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Factors Influencing User Satisfaction with Generative Artificial Intelligence Power Chat System

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ABSTRACT

This research aims to explore the factors that affect user satisfaction with AI chat systems, particularly within the Indonesian context, to create a comprehensive evaluation scale for user experience. A quantitative approach using surveys with a Likert scale model was employed. Questionnaires were distributed online to AI chat users in Indonesia. A total of 365 valid questionnaires were collected, and all items were recorded using a seven-point Likert scale. Factor analysis was adopted to identify user satisfaction. Then, multiple regressions analysis was used to examine the impact of the multiple factors on AI chat system user satisfaction. The data analysis identifies factors that directly affect user satisfaction with the Generative Artificial Intelligence Powered Chat System. These factors are credibility, interactivity, ease of use, usefulness, convenience, growth, logical inference, and enjoyment. In contrast, the factors that indirectly affect user satisfaction are security, creativity, anthropomorphism, and accuracy. This study aims to provide valuable insights that will inform the design and implementation of more effective and user-friendly AI chat technology.

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SARI PATI

Penelitian ini bertujuan untuk mengeksplorasi faktor-faktor yang memengaruhi kepuasan pengguna terhadap sistem chat berbasis AI, khususnya dalam konteks Indonesia, guna menyusun skala evaluasi yang komprehensif terhadap pengalaman pengguna. Pendekatan kuantitatif digunakan dalam penelitian ini melalui survei dengan model skala Likert. Sebanyak 365 kuesioner yang valid berhasil dikumpulkan. Analisis faktor digunakan untuk mengidentifikasi komponen-komponen kepuasan pengguna, yang kemudian dianalisis lebih lanjut menggunakan regresi berganda untuk menguji pengaruh berbagai faktor terhadap kepuasan pengguna sistem chat berbasis AI. Hasil analisis data menunjukkan bahwa terdapat beberapa faktor yang secara langsung memengaruhi kepuasan pengguna terhadap sistem chat berbasis Generative Artificial Intelligence. Faktor-faktor tersebut meliputi kredibilitas, interaktivitas, kemudahan penggunaan, kegunaan, kenyamanan, pengembangan diri, penalaran logis, dan kesenangan. Faktor-faktor yang memengaruhi kepuasan pengguna secara tidak langsung meliputi keamanan, kreativitas, antropomorfisme, dan akurasi.

INTRODUCTION

The landscape of artificial intelligence (AI) has undergone a remarkable transformation, with innovations permeating various sectors, from healthcare to industrial manufacturing (Febiandini and Sony, 2023; Kliestik *et al.*, 2023). One of the most groundbreaking advancements in AI is the development of conversational agents, particularly large language models like ChatGPT. Introduced in November 2022, ChatGPT rapidly established itself as the most swiftly adopted application in internet history, fundamentally changing the way individuals engage with technology (Chatelan *et al.,* 2023).

Created by OpenAI, ChatGPT is fundamentally a large language model (Xue *et al.,* 2023) that utilizes a neural network to comprehend text data by forecasting the next words in a specific sequence and producing responses that resemble human dialogue (OpenAI, 2022). This functionality enables it to participate in insightful conversations, making it an adaptable tool suitable for a wide range of applications. Additionally, the model's capability to improve through user interactions significantly boosts its performance, allowing it to deliver responses that are increasingly precise and contextually appropriate over time (OpenAI, 2022). The rapid rise in popularity of ChatGPT can be attributed to its simple and effective user interaction system, as well as its ability to create a positive user experience, which is a significant factor (Chatelan *et al.,* 2023). Despite this, there has been a notable lack of focus on this aspect. Presently, research into the factors that affect user adoption of ChatGPT is still emerging. As illustrated in Table 1, most studies tend to derive various influencing factors from existing literature and subsequently validate them through hypothesis testing.

The swift uptake of ChatGPT can be linked to its intuitive interface and the streamlined experience it provides. This appeal has not only engaged the technology sector but also profoundly influenced daily life, changing how individuals approach work, education, and entertainment (Li, 2023). Studies indicate that ChatGPT can improve the productivity of various tasks, including academic writing and medical research, underscoring its value in niche areas (Benichou, 2023). Despite its remarkable features, ChatGPT faces challenges. Concerns regarding inaccuracies, inadequate intellectual property protections, potential plagiarism and cheating, instances of academic fraud, and other ethical implications have emerged, highlighting the necessity for continuous enhancements (Koo, 2023; Alkhaqani, 2023; Rice *et al.,* 2024; Athilingam

Tabel 1. Current Landscape of Research on User Experience with AI Chat Systems

Influence factors	**Sources**
Social Impact, Novelty Value, Anthropomorphism, Performance Expectation, Pleasure Motivation, Effort Expectation	Ma and Huo (2023)
Time-Saving Function of Service, Electronic Word-of-Mouth, Academic Self-Efficacy, Academic Self-Esteem	Bin-Nashwan *et al.* (2023)
Intellectual Humility	Li (2023)
Performance Expectation, Effort Expectation, Pleasure Motivation, Learning Value, Personal Innovativeness, Information Accuracy	Foroughi *et al.* (2023)
Experience, Performance Expectation, Pleasure Motivation, Price Value, Habit, Convenience Conditions	Romero-Rodriguez *et al.* (2023)
Effort Expectation, Performance Expectation	Duong *et al.* (2023)
Usefulness, Ease of Use, Attitude	Sallam *et al.* (2023)
Performance Expectation, Risk-Return Evaluation, Decision	Shahsavar and Choudhury (2023)
Hedonism, Social Norms	Kopplin (2022)
Perceived Usefulness, Perceived Enjoyment, Perceived Control, Perceived Convenience	Wang (2012)

and He, 2023; Hosseini *et al.,* 2023). Additionally, the ''illusion effect,'' where the model produces plausible but incorrect information, represents a notable obstacle (Shen *et al.,* 2023).

The popularity of ChatGPT has generated considerable interest in identifying the factors that affect user satisfaction and technology adoption. Although preliminary research has started to delve into these issues, there is still a lack of comprehensive assessments of user experiences with AI chat systems. Filling this gap is essential for designing and developing future AI applications to effectively cater to user needs (Chatelan *et al.,* 2023).

The rise of ChatGPT represents a significant advancement in artificial intelligence, opening up both opportunities and challenges in various fields. The recent introduction of multiple AI chat systems, such as Google Gemini and Microsoft Copilot, has further propelled the progress of AI chat technologies. However, numerous studies have investigated the accuracy of these AI chat systems across different domains, including healthcare, revealing that each system exhibits its own level of accuracy (Rossettini *et al.,* 2024). These discrepancies in responses highlight the importance of choosing the right AI system tailored to the specific needs and contexts of various applications (Hiwa *et al.,* 2024). As research continues to probe into the functionalities and constraints of these technologies, it becomes crucial to enhance user experience while simultaneously addressing ethical issues to fully harness the capabilities of AI conversational agents.

The primary aim of this research is to explore the different factors that affect user satisfaction with Artificial Intelligence (AI) chat systems, with the goal of creating a detailed evaluation scale for user experience. This scale is anticipated to yield important insights into the factors driving customer satisfaction, especially concerning the usability of generative AI technologies. Historically, the most prevalent application of generative AI has been in the development of chatbots, which were initially deployed by corporations as a primary communication channel with customers. The decision to integrate AI into customer service strategies can significantly impact an enterprise's operational dynamics and overall customer engagement moving forward. The use of AI can be a make-or-break decision for an enterprise, determining whether it becomes the main channel for customer interaction (Adam *et al.,* 2020).

This research is conducted within the context of Indonesia and is informed by existing literature, particularly a pertinent study conducted in China by Xing and Jiang (2024). Additionally, this study introduces a new dimension (Enjoyment) as a potential factor influencing user satisfaction with AI chat systems. This addition is supported by findings from Wang (2012),which emphasized the role of enjoyment in improving consumer satisfaction with self-service technologies.

The findings of this research are expected to contribute to a broader understanding of user satisfaction in AI chat systems, offering practical implications for developers and businesses seeking to optimize their AI-driven customer service solutions. By addressing both positive and negative factors influencing user satisfaction, the study aims to inform strategies that enhance the overall user experience, thereby fostering stronger customer relationships and loyalty.

Literature Review and Hypotheses Development

Following engagement with the product or service, consumers undertake an evaluation of its actual performance. This evaluation is subjective and based on the extent to which the product or service meets their needs. The aspect of Expectation-Disconfirmation Theory (EDT) developed by Richard L. Oliver that has gained the greatest recognition and popularity is the disconfirmation process itself. This is particularly evident in the way it elucidates the relationship between customer

expectations and their subsequent satisfaction or dissatisfaction.

The underexplored aspect of the user experience satisfaction matrix through the service (Pei *et al.,* 2020; Keebler *et al.,* 2020), which has the potential to predict user loyalty (Hasfar *et al.,* 2020) and continuous behaviour (Ngoc *et al.,* 2023), has received less attention in the literature. Thus, it is crucial to analyse the influence of user experience aspects in AI chat systems and incorporate the additional dimension of enjoyment to enhance user satisfaction. The following section presents the hypotheses that emerge from the reviewed literature and theoretical frameworks, offering insights into how these factors are anticipated to interact within the context of AI chat systems.

Accuracy

Accuracy plays a crucial role in enhancing the perceived usefulness of AI services (Zhu *et al.,* 2021). It is defined as the degree to which AI chat services provide responses that accurately represent the actual context, characterized by a high level of precision and a low occurrence of errors concerning the quality of information. This factor highlights the necessity for service providers to improve AI's natural language processing capabilities, thereby reducing errors and ambiguities in communication.

H1a. Accuracy will positively influence the usefulness of AI chat services.

Anthropomorphism

Anthropomorphism has a positive effect on the perceived usefulness of AI services (Li and Wang, 2022). In this research, it is defined as «Anthropomorphism,» capturing users' emotional perception that AI chat services can conduct fluid and natural conversations akin to human interactions, thereby showing an understanding of users' emotional needs. The importance of this factor emphasizes the potential for service providers to improve the emotional responsiveness of AI services during user interactions.

H1b. Anthropomorphism will positively influence the usefulness of AI chat services

Creativity

Creativity positively influences the perceived usefulness of AI services (Park and Kim, 2020). The term creativity in AI is typically defined as the capacity of AI systems to generate outputs that are not only novel but also useful or appropriate within a given context (Park and Kim, 2020). This creativity is often assessed based on the extent to which the AI can produce original ideas, solutions, or content that align with human-like creativity. This involves factors such as originality, flexibility, and elaboration. The underlying mechanisms typically involve pattern recognition, recombination of existing ideas, and generating new concepts through learning from vast amounts of data.

H1c. Creativity will positively influence the usefulness of AI chat services.

Security

Security positively influences the perceived usefulness of AI services (Al-Adwan *et al.,* 2023). The term security in Chat AI encompasses the measures and practices designed to safeguard AI systems from potential threats and vulnerabilities that could compromise their integrity, confidentiality, and availability. This encompasses the protection of AI from adversarial attacks, the assurance of data privacy, and the implementation of robust mechanisms to prevent unauthorized access or manipulation. The objective is to ensure the trustworthiness and reliability of AI systems by addressing potential risks in data handling, algorithmic decision-making, and user interaction.

H1d. Security will positively influence the usefulness of AI chat services.

Usefulness

The usefulness of the result of AI Chat gives the direct impact of user satisfaction. Studies related to outcome effectiveness (Kivijärvi, 2023) indicate that satisfaction is defined as a thorough assessment of users' expectations versus the actual outcomes. Given that users expect AI chat services to help

solve problems and enhance work efficiency (Dell'Acqua *et al.,* 2023), they tend to rate the service higher when it demonstrates significant usefulness.
H2a. Usefulness will positively influence user satisfaction.

Logical Inference

In AI chat services, logical inference is one of the factors which positively impacts user satisfaction. In our study, logical inference is defined as ability of AI Chat services to understand and interpret the tasks given by the users. This includes the ability of AI Chat to understand the context or make rational inferences based on the given information, either partially or fully. Another observation related to this factor is the ability of AI Chat to understand user behavior and solve complex problems (Wang, *et al.,* 2023c). Moreover, users expect the responses to be logically sound, enhancing their overall satisfaction.
H2b. Logical Inference will positively influence user satisfaction.

Interactivity

Interactivity refers to the process of information exchange between users and the service, which includes the speed of responses, controllability, and overall responsiveness of the service (Sun *et al.,* 2024). In this research, interactivity is defined as the extent to which AI chat services facilitate effective and timely interactions and feedback regarding operational procedures. This factor is essential because it encourages service providers to enhance the efficiency of information exchange and feedback between AI services and users. It is suggested that higher levels of interactivity contribute to greater user satisfaction, as responsive and engaging interactions make users feel valued and understood, thereby improving their overall experience.
H2c. Interactivity will positively influence user satisfaction.

Growth

Growth positively influences user satisfaction, as users value the ability of AI chat services to undergo continuous improvement through training, learning, and self-optimization. Research shows a connection between growth and individual happiness and satisfaction (Kaufman, 2023). Consequently, users anticipate that AI services will not only rectify inaccuracies but also continuously enhance their knowledge by integrating shared data and improving their performance, ultimately delivering higher-quality services.
H2d. Growth will positively influence user satisfaction.

Convenience

Convenience plays a crucial role in enhancing user satisfaction (Saha *et al.,* 2023). In this study, convenience is defined by minimizing usage restrictions, enabling users to easily access these services anytime and from any location. Additionally, accommodating various languages ensures that users from diverse backgrounds can engage with the service without obstacles, further boosting satisfaction. By providing a seamless and user-friendly experience, AI chat services can foster a sense of inclusivity, ultimately leading to higher levels of user engagement and loyalty.
H2e. Convenience will positively influence user satisfaction.

Credibility

Credibility has a positive impact on user satisfaction, as it refers to the ability of the service to instill trust in the information it provides. Users primarily turn to AI chat services to accomplish various tasks by accessing diverse information (Golan *et al.,* 2023; O'Hagan *et al.,* 2023). Consequently, the quality and authenticity of the information are crucial for users' evaluations of the service (Oviedo-Trespalacios *et al.,* 2023). When an AI service offers real-time information that is well-sourced and comes from reputable sources, users are more likely to trust its authenticity, which in turn enhances their satisfaction with the AI chat service.
H2f. Credibility will positively influence user satisfaction.

Ease of use

Ease of use has a positive impact on user satisfaction (Sallam *et al.,* 2023). Research supports this notion, indicating that when users encounter complex usage processes, they are more likely to experience heightened levels of anxiety, uncertainty, and frustration, which can detract from their overall experience (Li *et al.,* 2023). Therefore, simplifying these processes not only alleviates user discomfort but also enhances their satisfaction, fostering a more enjoyable and efficient interaction with the service or product.

H2g. Ease of use will positively influence user satisfaction

Enjoyment

Enjoyment positively effects user satisfaction (Wang, 2012). Enjoyment is defined as the pleasure and satisfaction derived from using the service, making the experience more engaging and rewarding. Research indicates that enjoyable experiences can significantly enhance positive emotions, leading to greater user satisfaction (Kim *et al.,* 2023). We also examine another study that derived satisfaction based on user subjectivity influenced by emotional responses (Zheng, 2019).

H2h. Enjoyment will positively influence user satisfaction

METHODS

Research Design

As mentioned earlier, based on research from Xing *et al.* (2024), it was identified that four independent factors (accuracy, anthropomorphism, creativity, and security) significantly impact one dependent factor, which is usefulness. Additionally, there are eight independent factors (satisfaction, logical inference, growth, convenience, ease of use, interactivity and credibility) that influence another dependent factor.

Among these, enjoyment is notably included as an independent factor affecting satisfaction, as noted by Wang (2012). This addition helps to create a more comprehensive model for the user experience of AI chat services, as illustrated in the accompanying diagram (Figure 1).

Instrument

The questionnaire consisted of 48 questions written in Bahasa Indonesia to avoid misinterpretation and was publicly disseminated via Google Forms, shared through WhatsApp. It utilized a seven-point Likert scale with response options including: strongly disagree, disagree, somewhat disagree, neutral, somewhat agree, agree, and strongly agree.

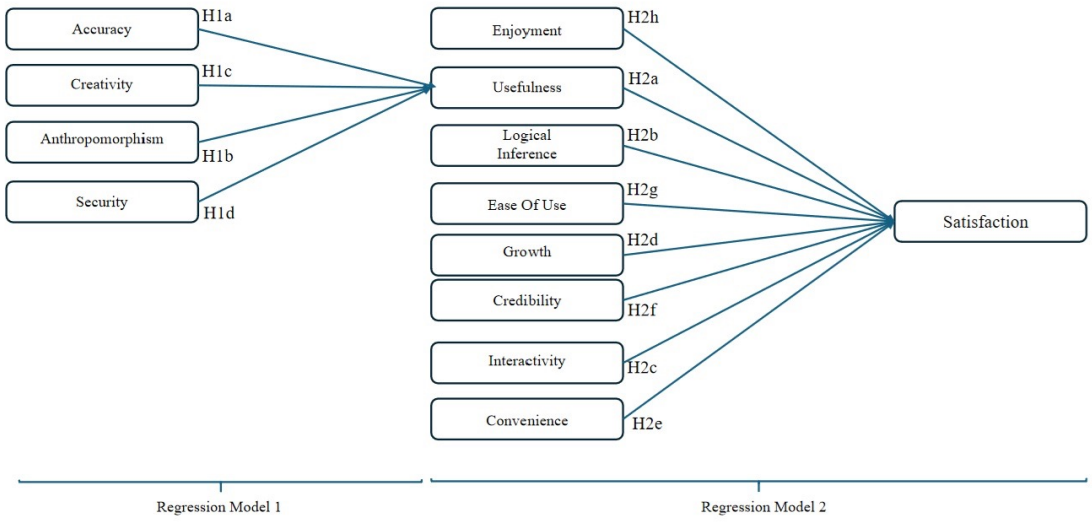

Figure 1. Research Model

The survey was distributed to 576 individuals, resulting in 365 valid responses from a diverse range of industries, which not only meets but exceeds the minimum sample size requirement of 250 respondents for factor analysis, as outlined by Comrey and Lee (2013).

To ensure the relevance of participants to the study, the questionnaire was structured into three sections. The first section featured a screening question aimed at confirming participants' familiarity with AI chat systems, specifically inquiring, "Have you used AI Chat (such as ChatGPT, Gemini, Copilot, and others) for over three months?" The survey advanced only if participants responded with a "yes." The second section of the survey concentrated on gathering basic demographic information about the respondents. Among the total 365 respondents, 71% were male, 41% were in the 21–30 year age group, and 70% had a Bachelor's Degree, with 50% of respondents working in Information Technology and Finance/Accounting. The comprehensive demographic details of the respondents are presented in Table A1 in the Appendix. The third section included essential core questions, which were answered using the seven-point Likert scale.

Data Analysis

The statistical analysis was conducted using the Statistical Package for the Social Sciences (SPSS), specifically version V21. SPSS is a widely utilized and highly regarded software tool that provides robust capabilities for efficiently managing and analyzing data, making it an essential resource in the diverse fields of social sciences and academic research.
The Kaiser-Meyer-Olkin (KMO) test was conducted to assess the adequacy of the sample size for factor analysis. Following this, Exploratory Factor Analysis (EFA) was performed to evaluate the reliability and validity of the data, identifying underlying relationships between variables and grouping them into factors based on correlations. Finally, multiple regression analysis was employed to investigate the interactions between the dependent variable and multiple independent variables, allowing the researcher to understand the extent to which each independent variable influences the dependent variable while controlling for others. This comprehensive approach (including the KMO test, EFA, and multiple regression analysis) ensures a robust examination of the data, enhancing the overall validity and depth of the findings.

RESULTS AND DISCUSSION

Exploratory Factor Analysis (EFA)

An EFA was conducted to assess the extent to which the items accurately measured the intended constructs associated with the discovered variables (Akturan and Tezcan, 2012). The study employed the KMO measure, which needs to surpass a threshold of 0.5, in conjunction with Bartlett's Test of Sphericity to assess the sufficiency of the sample, requiring a p-value below 0.05 (Malhotra, 2020). The KMO score in this study was 0.965, indicating a high level of sampling adequacy. The significance level was 0.00, indicating strong statistical significance (p-value < 0.05). The results validated the adequacy of the sample size for performing factor analysis.

Subsequently, a validity analysis was conducted for items Q1-Q48 as presented in Table 2, revealing seven constructs with eigenvalues greater than 1 (for Task 1). As a result, this study performed individual validity analyses for each of these factors. The KMO values and p-values for each factor are detailed in Table 2.

In accordance with the suggestions made by Hair *et al.* (2014), this study utilised factor loading as a method to evaluate convergent validity. A threshold of 0.5 was set to indicate the presence of significant loadings. From these criteria, four crucial characteristics were identified as the main features of perceived quality. The factor loading scores exhibited significant variation, ranging from 0.585 to 0.944, with all values exceeding the minimum acceptable threshold of 0.5. In order to assess reliability, the study analyzed the internal consistency of the questions using Cronbach's

Table 2. Assessments of Scale Along with Validity and Reliability

Construct	Questions	Items	Factor Loadings
Usefulness	Q1	It effectively saves time	0.809
Cronbach's α = 0.852	Q2	It effectively assists in daily work	0.831
KMO = 0.866	Q3	It provides personalized services based on user characteristics and preferences	0.786
	Q4	Applicability is comprehensive and versatile; it can answer various questions	0.780
	Q5	It helps me make informed decisions and judgments Factor	0.776
Accuracy	Q6	Responses are accurate	0.840
Cronbach's α = 0.869	Q7	The quality of answers is consistent	0.780
KMO = 0.866	Q8	Answers are fair, objective, and unbiased	0.811
	Q9	Responses are complete	0.843
	Q10	Responses are concise and clear	0.782
Logical Inference	Q11	Responses mention concepts and ideas that are consistent and coherent throughout the conversation	0.832
Cronbach's α = 0.839			
KMO = 0.796	Q12	The expression of response content is logical and well-organized	0.840
	Q13	It can automatically extract keywords to handle user queries with vague expressions	0.767
	Q14	It can understand the context of the conversation well	0.857
Interactivity	Q15	The response time is fast, ensuring high efficiency	0.807
Cronbach's α = 0.765	Q16	It provides smooth and stable operation	0.857
KMO = 0.765	Q17	The interactive interface is clear and engaging	0.848
	Q18	It allows interaction through voice or images	0.585
Growth	Q19	It has the ability to correct incorrect answers	0.758
Cronbach's α = 0.753	Q20	AI can be trained by users to improve its performance	0.780
KMO = 0.748	Q21	AI versions can self-upgrade	0.816
	Q22	It supports resource sharing	0.685
Anthropomorphism	Q24	It can communicate fluently and correctly in natural language	0.842
Cronbach's α = 0.820	Q25	Responses are flexible and not robotic	0.876
KMO = 0.715	Q26	The dialogue and discussion are in-depth	0.857
Convenience	Q27	It can be used anytime and anywhere	0.803
Cronbach's α = 0.709	Q28	It supports multiple languages for questioning	0.871
KMO = 0.630	Q29	The introduction of specific apps or application services	0.733
Credibility	Q30	The content of the answer has strong timeliness	0.840
Cronbach's α = 0.827	Q31	It provides detailed information sources	0.886
KMO = 0.713	Q32	AI's knowledge resources are authoritative and reliable	0.860
Ease of use	Q33	It can provide guidance and suggestions to help users describe issues	0.860
Cronbach's α = 0.808	Q34	The operation process is simple and easy to learn	0.880
KMO = 0.698	Q35	Easy login and registration	0.812
Creativity	Q36	The content of the answer is unique	0.885
Cronbach's α = 0.859	Q37	Answers are interesting and creative	0.928
KMO = 0.685	Q38	It provides inspiration and reference	0.835
Security	Q39	It protects personal privacy from intrusion	0.839
Cronbach's α = 0.890	Q40	AI has a robust regulatory and review system	0.920
KMO = 0.740	Q41	It can identify sensitive information and prevent the generation of malicious content	0.911
Enjoyment	Q42	I think using the AI chat service is fun	0.941
Cronbach's α = 0.935	Q43	I think using the AI Chat service is interesting	0.944
KMO = 0.770	Q44	I think using the AI Chat service is enjoyable	0.940
Satisfaction	Q45	I will be very satisfied with it	0.917
Cronbach's α = 0.920	Q46	I will consider its quality to be very high	0.924
KMO = 0.852	Q47	It basically meets my expectations	0.876
	Q48	It will enjoy using it	0.873

alpha. The results consistently showed high values ranging from 0.709 to 0.935, all above the threshold of 0.70 established by Nunnally (1978). Table 2 presents a concise overview of the factor loadings and Cronbach's alpha for each construct. Based on this analysis, it can be concluded that all items in the study meet the necessary criteria for both validity and reliability.

However, a more thorough examination of anthropomorphism revealed that question Q23 did not align with the other questions constituting the anthropomorphism factor loading. Therefore, to obtain more valid results, the survey responses from Q23 were excluded from the analysis.

Linear Regression

In this study, we used linear regression twice with two dependent variables. Usefulness is the dependent variable in Regression Model 1, influenced by Security, Creativity, Anthropomorphism, and Accuracy. Meanwhile, Satisfaction is the dependent variable in Regression Model 2, influenced by Usefulness, Credibility, Interactivity, Ease of Use, Convenience, Growth, Logical Inference, and Enjoyment, as shown in Figure 3.

As indicated by Hair *et al.* (2014), tolerance and the Variance Inflation Factor (VIF) are the two primary methods used to assess multicollinearity. According to Kutner *et al.* (2004), the accepted threshold for tolerance values lies between 0.1 and 1.0. Another important measure of multicollinearity is VIF, where a value below 5.0 suggests that multicollinearity is not a concern (James *et al.,* 2013).

Regression Model 1

In this study, Usefulness served as the dependent variable, while the other components were treated as independent variables analyzed through linear regression. The initial VIF values, which ranged from 1.62 to 2.50, indicate the absence of multicollinearity in the dataset. The coefficient of determination (R^2) was found to be 0.579, meaning that the four factors identified account for 57.9% of user satisfaction, indicating a strong model fit. The F-test for the model yielded a p-value below 0.05, confirming the statistical significance of the model. When evaluating the relationships' effects, the p-values for Accuracy, Anthropomorphism, and Creativity were all below 0.1, indicating a direct and positive influence on Usefulness. Conversely, Security had a p-value exceeding 0.05, suggesting it did not directly affect Usefulness. Additional details can be found in Table 3.

Regression Model 2

Subsequently, a comparable examination was carried out, with satisfaction being the dependent variable. The VIF ranged from 2.273 to 3.695,

Table 3. Linear Regression for Usefulness

Dependent Variable	Independent Variable	Unstandardized coefficient B	Unstandardized coefficient Std. Error	Standardized coefficient Beta	T	p	VIF	Tolerance	Hypothesis	Result
Usefulness	Accuracy	0.356	0.048	0.379	7.391	0.000***	2.280	0.439	H1a	Supported
	Anthropomorphism	0.980	0.043	0.114	2.274	0.024**	2.176	0.459	H1b	Supported
	Creativity	0.285	0.047	0.329	6.118	0.000***	2.500	0.400	H1c	Supported
	Security	0.027	0.030	0.039	0.891	0.374	1.617	0.619	H1d	Unsupported
R2	0.579									
F-test	F= 126,251; p=0.00									
p-value	***	p-value ≤ 0.01								
	**	p-value ≤ 0.05								
	*	p-value ≤ 0.1								

indicating that there is no significant multicollinearity in this dataset. The R^2 value was measured as 0.765, showing that the four factors discovered in this study explain 76.5% of user satisfaction, suggesting a strong match for the model. The p-value for the F-test of the model was found to be less than 0.05, indicating that the model is statistically significant. Upon analyzing the influence of relationships, it was determined that the p-values for Factor 1, Factor 3, Factor 5, Factor 8, Factor 9, and Factor 12 were all over 0.05. This indicates that these factors have a direct beneficial effect on user satisfaction. However, Factor 4 and Factor 7 had a p-value greater than 0.05, suggesting that they do not directly influence user satisfaction. Further details can be found in Table 4.

Discussion Of Result

Result – Regression Model 1

The first task evaluates how Accuracy, Anthropomorphism, Creativity, and Security which were identified as these variable positively influence Usefulness. Our test shows that only three independent variables were strongly influencing usefulness, namely Accuracy, Anthropomorphism, and Creativity, while only one factor, Security, does not influence usefulness. In essence, the results strongly support the previous research (Xing *et al.,* 2024) by positioning key constructs as drivers, with all hypothesized associations being significant.

The linear regression analysis indicates that accuracy has the highest significant impact, with a p-value of less than 0.01 and a Beta value of 0.379. The study by Zhu et al., (2021) affirms that accuracy is a vital factor in improving the perceived usefulness of AI services. It is defined as the degree to which AI chat services provide responses that accurately represent the actual context, characterized by a high level of precision and a low occurrence of errors concerning the quality of information. This factor highlights the necessity for service providers to improve AI's natural language processing capabilities, thereby reducing errors and ambiguities in communication.

The next one is Creativity, with a p-value of less than 0.01 and a Beta value of 0.329, confirming the perceived usefulness of the AI services. A previous study by Park and Kim, (2020) showed that while Creativity did not significantly positively influence usefulness, our study indicates differently. Current popular AI chat services like ChatGPT have already reached version 4.0, which has more than 175 billion parameters compared with the early version in 2020, and the library keeps updating (Brown, 2023). A further study by Singla, (2024), indicates that the adoption of AI generates more value for organizations.

Table 4. Linear Regression for Satisfaction

Dependent Variable	Independent Variable	Unstandardized coefficient B	Unstandardized coefficient Std. Error	Standardized coefficient Beta	t	p	VIF	Tolerance	Hypothesis	Result
Satisfaction	Usefulness	0.196	0.042	0.188	4.636	0.000***	2.546	0.393	H2a	Supported
	Logical Inference	0.178	0.044	0.175	4.017	0.000***	2.922	0.342	H2b	Supported
	Interactivity	0.024	0.05	0.023	0.484	0.629	3.379	0.296	H2c	Unsupported
	Growth	0.105	0.04	0.106	2.595	0.010**	2.604	0.384	H2d	Supported
	Convenience	-0.055	0.042	-0.055	-1.29	0.198	2.837	0.353	H2e	Unsupported
	Credibility	0.089	0.039	0.1	2.282	0.023**	3	0.333	H2f	Supported
	Ease of use	0.157	0.05	0.152	3.117	0.002***	3.695	0.271	H2g	Supported
	Enjoyment	0.314	0.035	0.341	8.893	0.000***	2.273	0.44	H2h	Supported
R2	0.765									
F-test	F= 148.962; p=0,00									

p-value *** p-value ≤ 0.01
** p-value ≤ 0.05
* p-value ≤ 0.1

The result on anthropomorphism shows a p-value of less than 0.05 with a beta value of 0.114, indicating that this factor is significant for the usefulness factor. By definition, anthropomorphism specifically focuses on the AI chat's ability to exhibit human-like traits, such as understanding emotions from inquiries, which positively impacts the usefulness of AI chat services (Li and Wang, 2022) as confirmed by our study.

These three factors indicate the foundation of the AI chat, which is intended to be the core feature that constructs artificial intelligence. The accuracy of the conversation, the creativity of the content, and the human-like interaction all positively contribute to the usefulness of the AI chat.

On the other hand, the security factor shows different results from the previous journal. Users expect AI chat services to have robust security measures in place. This expectation means that security is considered a basic necessity rather than an added value that enhances the usefulness of the service. When security is adequate, it goes unnoticed by users because it meets their expectations. However, if security is lacking, it can significantly detract from the service's perceived usefulness. According to Anderson and Agarwal (2010), users only notice security when there are issues or breaches.

The primary purpose of AI chat services like ChatGPT, Gemini, and Copilot is to enable and assist users in solving problems, answering questions, and providing information efficiently and effectively. The core functionality and performance of the AI are what users find useful. Research by Oviedo-Trespalacios *et al.* (2023) shows that users prioritize the AI's ability to provide accurate and relevant responses over security features. Therefore, while security is essential, it does not directly enhance the core usefulness of the AI service.

Result – Regression Model 2

The second evaluation will focus on Task-2, which is the primary evaluation of factors influencing user satisfaction. This study verified that usefulness, logical inference, growth, credibility, ease of use, and enjoyment positively contribute to user satisfaction.

The component that substantially and strongly influences user satisfaction is now enjoyment (β = 0.341, $p<0.01$). Our study supports that enjoyment is a factor impacting user satisfaction, consistent with the findings of the previous study (Wang, 2012). It assesses enjoyment based on user input regarding the joy of user experience, fun when using the AI chat, and whether the services themselves are generally fascinating.

Next, with $p<0.01$ and $\beta = 0.188$, usefulness positively increases user satisfaction. The primary goals of using AI chat services for users are to assist them in answering their inquiries and to facilitate their efficient work. Both goals were achieved in a manner consistent with earlier research (Dell'Acqua *et al.,* 2023).

User satisfaction with logical inference is greatly influenced by its β of 0.175 and $p < 0.01$. This includes the AI chat's capacity to comprehend context and draw logical conclusions based on the information provided, either entirely or in part. Another finding from this factor concerns the AI chat's ability to understand user behavior and resolve challenging issues (Wang, et al., 2023c). Users are also more satisfied overall because they anticipate logically sound responses.

User satisfaction is positively impacted by growth ($p<0.01$ and $\beta = 0.106$) because customers value AI chat services' capacity for ongoing training, learning, and self-optimization. Studies indicate a relationship between personal fulfilment and progress (Kaufman, 2023). Users therefore expect AI services to not only correct errors but also to constantly improve their understanding through the integration of shared data and performance enhancements, culminating in the provision of

higher-quality services. For comparison, the current ChatGPT-4 can process not only text but also images, with parameters in the hundreds of billions. This version has been replacing version 3 (starting in 2020) since 2023 and is projected to be updated to version 5 in a couple of years (Brown, 2023).

Credibility, defined as the service's capacity to inspire confidence in the information it offers, has a positive impact on user satisfaction with $p<0.05$ and $\beta = 0.1$. Users mostly use AI chat services to obtain a variety of information and complete various tasks (Golan et al., 2023; O'Hagan et al., 2023). As a result, users' assessments of the service heavily depend on the accuracy and legitimacy of the information (Oviedo-Trespalacios et al., 2023). Users are more inclined to believe the validity of real-time information provided by an AI service if it is well-sourced and originates from reliable sources. This increases users' satisfaction with the AI chat service.

According to Sallam et al. (2023), customer satisfaction is positively impacted by ease of use. In this study, we found alignment with $p<0.01$ and a beta value of 0.152. Research indicates that users are more likely to feel anxious, unsure, and frustrated when faced with complex usage processes, which can negatively affect their overall experience (Li et al., 2023). This principle has been central to the design of ChatGPT-4's user interface experience (UIX). Four design principles have been adopted to enhance ease of use (McCade, 2024), simple and straightforward conversation, ease of use and learning, dark mode for reducing eye strain, and mobile accessibility for AI on the go.

While interactivity ($\beta = 0.023$, $p > 0.1$) in this study shows that interactivity is not significantly influential towards user satisfaction. This result is contrary to previous research, which found that interaction between users and services significantly increases satisfaction (Joo and Yang, 2023). Another study (Orden, 2023) also indicates that while interactivity positively influences user satisfaction, especially with chatbots, the effect is only marginal, which is consistent with our findings. When we look in detail at the questionnaire leading to the factor of interactivity, the responsiveness and interaction media, such as voice or image of the AI chat services, are measured. Many AI chat services today offer these options as premium features, which might explain why interactivity does not significantly influence satisfaction. The findings of this study suggest that the fundamental aspect of interactivity is not only dependent on the capacity for effective feedback between users and services but is also significantly shaped by the accuracy of the responses, which in turn enhances the usefulness of the services.

The last finding from our study proved that convenience ($\beta = -0.055$, $p > 0.1$) does not positively influence user satisfaction; in fact, it has a more negative influence and an unsupported result ($p = 0.198$). This finding contradicts existing research (Saha *et al.,* 2023). In another study (Ismulyana, 2020), convenience shows an indirect positive influence on user satisfaction. We looked into the details of the questionnaire related to convenience and identified two aspects that limit this factor. First, the ability to use AI chat services anytime and anywhere requires users to have constant connectivity and the necessary tools to access the services. Second, the language barrier and limitations, as this study was conducted using Indonesian as the primary language. These issues are also supported by the relatively late development of AI in Indonesia, and many users do not rely on AI chat services developed by foreign entities.

MANAGERIAL IMPLICATIONS

Businesses and organizations can leverage these insights to tailor their AI chat systems to meet specific user needs, thereby gaining a competitive edge in the market. Establishing continuous feedback mechanisms, as suggested by Oviedo-Trespalacios et al. (2023), can further improve system responsiveness and adaptability to user needs. By integrating these practical contributions, organizations can develop AI chat systems that not

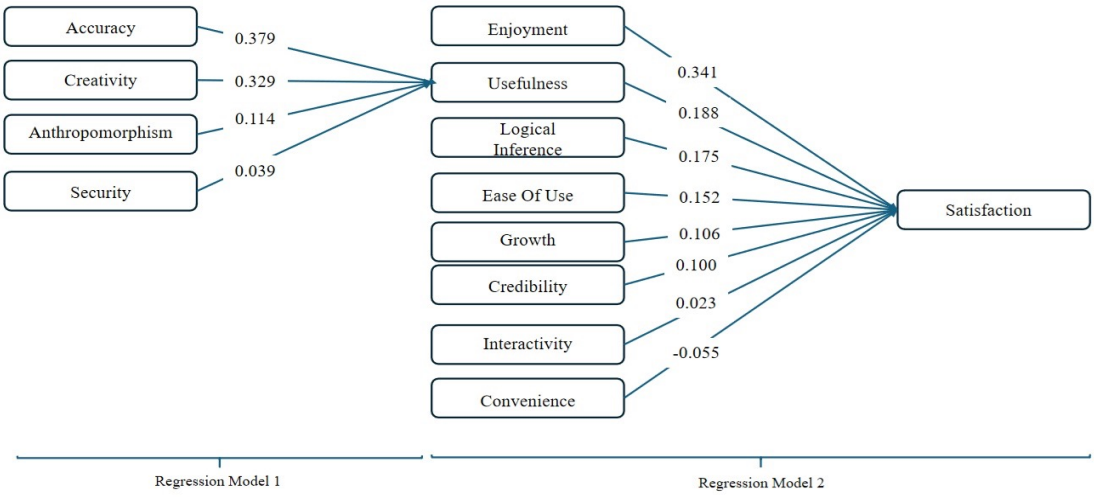

Figure 2. AI Chat User Experience Satisfaction Model

only meet functional requirements but also enhance overall user satisfaction and engagement..

CONCLUSION

Research Findings

This study delves into the factors affecting user satisfaction with AI chat systems, particularly within the Indonesian context. The research identifies twelve key dimensions that influence user satisfaction. Among these, enjoyment and usefulness emerge as crucial dimensions, significantly impacting user satisfaction. This aligns with Wang's (2012) findings on the importance of enjoyment in enhancing consumer satisfaction with self-service technologies.

The study further reveals that while factors like accuracy, creativity, and anthropomorphism positively influence the perceived usefulness of AI chat systems, security does not have a direct effect. This suggests that users view security as a baseline expectation rather than a value-added feature, consistent with Anderson and Agarwal's (2010) insights into user perceptions of security.

Moreover, the research highlights the limited impact of interactivity and convenience on user satisfaction, suggesting that these factors may not be as critical as previously thought. These findings challenge existing literature, such as Joo and Yang (2023), which posits that interactivity significantly enhances user satisfaction. Instead, the study underscores the importance of logical inference and growth in driving user satisfaction, emphasizing the need for AI systems to provide contextually relevant and evolving interactions.

Practical Contribution

This study provides several practical contributions that can enhance the design and implementation of AI chat systems, particularly in improving user satisfaction. By identifying enjoyment and usefulness as pivotal factors, developers are encouraged to prioritize these factors in AI chat system design. This focus can lead to more engaging and effective user interactions, ultimately improving customer retention and satisfaction, as supported by Wang (2012).

The research also highlights the importance of addressing both positive and negative factors influencing user satisfaction. Understanding potential negative impacts, such as slow response times or poor data security, allows developers and service providers to implement strategies

to mitigate these issues, enhancing the overall user experience. This aligns with Anderson and Agarwal's (2010) emphasis on the importance of practicing safe computing to build user trust and satisfaction.

Furthermore, the study's findings can inform training programs for AI systems, ensuring they are better equipped to handle diverse user queries and provide accurate, relevant responses. This is particularly beneficial in multilingual contexts, such as Indonesia, where language support is crucial. As supported by Ma and Huo (2023), providing comprehensive training and support can enhance user experience and acceptance of AI systems.

Limitation and Future Research

This study, while providing valuable insights into user satisfaction with AI chat systems, acknowledges several limitations that offer avenues for future research. One primary limitation is the sample composition, which predominantly consists of Indonesian users. This focus may restrict the generalizability of the findings to other cultural contexts. Future research should aim to include a more diverse and internationally representative sample to enhance the applicability of the outcomes across different cultural settings.

Additionally, the study primarily employed linear regression analysis to investigate the relationships between influencing factors and user satisfaction. This method may overlook potential complex interactions among these factors. Future studies could benefit from adopting more advanced analytical techniques, such as structural equation modelling, to uncover hidden connections and provide deeper insights into the dynamics of user satisfaction, as suggested by Xing and Jiang (2024). Moreover, while this research introduced enjoyment as a significant contributor to user satisfaction, it did not extensively explore possible negative factors that might affect user experiences with AI chat systems. Future investigations should consider both positive and negative aspects to achieve a more comprehensive understanding of user satisfaction. This approach aligns with the recommendations of Chatelan et al. (2023) for a balanced exploration of user experiences.

Lastly, as the AI chat industry continues to evolve, targeted research focusing on specific professional or demographic groups is warranted. Subsequent studies could conduct refined user experience evaluations tailored to different segments, contributing to the development of specialized AI chat systems that meet diverse user needs, as highlighted by Xing and Jiang (2024). ■

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APENDIX

Table A1

Demographic Characteristics

Items	Option	Frequency
Gender	Pria	258
	Wanita	107
Age Group	0 - 20	21
	21 - 30	149
	31 - 40	122
	41 - 50	68
	51 - 60	5
AI Chat System	ChatGPT	224
	ChatGPT & Gemini	53
	ChatGPT & CoPilot	25
	Others	63
Occupation Type	Information Technology	119
	Finance / Accounting	43
	Marketing	33
	Engineer	28
	Student	27
	Others	115
Highest Education	Diploma (D1/D2/D3)	24
	Bachelor's Degree	254
	Master's Degree	55
	Doctoral Degree	3
	High School / Vocational School	29
Total		365