

Designers Co-Create with AI-Based Painting Software: An Empirical Analysis Based on TAM and FsQCA

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ABSTRACT

The launch of DALL-E by OpenAI in January 2021 has generated considerable global interest in AI's impact on art and design. Midjourney, a prominent and widely adopted AI drawing tool, has become a key focus for many designers, who eagerly seek to explore and utilize its capabilities. Currently, scholars are more inclined to explore the algorithms and functions of artificial intelligence-based painting systems (AIBPS). However, there is still a research gap in understanding what individual factors or configuration elements influence the experience of using AIBPS by one of its mainstream audiences, the designer community. In the first phase, this research identifies innovative variables that may influence designers' use of Midjourney and develops hypotheses based on the Expanded Technology Acceptance Model (ETAM). The analysis of 322 questionnaires revealed important factors that drive the user experience. In the second phase, a fuzzy set qualitative comparative analysis (fsQCA) was used to further research the configuration effects of these factors. The results of the research indicate that Personal Innovativeness (PI), Perceived Enjoyment (PE), Perceived Performance (PP), Perceived Safety (PS), Perceived Cost (PC), and Perceived Inspiration (PINS) significantly influence designers' willingness to use Midjourney. At the same time, function developers need to reflect on the traditional concept of focusing only on usability and ease of use. The influence of these two factors is being weakened by other factors. Adding considerations to user PE or PS will make specific AIBPS software stand out in the market.

Keywords: AI-based painting systems (AIBPS), behavioral intentions, fuzzy-set qualitative comparative analysis (fsQCA), technology acceptance model (TAM), user experience (UX)

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INTRODUCTION

In the contemporary era, the pervasive influence of Artificial Intelligence (AI) technology is reshaping diverse aspects of

human existence and professional spheres. Amidst the surge of novel technological innovations, Midjourney has emerged as a focal point for design industry practitioners, serving as an AI drawing tool capable of generating images from textual inputs. Leveraging natural language commands and intuitive operational algorithms, Midjourney swiftly produces highly realistic or imaginative visuals. Its integration with Discord servers further facilitates an interactive platform for open communication and collaborative sharing. It has attracted more and more designers to use it in their own practical creations. At the same time, the rise of new technologies is facing many social problems (Audry & Ippolito, 2019). In current research, most of the research on AIBPS focuses on the technological development itself, while there is less research on the acceptance level of specific user groups and their influencing factors. As Sinitsa and Fried (2023) pointed out in their research, as an emerging technology, fully studying its user experience issues is the key to promoting the real-time development of artificial intelligence. Therefore, this research is based on such a need and will be empirically researched around the following two questions: How is the AIBPS experience for designer-users? How to improve the user experience of designers and promote the development of AIBPS?

This research design consists of three parts: the first section actively explores the development of AI painting and the connection between designers and AIBPS through a literature review, and reviews the

expansions and innovations that scholars have made to TAM in a variety of fields. It also describes the feasibility and necessity of TAM's complementary analysis by combining fsQCA in the field of AI art; In the second section David (1985) stated that by inviting professionals from the design industry to participate in a questionnaire survey, 322 valid scale data were collected regarding their perceptions of the AI painting tool Midjourney This dataset reflects the experiential aspects and acceptance of Midjourney. Subsequently, this study used a unique and original hybrid approach based on TAM and fsQCA to analyze the data multidimensionally. The final section provides a summary and discussion based on the data results, addressing both theoretical and practical perspectives. It reflects on the limitations of the research and outlines new directions for future studies as well as the development trajectory of AIBPS. The unique theoretical significance of this research lies in its empirical analysis of user experience within the subfields of artificial intelligence, thereby filling research gaps at the intersection of multiple disciplines. The innovative practical significance of this research is found in its provision of guidance for the iterative development of AINPS science and its future directions.

LITERATURE REVIEW

AIBPS and Designer

AI-based painting software has received a lot of attention from the design industry in recent years for its ability to create high-quality, creative images with a simple textual

description (Ploennigs & Berger, 2023). As a co-creation partner with the designer, these tools can quickly generate visual images from accidental bursts of design inspiration, enriching the creative process and content of designers, and enhancing effective communication between designers or between designers and other industry practitioners (Paananen et al., 2023). As the ecosystem of text-to-image tools improves, it is increasingly important for design practitioners to understand and utilize these tools to support the realization of their creative work. Therefore, the traditional product-centered view of creativity is deficient in this context, and this creativity in the creation process is simultaneously reflected in the interaction between the designer and the AI (Ko et al., 2023; Oppenlaender, 2022). In Liu et al.'s (2023) investigation, it was also demonstrated that there is potential for text-generated image systems to enhance the experience of the design process and provide new avenues for inspiration generation.

Based on these needs and the great potential of AIBPS to enhance the experience of the design process and the generation of design inspiration, it is also natural for designers to be an integral part of the audience (Liu et al., 2023). However, the ability of AIBPS to help users from various industries to easily create impressive works (Lyu et al., 2022) has given it a rather wide target audience, so much so that the focus on the community of designers has been neglected in previous scholarly studies. AI intervention in the art of drawing and painting brings more possibilities

while at the same time subverting the paradigm of traditional art and design and changing the way people think about evaluating design works and designers (Sun et al., 2022). This has led to a wealth of challenges and opportunities for design industry practitioners in the AIBPS space (Di Bartolomeo et al., 2023). Based on this inherent conflict, how do practitioners in the design industry embrace AIBPS as represented by Midjourney? What factors directly or in combination influence their intention to use it? And what insights can AIBPS find to further develop itself? These are the themes that this research hopes to explore.

Theoretical Framework

Structural Equation Model

Structural equation model (SEM) is a model based on factor analysis and linear regression methods for analyzing the path relationship between complex variables (Cui et al., 2021). It can combine two or more structural models to realize a statistical framework for modeling multivariate relationships, thereby solving the causal relationship that cannot be obtained in correlation analysis and distinguishing between direct and indirect effects. It is a very important multivariate data analysis tool. Unlike linear regression, SEM is based on scales, that is, the scale is reduced to 1 principal component through factor analysis (multiple variables are converted into one variable), and then path analysis is performed (M. S. Chen & Huang, 2023; Marikyan et al., 2023). As a powerful statistical technique, SEM is very good at

analyzing complex relationships between multiple variables. Therefore, using SEM for analysis and verification in TAM is very popular.

Technology Acceptance Model

The Technology acceptance model (TAM) has been widely used in many research areas to understand the use and acceptance of emerging technologies, and the external variables in this model affect the Attitude Toward Use (ATU) through Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), which directly or indirectly impact the user's Intention to Use (ITU) a particular technology (Al-Okaily et al., 2021; M. S. Chen & Huang, 2023; Drljevic et al., 2022; J. Kim & Kang, 2023). It has proven to be effective in explaining and predicting the use of emerging information technologies (Marikyan et al., 2023). However, it has also been shown in several studies that the underlying TAM factors may not be sufficiently complete to predict technology acceptance (Edmunds et al., 2010, in the study of Yousafzai et al.(2007), by reviewing the empirical studies based on TAM and then summarizing and analyzing them, a total of more than seventy kinds of variables containing organizational, individual, system characteristics and other related variables were counted, which confirms that TAM, with reasonable expansion and modification, can better discover and explain the process of user's acceptance of the new technology, reflecting the wide applicability of TAM. Therefore, to better understand exactly how users accept a particular

new technological product, researchers must consider the effects of different external variables on user perceptions. Such extended and refined TAMs have also been used in many emerging technologies, such as VR devices (Shen et al., 2022), biometrics (Nakisa et al., 2022), ChatGPT (Ofosu-Ampong et al., 2023), or the use of robots (Savela et al., 2017). The expansion of TAM is also widely used in the design industry. For example, the importance of the fit between BIM technology and designers' task expectations was explored by integrating a theoretical model of TAM and Expectation Confirmation Theory (ECT) to study the Continuous Use Intentions (CUI) of BIM (Cui et al., 2021).

However, TAM, which posits that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are the primary factors influencing technology adoption, tends to oversimplify the complexities of user behavior. Research by Ali and Warraich (2024) highlights that TAM's linear approach does not fully account for the variety of external factors that might influence adoption, such as system and information quality (Ali & Warraich, 2024). Furthermore, the model's neglect of social and organizational factors can make it less applicable in some real-world settings (Mvondo & Niu, 2024). Another significant limitation is that TAM typically assumes linear relationships between variables, which may not capture the true dynamics in some contexts. Recent studies by Zabukovšek et al. (2022) show how advanced techniques like Artificial

Neural Networks (ANN) and Importance-Performance Matrix Analysis (IPMA) help overcome TAM's linearity by uncovering more complex, nonlinear relationships that influence acceptance.

Theoretical Support

Complexity theory is a theoretical framework for understanding complex systems and their behavior. Complex systems are composed of many interacting parts that interact with each other through simple rules, resulting in the system as a whole exhibiting complex behaviors and patterns. This behavior is usually non-linear, i.e., small changes may lead to large outcomes, which applies to explaining complex social phenomena (Izquierdo, 2010).

Configurational Theory is an approach used to understand and analyze complex causal relationships, with a particular focus on how different combinations of conditions work together to influence outcomes. Thus, outcomes are often produced by many different combinations of factors, while different configurations can lead to similar outcomes, reflecting multiple realizations (Braumoeller, 2008).

Based on the suitability of these two theories, the use of fuzzy-set qualitative analysis (fsQCA) in this research is necessary. fsQCA is a case-oriented research method, which is based on set-theoretic ideas and groupthink, effectively linking qualitative and quantitative analysis, and examining the relationship between antecedent conditions and combinations of conditions and the results from the

perspective of a set, to explain the complex causal relationships behind the phenomena. While fsQCA is praised for identifying multiple configurations leading to an outcome, its interpretation can be difficult. The process of calibrating fuzzy sets and deriving meaningful conclusions from them often requires expert knowledge, which can limit its applicability in broader contexts (Wandira et al., 2024). Moreover, fsQCA is sensitive to the choice of thresholds and the granularity of fuzzy membership, which can sometimes lead to inconsistencies or overfitting. This complexity is especially notable when attempting to validate fsQCA results with other methods (Mvondo & Niu, 2024).

Combining TAM with fsQCA allows for a more comprehensive approach to understanding technology acceptance. While TAM offers a structured framework focusing on individual variables like PU and PEOU, fsQCA can uncover complex configurations of factors that lead to adoption outcomes. For instance, by integrating fsQCA with PLS-SEM, researchers have demonstrated the value of using TAM alongside fsQCA to identify both individual variables and their interactions (Mvondo & Niu, 2024). The fusion of TAM and fsQCA addresses the individual weaknesses of both models. TAM's simplistic approach to adoption can benefit from the configurational depth provided by fsQCA, which accounts for the multivariable nature of user acceptance. As an example, fsQCA can be applied to map configurations that explain high and low user acceptance outcomes, complementing

TAM's insights into the direct effects of ease of use and usefulness (Wandira et al., 2024). This integration offers an innovative solution to the problem of linearity in TAM, as fsQCA can identify more complex, nonlinear relationships that TAM is unable to capture. Furthermore, combining both models could lead to the development of a more robust and holistic framework for understanding technology adoption. A recent example of this innovative approach is seen in research on portable intelligent personal assistants, where TAM was extended with fsQCA to explain user acceptance from multiple angles (Mvondo & Niu, 2024). Moreover, based on the ETAM quantitative analysis method, which primarily measures the impact of individual factors on outcomes from an individual perspective, employing Fuzzy-set Qualitative Comparative Analysis (fsQCA) enables further supplementary analysis of data from both "qualitative" and "configuration" aspects. This approach yields more profound and comprehensive mixed-method analytical results (Chen et al., 2025).

Based on the shortcomings and strengths of TAM and fsQCA, and after examining the feasibility of combining the two research methods as explored by scholars in the past, this paper finds that no scholars have applied a mixed analysis method combining TAM and fsQCA to the field of AI art. Moreover, empirical studies combining TAM with AIBPS are scarce, and there is a lack of further exploration into potential external variables that may have an impact. The purpose of this research is to propose a new Extended Technology

Acceptance Model (ETAM) for Midjourney, a representative product in the field of AIBPS, to conduct regression analysis on the questionnaire data, supplemented by fsQCA for configuration analysis, and to explore single and combined causal factors affecting users' intention, to fill the research gap in the theory and to promote the development of AI art in reality. Fill the research gap and promote AI art in reality.

RESEARCH MODELS AND ASSUMPTIONS

TAM Original Framework

Based on the previous research results, we constructed a new theoretical model using TAM as the original framework, aiming at exploring the acceptance of "Midjourney", a text-to-image AI drawing tool, and the related influencing factors of the target individuals (practitioners in the design industry).

As shown in Figure 1, Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Intent to Use (ITU) are the classical components of TAM. Perceived usefulness refers to an individual's perception that new technology improves his or her performance of a task after an experience with the new technology (Morosan & Jeong, 2008), which in this research is the target user's perception of whether Midjourney is useful or not; Perceived ease of use describes an individual's subjective feelings about the convenience and ease of using new technology (Davis, 1989), which in this paper mainly reflects the target users' perception that Midjourney can be used

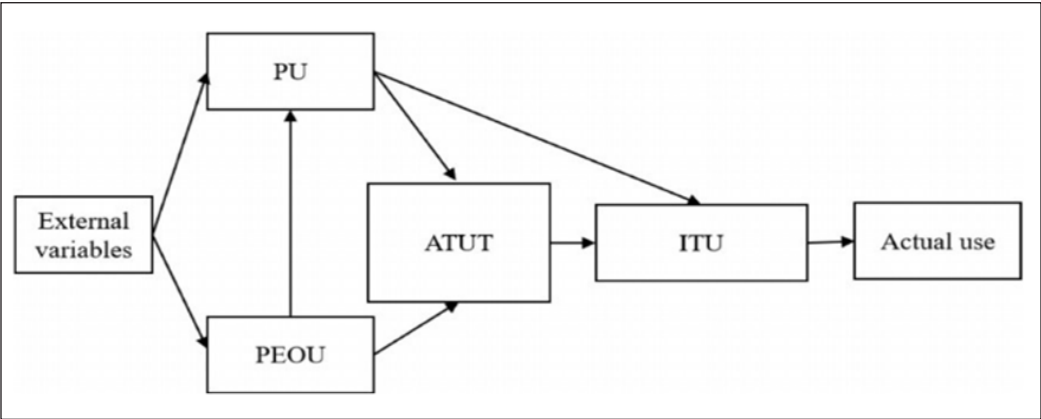


Figure 1. TAM designed by Davis, Bagozzi, and Warshaw
Source: Davis (1989)

proficiently without much effort. Numerous studies (Lou et al., 2017; Man et al., 2022) have shown that PEOU has a positive effect on PU and that both have a positive effect on the intention to use the technology. Therefore, based on the TAM expansion model, a total of eleven sets of hypotheses are proposed in this research.

- H1: PEOU has a positive impact on PU.
- H2: PEOU has a positive impact on ITU.
- H3: PU has a positive impact on ITU.

Personal Innovativeness (PI)

PI is generally used to measure a person's willingness to try and accept new things, especially new technologies (Agarwal & Prasad, 1998). In a study conducted by Rosen (2005), an attempt was made to demonstrate the position of individual innovativeness in a technology acceptance model by investigating individual innovativeness from three distinct logical positions in UTAUT,

a model used to predict and explain user behavior. In the study by Yi et al. (2006), it was also shown that PI has a positive impact on PEOU. Therefore, in the current study, faced with Midjourney, a new AI drawing tool, the following hypotheses were made regarding the relationship between subjects' PI and PEOU:

- H4: PI has a positive impact on PEOU.

Perceived Enjoyment (PE)

Scholars have argued (Davis et al., 1992; DeLone & McLean, 2003; Oghuma et al., 2016), PE that personal intrinsic motivation is a foundational determinant in the technology acceptance system and a significant predictor of perceived ease of use and intention to use. Therefore, for the relationship between the influence of PE using Midjourney on the overall technology acceptance, the following hypotheses were made in this research:

H5: PE has a positive impact on PEOU.

H6: PE has a positive impact on ITU.

Perceived Performance (PP)

When people use new technologies, they usually evaluate the systems and services they use, such as the functionality, speed, and stability of the technology. In Vitaliy et al.'s study on the status of SBSE technology acceptance (Mezhuyev et al., 2019), it was concluded that PP has a positive impact on the PU of SBSE technology. Although Vitaliy et al. highlighted the importance of PP in their study, they did not work on exploring the specific TAM structural relationship between it and the new technology PE. Therefore, the current study suggests that PP may have a positive effect on the perceived enjoyment of Midjourney. Accordingly, the following hypotheses were made:

H7: PP has a positive impact on PU.

H8: PP has a positive impact on PE.

Perceived Security (PS)

The use of web-based technology products often raises issues of personal data privacy, and many users are concerned that their data may be unconsciously collected, leaked, or misused. Han et al. (2021) examined whether the use of new smart technologies in hospitality services impacts users' acceptance of new technologies to varying degrees due to concerns about their phone numbers, email addresses, or credit card information. They concluded that PS impacts users' attitudes toward the

use of new technologies and, consequently, their intentions to use them. Therefore, the following hypotheses were made in this research regarding the use of Midjourney's PS:

H9: PS has a positive impact on ITU.

Perceived Cost (PC)

PC is the trade-off between the benefits consumers derive from using a technological product and the costs they incur (Venkatesh et al., 2012). In many cases, the price of a commodity is a significant factor in a user's decision to adopt a new product; for instance, Luarn and Lin (2005) found that the perceived cost of using mobile banking services limited users' usage. Therefore, it is reasonable to suspect that the willingness of design industry practitioners to use Midjourney is also influenced to some extent by PC, and PC was included as a variable in this research:

H10: PC has a positive impact on ITU.

Perceived Inspiration (PINS)

Inspiration allows one to go beyond the limits of what one would normally be able to do (Thrash & Elliot, 2004). In Wu and Ding's (2023) study, based on the Customer Inspiration Theory, users' inspiration was categorized into "Inspired-by" and "Inspired-to" components. These two components interlocked to mediate the relationship between short travel videos and tourists' intention to travel. Through Rodger's (2014) investigation, it was concluded that inspiration affects individual

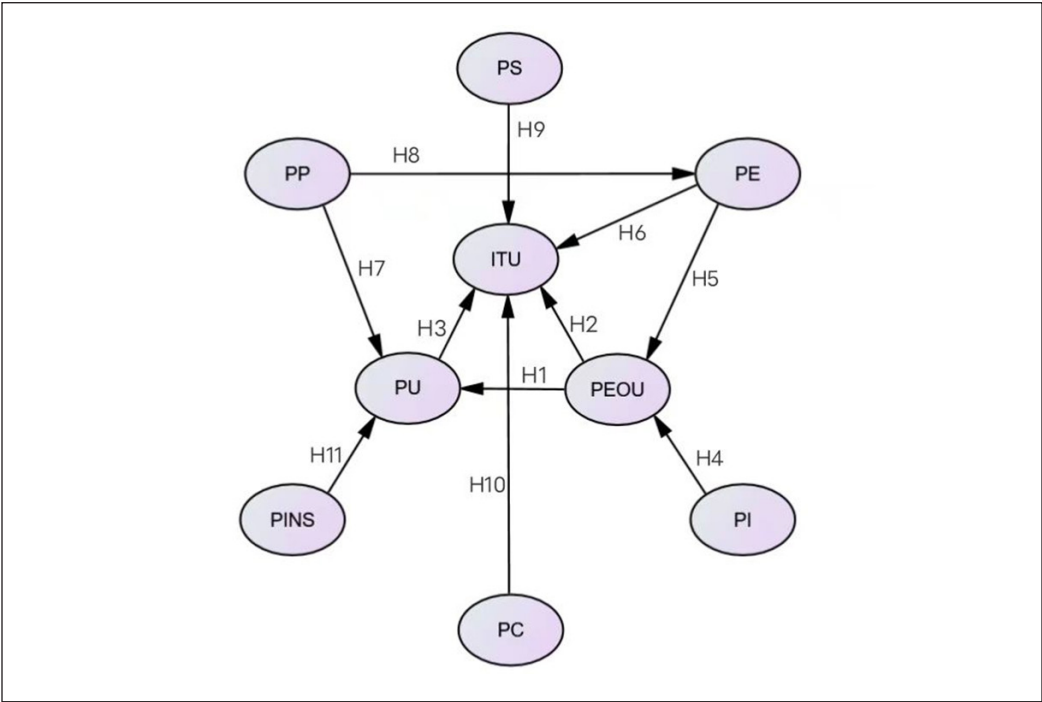


Figure 2. Hypothetical modeling of Midjourney acceptance

behavior as well as inspiration affects the acceptance of technology through memory. The research subjects of this experiment are designers, who have a stronger need for inspiration than other research subjects. Midjourney, as an AI creation tool, the inspiration it brings will be an important influencing factor for users to perceive the usefulness of this AI drawing tool, so the hypothesis is proposed:

H11: PINS has a positive impact on PU.

Research Models

Based on the above assumptions, a preliminary sketch of the research model is drawn in Figure 2.

RESEARCH METHODOLOGY

This research combines literature and questionnaire methods. First, a literature review was conducted, aiming to understand the status of AIBPS development and research, while selecting appropriate theoretical research models used to support subsequent research. Secondly, scales were designed for comprehensive data collection, analysis, and testing. Finally, the empirical data are discussed to understand the reasons and motives behind the research data, to reveal the potential mechanisms behind the results of this experiment, and finally to draw the theoretical and practical value of the conclusions of this research.

Research Tool

After completing the literature research, the present study unfolded a questionnaire design. This research used a questionnaire to collect quantitative data from professionals within the design industry to test the research hypotheses. Before completing the questionnaire, subjects were required to read the instructions for participation in full to fully understand the content and purpose of this experiment. To increase the credibility of the participants and provide comprehensive quantitative information, the questionnaire included inquiries about gender, age, education, and specific design-related occupations. Responses to all questions were evaluated and summarized using a Likert scale ranging from 1 to 5 (Pikkarainen et al., 2004), representing

strongly disagree, disagree, neutral, agree, and strongly agree, respectively.

At the same time, to ensure the reliability and validity of the variables, the measurement questions of this questionnaire were taken from existing literature and appropriately adapted to the characteristics of Midjourney and design industry practitioners. To ensure the reliability and validity of the adjusted questionnaire and avoid ambiguity in language expression or other errors, five PhDs in psychology, design, and other majors were invited to pre-test and evaluate the existing questionnaire before the questionnaire was distributed. Modify and adjust the questionnaire based on relevant feedback and finalize the questionnaire design. The specific content and sources are shown in Table 1 below.

Table 1
Measurement items of this research

Construct	Item	Content	Reference
Perceived usefulness (PU)	PU1	Using Midjourney increases my productivity.	Ashfaq et al. (2020)
	PU2	Using Midjourney helps me perform many things more conveniently.	
	PU3	Midjourney allows for solving complex problems.	Mezhuyev et al. (2019)
	PU4	Midjourney increases productivity and enhances the quality of work development.	
Perceived ease of use (PEOU)	PEOU1	Learning to use Midjourney is easy for me.	Lou et al. (2017)
	PEOU2	I find it easy to get Midjourney to do what I want it to do.	
	PEOU3	It is easy for me to become skillful at using Midjourney.	
	PEOU4	My interaction with Midjourney is clear and understandable.	

Table 1 (continue)

Construct	Item	Content	Reference
Perceived enjoyment (PE)	PE1	I enjoy a mode of communication with Midjourney.	Ashfaq et al. (2020)
	PE2	It is enjoyable to create with Midjourney.	
	PE3	Creating with Midjourney is exciting.	
	PE4	I enjoy creating with Midjourney more than any other software.	
Perceived security (PS)	PS1	I trust Midjourney's ability to protect my privacy.	Pikkarainen et al. (2004)
	PS2	Using Midjourney is financially secure.	
	PS3	I am not worried about the security of Midjourney.	
Perceived performance (PP)	PP1	Midjourney has a good performance.	Mezhuyev et al. (2019)
	PP2	Midjourney allows us to achieve valuable results in a reasonable time frame.	
	PP3	Midjourney allows us to achieve a comprehensive resolution.	
Personal innovativeness (PI)	PI1	I like to experiment with new technologies.	Yi et al. (2006)
	PI2	If I hear about a new technology, I am always keen to try it out.	
	PI3	Among my peers, I am usually the first to try out new technologies.	
Perceived inspiration (PINS)	PINS1	Midjourney has inspired me in a way.	Faqih (2022)
	PINS2	Midjourney stimulated my thinking.	
	PINS3	Midjourney gave me new ideas and views.	
Perceived cost (PC)	PC1	Midjourney was expensive.	K. Kim & Shin (2015)
	PC2	Subscribing to Midjourney was a burden to me.	
	PC3	I am willing to pay additional prices for more advanced Midjourney services.	Ni & Cheung (2023)
Intention to use (ITU)	ITU1	I would like Midjourney to assist me in making creations.	Wixom & Todd (2005)
	ITU2	I intend to use it as a routine part of my job over the next year.	Lee & Choi (2017)
	ITU3	I am satisfied with using Midjourney because it is easy to use and better than having to do it myself.	
	ITU4	I would recommend Midjourney to others.	

Sample Design

Aleamoni suggests that the sample size in relation to the number of variables is very important when using factor analysis techniques. It is generally recommended that the sample size should be at least 10 times more than the number of variables to ensure the reliability of the analyzed results (Aleamoni, 1976). In terms of the specific selection of the sample, we implemented maximum inclusion in terms of population and gender, and partitioned it according to general research norms, thus obtaining a greater breadth of sample data (Yi et al., 2006). In terms of occupation, we limited the questionnaire to designers only; if the subject is not a designer, the questionnaire will be automatically canceled. At the same time, there is a very detailed description of the experiment at the beginning of the questionnaire, and this research needs to be carried out on the premise that the research participants fully understand the purpose of the experiment. During the review stage, if it is found that the difference between the time spent on certain questionnaires and the

average time spent is too large, this research will cancel this part of the data to ensure the authenticity of the data.

Data Collection and Sample Analysis

A total of 330 copies of this questionnaire were distributed through the online platform, and a total of 322 valid samples were obtained after screening, with a sample validity rate of about 97.6%. Analysis of the sample reveals a balanced gender representation; Regarding age demographics, participants spanned all age groups, with the 26-35 age bracket comprising the highest number of respondents, while the category of individuals younger than 18 years old constituted the smallest sample size; Occupationally, the distribution was relatively even, with a notable presence in the graphic design sector; In terms of education, nearly 70% of the respondents held bachelor's or graduate degrees, while the sample size for high school and below was comparatively smaller, as detailed in Table 2.

Table 2
Sample characterization

Variant	Categories	Frequency	Effective	Cumulative
Gender	Male	162	50.3	50.3
	Female	160	49.7	100.0
	Less than 18	3	0.9	0.9
Age	18-25	75	23.3	24.2
	26-35	141	43.8	68.0
	36 and above	103	32.0	100.0

Table 2 (continue)

Variant	Categories	Frequency	Effective	Cumulative
Careers	Graphic designers	76	23.6	23.6
	Product Designer	37	11.5	35.1
	Interior Designer	62	19.3	54.3
	Interaction Designer	23	7.1	61.5
	Animation Designer	37	11.5	73.0
	Environmental Designer	28	8.7	81.7
	Fashion Designer	41	12.7	94.4
	Other	18	5.6	100.0
	High school and below	38	11.8	11.8
Education	Bachelor	190	59.0	70.8
	Postgraduate	94	29.2	100.0

DATA ANALYSIS

Reliability Test

In this research, data were gathered using a scale, necessitating a rigorous evaluation of measurement data quality to ensure the meaningfulness of subsequent analyses. Firstly, the internal consistency of each dimension was assessed through Cronbach's Alpha coefficient, a widely employed reliability measure. The Alpha coefficient ranges from 0 to 1, where values closer to 1 indicate higher reliability. Typically, a coefficient below 0.6 signifies an unreliable level, while values between 0.6 and 0.7 denote acceptable reliability, 0.7 to 0.8 indicate good reliability, and above 0.8 represents a highly credible level of reliability. Through meticulous data analysis, all test results in this research exceeded 0.8, affirming the highly credible reliability of the measurements (Manly

& Alberto, 2016). This robust reliability supports the subsequent analyses conducted in this research. Table 3 below shows the reliability testing for this study.

Table 3
Reliability test

Variable	Cronbach Alpha (α)	No.
PU	0.864	4
PEOU	0.857	4
PE	0.861	4
PS	0.840	3
PP	0.858	3
PI	0.846	3
PINS	0.845	3
PC	0.830	3
ITU	0.849	4

Model Fit Test

Confirmatory Factor Analysis (CFA) serves as a research method employed to assess whether the interrelationships

Table 4
Table of model fitness test

Statistics	Recommended Value	Computed
CMIN/DF	1-3 excellent, 3-5 good	1.111
RMSEA	0-0.05 excellent, 0.05-0.08 good	0.019
GFI	0.9-1 excellent, 0.8-0.9 good	0.916
IFI	0.9-1 excellent, 0.8-0.9 good	0.992
TLI	0.9-1 excellent, 0.8-0.9 good	0.991
CFI	0.9-1 excellent, 0.8-0.9 good	0.992

among variables align with the researcher's theoretical framework (Li et al., 2019). The results of the model fitness test, as depicted in Table 4, reveal a Chi-Square Minimum/Degrees of Freedom (CMIN/DF) value of 1.111, falling well within the optimal range of 1-3. Furthermore, the Root Mean Square Error of Approximation (RMSEA) value stands at 0.019, which also falls within the desirable range of 0-0.05. Additionally, metrics such as Goodness-of-Fit Index (GFI), Incremental Fit Index (IFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI) demonstrate values of 0.916, 0.992, 0.991, and 0.992, respectively, all of which lie between 0.9-1, indicating exceptional performance. Consequently, based on the comprehensive analysis of these results, it can be concluded that the present model exhibits an outstanding fit.

Convergent Validity and Composite Reliability Tests

Given the satisfactory fitness of the Confirmatory Factor Analysis (CFA) model, a meticulous examination of the Average Variance Extracted (AVE) and Composite Reliability (CR) for the scale's

dimensions was conducted. The inspection process unfolded as follows: First, the standardized regression coefficient for each measure corresponding to its dimension was calculated from the established CFA model (Fig. 2). Subsequently, the values for mean-variance extracted and composite reliability were computed utilizing the relevant formulas. As per established standards, a minimum AVE value exceeding 0.5 and a CR value surpassing 0.7 are essential indicators of robust convergent validity and composite reliability.

Upon analyzing the computation results detailed in Table 5, it becomes evident that, in this validity assessment, all dimensions exhibited AVE values exceeding 0.5 and CR values surpassing 0.7. This substantiates that each dimension displays strong convergent validity and composite reliability. (Manly & Alberto, 2016).

Differentiation Validity Test

The analysis results in Table 6 indicate that the standardized correlation coefficients among the dimensions in this differential validity test are below the critical value corresponding to each dimension,

Table 5
Individual dimensions convergent validity and composite reliability tests

	Path relationship		Estimate	AVE	CR
PE1	<---	PE	0.881	0.608	0.860
PE2	<---	PE	0.725		
PE3	<---	PE	0.754		
PE4	<---	PE	0.750		
PI1	<---	PI	0.908	0.656	0.850
PI2	<---	PI	0.744		
PI3	<---	PI	0.769		
PS1	<---	PS	0.860		
PS2	<---	PS	0.753	0.640	0.842
PS3	<---	PS	0.784		
ITU1	<---	ITU	0.853		
ITU2	<---	ITU	0.685		
ITU3	<---	ITU	0.760	0.588	0.850
ITU4	<---	ITU	0.759		
PC1	<---	PC	0.869		
PC2	<---	PC	0.756	0.627	0.834
PC3	<---	PC	0.745		
PINS1	<---	PINS	0.894		
PINS2	<---	PINS	0.766	0.651	0.848
PINS3	<---	PINS	0.753		
PU1	<---	PU	0.926		
PU2	<---	PU	0.738	0.618	0.865
PU3	<---	PU	0.707		
PU4	<---	PU	0.756		
PEOU1	<---	PEOU	0.890	0.602	0.857
PEOU2	<---	PEOU	0.754		
PEOU3	<---	PEOU	0.721		
PEOU4	<---	PEOU	0.726		
PP1	<---	PP	0.901	0.675	0.861
PP2	<---	PP	0.780		
PP3	<---	PP	0.778		

Table 6
Differentiation validity test table (AVE values for divisions on the diagonal)

	PU	PEOU	PP	PE	PI	PS	ITU	PC	PINS
PU	0.618								
PEOU	0.529	0.602							
PP	0.581	0.574	0.675						
PE	0.497	0.509	0.572	0.608					
PI	0.564	0.572	0.622	0.580	0.656				
PS	0.521	0.547	0.606	0.567	0.628	0.640			
ITU	0.553	0.562	0.563	0.561	0.602	0.615	0.588		
PC	0.590	0.612	0.629	0.611	0.635	0.653	0.663	0.627	
PINS	0.569	0.583	0.622	0.568	0.647	0.622	0.650	0.653	0.651
AVE ²	0.786	0.776	0.822	0.780	0.810	0.800	0.767	0.792	0.807

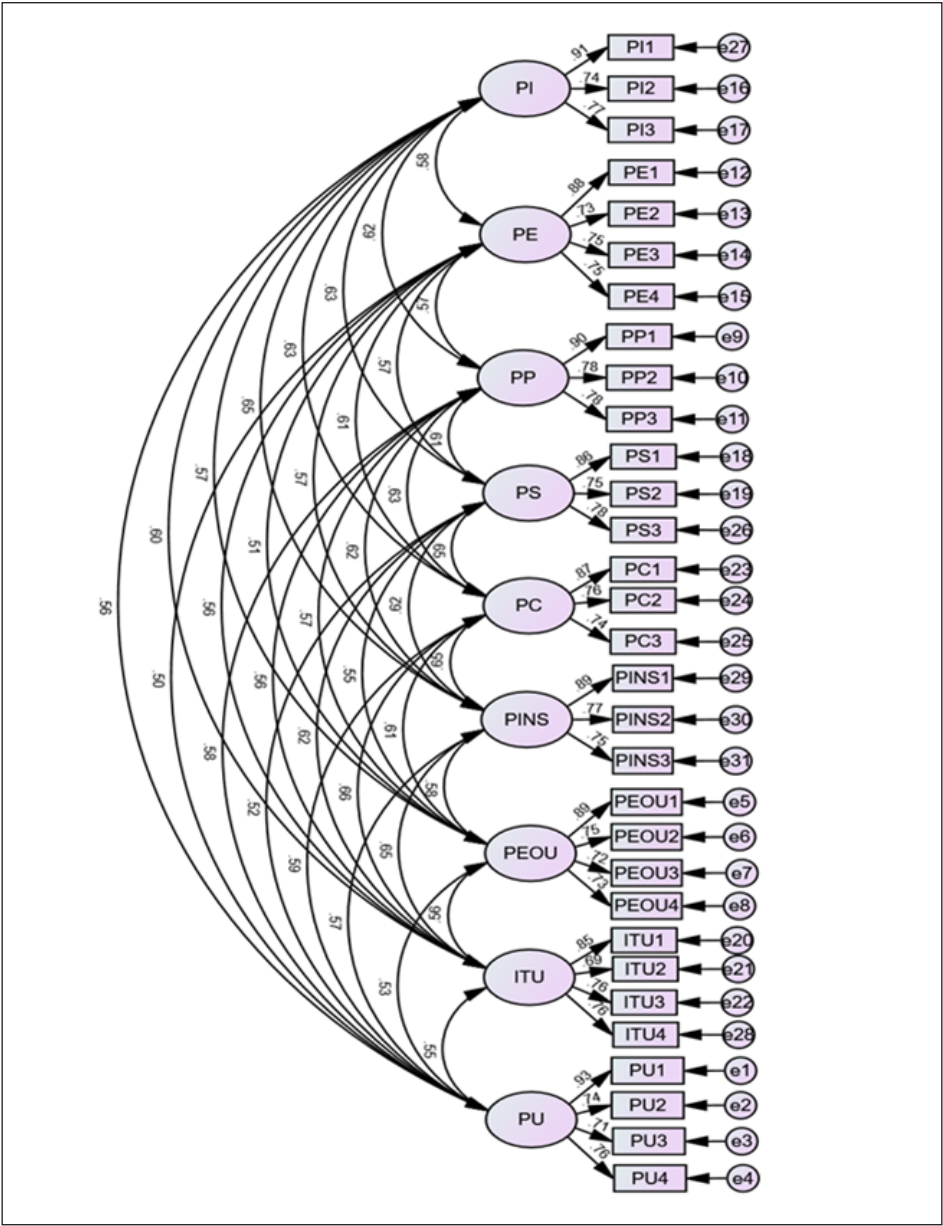


Figure 3. Validation factor analysis CFA model plot

represented by the square root of the Average Variance Extracted (AVE) value. Therefore, it can be shown that there is good discriminant validity between all

dimensions (Manly & Alberto, 2016). Figure 3 shows the validation factor analysis CFA model plot based on the Table 6.

Descriptive Statistics and Normality Tests

Table 7 presents the results of the normality test conducted in this research. The descriptive analysis reveals that the mean scores of the variables range from 3.02 to 3.66, within a positively scored scale of 1-5. So, this research has a more than moderate

level of perception of the impact of the use of Midjourney on the practitioners in the design industry.

In this analysis, we utilized skewness and kurtosis to assess the normality of individual measurement items. Following Kline and Little's (2016) established criteria. Skewness values within the range of -3 to

Table 7
Normality test table

Variable	Average value	Standard Deviation	Skewness	Kurtosis
PU1	3.47	1.370	-0.530	-0.949
PU2	3.23	1.194	-0.138	-0.780
PU3	3.17	1.118	-0.079	-0.600
PU4	3.21	1.177	-0.134	-0.702
PEOU1	3.37	1.357	-0.431	-0.952
PEOU2	3.14	1.172	-0.099	-0.800
PEOU3	3.08	1.112	0.010	-0.590
PEOU4	3.08	1.153	-0.042	-0.640
PE1	3.50	1.324	-0.524	-0.874
PE2	3.26	1.166	-0.088	-0.766
PE3	3.24	1.167	-0.150	-0.661
PE4	3.23	1.156	-0.117	-0.679
PS1	3.51	1.293	-0.526	-0.795
PS2	3.32	1.163	-0.258	-0.636
PS3	3.29	1.206	-0.212	-0.817
PP1	3.23	1.395	-0.161	-1.238
PP2	3.10	1.197	-0.089	-0.802
PP3	3.02	1.154	-0.036	-0.740
PI1	3.30	1.413	-0.301	-1.182
PI2	3.14	1.176	-0.002	-0.711
PI3	3.12	1.161	-0.076	-0.669
PINS1	3.52	1.358	-0.579	-0.863
PINS2	3.15	1.152	-0.153	-0.691
PINS3	3.23	1.150	-0.193	-0.592
PC1	3.55	1.369	-0.637	-0.797
PC2	3.33	1.162	-0.246	-0.607
PC3	3.25	1.172	-0.266	-0.566
ITU1	3.66	1.302	-0.809	-0.429
ITU2	3.35	1.121	-0.278	-0.426
ITU3	3.37	1.164	-0.356	-0.594
ITU4	3.42	1.136	-0.358	-0.514

+3 and kurtosis values between -8 and +8 are regarded as indications of data closely approximating a normal distribution. The analysis results, as delineated in Table 7, reveal that the absolute values of skewness and kurtosis coefficients for every measurement item in this research are within the established standard range.

Correlation Analysis

In this analysis, the relationship between variables was examined using Pearson correlation coefficient analysis Table 8 below. The findings unequivocally demonstrate a substantial and positive correlation among all variables considered.

The significance levels, exceeding 99%, indicate robust statistical significance. Moreover, the correlation coefficients, consistently greater than 0 ($r > 0$), signify a strong positive relationship between the variables under scrutiny. Thus, the combined results of the analysis can indicate that there is a significant positive correlation between all the variables in this analysis.

Structural Equation Modeling (SEM) Fitness Tests

Table 9 shows the results of the fitness test of this model, as shown CMIN/DF = 1.317, which is excellent in the reference standard range of 1-3; RMSEA = 0.031, which is

Table 8
Pearson correlation coefficient between dimensions

	Pua	PEOUa	PEa	PSa	PPa	Pla	PINSa	PCa	ITUa
Pua	1								
PEOUa	0.431**	1							
PEa	0.409**	0.437**	1						
PSa	0.446**	0.457**	0.477**	1					
PPa	0.499**	0.490**	0.491**	0.513**	1				
Pla	0.493**	0.491**	0.497**	0.540**	0.547**	1			
PINSa	0.476**	0.499**	0.469**	0.531**	0.540**	0.549**	1		
PCa	0.482**	0.504**	0.510**	0.554**	0.534**	0.537**	0.553**	1	
ITUa	0.456**	0.472**	0.483**	0.521**	0.489**	0.521**	0.540**	0.560**	1

Note. **: At the 0.01 level (two-tailed), the correlation is significant

Table 9
Model fitness test table

Statistics	Recommended Value	Computed
CMIN/DF	1-3 excellent, 3-5 good	1.317
RMSEA	0-0.05 excellent, 0.05-0.08 good	0.031
GFI	0.9-1 excellent, 0.8-0.9 good	0.899
IFI	0.9-1 excellent, 0.8-0.9 good	0.977
TLI	0.9-1 excellent, 0.8-0.9 good	0.974
CFI	0.9-1 excellent, 0.8-0.9 good	0.977

excellent in the reference standard range of 0-0.05; the GFI value is 0.899, which is very close to the excellent interval of 0.9-1; the values of IFI, TLI, and CFI measurements were 0.977, 0.974, and 0.977, respectively, all in the 0.9-1 range of excellence. Therefore, it can be concluded that the structural equation model constructed in this case has excellent fitness and can be further analyzed for model test results.

Results of Testing the Path Relationship Hypothesis

In conducting the path analysis of structural equation modeling, IBM Amos 26 was employed, and the resulting standardized regression coefficients are detailed in Table 10. According to Fisher's theory (Fisher, 1970), all 11 sets of hypotheses (H1-H11) proposed in the hypothesis stage of this research were evidenced by the data, presenting a significant impact ($p < 0.05$). Notably, PP ($\beta = 0.639$, $p < 0.001$, H8) exhibited a substantial positive influence on

PE; PE ($\beta = 0.264$, $p < 0.001$, H5) and PI ($\beta = 0.48$, $p < 0.001$, H4) displayed significant positive effects on PEOU; PP ($\beta = 0.339$, $p < 0.001$, H7), PEOU ($\beta = 0.195$, $p < 0.01$, H1), and PINS ($\beta = 0.26$, $p < 0.001$, H11) exerted significant positive impacts on PU; PC ($\beta = 0.309$, $p < 0.001$, H10), PS ($\beta = 0.218$, $p < 0.01$, H9), PEOU ($\beta = 0.135$, $p < 0.05$, H2), PE ($\beta = 0.133$, $p < 0.05$, H6), and PU ($\beta = 0.147$, $p < 0.05$, H3) had notable positive effects on ITU. Figure 4 shows the TAM and pathway relationships diagram.

Fuzzy-Set Qualitative Comparative Analysis (fsQCA)

Variable Selection

Based on the analysis of this TAM, it was found that all five hypothesized paths that directly and significantly influenced the intention to use Midjourney were valid. However, among the five variables directly influencing ITU, the p-values for four of them (PE, PS, PEOU, and PU) range

Table 10
Path relationship test results

	Hypothesis	Estimate	S.E.	C.R.	P	Result
PE	<--- PP	0.639	0.067	9.479	(***)	Accept
PEOU	<--- PE	0.264	0.082	4.270	(***)	Accept
PEOU	<--- PI	0.480	0.088	7.296	(***)	Accept
PU	<--- PP	0.339	0.079	4.261	(***)	Accept
PU	<--- PEOU	0.195	0.046	3.174	0.002(**)	Accept
PU	<--- PINS	0.260	0.076	3.461	(***)	Accept
ITU	<--- PEOU	0.135	0.058	2.147	0.032(*)	Accept
ITU	<--- PE	0.133	0.076	2.159	0.031(*)	Accept
ITU	<--- PC	0.309	0.098	3.904	(***)	Accept
ITU	<--- PS	0.218	0.087	2.862	0.004(**)	Accept
ITU	<--- PU	0.147	0.077	2.351	0.019(*)	Accept

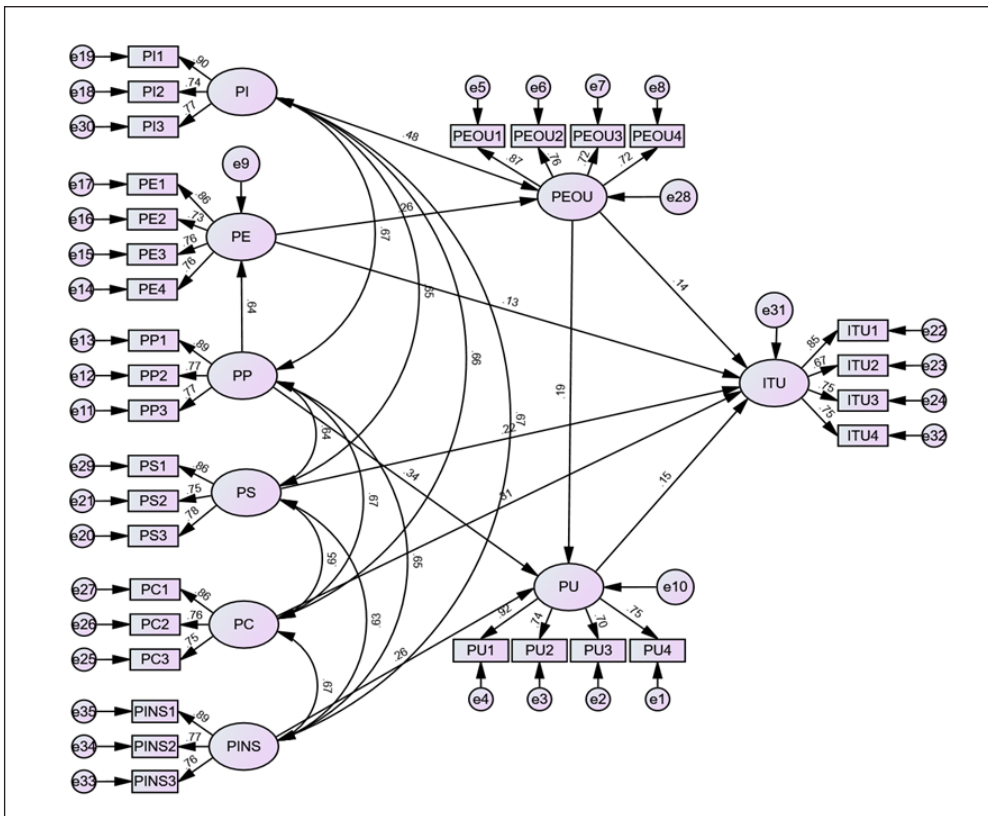


Figure 4. TAM and pathway relationships

between 0.05 and 0.001, and the β -values are all less than 0.25. This suggests that the direct effects of these four variables on ITU, while statistically significant, are relatively small compared to those of PC (Urbach & Ahlemann, 2010). Research has demonstrated that fsQCA can enhance the examination of the average net effect in SEM by analyzing the outcomes arising from the interdependence of multiple conditions (Du & Jia, 2017). Therefore, this research selected these four variables as antecedent variables and further analyzed their data through fsQCA. The aim was to investigate whether, given that their individual impact

on the outcome variable ITU is relatively small, they collectively form a complex causal joint effect on the outcome.

Data Calibration

In this research, perceived enjoyment, perceived security, perceived usefulness, and perceived ease of use are chosen as antecedent variables. As the data for this research are derived from Likert scale responses in a questionnaire survey, before analysis, the scores for each measurement item need to be summed and then averaged. Following the theoretical framework proposed by Ragin (2009), the 5% (Fully

Out), 50% (Fully In), and 95% (Crossover Point) percentiles of the averaged data are selected as anchor points. Finally, the membership scores for each variable are assigned between 0 and 1.

Necessity Analysis

Before conducting a configurational analysis on the calibrated data, it is necessary to perform an analysis of the necessity of individual conditional variables. This research utilized fsQCA 4.1 software for analysis. The results, as shown in Table 11, indicate that the consistency results of individual antecedent variables are all less than 0.9 (Schneider & Wagemann, 2010). This suggests that none of the four antecedent variables is a necessary condition for triggering the outcome. Therefore, further configurational analysis is needed to explore their combined impact on the outcome variable ITU.

Table 11
Necessity analysis results (~indicates absent or low)

	Consistency Coverage	
Perceived performance	0.860	0.898
~Perceived performance	0.535	0.575
Perceived usefulness	0.845	0.903
~Perceived usefulness	0.536	0.563
Perceived security	0.877	0.905
~Perceived security	0.522	0.568
Perceived ease of use	0.814	0.906
~Perceived ease of use	0.552	0.559

Adequacy Analysis

Before the conditional configuration analysis, the truth table is constructed,

and the frequency threshold should be set to ensure that the retained sample size is not less than 80% of the total sample size according to the practical operation standard (Rihoux & Ragin, 2008). In this research, the frequency threshold is set to 2, the original consistency threshold adopts the default value of 0.8, the PRI Consistency threshold is 0.7, and the final conditional configuration and analysis results are shown in Table 12. The results indicate that the solution consistency of the three configurations formed by the four conditional variables is 0.956, exceeding the threshold of 0.75. This suggests that

Table 12
Results of adequacy analysis

	Construct 1	Construct 2	Construct 3
Perceived enjoyment	●	○	
Perceived usefulness	⊗	●	●
Perceived security	●	⊗	○
Perceived ease of use	⊗	●	●
Raw coverage	0.809	0.725	0.727
Unique coverage	0.120	0.036	0.037
consistency	0.953	0.949	0.950
solution coverage		0.882	
solution consistency		0.956	

Note. ○: The antecedent variable is an auxiliary condition of the structure. ●: The antecedent variable is a core condition of the construct. ⊗: The antecedent variable does not exist in the construct

all configurations have high reliability and serve as sufficient conditions for designers to accept Midjourney, and with these three configurations in place, the probability of achieving the outcome variable reaches 95.6%; the three configurations' solution coverage is 0.882, which shows that the probability of being explained by these three configurations in all successful cases reaches 88.2%.

DISCUSSION

The current research was conducted with a sound theoretical foundation. Based on the results of previous research, this study is the first to incorporate six new latent variables, PI, PS, PC, PP, PE, and PINS, into the Technology Acceptance Model (TAM) to elucidate the user experience of AIBPS (Midjourney) among design industry professionals. Different from other studies on AIBPS, this research no longer focuses on the details of AI technology, nor on the testing of product performance. Instead, it focuses on the human-centered user experience in AI technology and product development, and focuses on the designer group. In this way, this paper possesses new perspectives and findings.

This research holds significance from both theoretical and practical standpoints. The validation of H1, H2, and H3 implies the applicability of traditional TAM theories to the realm of AIBPS. Designers, as an important user group of Midjourney, have their Perceived Usefulness (PU) also significantly influenced by Perceived Ease of Use (PEOU), and at the same time,

both of them significantly affect designers' intention for the Midjourney's to use Midjourney. Based on ETAM, this research also introduced personal innovativeness (PI) and perceived enjoyment (PE) as external variables affecting PEOU; perceived performance (PP) and perceived inspiration (PINS) as external variables affecting PU. The results show that designers who are more willing to try new things, or who are good at finding joy in doing, are less likely to find AIBNPS difficult to use. Some management scholars have found that if a company adopts a dual strategy of simultaneously enhancing efficiency and fostering innovation, it can gain a competitive edge in intense market competition (Sarkees & Hulland, 2009). This proved to be true for Midjourney's PUs as well, with the efficiency gains and bursts of inspiration that AIBPS brought to the designers significantly influencing their evaluation of whether it was useful or not. The establishment of H8 underscores that the enhancements in performance and efficiency resulting from Midjourney significantly impact users' positive experiences with the software. This finding affirms that PP not only directly influences PU but also has the capacity to affect PEOU and ITU by influencing PE, which undoubtedly affirms the importance of the efficiency improvement of AIBPS. In the subsequent maintenance and development, it is possible to optimize performance and improve efficiency in order to enhance the user experience, strengthen the perceived ease of use and usefulness of the product, and ultimately promote the tendency of designers to use AIBPS.

Methodologically, the research is distinguished by its innovative hybrid approach that combines a thorough literature review, a well-structured questionnaire survey yielding 322 valid responses, and an integrative analysis using both TAM and fsQCA. This design not only allows for the rigorous testing of individual variable relationships within the TAM framework but also uncovers the complex, multifactorial configurations that drive user acceptance in a nuanced manner. By bridging quantitative analysis with qualitative comparative insights, the research addresses the limitations of traditional single-method studies and provides a more comprehensive framework for exploring technology acceptance phenomena. This methodological advancement enriches the empirical analysis of user experiences with emerging AI technologies, offering a replicable model that can be applied across interdisciplinary contexts to investigate the dynamics at the intersection of technological innovation and creative design.

It is worth noting that, given the characteristics of the study population (designers) and the research subject (AIBPS), the inclusion of the perception of inspiration (PINS) holds significant importance in the construction of TAM in this paper. The establishment of H11 also suggests that future researchers exploring the usage of emerging technological products in such user groups should consider external variables with specific group needs, such as "creativity or inspiration." This encourages developers to consider the

unique requirements of different professional groups. Design industry practitioners use Midjourney not only in the hope that this tool can quickly and excellently help them complete their work, but also in some cases, in the hope that AI algorithms can inspire them so that they can break through the limitations of their own thinking and expand the boundaries of their own thinking. Therefore, considering this dimension, combined with this demonstration of the significant effect of perceived inspiration on perceived usefulness, this paper suggests that this external variable will have a non-negligible impact in any future research on the acceptance of AIBPS.

This research also innovatively introduces Perceived Cost (PC) and Perceived Security (PS) as variables directly affecting designers' intention to use Midjourney. The two also happen to have relatively high β -values among the factors constructed in this paper that directly affect ITU. It should be noted that since the subjects in this study were all from China (with network-specific limitations), the costs in this study also include the cost of crossing the limitations, which makes the perceived costs here unique, and as the world's second-most populous country, China has a huge number of users, so this variable deserves to be taken into account more. For perceived security, the reason for this situation may be, on the one hand, because with the rapid development of information technology, the importance of information security has gradually been placed in a relatively high dimension of consideration;

on the other hand, Midjourney operates as an AI drawing tool integrated into Discord, a global commercial community platform with servers maintained overseas, leading to heightened concerns among design industry practitioners about information security. Therefore, while providing a convenient service of free information exchange and communication, Midjourney is an online AI drawing tool. Compared with the AI drawing tool installed on the local computer (Stable Diffusion), the risk of its information security is more concerning the design industry practitioners. For the perception of the cost of use, on the one hand, it may be because Midjourney, as an emerging AI painting tool, the market is still in the exploratory stage of judging its value, and has not yet been able to have a clear measure of the value of the subscription price it sets; on the other hand, for Chinese designers, accessing community platforms such as Discord and using Midjourney requires the use of a Virtual Private Network (VPN), which is an additional cost, and the time and effort required to apply for a VPN can put pressure on some companies or individual designers, these factors will make them have to think further about the additional costs they have to face by using Midjourney.

The unique contribution of this research is that we propose to combine TAM and fsQCA to measure the impact of various factors on designer acceptance in the AIBPS domain. This hybrid approach can combine the strengths of both quantitative and qualitative analyses, not only considering the impact of individual factors but also

being able to reveal the impact of selective multifactorial. We believe that this approach can also be applied to other fields to obtain more convincing results. The analysis of fsQCA reveals that individual factors directly affecting the outcome variables may not be significant, but by combining them, they can have a significant impact on ITU. This also suggests that it is not necessary to consider all the influencing factors in the development of AIBPS, that any combination of design factors may emphasize or ignore certain factors, and that the development of AIBPS can be based on its own actual needs and environment to choose the appropriate structure.

In terms of practical significance, due to the occupational characteristics of the subjects in this study, the introduction of perceived inspiration is highly significant for the construction of ETAM in this paper. This reminds developers to focus more on how Midjourney induces inspiration in users during the process of generating works. For the actual operation and development of the software, this study suggests that, in addition to making users feel that Midjourney is good and easy to use, it is also important to put ourselves in the shoes of users in different regions to consider the cost they need to pay, so that the price can be adjusted appropriately in accordance with the different situations. At the same time to strengthen the publicity of Midjourney, to enhance the user's subconscious awareness of the value of using Midjourney can bring, of course, for the user's information security and the use of experience should be further

in-depth investigation, investigation of user pain points and continuous improvement, to affect the user's perception of the price, the safety of the security of the peace of mind, the use of the satisfaction of the experience. Ultimately, it will increase the probability that Midjourney will be chosen by users. As for how to improve users' perception of Midjourney's usefulness and ease of use, this study suggests that the tool can be made more useful by both improving software performance and tuning AI creativity; And making Midjourney more accessible to users by enhancing the mental pleasure of using it and by filtering more creative users as the main promotional demographic.

CONCLUSION

Theoretical Contribution

This research uses the Technology Acceptance Model (TAM) as the main research basis and theoretical framework. By innovatively introducing 6 variables and proposing 11 sets of research hypotheses, it explores the user experience of the artificial intelligence drawing tool "Midjourney" among design industry professionals. By shifting the focus from AI technology details and product performance to a human-centered perspective, the research provides new insights into how traditional constructs of perceived ease of use (PEOU) and perceived usefulness (PU) are moderated by additional factors like innovation, inspiration, cost, and security. This enhanced model not only broadens the empirical applicability of TAM in the creative sector but also underscores the

significance of addressing domain-specific needs, such as the role of inspiration, in understanding technology acceptance among designers. The findings can guide developers, marketers, and researchers in creating, promoting, and studying AI tools that meet the needs of the design community.

Practical Contribution

The findings of this research offer valuable guidance for developers, marketers, and practitioners in the art and design industries. The empirical validation of key hypotheses demonstrates that improvements in system performance and efficiency, alongside enhancements in user enjoyment and inspiration, can significantly boost the perceived usefulness and ease of use of AI drawing tools. Furthermore, the study highlights the critical role of perceived cost and security, suggesting that software developers should tailor subscription strategies, optimize user interfaces, ensure robust data protection, and incorporate interactive tutorials to enhance user engagement. Although the development of AIBPS is still incomplete, it has already demonstrated its value for use and development potential that cannot be ignored. Developers should pay more attention to its impact on the art and design industry, and turn the contradiction into motivation, and designers will be an important user group in promoting the development of AIBPS. For art creators, the emergence and rapid development of AIBPS are both facts and future trends. While it is essential to discuss the advantages

and disadvantages of AI, we must not let the balance of pros and cons deter us from understanding and mastering these new tools. By inheriting through critique and adapting with innovation, the art industry can better harness and control these technologies. At the same time, some limitations that emerged from the research need to be further explored and addressed in future research.

Practice Recommendations

To increase the adoption and effectiveness of AI-based drawing software such as Midjourney among design professionals, several strategic recommendations can be implemented. First, focus on improving the user interface and overall user experience by making the software intuitive and easy to navigate. Comprehensive tutorials and support resources should be provided to help users quickly become proficient with the tool. The marketing strategy should target early adopters and innovators in the design industry by emphasizing innovative features and providing opportunities for hands-on experimentation through free trials or interactive demos.

Incorporate features that stimulate creativity and provide inspiration, such as customizable templates, AI-generated design suggestions, and collaboration tools that allow users to share and give feedback seamlessly. Highlighting these creative support features in promotional materials can appeal to designers who are looking for tools to enhance their creative process.

Addressing security concerns is critical; therefore, developers should implement strong data protection measures and clearly communicate them to build user trust. Transparent privacy policies and secure data handling practices should be prioritized. To mitigate cost-related barriers, offering a variety of subscription plans, including free trials and discounted prices for long-term commitments, can make software more accessible. Emphasizing value for money and potential productivity gains can help justify the investment to potential users.

In addition, collecting ongoing feedback from users and incorporating it into the development process will ensure that the software evolves according to user needs and preferences. Regular updates and improvements based on user input can increase satisfaction and foster long-term loyalty. By implementing these comprehensive strategies, developers can significantly increase the adoption and utilization of AI-based drawing software by design professionals, thereby driving innovation and efficiency in the industry.

Finally, based on further fsQCA of the four variables with small β -values, this research makes recommendations in response to the findings. In the development and design of AIBPS, the traditional idea of only considering usability and ease of use needs to be changed. Because the influence of these two factors on the user experience of emerging AIBPS is diluted by other factors, such as the perceived safety and perceived enjoyment of designers in this study. In the market, while the developers

of various AIBPS strive to ensure excellent PEOU and PU, if a product considers the user's PS or PE, it will make it stand out.

Limitations and Future Research

The limitations of this current study can serve as a source of inspiration for future researchers. While this research effectively utilized internet-based questionnaires to collect a wide range of high-quality data across various dimensions, it encountered challenges in achieving sample balance within different age groups. Notably, subjects from distinct age groups may possess varying perspectives on new technology, and this research did not sufficiently address the perceptions of older design industry practitioners concerning Midjourney. In future research, it is recommended that researchers expand their inquiry both horizontally and vertically. This expansion can be achieved by selecting representative subjects from diverse age groups within the design industry and employing research methodologies like "interviews."

Additionally, this research gathered user data through the distribution of questionnaires, and the data derived from the scales contained a certain level of subjectivity. The uncertainty associated with subjective cognition can introduce a degree of inaccuracy in the study's conclusions. To address this limitation, future research endeavors should seek additional objective data to further substantiate the findings of this research. At the same time, although this study used an innovative mixed analysis research method, the entire research

conclusion is rooted in the empirical data collected by the research team. Although these data have advantages such as timeliness and authenticity, there is still the possibility of bias. In future research, it may be possible to combine more official panel data to reduce limitations and bias.

Lastly, the research sample was exclusively composed of design industry practitioners in China. Consequently, the conclusions drawn may bear regional limitations. These limitations may stem from factors such as the geographical constraints of network access, which may influence the perception of Midjourney's cost. Future research could enhance the robustness of findings by incorporating subjects from diverse countries, thereby gathering more multidimensional data and facilitating more comprehensive studies.

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