to evaluate discriminant validity is the criterion proposed by Fornell and Larcker. The construct variation with the assigned construct is higher than the other constructs, as shown in Table 5. In addition, no component in the model has a shared variance higher than its respective AVE. As a result, discriminant validity can be said to have been met [30].

Table 4. Discriminant Validity [19] Criterion

	Effort Expectancy	Performance Expectancy	Quality of Life	Technology AI Digital	Use Behavior
Effort Expectancy	0.848				
Performance Expectancy	0.882	0.906			
Quality of Life	0.832	0.818	0.860		
Technology AI Digital	0.800	0.859	0.853	0.876	
Use Behavior	0.750	0.770	0.860	0.825	0.859

Table 5. Direct Hypothesis Result

Hypothesis	Effect	Coefficient	T value	P value	Decision
H1	Technology AI Digital >> QoL	0.217	2.065	0.039	Significant
H2	Effort Expectancy >> Technology AI Digital	0.248	0.286	0.775	Not Significant
H3	Performance Expectancy >> Technology AI Digital	0.229	2.471	0.014	Significant
H4	Use Behavior >> Technology AI Digital	0.064	2.199	0.028	Significant
H5	Use Behavior >> Quality of Life	0.204	2.403	0.016	Significant

The results of the structural model linkage are shown in Table 4. Four (4) out of five (5) estimates in the structural model direct relationship (Table 5). Technology Ai Digital and

Use Behavior have the most significant direct correlation ($t = 12.993$), followed by Effort Expectancy and Technology AI Digital ($t = 3.005$). More than 65% of the use of Digital AI Technology is explained by Use Behavior (Table 6). Moreover, according to Table 5, these three components account for nearly 80% of the variance in QoL.

Table 6. R squared

Construct	Coefficient of determination (R2)	Adjusted R2
Technology AI Digital	0.069	0.041
Use Behavior	0.004	-0.011
Quality of Life	0.560	0.547

3.2 Discussion

The findings of this study suggest a relationship between quality of life (QoL) and the adoption of digital AI technologies, such as H1. Digital AI technologies improve quality of life. The level of QoL increases as the use of digital AI technologies increases, but conversely, QoL can also influence the use of digital AI technologies. For example, digital AI technologies can enhance social interactions and enable a more emotionally balanced life, thus improving QoL. On the other hand, excessive and too frequent use of digital AI technologies can adversely affect quality of life (QoL) by reducing social connections and fostering a sense of loneliness and isolation. Therefore, it is imperative to consider the potential effects of digital AI technology use on QoL and design measures to mitigate the adverse impacts and optimize the good benefits.

In addition, H2. The results showed that Effort Expectancy has not supported the application of Digital AI Technology. This may be due to how easy and widespread digital AI technology is currently available to consumers. However, keep in mind that people still need to see digital AI technology as something challenging and sophisticated, and this problem must be solved. Therefore, ensuring that digital AI solutions created to improve QoL are also easy to use and provide clear benefits to their users is crucial.

The findings also show that H3. Performance Expectancy has a favorable impact on the use of digital AI technology. It suggests that consumers are more willing to use technology if it is projected to perform better than expected. To meet customer expectations, organizations and creators of digital AI technology must continuously improve the performance of the technology.

In addition, the results of research H4. show that the use of digital AI technology has an impact on use behavior that affects quality of life. The likelihood that digital AI technologies will impact the quality of life will increase as the number of users grows. Therefore, organizations and creators of digital AI technologies should ensure that consumers can easily access and use these technologies to increase adoption and improve quality of life.

The results show that H5 there is a significant positive correlation between use behavior (e.g., technology use, health services, or healthy consumption patterns) with improved quality of life in respondents. For example, judicious and healthy use of technology can help reduce stress and improve psychological well-being. Likewise, participation in social activities that build strong social relationships can provide social support and increase feelings of happiness.

4. Conclusion

This study aims to explore how digital AI technologies affect people's quality of life globally. To validate the relationship, we used PLS-SEM as the analysis method, which has dramatically modified the understanding of the relationship between digital AI technology and quality of life based on our findings. Our results show that H3 performance expectations have an influence on the adoption of digital AI technologies and show a significant impact on quality of life (QoL) and reveal that the relationship between digital AI technologies and QoL is an

under-explored topic globally. Therefore, it is important to consider digital literacy as an essential factor in improving the utilization of digital AI technologies for quality of life. Through this study, we also recommend further research by incorporating more elements such as technology readiness, and involving more countries to gain a deeper understanding of the relationship between digital AI technology and quality of life. Thus, future research is expected to provide further insights into the effects of using AI technologies on people's quality of life globally and expand our understanding of their impact on a broader scale.

5. Acknowledgment

We thank all the researchers who have worked hard to complete this remarkable study, which will hopefully have a substantial positive impact on the advancement of artificial intelligence technology and the standard of living of people worldwide. We hope this study will serve as a model for future research on technology and quality of life. We wish the researchers the best of luck as they design their future studies.

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